

MAJOR POST-EVENT INQUIRIES AND REVIEWS: REVIEW OF RECOMMENDATIONS

A Tactical Research Fund project

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EXECUTIVE SUMMARY

BACKGROUND, PURPOSE AND SCOPE

Natural disasters and emergencies in Australia have been followed by formal, complex, post-event inquiries and reviews literally hundreds of times. These inquiries vary in form and focus, however, their common objective is to identify the causes of disasters and their consequences and to identify better future practices.

The outcomes of major inquiries in one jurisdiction sometimes have ramifications and lead to reform action in other states and territories. While this may be true of larger, higher profile events and inquiries, there is a foregone opportunity if the same process is not systematically undertaken for the outcomes of less prominent reviews and inquiries.

The purpose of this project is to generate a high level and comprehensive description of the major recurrent categories of recommendations across multiple post-event reviews conducted since 2009. The negative hypothesis being tested, provided to the review team, is:

'There are no common themes to be identified when comparing and contrasting major post-incident reviews of emergency incidents, and the outcomes of those incidents and consequent recommendations turn on their own particular facts.'

In testing this hypothesis, the project seeks to understand whether there is ongoing value for state and territory emergency services to consider the lessons from major reviews and inquiries from other jurisdictions within their own context, or whether lessons are too specific and lack broader import.

A core element of this project is the development of a comprehensive and user-friendly database of recommendations from post-event reviews and inquiries that can inform agencies own lessons identification practise now and into the future.

FINDINGS

To test the hypothesis, a list of 140 post-event reviews and inquiries undertaken since 2009 was compiled. Inclusion and exclusion criteria were applied to generate a short-list of 55 reviews and inquiries for analysis. 1,336 recommendations were imported into the database and categorised as belonging to one of 32 themes. Parallel recommendations that may have broader import for the Emergency Management (EM) sector were identified by asking the question, *'is this recommendation similar to a recommendation in another inquiry?'*

Overall findings

The analysis shows that the negative hypothesis is false; a significant number of parallel recommendations were identified amongst the reviews and inquiries. Furthermore, the analysis revealed a number of recommendations that have not been matched by similar recommendations, but are generic in nature and could have broader import for other jurisdictions.



A comprehensive database was developed that will be a valuable resource for gaining an overview of, and insight into, the recommendations that are made across multiple jurisdictions, hazards and inquiry types. This is an important tool capable of supporting increased inter-jurisdictional learning and lesson sharing.

The project team considers that continued development and use of this tool is a worthwhile endeavour, supporting the lesson management practices of EM agencies to:

- identify and understand the themes and recommendations from major post-event reviews that may be relevant to their jurisdiction
- track progression towards implementation of recommendations (not considered in this study)
- identify themes from other jurisdictions and review their systems to consider whether similar recommendations would be likely to occur (not considered in this study).

Given the size of the database and the need for consistent maintenance and updates, there is a clear need for a nationally coordinated approach. AFAC, or a similar organisation, could perform a coordinating role, acting both as database 'owner' and assisting jurisdictions to identify and consider recurring recommendations and themes within their own operating and risk environments.

Summary of dataset

Of the 55 reviews and inquiries subject to this review, 17 are Independent, 14 are agency, 13 are audit, 7 are parliamentary, 2 are coronial, and 2 are Royal Commissions. By jurisdiction, there were 18 reviews undertaken in Western Australia, followed by New South Wales and Victoria (9 each), Queensland (7), Tasmania (6), South Australia (3), and the Federal government (3).

With regard to the types of hazards and events that generate reviews and inquiries, the vast majority are undertaken in response to bushfires (34). Floods (6) and storms (3) are also significant stimuli of reviews and inquiries in Australia. A further 11 reviews and inquiries are 'all hazard'.

Detailed analysis of recommendations

The analysis revealed that recommendations can generally be understood as belonging to one of 32 descriptive themes. To give due consideration to the types of recommendations that are recurrent amongst the dataset (and to go beyond the simple validation that parallel recommendations exist) a subset of themes were analysed in greater detail. The sample was selected according to the five largest categories, three 'intermediate' categories, and the five smallest categories.

Detailed analysis focused on describing, and to an extent commenting on, a number of recurring recommendations highlighted by this review. It is noted that categorisation of findings is a subjective process and that numerous recommendations can be categorised in different ways based on context. Nevertheless, the value of this exercise lies beyond the observation of patterns and correlation in the data, and in description and consideration of patterns or the lack thereof. Careful consideration of the context is vitally important and must be practiced by EM agencies.



NEXT STEPS

- This study involved preparation of a comprehensive database of recommendations from major post-event reviews and inquiries undertaken since 2009. Categorisation of recommendations and analysis revealed a number of recurring common themes.
- A number of potentially significant recommendations were identified that may have broader significance for the EM sector. Areas of future interest were also identified that may be worthy subjects of more detailed scrutiny and review.
- There will be value in continuing this practice, to ensure that EM agencies are better able to identify cross-jurisdictional learnings within budget and time constraints. There is a clear need for a coordinating body such as AFAC to ensure that recurring recommendations are highlighted and considered across jurisdictions with greatest efficiency.



INTRODUCTION

BACKGROUND

Natural disasters and emergencies in Australia are typically followed by formal, complex, post-event inquiries and reviews. This has occurred literally hundreds of times; during the years since 2009 alone, there were over 140 inquiries into major bushfires, floods, storms, other natural hazards and emergency management arrangements.

These inquiries vary widely in form and focus, from Royal Commissions and other quasi-judicial formats, through expert panels and commissions of inquiry, to more focused in-agency reviews, but all seek to identify the causes of losses and to identify better practices to be used in future (and, in some cases, to attribute blame). Formal reviews and inquiries are an important aspect of lessons management. They provide opportunities for identification and learning of lessons relating to how the emergency management (EM) sector, including Governments and their organisations and agencies, business and industry and the individuals can better prepare for, respond to and recover from emergency events. In particular, there is significant interest in understanding how the findings and recommendations from formal reviews can help drive continuous improvement activities by agencies.

Over time, the outcomes of major inquiries in one jurisdiction, have had ramifications and led to reform action in other states and territories. For example, following the 2009 Victorian Bushfires Royal Commission (VBRC) there was widespread consideration of findings and recommendations by interstate emergency service agencies in light of their own operating and risk environments. This process also led to national initiatives such as revisions to the fire danger rating system, and amendments to the Australasian Inter-service Incident Management System (AIIMS).

While this observation may be true of larger, high profile examples, the extent to which cross-jurisdictional lessons have been applied from other post-event inquiries and reviews is unclear. Furthermore, given that the Terms of Reference (ToR) and carriage of each inquiry is shaped by the event in question and the jurisdiction within which it takes place, integration of findings and appreciation of the totality and coherence of findings is lacking. Budgetary and resourcing constraints further limit the opportunity for emergency service organisations to systematically review the outcomes of interstate inquiries and apply findings to their jurisdictional context within their typical continuous improvement practices.

The result is that potential opportunities for identifying lessons learnt across the diversity of Australia's post-event inquiry processes are foregone. There is a clear need for synthesis and categorisation of the outcomes of major post-event reviews and inquiries to identify the main recurrent themes and assist agencies to identify the value in their application in their own context.



PURPOSE

The purpose of this project is to generate a high level and comprehensive description of the major recurrent categories of recommendations across multiple post-event reviews conducted since 2009. The negative hypothesis being tested, provided to the review team, is:

'There are no common themes to be identified when comparing and contrasting major post-incident reviews of emergency incidents, and the outcomes of those incidents and consequent recommendations turn on their own particular facts.'

In testing this hypothesis, the project seeks to understand whether there is ongoing value for state and territory emergency services considering the lessons from major reviews and inquiries from other jurisdictions within their own context, or whether lessons are too specific and lack broader import.

A core element of this project is the development of a comprehensive and user-friendly database of recommendations from post-event reviews and inquiries that can inform agencies' own lessons identification practise now and into the future.



APPROACH AND METHOD

Aither's approach broadly consisted of the following phases:

- development of a database to identify major events and associated reviews, prioritise focus and capture data
- coding recommendations and thematic analysis
- interpretation of findings.

This approach allowed Aither to develop a searchable database of recommendations from major post-event reviews and inquiries since 2009, as well as informing the findings, lessons and opportunities arising from this review.

DATABASE PREPARATION

A core focus of the project was to prepare a searchable database of the recommendations of inquiries and after-action reviews undertaken since 2009. This was a vital step for undertaking the analysis as well as developing a resource that can be retained and developed by the Bushfires and Natural Hazards Cooperative Research Centre (BNHCRC) and the Australasian Fire and Emergency Service Authorities Council (AFAC) or other users into the future. The review built upon earlier preliminary work by Eburn and Hudson (2014) which sought to provide an overview of the main types of recommendations occurring over 75 years (1939-2013) of bushfire inquiries.

Through a desktop search of keywords and relevant websites over 140 reviews and inquiries occurring since 2009 were identified. Reviews can be understood as falling into the following categories: Royal Commissions, independent reviews commissioned by government, Coroner's reports, Emergency Management Inspector-General's (IGEM) reports, agency reviews, internal agency reviews, audit reports and parliamentary inquiries. The long-list of reviews was refined by applying exclusion and inclusion criteria to identify a subset of appropriate reports. Furthermore, reviews that did not appear to yield any practicable recommendations were ignored. A final short list of 55 major post-event reviews and inquiries was submitted to AFAC for validation and sign-off.

DATA CODING AND THEMATIC ANALYSIS

In total 1,336 recommendations were incorporated into the database. Each recommendation was then independently coded into one of 32 broad themes by three members of the review team. Where the review team disagreed on the coding of recommendations, the divergent interpretations were discussed, and the appropriate code agreed by consensus. Recommendations were initially coded based on the categories applied previously in Eburn and Hudson (2014) however as the process progressed, additional categories were induced.

This project called for analysis of a large dataset within a limited timeframe and set budget. The review team employed a targeted approach to interrogate the data, so that these limitations could be managed and still provide valuable insights. The themes were analysed to separate the largest high-level themes into groupings of recommendations with similar subject matters. The same process was applied to several themes that contained what could be described as an average number of



recommendations. The themes containing the least recommendations were also identified for analysis.

Given that many of the recommendations were equivocal, the process was iterative and a number of recommendations were reinterpreted and assigned to different themes time and again. In undertaking the thematic analysis, there have been a number of marginal interpretations that would allow for the recommendation to be categorised differently. This is a natural implication of qualitative methods for which a degree of subjectivity is inescapable. Rather than being prescriptive, the value of this high-level categorisation is that it allows for the users to interrogate the data and generate meaning for themselves.

INTERPRETATION

Finally, we examined the specific meaning of recommendations against others of the same subject matter to understand whether they are generic in nature and recur across multiple inquiries, or are very specific to unique contexts. Where possible, we have identified commonalities as well as going beyond similarities to offer commentary and interpretations of why specific themes are apparent. Our approach aims to point towards future areas of interest and highlight the value of this exercise for lessons management.



FINDINGS

The following section presents analysis and findings from the review. Findings are presented in order of an overall testing of the hypothesis, a high-level summary of the dataset and detailed analysis of themes. Where illustrative examples are called for, inquiries and reviews are referenced according to the file identification numbering set out in Appendix A: List of major post-event reviews and inquiries in Australia.

OVERALL FINDINGS

The negative hypothesis that this review set out to test was:

'There are no common themes to be identified when comparing and contrasting major post-incident reviews of emergency incidents, and the outcomes of those incidents and consequent recommendations turn on their own particular facts.'

To assess this assumption, a database of the recommendations from a shortlist of major-post event reviews was compiled and the recommendations were categorised into broad themes and analysed by asking the question, 'is this recommendation similar to a recommendation in another inquiry?'

The analysis shows that the negative hypothesis is false; a significant number of parallel recommendations were identified amongst the reviews and inquiries. Furthermore, the analysis revealed a number of recommendations that are not matched by similar recommendations, but are generic in nature and could have broader significance for other jurisdictions. The fact that recommendations are not echoed by inquiries from other jurisdictions could simply indicate that these jurisdictions have not yet experienced an event that reveals specific weaknesses or issues in a system.

A comprehensive database was developed and is a valuable resource for gaining an overview of, and insight into, the recommendations that are made across multiple jurisdictions, hazards and inquiry types. Continued development and use of the database is a worthwhile endeavour, supporting the lesson management practices of EM agencies to:

- identify and understand the themes and recommendations from major post-event reviews that may be relevant to their jurisdictions
- track a jurisdiction's progression towards implementation of recommendations (not considered in this study)
- identify themes from other jurisdictions and review their systems to consider whether similar recommendations would be likely to occur (not considered in this study).

Given the size of the database and the need for consistency when maintaining and updating it over time, there is a clear need for a nationally coordinated approach. AFAC, the BNHCRC or similar organisation may be ideally placed to perform a coordinating role, both owning and assisting jurisdictions to identify and consider recurring recommendations and themes within their own operating and risk environments.

In testing the negative hypothesis, we undertook more detailed analysis of the recommendations that fall within the major themes. To achieve a subset from across the breadth of themes, analysis was targeted at the five themes with the most



recommendations, themes from around the median, and the five themes with the least recommendations. The analysis is illustrative of the types of insights that could be derived from this exercise if employed by EM agencies in the future.

Recommendation:

That AFAC, the BNHCRC, or a similar organisation, maintain and utilise the recommendations database and provide access to state and territory jurisdictions for use in inter-state lessons management exercises.

SUMMARY OF THE DATASET

55 Australian major post-event reviews and inquiries were analysed to describe the major types of recurring themes since 2009 (see Table 2). The analysis incorporated 1,336 recommendations from a range of different types of review and inquiry. Of the 55 reviews and inquiries subject to this study, 17 are Independent, 14 are agency, 13 are audit, 7 are parliamentary, 2 are coronial, and 2 are Royal Commissions. By jurisdiction, the majority were undertaken in Western Australia (18). For comparison, there were 9 reviews and inquiries each in New South Wales and Victoria, 7 in Queensland, 6 in Tasmania, 3 in South Australia, and 3 undertaken by the Federal government. There were no reviews or inquiries undertaken in the Australian Capital Territory or the Northern Territory within the subset selected for this project.

With regard to the types of hazards and events that generate reviews and inquiries, the vast majority are undertaken in response to bushfires (n=34). Floods (n=6) and storms (n=3) are also significant originators of reviews and inquiries in Australia. A further 11 reviews and inquiries are 'all hazard', relating to generalised emergency management arrangements across hazard types. It is important to note that this project is focused at the number of inquiries, not the number of natural hazards or events. There are occasions where several different inquiries or reviews may be called in response to a single event.

The analysis revealed that recommendations can generally be understood as belonging to one of 32 descriptive themes. Table 1 shows the number of recommendations from 55 inquiries in each of the 32 themes identified through this study. The themes with the largest number of recommendations were:

- Doctrine, plans, standards and legislative reform (n=200)
- Land use planning/ development/ building codes/ regulation of building and refuges (n=81)
- Community warnings and communication (n=76)
- EM agency organisation, management and authority (n=75)
- Incident Management Teams (n=73).

The absence of recommendations relating to topics that have been the focus of important policy decisions and public attention is interesting, at least to identify where attention in major inquiries may be lacking. Themes with the least recommendations include the role of police (n=12), role of Business and Industry (n=11), personal responsibility (n=9), Occupational Health and Safety (OH&S) (n=9) and offences (n=3).



TABLE 1: SUMMARY MAJOR DESCRIPTIVE THEMES AND NUMBER OF RECOMMENDATIONS

Descriptive theme	Number of inquiries ¹	Number of recommendations	Percentage of recommendations
Doctrine, plans, standards and legislative reform	42	200	15.0%
Land use planning/ development/ building codes/ regulation of building and refuges	11	81	6.1%
Community warnings and communication	25	76	5.7%
EM agency organisation, management and authority	21	75	5.6%
Incident Management Teams	21	73	5.5%
Training, skills and behaviours	25	68	5.1%
Assets and technology	21	61	4.6%
Whole of government response/State government responsibility	18	61	4.6%
Inquiry, audit and after-action review	22	61	4.6%
Community education and preparedness	25	58	4.4%
Role of Local Government	11	48	3.6%
Cooperation between emergency services	25	46	3.4%
Mapping and data quality	18	45	3.4%
Relief and recovery	14	41	3.1%
Hazard reduction burns	12	36	2.7%
Research	13	34	2.5%
Pre-fire season preparation	16	30	2.2%



Descriptive theme	Number of inquiries ¹	Number of recommendations	Percentage of recommendations
Incident area and inter-agency communication	18	30	2.2%
Access to fire ground	11	25	1.9%
Volunteers	9	24	1.8%
Role of Commonwealth Government	9	23	1.7%
Funding	11	19	1.4%
Electricity infrastructure	8	19	1.4%
Insurance and legal liability	8	17	1.3%
Evacuation and shelters	8	15	1.1%
Incorporate local knowledge	9	13	1.0%
Emergency powers	9	13	1.0%
Role of police	7	12	0.9%
Role of Business and Industry	6	11	0.7%
Personal responsibility	7	9	0.7%
Occupational Health and Safety (OH&S)	6	9	0.7%
Offences	3	3	0.2%
Grand Total	55	1,336	100%

Note: 1) Reviews and inquiries may have recommendations that relate to multiple themes.



A number of high-level observations are illustrative of the types of insights that frequency analysis of the recommendations can provide. Figure 1, Figure 2 and Figure 3 present frequency analysis of recommendations by state, inquiry type and hazard type respectively (Appendix B – Frequency of recommendations). Further analysis by jurisdictions would articulate the underlying reasons behind, and correlation between these observations, and may be useful for planning and prioritising analysis towards inquiries and recommendations that are of greatest interest and value to their own context:

- Western Australia and Queensland have produced the most recommendations overall, accounting for 28 per cent and 23 per cent of recommendations respectively.
- Queensland is also responsible for the bulk of recommendations relating to land use planning, development and building codes (66 per cent) while 75 per cent of recommendations relating to this theme are made in relation to flood events.
- Federal inquiries and reviews make recommendations within their sphere of influence such as role of the Commonwealth Government (35 per cent) or electricity infrastructure (11 per cent), but are noticeably silent concerning operational matters.
- Royal Commissions are responsible for 47 per cent of recommendations related to insurance and legal liability.
- Recommendations concerning the role of business and industry are better represented by flood (78 per cent), storm (11 per cent) and technical hazard reviews (11 per cent). Interestingly, no bushfire related inquiries make reference to the role of industry.

It is important that jurisdictions initiate this analysis to ensure that areas of greatest value are investigated. Given the examples above (and notwithstanding the fact that the 2012 Queensland Floods Commission of Inquiry (QFCI) (25) made a large contribution to the land use planning, development and building codes category) flood inquiries undertaken in Queensland would be a good focus for jurisdictions who have identified land use planning controls as a critical need. Likewise, jurisdictions seeking to reveal recommendations related to EM agency organisation, management and authority would be ill advised to search for recommendations from Federal reviews or inquiries. Given that the role of business and industry appears to be underrepresented when it comes to bushfire, there may be value in considering these recommendations in a bushfire context.

TOP FIVE MOST FREQUENT THEMES

Themes with the largest number of recommendations are worthy of further exploration, given they have received the most attention in reviews and inquiries since 2009. Therefore, they may be of greater interest for state agencies and jurisdictions. The recurring recommendations within the top five largest themes by number of recommendations are described below.



Doctrine, plans, standards and legislative reform

The largest theme is doctrine, plans, standards and legislative reform which incorporates 200 recommendations from 42 inquiries. Numerous recommendations advise that governments, or their agencies, implement already adopted policies or plans, or enforce or use already available laws (for example see inquiries 2, 14, 25, 27, 30, 33, 42, 50 and 55). Inquiries also recommend that governments and agencies provide further training or guidance on government or agency emergency management roles or that further, specific functions be given to agencies and office holders who already have responsibilities under current plans (54, 45, 43, 42, 41, 45, 34, 30, 27, 17 and 5).

Concerning review or reform of doctrine, plans and standards, a number simply recommend that plans or policies be reviewed (54, 48, 42, 27, 22, 21, 7 and 2). Others are detailed, urging that state emergency management plans be reviewed to deal with the very risk under inquiry rather than in a more generic or 'all hazards' way. Where the recommendations do refer to specific issues, they do not detail what or how the issues should be dealt with. Matters that have been the subject of recommendations for review include: dealing with power black outs, maintaining mobile communications in times of power failure, dam management, interstate deployment, waste management, state relief and recovery, command and control, airbase safety, private sector preparedness and response, aerial monitoring of fires, risk assessment including identifying and planning for the protection of assets within the agencies area of responsibility, the appropriate strategic focus or role of agencies, monitoring river levels, the development of local and regional plans and, roles at the sub-state level and recovery planning.

A number of recommendations identify issues that should be added to state or federal government, COAG or Australia and New Zealand Emergency Management Committee agenda for the purposes of driving a whole of government response, or national consistency. For example, the Hazelwood Mine Fire Inquiry report (35) recommends that the 'State take the lead in advocating for a national compliance standard for PM2.5'.¹ The focus of other similar recommendations include redundancies in mobile communications, fire danger ratings, bush fire hazard reduction, the role of various government councils and committees, sharing or maintaining shared data and the development of unified legislation.

The need to develop common terminology or common doctrine between agencies to facilitate inter-agency cooperation is another common theme. For example, the 2016 Responses to, and lessons learnt from, the January and February 2016 bushfires in remote Tasmanian wilderness report (49) recommends that the 'Australian and Tasmanian Governments work together to ensure strong provisions to protect the Tasmanian Wilderness World Heritage Area from bushfire risks are included in the Tasmanian Wilderness World Heritage Area Management Plan'.

Other recommendations include the need to commit to, or provide resources to allow the implementation of earlier recommendations from other inquiries or reviews (52), and to ensure quality assurance processes with the EM sector by the creation of an Emergency Management Assurance Framework or IGEM (52) or the adoption of performance measures (42 and 11).

As the information above suggests it is not enough that governments or agencies review and update their plans and policies; they must also take appropriate steps to communicate plans, procedures, or legislative requirements either to the public, their

¹ PM2.5 refers to particulate matter pollution smaller than 2.5 micrometres



own staff and volunteers, or both. For example, the Hazelwood Mine Fire Enquiry Report (35) recommends that the 'Victorian Government develop a State Smoke Guide... to provide practical advice and support materials to employers, communities and individuals on how to minimise the harmful effects of smoke'.

When it comes to legislative reform, recommendations range from a general need to review the relevant legislation (32, 10, 5 and 2) to very specific recommendations including to:

- create new agencies (52)
- improve the funding or management of and response by relevant agencies (46)
- empower agencies or officeholders to exercise new or expanded powers or to require them to adopt policies or procedures (35)
- recognise or enhance the standing of volunteers (31)
- require mitigation action by individuals or businesses (25)
- give legislative effect to earlier guidelines or policies (15)
- ensure provisions for the formal declaration of a state of disaster, emergency or alert (10).

Land use planning/development/building codes/regulation of building and refuges

The bulk of the recommendations in this theme derive from flood inquiries, with the remainder concerning fire (19 in total, with over half from the 2010 VBRC (see 10)) and all hazards (1). Of the 61 flood-related recommendations, 52 were made by the 2012 QFCI (25). The recommendations can be grouped as per below, with commentary of the main themes and issues dealt with. (Note: as with other codes, there is some overlap or blurred boundaries: for example, a suggested legislative change could be assigned to the code 'Doctrine, plans, standards and legislative reform', however is discussed here as it concerns planning legislation specifically).

At the broadest level, a number of recommendations are concerned with the development and consistency of State planning policies and guidelines, aimed at ensuring that development does not occur without due assessment of risk, via more coordinated, state-wide policy and guidelines. An example is from the 2013 Hawkesbury-Nepean Valley Flood Management Review (29) which recommended development of a NSW Planning Policy and Guideline. The 2012 QFCI (25) dealt with the need to clarify or improve aspects of the existing State Planning Policy 1/03 and the Sustainable Planning Act 2009 (Queensland). The 2010 VBRC (10) recommended restricting development in fire prone areas, via use of risk overlays. There would be merit in comparative examination of such issues across jurisdictions, and the recently commenced BNHCRC research project in this area is noted. Two inquiries saw the need for higher level consistency to be achieved via a 'designated group or body', suggesting that other inquiries saw existing organisational structures as adequate (29 and 32).

At a finer scale within the planning regime, attention has focused on development applications and approvals or decision-making criteria, via recommendations aimed at ensuring the above state-wide policy frameworks are applied consistently through consideration of specific developments or classes thereof. Almost all in this category are



from the 2012 QFCI (25), although the VBRC (10) inquiries and the Western Australia (WA) Review of the ability of the Department of Environment and Conservation Western Australia to manage major fire report (7) dealt with the role of fire agencies, and matters regarding vegetation removal.


The QFCI (25) recommended a 'model flood planning controls' and elements of that, and it is noted that such 'model codes' are a standard means of applying new knowledge across planning regimes, promulgating new practices prior to their formal incorporation in jurisdictions. With floods, the main focus is on general and some specific recommendations aimed at ensuring that flood risk information was readily available and used in development application and approval process. Some very specific issues are attended to, such as electricity supply for sewage plants and the location of necessary infrastructure and services in flood prone basements. Several more specific recommendations concerned the availability and application of information via risk/risk based mapping/likelihood and consequences in decision processes: the availability of flood risk information useful at property or precinct level has been and remains an ongoing matter of attention.

Attention has been paid to making risk-related information available to potential property buyers and existing owners, especially from the 2011 WA 'Shared Responsibility' inquiry (15). The consistent message is that the flood and fire risk status of properties should be firstly known, and secondly easily accessed by relevant parties. The 2010 Senate Select Committee report, 'Incidence of bushfires across Australia' report (9) went further and recommended a national house loss risk index.

The 2010 VBRC (10) and 2012 QFCI (25) reports discussed restrictions on resettlement or development of post-event areas, in Queensland via use of an existing 'limited development' zoning measure. The VBRC recommended non-compulsory acquisition, and the development of a policy dealing with regional city growth areas and small rural lot development, these being areas where losses occurred and where changes in land use and thus risk continue. Use of existing measures were also identified by the QFCI regarding use of interim planning instruments under relevant legislation. It appears that adjusting existing laws and other instruments has considerable potential that has been revealed by inquiries. This was found to be the case with instruments outside the main planning act to ensure consistency across the broader planning regime (QFCI), and with SA 3959-2009 and relevant building codes (VBRC).

Attention has also been paid to infrastructure, mainly by the 2012 QFCI (25), via recommendations dealing with ensuring evacuation routes, protection of critical community assets, and the management of flood levees.

Some consistent recommendations emerge across the above, although specific to many different jurisdictional contexts and often targeting specific planning instruments and codes. One is for planning decision making, at various levels, to gain advice or input from emergency services organisations, matched with various detailed amendments to ensure that consistent attention is paid to flood (and fire) risk across all elements of planning regimes. Another is for the development and better use of flood and fire risk information to be made available to property buyers and owners. While these recommendations in a general sense are clearly logical, a qualification is that more than half arise from one inquiry (2012 QFCI, 25) and this cautions toward careful translation of particular recommendations in other jurisdictions given the variation in planning regimes across the states and territories. It is noted that in this area, while emergency agencies



may have input to reforms, the ability to commence and implement most of these recommendations lies elsewhere in the political and policy system.

Community warnings and communication

There are 76 recommendations from 25 separate inquiries that relate to community warnings and communication. This is unsurprising – the need to alert the public of potential danger emanating from an incident, provide advice about what to do, and communicate arrangements for response, relief and recovery is critical for any emergency. Within this theme, a large number of recommendations (20) relate to the timeliness, accuracy, clarity and consistency of alerts and information. The specific actions proposed typically relate to reviewing current practice for issuing alerts, as well as developing standard approaches and techniques to providing emergency warnings and information. Of broader importance for the EM sector is the repeated recommendation made by the 2011 Tasmanian Auditor-General Report on Bushfire Management (11) and 2010 Senate Select Committee on Agriculture and Related Industries Incidence of bushfires across Australia reports (9) for Federal and State government cooperation in pursuit of consistency of warning systems and terminology. These recommendations are noteworthy because they elevate the goal of accurate and consistent community warnings and communication to the national scale, rather than a specific State jurisdiction.

19 recommendations relate the need to develop, implement or review specific warning or communication platforms for community warnings and communication. Almost all of these recommendations highlight the need for innovative systems to ensure that alerts are accurate, timely and consistent across the range of media that the public might expect to receive alerts. Four recommendations from separate inquiries echo the need for 'One Source One Message' content delivery management (CDM) software capabilities, which allows for alerts and warnings to be generated from a central location that are automatically and simultaneously sent out across multiple media (10 15, 18 and 19). Recommendations of at least two additional inquiries advocate for similar integrated and centralised systems for dispersing alerts and warnings (1 and 52). Given the diverse ways that people digest information, and the need for accurate, timely consistent information outlined above, this is unsurprising.

Multiple recommendations were made to government (and one industry operator) to develop, review or revise strategies, plans, protocols and guidelines for community warnings and communication. The recommendation to develop specific State-level community warning and communication plans or strategies was highlighted by five recommendations (14, 19 28, 32 and 35). This type of recommendation may be driven by the particular focus of the inquiries; audit, agency and independent reviews are all necessarily prepared to suggest improvements to the way that governments respond to emergencies.

Since 2011, the use of the internet and social media to communicate with the community during emergencies has been a prominent topic. As highlighted by a number of recent inquiries, modern modes of communication such as the internet and social media offer a range of potential benefits and risks for communicating with the community during events. By and large, inquiries view increased use of social media by government agencies as an opportunity to improve how information is relayed to the community during emergencies. Four inquiries recommend expanded use of social media for this purpose, including providing the necessary resources to actively support the use of social



media, and integration with existing modes of communication (17, 19, 23, 32). This is an indicator of the evolving nature of public communication and provision of information, and the need for agencies to be a part of the conversation.

Emergency management agency organisation, management and authority

Overall, there were 75 recommendations relating to the EM agency organisation, management and authority theme. This theme is concerned with a broad range of topics relating to first responder EM organisations, from specific institutional systems and policies employed by government agencies to undertake their designated EM roles and functions, to considerations such as the location of offices and geographic boundaries.

The majority of recommendations (17 in total) relate to workforce planning and resourcing, as well as the recruitment and retention of staff. These recommendations are derived from 12 separate reviews. Recommendations within this category are largely specific in nature, although many recommendations highlight the need to increase and maintain skills and experience within agencies, and minimise the loss of core skills and experience. These considerations are crucial to the workforce needs of any EM agency or organisation; planned approaches to ensuring that agencies acquire and maintain the appropriate skills and experience are required.

Also of broader importance for the EM sector is the recommendation to ensure that resource allocation mechanisms allow for an accurate reflection of resources deployed to a specific location at any given time. The context of the inquiries that prompted these recommendations is important; both the Review of the initial response to the 2015 Wye River – Jamieson Track fire (43) and the AFAC Independent Operational Audit - South Australian Fires of January 2015 (38) are directly concerned with the operational response to emergencies.

The need for standardised processes, systems and tools is true of all organisations to ensure consistency across an agency's activities. 14 recommendations relate to this need, derived from 8 different reviews. An example is the 2017 Independent Review of the Extreme Weather Event South Australia 28 September - 5 October 2016 (54), which recommended that the State Emergency Service 'identify and implement a robust system and procedures for prioritising, allocating and coordinating multiple tasks'.

As observed in other themes, the recommendations are mostly specific to the particular issues or problems faced by a particular agency. Recurrent across the 2013 Malone Review into the Rural Fire Service (33), 2011 Management of Rural Fire Services in Queensland (13) and 2011 Review of the February 2011 Tostaree Fire (14) was the need for common communication and information transfer platforms amongst first responder agencies (principally Rural Fire Brigades) including email.

Recommendations from three inquiries also convey the need to affirm a specific vision or principles within agencies' corporate policies or statements (2016 Major Incident Review of the Esperance District Fires DFES (48), Malone Review into the Rural Fire Service (33) and Review of the Ability of the Department of Environment and Conservation Western Australia to Manage Major Fires (7)).

Incident Management Teams

Of the 73 recommendations concerning incident management teams (IMTs) all but one concern bushfire, and almost all arise from specific event inquiries rather than wider reviews. The largest set of detailed recommendations are drawn from the deliberations



of the 2012 WA Post Incident Analysis Blackwood Fire 8 inquiry (22) (although note that some inquiries gather multiple elements into one recommendation, e.g. the Independent Review of the SA Extreme Weather Event (54)). Recommendations are generally very specific to a particular event and jurisdiction, and reiteration of detail is less important here than distillation of overall themes that recur through the suite of issues and recommendations. These are:

- The need for IMTs to be pre-formed and ready prior to events, clearly entraining personnel, authority and resources from multiple agencies, with ensuing clarity and coordination in operation during events.
- Clarity over the location of responsibility (overall and for specific roles), and over the chain-of-command that will operate in action.
- The need for incident action planning to ensure readiness and the incorporation of new knowledge and contextual changes.
- Issues of adequacy of resources (especially including information), personnel training, and assurance of competence.

It is noted that this set of recommendations are clearly within the purview of fire agencies to initiate and implement, although often they require the coordination of other, non-fire agencies. In that sense, while specific to IMTs, issues and options arise in this theme that are relevant to the whole of government response/state government responsibility theme (discussed below).

INTERMEDIATE THEMES

Analysis of themes that fall outside of the top and bottom five themes by number of recommendations (intermediate themes) is also likely to reveal where parallel recommendations have been made. Recurring recommendations from within this subset are described below.

Whole of Government response/State Government responsibility

The 61 separate recommendations in this category arise from 18 different inquiries dealing with flood, fire and to a lesser extent storm events, across several jurisdictions. The most (22) are contained within the 2012 QFCI (see 25), followed by 7 recommendations in the Independent Review of the SA Extreme Weather Event report (see 54) and 6 recommendations in the 2011 Review of the 2010-11 Flood Warnings and Response (see 17). At a broader level than specific areas such as Incident Management Teams, recommendations in this theme deal with issues requiring the attention, skills or authority of state or territory agencies outside the emergency management domain, or by a state or territory government as a singular authority. It is noted that the target of the bulk of recommendations in the most common source (QFCI, 25) is stated as 'the Queensland Government', thus being cast as a whole-government responsibility rather than that of a particular agency or actor within the government, even where the location of responsibility may be implicit (e.g. councils, a specific department). Many of these relate to an issue particular to that event or jurisdiction, such as flood management and dam operations.

The recommendations vary significantly in specificity, from general calls for more coordination across agencies, to detailed measures such as adding to the membership of a specific sub-committee. In some cases, the need for a new, central policy unit or



centre to ensure coordination is expressed (see 33, 53 and 54). It is assumed that in other cases, existing coordination mechanisms were considered adequate or amenable to improvement. The responsibilities or use of the skills or authority of non-EM agencies is the subject of a number of recommendations, including some concerning the role of central agencies (e.g. premier and cabinet, attorney-general) and more focused roles or contributions of line departments (e.g. education, health, children's affairs). Some attention is paid to the carriage of relief and recovery matters (e.g. 2013 Victorian Flood Relief and Recovery (see 28)).

While the recommendations vary greatly in their resolution and targeting of jurisdiction-specific issues and contexts, the clear theme emerging is for a greater or optimal level of coordination across multiple departments outside of the emergency management area in collaboration with EM agencies, via specific measures and by the structure and composition of state-wide governance mechanisms such as state emergency management committees. Given the current EM focus on shared responsibility (in this case, shared across portfolios) and the recent emergence of new all-hazard overview governance arrangements (e.g. in Victoria and Queensland), this is an area that may be worthy of closer examination through comparative policy and governance analysis.

Volunteers

Given that volunteers are a fundamental and highly valued component of emergency management in Australia, it is surprising that only 9 inquiries and 24 recommendations deal with volunteers. This may reflect a lack of argument and evidence presented, an assumption of regard and importance that remains unremarked, or the limits of specific terms of reference. The Tasmanian 2016 State Fire Commission report (see 46) warned of volunteers being undervalued and sought better recognition. The WA 2016 Major Incident Review of the Esperance District Fires DFES report (see 48) made a general request for better acknowledgement of the role of volunteers, and suggested a 'Volunteer Charter'.

Recommendations relating to volunteers also encouraged agencies to collect data to understand their volunteer workforce (see 36, 44 and 51), to actively plan to recruit, engage and retain volunteers (36, 51) and to acknowledge, recognise and reward volunteer service (18, 46). Inquires also recognise the need to actively manage the volunteer workforce (18), to have volunteer specific policies to deal with issues that are generally well covered with employees such as fatigue management (44), provide support to volunteers (33, 36) and record and be able to identify volunteer activity and availability (36).

Two very specific recommendations were to maintain a register of volunteers qualified in the Australasian Inter-Service Incident Management System (AIIIMS) and willing to take on IMT roles at the District level (see 33) and to train community volunteers, including training in AIIIMS, to allow them to provide flood information back to the relevant control agency (17).

In the recovery stage it was recommended that recovery agencies work with volunteer organisations to coordinate volunteer support to the community and ensure that support is complementary and directed to the areas in most need (40).

The recommendations within this theme suggest that governments need to support and encourage volunteers and their agencies. Illustrative examples include recommendations that suggest gifting the land where volunteer agencies had



established stations or training rooms (31), reimbursing out of pocket expenses, removing or at least reviewing legislative impediments (such as strict Work Health and Safety compliance) for volunteers in the emergency services (31), conducting state wide campaigns to promote volunteering (31), allowing state government employees leave to perform their volunteer emergency service duties (33) and providing corporate support from government funded emergency services to volunteer services to build closer working relationships (33).

Funding

There were 19 recommendations related to funding. This relatively low number of such an important topic may reflect the terms of reference of the inquiries and in particular, internal or agency inquiries that have to make recommendations to agencies that they can accommodate within their budget. The 2013 report on community Safety and Emergency Services in South Australia report (see 31) was the only recommendation to specifically suggest that the budget of the emergency services be increased.

Other findings recommend reallocation of funding from one agency to another (31) or alternative methods of allocating funds between the emergency services or units of a particular service (10, 13 and 33). Other recommendations would have budget implications but the recommendations do not expressly address those implications or where funds are to be found. For example, recommendations to increase resources for emergency services to reflect their increased role or responsibilities (32), to reimburse agencies for expenses incurred (40) or for state agencies to take on responsibility for expenditure that would otherwise be met locally (13).

Other recommendations call on governments or agencies to find or apply for funding to meet certain needs (11, 30 and 33). The 2013 NSW Independent Hazard Reduction Audit Panel report (30) recommended that money provided for hazard reduction in one year be carried over to the next if the hazard reduction could not be completed.

Finally, there were recommendations about changes to administrative arrangements for the collection of levies to raise funds to meet emergency management needs (10, 13, 15 and 33). The 2010 Senate Select Committee on Agriculture and Related Industries Incidence of bushfires across Australia report (9) made a recommendation directed to the Commonwealth not to increase funding, but to make Federal funding conditional on state agencies and governments agreeing to federal oversight of bushfire fuel reduction programs, that is using funding as a 'stick' to encourage compliance rather than as a necessary resource to enhance capability.

FIVE LEAST FREQUENT THEMES

Themes with comparatively fewer recommendations may also be of interest given they have not received as much attention from inquiries and reviews despite often being important in of themselves, or being the focus of significant policy interest. The recurring recommendations within the five smallest themes by number of recommendations are described below.

Role of police

The role of police in emergency management is rarely the focus of the inquiries and reviews within this study; only 12 recommendations relate to this category. The bulk of inquiries are principally concerned with ensuring that police organisations are aware of



and able to meet their roles and responsibilities under state EM arrangements, including by having specific plans in place for responding to emergencies. For example, the 2017 Independent review of the SA Extreme Weather Event (54) recommended that Tasmania Police conduct 'a review to ensure that emergency management is treated as a priority and a core function'. A more specific recurrent matter refers to the appropriate location for police to exercise incident control duties during emergencies. For example, the 2011 Review of the 2010-11 Flood Warnings and Response (17) recommends that 'Victoria Police revise coordinator arrangements to ensure a coordinator presence is maintained at the place where incident control is being exercised'. Echoing this, the 2010 VBRC (10) recommends that the 'State clarify whether... Victoria Police should discharge its coordination functions from the State Emergency Response Coordination Centre or from the State Control Centre'. It is noteworthy that inquiries from Queensland, South Australia, Victoria, Tasmania and Western Australia all make recommendations concerning the role of police, which could indicate that despite relatively lower attention, consistent issues prevail across jurisdictions.

Role of business and industry

Six inquiries made recommendations to private sector businesses, and the bulk are specific to particular situations. Given higher-level policy commitments to shared responsibility (generally taken to span government-community-business), and widespread interest in the sector in the role of firms, this minimal level of attention is noteworthy. In the only generic recommendation regarding the private sector, the Independent Review of the SA Extreme Weather Event report (54) recommended a program of encouraging 'businesses' (not defined) to prepare Business Continuity Plans. The NSW 2015 East Coast Storm and Flood report (40) warned against well-prepared primary industry operators being disadvantaged in terms of support, and sought better processes ('more elegant') for determining eligibility for support. The 2011 review of the 2010-11 Flood Warnings and Response (17) report made four recommendations regarding the responsibilities of dam operators. The 2012 QFCI (25) report also made the specific recommendation that Seqwater (Queensland bulk water supplier and dam operator) ensure that the Somerset Dam gallery is not susceptible to flooding.

Personal responsibility

It is worth noting that despite claims that emergency management depends upon shared responsibility (which includes individuals taking responsibility for their own safety and decisions) recommendations regarding personal responsibility fall in the lowest 5 areas of comment by inquiries. This is in stark contrast to the significant policy interest that this topic has generated across a number of jurisdictions.

Even where there are recommendations relating to the need for greater personal responsibility, the recommendations remain directed to governments and their agencies to encourage or facilitate people to take responsibility, rather than recommendations directed to the individuals or business who might be expected to accept that responsibility. An example is the 2017 Independent Review of the SA Extreme Weather Event report (54), which recommended that the SA SES establish a plan for 'coordinated provision of sandbags to the public'. This is a reflection on the audience of inquiries and reviews more than anything; governments are expected to facilitate and support individuals to recognise and act on their own personal responsibility.



Occupational health and safety

Six inquiries contain recommendations relating to occupational health and safety (OH&S). This is a relatively low number considering the operational focus of some inquiries and the importance that modern organisations place on the health and safety of their staff. Nevertheless, a total of 9 recommendations suggest explicit changes to OH&S policies, protocol and practice. Logically, recommendations are narrowed at the agency level rather than broader government actions. Three recommendations highlighted the need for designated safety officers and advisors within IMTs and brigades; the appointment of a safety officer to level 3 IMTs was preeminent (see 10, 12 and 33).

Another common topic was the need for protocols and procedures to support OH&S. The 2010 VBRC (10) recommended amendment to fire agencies' procedures for investigating safety incidents, while the Malone Review into the Rural Fire Service (33) advocated a review of medical and health protocols for Queensland's Volunteer Fire service organisation.

Offences

One might think that the criminal law could be a useful policy tool by requiring, upon pain of punishment, people to take active steps to reduce risks that are posed to their neighbours, for example by reducing hazards or by not engaging in hazardous activity during times of high fire danger or in floodwaters. Even so, only two recommendations refer to the use of the criminal law as part of the response to, and preparation for, natural hazards. Both recommendations are generic in nature, and arise from fire inquiries. The 2013 Tasmanian Bushfire Inquiry (32) recommended that the government review current laws to 'ensure there are suitable offences and penalties, investigation and enforcement capabilities...', while the 2009 WA Review of Western Australia's Bushfire Preparedness (6) report recommended that the State 'consider options for legislative amendments to extend criminal liability to all damage, injury or death directly caused by arson'.

The 2012 QFCI report (25) made the recommendation for local government and water distributors to make general arrangements to share information about investigation and prosecution of illegal water connections, presumably to avoid duplication of effort.

APPENDIX A: LIST OF MAJOR POST-EVENT REVIEWS AND INQUIRIES IN AUSTRALIA

TABLE 2: MAJOR POST-EVENT INQUIRIES SUBJECT TO THIS REVIEW

ID	Year	State	Inquiry type	Disaster type	Author	Title	No. recs
1	2009	WA	Agency	Bushfire	WA Department of Environment and Conservation	2009, Bridgetown Complex Post Incident Analysis (WA)	48
2	2009	WA	Audit	All hazard	Colin Murphy	2009, Coming Ready or Not: Preparing for Large-scale Emergencies (WA)	17
3	2009	WA	Coronial	Bushfire	A.N. Hope	2009, Record of Investigation into Death (2007 Boorabin fires) (WA)	5
4	2009	NSW	Independent	Flood	K E Moroney	2009, Recovery Coordinator's Report of the Mid North and Far North Coast Flood Recovery – May 2009 (NSW)	7
5	2009	QLD	Independent	All hazard	Jim O'Sullivan	2009, Report on a Review of Disaster Management Legislation and Policy in Queensland (QLD)	22
6	2009	WA	Agency	Bushfire	WA Director General, DPC	2009, Review of Western Australia's Bushfire Preparedness (WA)	6
7	2010	WA	Independent	Bushfire	Euan Ferguson	2010, A Review of the Ability of the Department of Environment and Conservation Western Australia to Manage Major Fires (WA)	17
8	2010	WA	Independent	Bushfire	P. Murphy	2010, Major Incident Review of Toodyay Fire December 2009 (WA)	13
9	2010	Federal	Parliamentary	Bushfire	B. Heffernan	2010, The incidence of bushfires across Australia. Senate Select Committee on Agriculture and Related Industries. (Federal)	15
10	2010	VIC	Royal Commission	Bushfire	B. Teague et al.	2010, Victorian Bushfires Royal Commission - Final Report (VIC)	67
11	2011	Tas	Audit	Bushfire	H. M. Blake	2011, Auditor-General Report on Bushfire Management (Tas)	11
12	2011	WA	Independent	Bushfire	S. Ellis.	2011, Major Incident Review: Lake Clifton, Red Hill and Roleystone Fires June	14



ID	Year	State	Inquiry type	Disaster type	Author	Title	No. recs
						2011. (WA)	
13	2011	QLD	Parliamentary	Bushfire	Queensland Public Accounts and Public Works Committee	2011, Management of Rural Fire Services in Queensland (QLD)	15
14	2011	VIC	Agency	Bushfire	Office of the Emergency Services Commissioner	2011, Review of the February 2011 Tostaree Fire (VIC)	29
15	2011	WA	Independent	Bushfire	M.J. Keelty	2011, Shared Responsibility: The Report of the Perth Hills Bushfire February 2011 Review. (WA)	55
16	2011	Federal	Parliamentary	All hazard	Commonwealth of Australia Environment and Communications References Committee	2011, The capacity of communication networks and emergency warning systems to deal with emergencies and natural disasters (Federal)	7
17	2011	VIC	Independent	Flood	N Comrie.	2011, The review of the 2010-11 Flood Warnings and Response (VIC)	93
18	2011	WA	Parliamentary	Bushfire	WA Community Development and Justice Standing Committee	2011, Western Australia's Readiness for the 2011-12 Bushfire Season (WA)	21
19	2011	VIC	Agency	Bushfire	Molino Stewart	2011, Fire Services Commissioner review of Community Bushfire Warnings (Vic)	18
20	2012	WA	Independent	Bushfire	M.J. Keelty.	2012, Appreciating the Risk: Report of the Special Inquiry into the November 2011 Margaret River Bushfire (WA)	10
21	2012	NSW	Parliamentary	Technical accident	NSW Government Select Committee on the Kooragan Island Orica Chemical Leak	2012, Kooragan Island Orica chemical leak (NSW)	7



ID	Year	State	Inquiry type	Disaster type	Author	Title	No. recs
22	2012	WA	Agency	Bushfire	WA Department of Fire and Emergency Services	2012, Major Incidence Review Black Cat Creek Fire (WA)	10
23	2012	WA	Agency	Bushfire	Noetic Solutions	2012, Post Incident Analysis Blackwood Fire 8 (WA)	58
24	2011	WA	Agency	Bushfire	Noetic Solutions	2011, Post Incident Analysis Blackwood Fire 11 (WA)	33
25	2012	QLD	Royal Commission	Flood	CE Holmes et. al.	2012, Queensland Floods Commission of Inquiry (QLD)	177
26	2014	NSW	Agency	Bushfire	Phil Koperberg	2014, 2013 Blue Mountains Bushfire (NSW)	6
27	2013	TAS	Audit	Bushfire	AFAC	2013, AFAC AUDIT-REVIEW The Tasmania Fires of January 2013 (TAS)	14
28	2013	VIC	Audit	Flood	Peter Frost	2013, Flood Relief and Recovery (VIC)	7
29	2013	NSW	Agency	Flood	NSW Department of Primary Industries, Office of Water	2013, Hawkesbury-Nepean Valley Flood Management Review Stage One (NSW)	20
30	2013	NSW	Independent	All hazard	NSW Independent Hazard Reduction Audit Panel	2013, Independent Hazard Reduction Audit Panel (NSW)	18
31	2013	SA	Parliamentary	All hazard	SA Select Committee on Community Safety and Emergency Services in South Australia	2013, On community Safety and Emergency Services in South Australia (SA)	14
32	2013	Tas	Independent	Bushfire	Malcolm Hyde	2013, Tasmanian Bushfires Inquiry (Tas)	103
33	2013	QLD	Independent	Bushfire	Ted Malone	2013, The Malone Review into the Rural Fire Service (QLD)	91



ID	Year	State	Inquiry type	Disaster type	Author	Title	No. recs
34	2014	NSW	Coronial	Bushfire	HCB Dillon	2014, Coronial Inquest into the Warrumbungle Bushfire (NSW)	23
35	2014	VIC	Independent	Bushfire	Bernard Teague et al.	2014, Hazelwood Mine Fire Inquiry Report (VIC)	18
36	2014	VIC	Audit	All hazard	John Doyle	2014, Managing Emergency Service Volunteers (VIC)	10
37	2014	WA	Agency	Bushfire	WA State Emergency Management Committee	2014, Parkerville Stoneville Mt Helena Bushfire Review (WA)	28
38	2015	SA	Independent	Bushfire	Independent Operational Audit	2015, AFAC Independent Operational Audit - South Australian Fires of January 2015 (SA)	18
39	2015	QLD	Audit	Bushfire	Andrew Greaves	2015, Bushfire prevention and preparedness (Report 10: 2014-15) (QLD)	2
40	2015	NSW	Agency	Storm	Darren Naumann	2015, East Coast Storm and Flood - April 2015 (NSW)	16
41	2015	WA	Agency	Bushfire	Nous Group	2015, Major Incident Review of the Lower Hotham and O'Sullivan fires DFES (WA)	3
42	2015	QLD	Audit	All hazard	Inspector-General Emergency Management	2015, Review of state agency integration at a local and district level (QLD)	5
43	2015	VIC	Audit	Bushfire	Inspector-General for Emergency Management	2015, Review of the initial response to the 2015 Wye River – Jamieson Track fire (VIC)	3
44	2015	WA	Audit	All hazard	Colin Murphy	2015, Support and Preparedness of Fire and Emergency Services Volunteers (WA)	4
45	2016	TAS	Independent	Bushfire	AFAC	2016, AFAC Independent Operational Review of the Management of the Tasmanian fires of January 2016 (TAS)	12



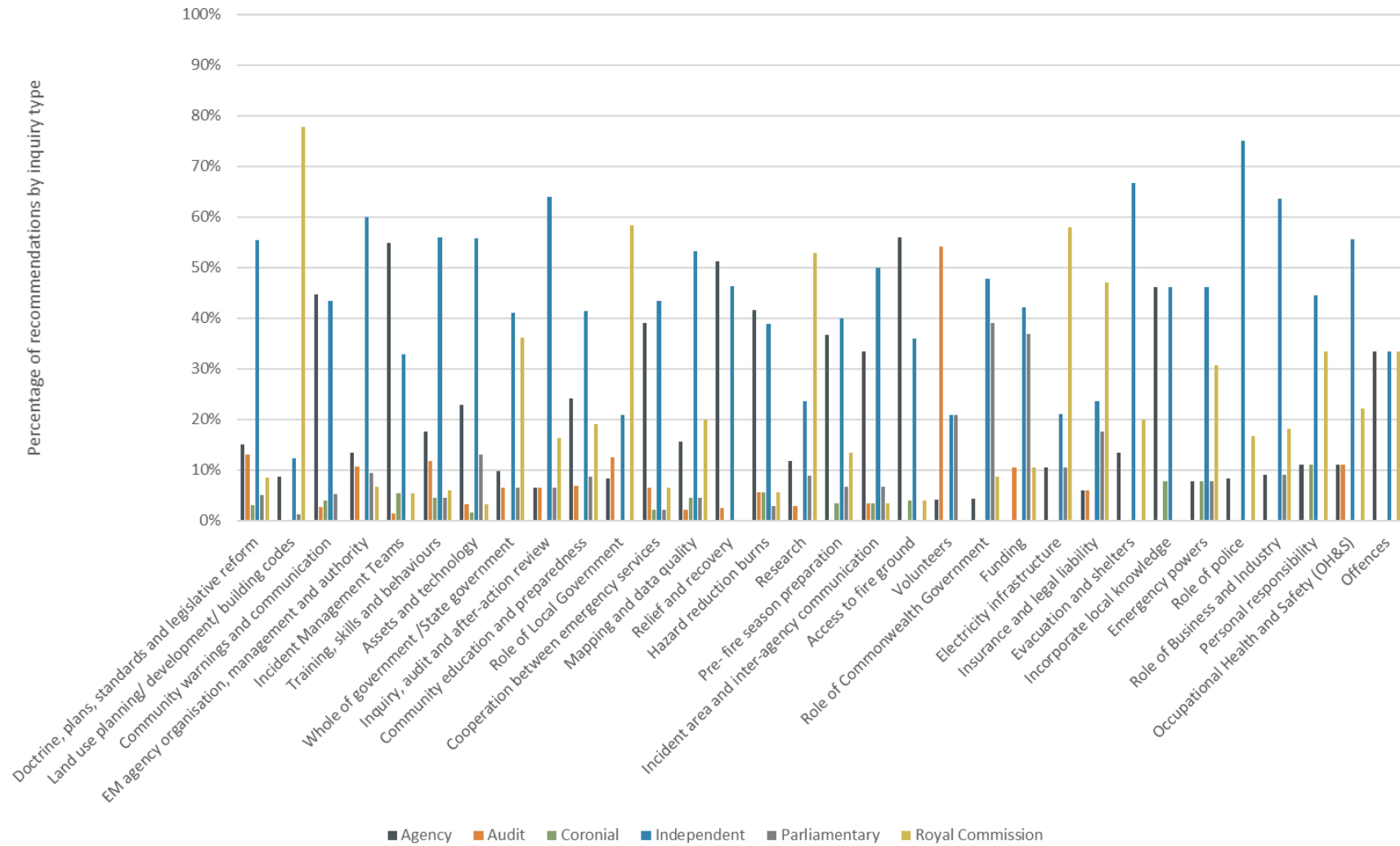
ID	Year	State	Inquiry type	Disaster type	Author	Title	No. recs
46	2016	TAS	Audit	Bushfire	TAS House of Assembly Standing Committee on Community Development	2016, Inquiry into the State Fire Commission (TAS)	10
47	2016	NSW	Agency	Storm	NSW Government Justice	2016, June 2016 East Coast Low (NSW)	7
48	2016	WA	Agency	Bushfire	Nous Group	2016, Major Incident Review of the Esperance District Fires DFES (WA)	12
49	2016	Federal	Parliamentary	Bushfire	Commonwealth Environment and Communications References Committee	2016, Responses to, and lessons learnt from, the January and February 2016 bushfires in remote Tasmanian wilderness (Federal)	6
50	2016	VIC	Audit	All hazard	Inspector-General for Emergency Management	2016, Review of Victoria's emergency management sector preparedness for major emergencies (VIC)	1
51	2016	NSW	Audit	All hazard	Grant Hehir	2016, SES Management of Volunteers (NSW)	6
52	2016	WA	Independent	Bushfire	Euan Ferguson	2016, Waroona Fire Special Inquiry (WA)	17
53	2017	TAS	Independent	Flood	Mike Blake	2017, Independent Review into the Tasmanian Floods of June and July 2016 (TAS)	24
54	2017	SA	Independent	Storm	Gary Burns et al.	2017, Independent Review of the Extreme Weather Event South Australia 28 September – 5 October 2016 (SA)	62
55	2017	QLD	Audit	All hazard	QLD IGEM	2017, Review of capability at a district and local level (QLD)	1

Source: Aither 2017

Note: * This recommendation included two separate but related points. It was inserted into the database as two recommendations.

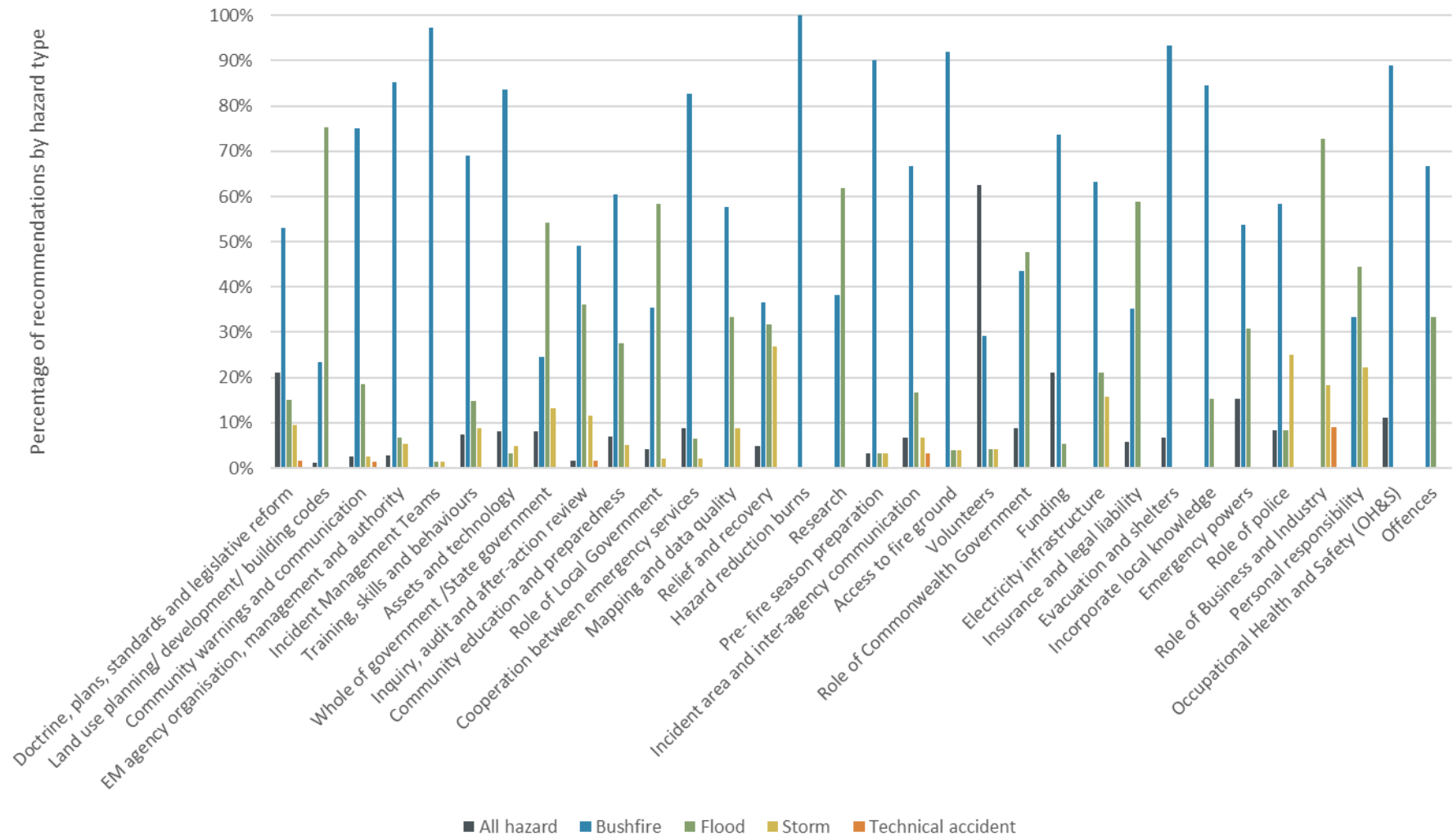


APPENDIX B: FREQUENCY OF RECOMMENDATIONS



Source: Aither 2017.

FIGURE 1: NUMBER OF RECOMMENDATIONS IN THEMES BY INQUIRY TYPE AS A PERCENTAGE OF OVERALL THEME



Source: Aither 2017.

FIGURE 2: NUMBER OF RECOMMENDATIONS IN THEMES BY HAZARD TYPE AS A PERCENTAGE OF OVERALL THEME

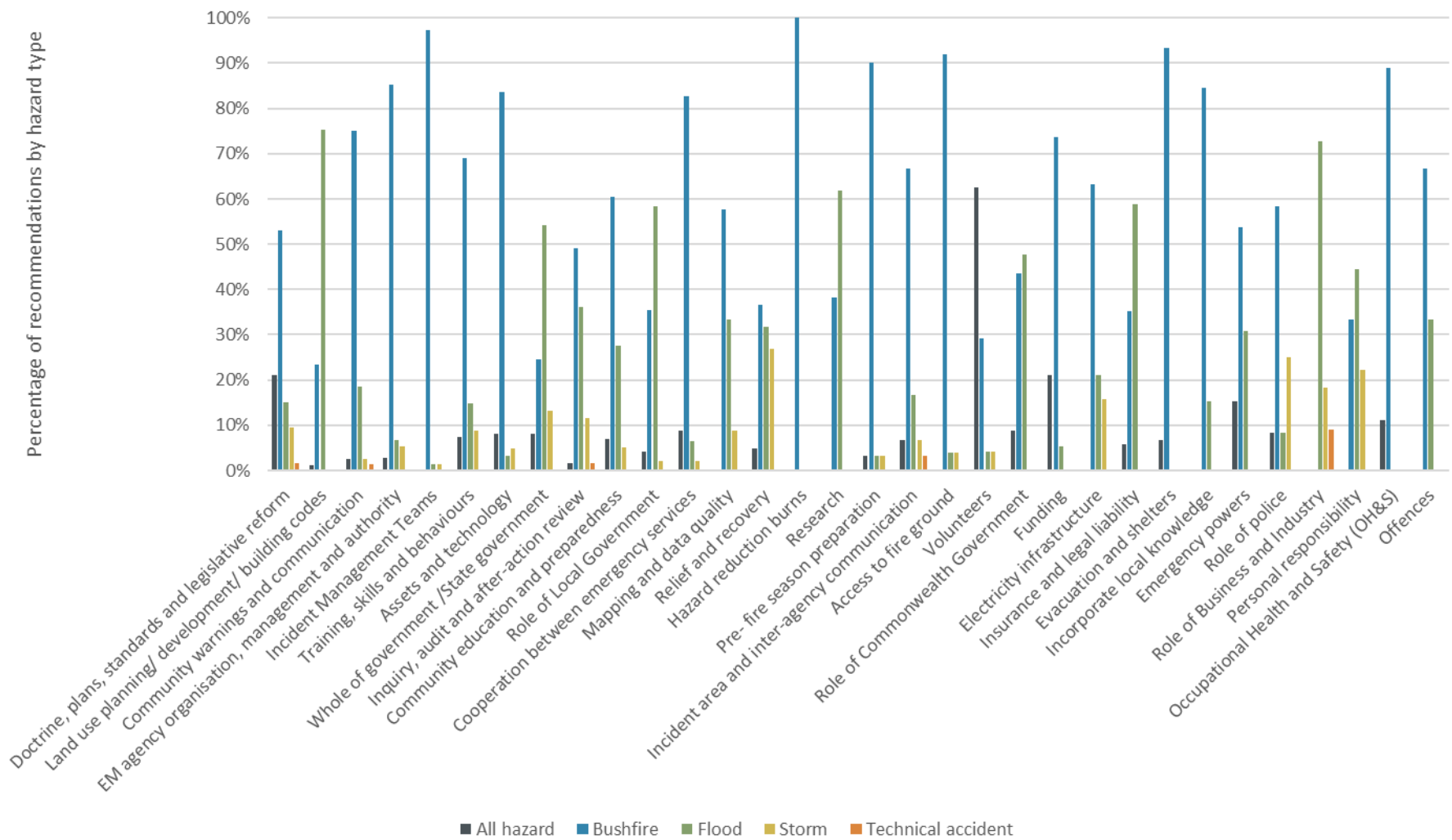


FIGURE 3: NUMBER OF RECOMMENDATIONS IN THEMES BY HAZARD TYPE AS A PERCENTAGE OF OVERALL THEME