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Integrating spatial planning with bushfire risk and emergency management in the context of climate change: critical literature review—stage 1

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About this paper

This is the first in a series of critical reviews of the literature relating to integrating spatial planning, bushfire risk and emergency management in the context of climate change. The review has been undertaken as part of a broader research project in Urban and Regional Planning at University of Canberra, supported by the Bushfire Cooperative Research Centre.

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Comments on the literature review are welcomed – subsequent stages of the literature review will be revised to reflect end user feedback. To provide comment on the review or seek further information about the project, please contact:

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Introduction

This is the first in a series of critical reviews of the literature relating to integrating spatial planning, bushfire risk and emergency management in the context of climate change. The review has been undertaken as part of a broader research project in Urban and Regional Planning at University of Canberra, supported by the Bushfire Cooperative Research Centre (CRC).

Background on research project

The Urban and Regional Planning for Risk and Uncertainty project is a three-year research project that commenced in September 2010. It is part of the 'Understanding risk' research program of the Bushfire CRC and forms one of three research streams within the Bushfire CRC's 'Community expectations – mainstreaming fire and emergency management across policy sectors' project (see <http://www.bushfirecrc.com/category/projectgroup/1-community-expectations>):

- University of Canberra – urban and regional planning for risk and uncertainty
- RMIT University – shared responsibility
- Australian National University – mainstreaming fire and emergency management across legal and policy sectors

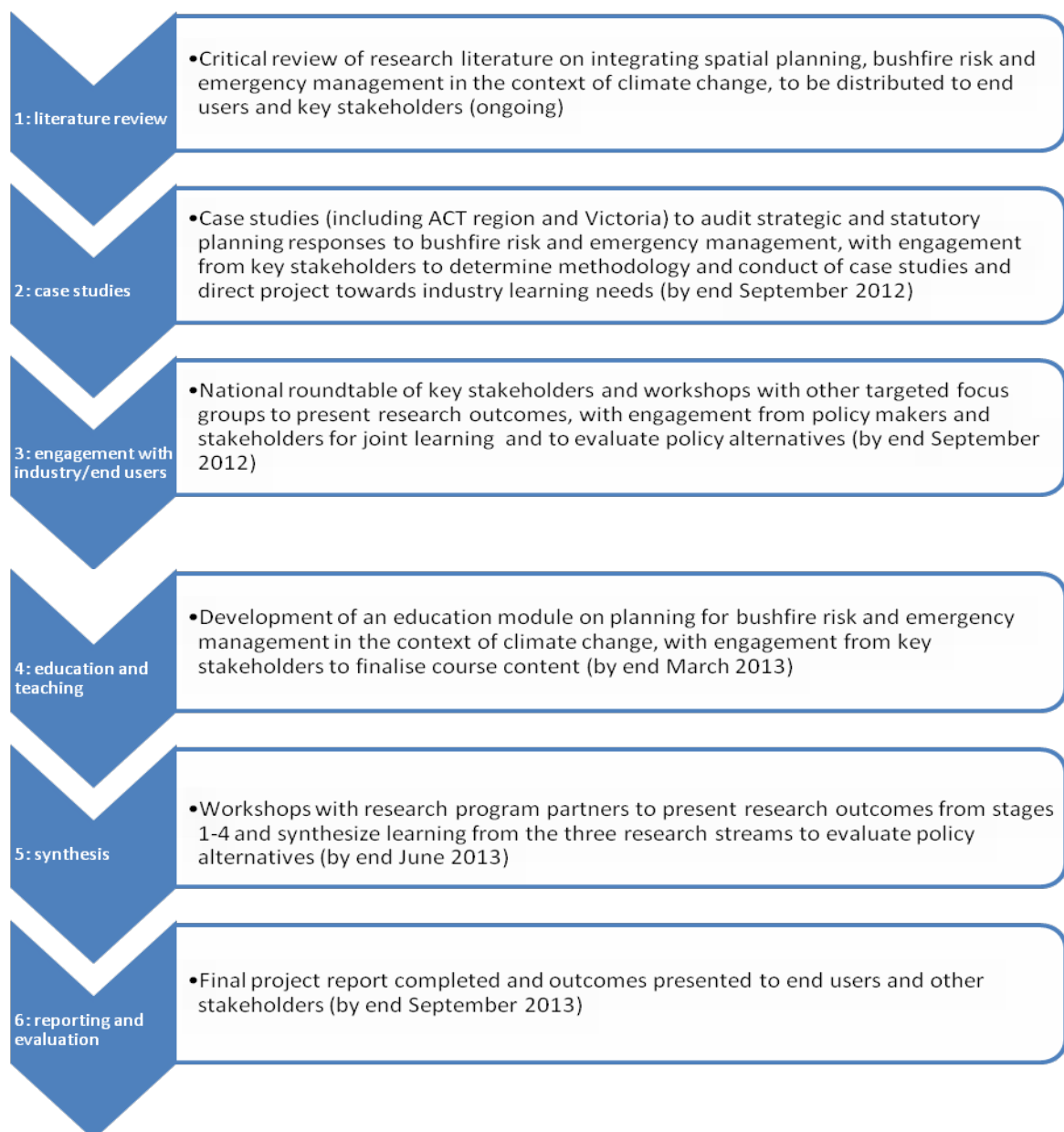
Key project researchers are Professor Barbara Norman (Project Leader) and Dr Kate Sullivan (Senior Research Fellow) from Urban and Regional Planning at the University of Canberra.

The primary focus of the University of Canberra project is on the integration of spatial planning, bushfire risk and emergency management in the context of climate change.

The objective of the research project is to identify leading practice in spatial planning for bushfire risk and emergency management in the context of climate change, as well as barriers to integrating spatial planning, bushfire risk and emergency management. The project involves collaboration and interdisciplinary research and aims to develop an integrated planning approach to bushfire risk and emergency management, to inform policy and practice. The research process aims to be highly inclusive of stakeholders across planning, bushfire and emergency management sectors, to ensure relevance and practicality of outcomes.

The research methodology involves a series of comprehensive literature reviews on integrating spatial planning, bushfire risk and emergency management in the context of climate change; an audit of current strategic and statutory planning

responses, drawing on geographically based case studies, including the Canberra region, Victoria and another state/territory; and a national roundtable of key stakeholders involved in planning for bushfire risk and emergency management. This research will form the basis of an education module for professional and ongoing training on planning and bushfire risk, with application more broadly for emergency management in the context of climate change. The project has six key stages.



Background on critical literature review

This is the first in a series of three critical reviews of the literature relating to integrating spatial planning, bushfire risk and emergency management in the context of climate change. The literature reviews are based around key research themes. The literature review series will provide an important foundation for reports, conference papers and journal articles completed over the three years of the project, reflecting research findings to date around specific themes and concepts.

The target audience for the literature reviews is cross-sectoral and multidisciplinary, including stakeholders in planning, bushfire and emergency services sectors, and the research community.

Review stages 1-3 by key research theme

The project involves the completion of three literature reviews, covering a series of key research themes, to provide a range of perspectives on the integration of spatial planning, bushfire risk and emergency management in the context of climate change. The content of each stage of the literature review by key research theme and the scope of the literature to be reviewed are as follows:

- ❖ Preliminary – stage 1
 - **Integrating spatial planning, bushfire risk and emergency management in the context of climate change:** defining policy integration ('mainstreaming') and why it is important, and identifying barriers to policy integration and possible examples of leading practice
 - Literature review scope: international peer-reviewed literature on policy integration or 'mainstreaming'
 - **Emergence of land use planning as an issue in bushfire risk and emergency management:** identifying the 'planning turn'
 - Literature review scope: Australian bushfire inquiry reports (excluding submissions and exhibits)
 - **Planning education and capacity building:** building professional capacity in the planning sector to respond to projected extreme weather events in the context of climate change and establishment of a tertiary education module on planning for bushfire risk, with application more broadly for emergency management in the context of climate change
 - Literature review scope: international and Australian peer- and non-peer reviewed literature on planning education

- ❖ Practical (to coincide with the case studies) – stage 2
 - **Auditing the planning system to identify gaps, connections and leading practice:** current state of state/territory, regional and local planning systems to incorporate planning for bushfire risk and emergency management, with a particular focus on the role of bushfire risk management in strategic and statutory planning processes
 - Literature review scope: Australian state/territory strategic planning documents relating to bushfire risk and relationship to statutory planning – based on case study states and territories
 - **Bushfire risk, emergency management and climate adaptation through the ‘planning lens’:** gaps, connections and leading practice
 - Literature review scope: international and Australian peer- and non-peer reviewed literature on spatial planning, bushfire risk, emergency management and climate adaptation; Australian peer-reviewed literature on bushfire risk, emergency management and climate adaptation in *Australian Planner*; and Planning Institute of Australia policy statements on bushfire risk, emergency management and climate change, and PIA and planning submissions to major bushfire inquiries
 - **Extent of integration of national planning principles with bushfire risk, emergency management and climate change**
 - Literature review scope: Australian policy documents at the national level on spatial planning, bushfire risk, emergency management and climate change
 - **Bushfire risk, emergency management and climate change issues at the urban-rural interface**
 - Literature review scope: international and Australian peer-reviewed literature on the urban-rural interface – planning, bushfire risk, emergency management and climate change aspects
 - **Integrating bushfire risk, emergency management and climate adaptation**
 - Literature review scope: international and Australian peer-reviewed literature on emergency management and climate adaptation integration
- ❖ Theoretical – stage 3
 - **Risk management and planning:** urban resilience, new approaches to planning for risk, and possibility of a more risk management approach to planning for bushfire risk and emergency management in the context of climate change

- Literature review scope: research on scenario planning, and on spatial planning theory, and risk and resilience theory
- **Identifying critical areas of planning risk:** urban growth, climate change and disaster risk
 - Literature review scope: planning research on managing urban growth and climate change mitigation and adaptation
- **Community engagement and communication on planning:** engagement in and ownership of initiatives to integrate urban and regional planning, and fire risk and emergency management, and improved communication on urban and regional planning, and fire risk and emergency management in the context of climate change
 - Literature review scope: planning theory research

Scope and methodology

The three reviews undertake a critical analysis of the literature on spatial planning, bushfire risk and emergency management in the context of climate change. Rather than limiting the review to a particular area, a broader focus was therefore taken. This was considered important for establishing the scope of the project as a whole for policy makers and practitioners, and reflects the broad policy and governance space in which urban and regional planning is situated.

The reviews seek to take a critical approach to the research literature and the concepts discussed by that literature, reflecting contemporary developments in cultural theory on the conduct of metacritique (Bernstein, 1983) and recent critiques of some traditional literature reviews in the social sciences (Badger et al, 2000; Berrang-Ford et al, 2011; Lettieri et al, 2009; McLennan & Handmer 2011; Petticrew & Roberts, 2006).

Some traditional literature reviews have been regarded as lacking in transparency in terms of their methodology and critical approach (Berrang-Ford et al, 2011; Petticrew & Roberts, 2006). While philosophical problems arise with simply dismissing such reviews as 'subjective' (Bernstein, 1983), valid concerns can be raised about their transparency and critical rigour. A more critical approach is therefore preferred that uses a clearly and transparently defined methodology, focused by clearly formulated research questions, but one that also clearly acknowledges the limitations of its so-called 'critical' approach and is self-reflecting of its metacritical approach.

A critical literature review is not the same as a systematic literature review (Higgins & Green, 2011; Petticrew & Roberts, 2006). Systematic literature review processes often focus only on peer-reviewed literature (journal articles and scholarly books),

as representing “widely accepted” and “rigorous” sources of information (Berrang-Ford, page 26). However, spatial planning sits firmly in a policy space and it is therefore important to also include what is sometimes referred to as ‘grey’ literature—reports, working papers and policy documents produced by government and non-government bodies, academics and industry (Pettigrew & Roberts, 2006). A critical review is closer to a conceptual review or synthesis, in providing an overview of major ideas, debates and areas of conceptual knowledge in the literature, so as to contribute to a better understanding of the issues.

This critical approach can be likened to the pragmatic approach of philosophers such as Richard Bernstein—the inability to give “definitive knock-down foundational justifications” should not be “confused with giving historically contingent fallible reasons to support our beliefs” (Bernstein, 1991, page 277). Such an approach emphasises the importance of making clear one’s theoretical approach and methodology, and engaging in dialogue with others.

Consistent with the discussion above, it is therefore necessary to provide a clear statement about the review methodology and scope, what types of research evidence are included and excluded, and a description of the search strategy and other aspects of the research review process. (More specific details about the literature review methodology and scope, specific to each research theme, are set out in the introduction to each of the literature reviews.)

The three literature reviews seek to establish the key literature relevant to the project as a whole and critically engage with some of that literature. The key research themes, as set out above, helped to generate the research questions for each stage of the literature review. This in turn helped to focus the scope of the reviews. The research themes were discussed with industry end users, to better target the scope of the reviews to inform policy and practice, and promote broader engagement and communication of research outcomes.

The scope of literature to be reviewed, by research theme, was set out above. The sources include both peer-reviewed academic literature (journal articles, books, conference papers) and ‘grey’ literature (reports, working papers and policy documents produced by government and non-government bodies, academics and industry). Peer-reviewed literature is often regarded as representing “widely accepted” and “rigorous” sources of information (Berrang-Ford, page 26). However, recognising the governance space in which spatial planning is situated, the scope of the literature reviews is not restricted to the peer-reviewed academic literature.

As the focus of this research project is on spatial planning and not on engineering, architecture, heritage, building and design, it is important to make clear that the literature reviews do not specifically include material on these areas. However, it is noted that an integrated planning and building framework is critical for bushfire

risk and emergency management, and the reviews therefore look at where planning intersects with building controls.

In terms of inclusions, the scope of the literature reviews encompasses both Australian and international (English language) references. The reviews also include both empirical and theoretical cross-sectoral studies and, excepting for the analysis of state/territory based strategic and statutory planning documents, no date or geographic restrictions were used to limit the scope of the review.

The review of academic literature involves keyword searches using the comprehensive, up-to-date and widely used search engine, Thomson Reuters Web of Knowledge, as well as searches using GoogleScholar (<http://scholar.google.com.au>) and the Libraries Australia catalogue (<http://www.nla.gov.au/librariesaustralia>). The primary keyword of 'planning' (urban and regional, land use, spatial) is used in combination with other keywords across several sets:

- fire/ bushfire/wildfire
- emergency/ disaster/ natural hazard/ management
- risk/ resilience
- climate change/ adaptation/ extreme weather events/ weather related risk
- peri-urban, wildland/ rural/ urban interface

Other specific keywords, reflecting particular research themes (for example, 'education', 'mainstreaming', 'integration') are used in combination with 'planning' and 'fire' terms. Reviewing the citations listed in key sources and searching for a number of identified authors also forms an important part of the search methodology.

The websites of relevant Commonwealth, state and territory government agencies were accessed to locate significant reports and policy documents, as well as contemporary strategic and statutory planning material. Reflecting the focus on bushfire and emergency management, the Emergency Management Australia library resources and the Australasian Fire and Emergency Service Authorities Council's Knowledge Web (<http://knowledgeweb.afac.com.au>) were also useful.

The target audience for the literature reviews is cross-sectoral and multidisciplinary, including stakeholders in planning, bushfire and emergency services sectors, and the research community.

Critical literature review—part 1

Stage 1 of the literature review looks at how policy integration ('mainstreaming') is defined in the literature and why it is important, and identifies barriers to policy integration and possible examples of leading practice. Of interest here is what can be learnt from the more established areas of environmental policy integration and climate policy integration for the integration of spatial planning, bushfire risk and emergency management in the context of climate change.

The review then traces the emergence of land use planning as a critical issue in bushfire risk management, drawing on a significant body of literature on Australian bushfire research – bushfire inquiry reports.

The review concludes by looking at the literature on planning education and capacity building.

Policy integration ('mainstreaming')

This section of the literature review looks at the following key research theme and literature sources:

- Integrating spatial planning, bushfire risk and emergency management in the context of climate change: defining policy integration ('mainstreaming') and why it is important, and identifying barriers to policy integration and possible examples of leading practice
 - Literature review scope: international peer-reviewed literature on policy integration or 'mainstreaming'

Of interest here is literature on the integration of spatial planning, bushfire risk and emergency management in the context of climate change.

Key research questions of interest include:

- what constitutes policy integration ('mainstreaming')
- why integration of spatial planning, bushfire risk and emergency management in the context of climate change is considered important
- what barriers exist to policy integration
- what examples exist of leading practice in this area

Integration of spatial planning, bushfire risk and emergency management has been identified as a particular priority. The need for a whole-of-government approach to complex policy problems has been widely accepted, particularly concerning the areas of sustainability and the environment (Jordan & Lenschow, 2010; Lafferty &

Hovden, 2003; Ross & Dovers, 2008; Simeonova & van der Valk, 2009) and climate change mitigation and adaptation (Ahmad, 2009; Kok & de Coninck, 2007; Mickwitz et al, 2009; Urwin & Jordan, 2008). Critical issues concerning these areas are defined by policy settings across various sectors, and this has led to a call for 'mainstreaming' – that is, for policy integration across sectors and levels of government.

International and Australian policy makers and academics have also noted the importance of policy integration in the areas of bushfire risk and emergency management (COAG, 2002; Eburn & Jackman, 2011; EMA, 2002; Fra Paleo, 2009; Gillen, 2005; Handmer, 2003; NEMC, 2011; Norman, 2010; Schipper & Pelling, 2006; United Nations, 2007; Wamsler, 2006).

Turning to Australia, a major report on natural disaster management arrangements by the Council of Australian Governments noted that, "while particular departments within all levels of government undertake leadership and coordination roles in disaster mitigation, major improvements cannot be achieved without 'mainstreaming' mitigation into all relevant areas of activity" (2002, page 25).

Integrating emergency management across all areas of policy making is therefore regarded as critical. However, recent experience in Australia has suggested that policy integration in this area is lacking. In particular, a series of major national inquiries into natural disasters and bushfire management have consistently pointed to a need to integrate spatial planning, bushfire risk and emergency management in the context of climate change (COAG, 2002; Ellis et al, 2004; House of Representatives, 1984 & 2003; Teague et al, 2010). The Council of Australian Governments report on natural disaster management arrangements identified "land use planning which takes into account natural hazard risks" as the "single most important mitigation measure in preventing future disaster losses in areas of new development" (2002, page 17).

It is useful to look more closely at the concept of policy integration – what it is and why we need it. Of particular interest here is what can be learnt from the more established areas of environmental policy integration (EPI) and climate policy integration (CPI).

A considerable body of academic literature on EPI and CPI has been established over time, with EPI having the longer history of policy practice. There is also an emerging body of literature on mainstreaming emergency management (Handmer, 2003), particularly across specific policy sectors such as housing and urban planning (Wamsler, 2006), spatial planning (Norman and Sullivan, 2011) and law (Eburn & Jackman, 2011). A critical survey of the academic literature on EPI and CPI points to a range of processes that variously constrain or support policy integration – barriers to policy integration and possible examples of leading practice that may of

relevance to policy mainstreaming of emergency management. To explore this area, it is useful to look at two sets of themes: firstly, the degree of policy integration, including implementation through policy, legal and administrative mechanisms, and reporting on outcomes; and, secondly, clarity of policy objectives and consistency of policy integration. It is also of interest to look at how these issues have been framed and conceptualised.

The first set of themes concern the degree or “extent” of policy integration (Ross & Dovers, 2008) across sectors (horizontal integration) and across multiple levels of government (vertical integration). Unwin and Jordan are interested in horizontal and vertical “policy interplay” in this context (2008, page 182) – the relationship between policies across sectors and between different spatial scales of governance. In particular, they highlight a need to focus on the vertical or spatial scale – to look at both ‘top-down’ international/national level approaches to policy integration and ‘bottom-up’ local and regional level approaches. The way in which policies are implemented at lower levels, ‘on the ground’, may be very different to the way those policies were set at a higher level. This points to a need to therefore compare and contrast both perspectives – that is, to look at how policy is reinterpreted and redefined as it travels from higher to lower scales in implementation process and the extent of effective policy integration occurring (Unwin and Jordan, 2008).

This discussion on some of the constraints to the degree of policy integration leads into a discussion of some of the processes that might support this area. Jordan and Lenschow highlight how existing scholarship on policy integration has tended to focus on particular “points” where attempts are made to intervene in the standard policy cycle or on the different “mechanisms” for policy integration (2010, page 152). This highlights that, in order to make policy integration strategies fully operational, there needs to be a clear policy framework, clear objectives and performance indicators for monitoring and evaluation of policy integration.

Commentators further point to the usefulness of screening new and established sectoral policies and relevant legislation at national, state, regional and local levels for EPI and CPI priorities, to assess the degree of policy integration across scales (Urwin and Jordan, 2008; Lafferty & Knudsen, 2007). However, it is noted that such a process could just identify the presence rather than the effectiveness of policy integration (Ross & Dovers, 2008).

The second set of themes concern clarity of policy objectives and consistency of policy integration. Some commentators have pointed to a lack of clarity concerning EPI and CPI, arguing that these concepts are sometimes accepted in principle with little reflection on their meaning (Jordan & Lenschow, 2010). This lack of clarity also has implications for defining clear policy objectives, identifying the problem that policy integration is actually trying to address (Ahmad, 2009) – a process fundamental to successful integration across sectors.

This in turn raises the issue of competing policy objectives and how these are to be resolved – the issue of trade-offs between different sectoral (economic, social and environmental) concerns and the relative weighting of different sectoral concerns. This issue is a complex one and much debated (see Lafferty & Knudsen, 2007). For example, Lafferty and Hovden argue that the concept of sustainable development attributes “principled priority” to environmental objectives in seeking to ‘balance’ economic, social and environmental concerns (2003, page 9), and Jordan and Lenschow describe sustainable development as a “first order principle” (2010, page 147). It is useful to bring in Ross and Dovers here, with their focus on the assessing the “strength” of environmental policy integration by the relative weight given by other sectors to identified key environmental objectives compared to other objectives (2008, page 246). Lafferty and Hovden’s approach suggests a strong interpretation of this area. Other versions of policy integration might support improving coordination and consistency between different sectoral policy objectives, building synergies, and balancing competing objectives to achieve ‘win-win’ solutions.

As Jordan and Lenschow note, the main point of contention here is “precisely what level of attention (or ‘principled priority’) to give to environmental protection in the sectors” (2010, page 156). EPI and CPI need not suggest abandoning all other policy objectives and considerations but rather require that objectives from other sectors be taken into account in working out how to achieve a range of policy objectives (Lafferty and Knudsen, 2007). This reinforces the need for policy objectives to very clear – and, if necessary, for them to be legally defined in statute and therefore form a suitable foundation for legal rules so as to be legally enforceable (Jordan & Lenschow, 2010).

Australian bushfire inquiry reports

This section of the literature review looks at the following key research theme and literature sources:

- Emergence of land use planning as an issue in bushfire risk and emergency management: identifying the 'planning turn'
 - Literature review scope: Australian bushfire inquiry reports (excluding submissions and exhibits)

Of interest here is tracing the emergence of land use planning as a critical issue in the Australian bushfire inquiry literature.

Key research questions of interest include:

- what range of spatial planning themes have been discussed by the literature
- to what extent integration of spatial planning, bushfire risk and emergency management in the context of climate change is taking place in Australia, and how it is taking place
- what barriers exist to policy integration in this area
- what examples of leading practice exist in this area

The major Australian government, parliamentary, coronial and royal commission bushfire inquiry literature has been analysed in the past (Kanowski et al, 2005; Petris, 1996; Richardson, 2009), but spatial planning has not to date been a major focus of such analysis. The analysis of this literature traces the emergence of spatial planning as a critical issue in bushfire risk management and points to a significant 'planning turn' over the 1980s and 1990s. (The following analysis is a summary of a more comprehensive critical re-reading of the bushfire inquiry literature that has been undertaken by the researchers.)

It needs to be noted at this point that the bushfire inquiry reports are of course written for different purposes, with different objectives and intents (political, legal, coronial). How this discourse has been conceptualised and framed is therefore also of interest.

The first major bushfire inquiry was conducted in 1939 (Stretton) as a result of bushfires in the Australian state of Victoria of that year that resulted in 71 deaths and the loss of over 650 properties. This inquiry was significant not only because it resulted in the first major inquiry report into bushfires but also because, at this early point, it clearly recognised the need to mainstream bushfire risk management across policy sectors, including the planning sector, and resolve conflicting policy objectives. The report noted a lack of policy integration between the range of

departments concerned with “land utilisation control” (Stretton, 1939, page 11, page 20).

The next major bushfire inquiries were not until the 1960s, with the 1961 Western Australian report (Rodger), as a result of the loss of over 130 homes in bushfires, and the 1967 Tasmanian report (Chambers & Brettingham-Moore), as result of the loss of 62 lives and over 1,400 homes. The 1967 report noted two issues that would become of significant concern in future bushfire inquiry reports: the expansion of the urban fringe and the fact that major bushfires could enter the suburbs, far beyond the urban edge (Chambers & Brettingham-Moore, 1967, page 18, page 22).

The 1961 Western Australian report referred to the importance of vegetation management and maintenance by private landholders, including creating firebreaks and protection zones (defendable space) around private lands and buildings (Rodger, 1961). This issue was to become of increasing concern, with recent inquiry reports pointing to a need to link **vegetation management and maintenance** to planning approvals and development controls in designated high bushfire risk areas (Ellis et al, 2004; Teague et al, 2010c). The issue here is that the standards and conditions that apply at the time of planning and building approval are maintained for the life of a development, as well as monitoring for compliance and enforcement. Adequate resourcing of local government to monitor for compliance also then becomes an issue (Teague et al, 2010c), and whether maintenance is required by legal statute. The Victorian Bushfire Royal Commission reinforced the need for planning permits for development in high bushfire risk areas to contain detailed conditions for water supply, access and vegetation management for achieving and maintaining defendable space. It recommended that the state government implement “a mechanism for sign-off by municipal councils of any permit conditions ... and the regular assessment of landowners’ compliance with conditions” (Teague et al, 2010c, page 265). In this way, the commission called for a “stronger stance on defendable space”, noting that a development should not be approved “in the absence of being assured that defendable space exists or can be created and maintained on the site without excessive damage to conservation values” (Teague et al, 2010c, page 237).

The next major bushfire inquiry was the 1977 Victorian report (Barber), as a result of four deaths and the loss of over 100 properties. While this report did not specifically address land use planning, it touched upon an issue critical to modern spatial planning – **settlement patterns and demographics**. The report is notable in registering a demographic shift of people away from regional areas and into cities (Barber, 1977, page 169).

The next major inquiries followed the 1983 bushfires that resulted in 47 deaths and the loss of over 2,000 properties across Victoria, and in 28 deaths and the loss of over 380 homes in South Australia. Two 1984 reports are of interest here (Miller et

al; House of Representatives) in signalling the beginnings of a 'planning turn' – a focus on spatial planning as having a significant contribution to make in managing bushfire risk. The need for **integration of spatial planning and bushfire risk** emerged as a strong theme in the 1984 House of Representatives report, with its finding that “land use management which incorporates fire protection measures could significantly reduce the impact of bushfires and should be given higher priority” (1984, page 21).

The 1984 House of Representatives report particularly focused on the importance of **settlement location and design**, and pointed to a range of planning measures in this area necessary to reduce bushfire risk. A coordinated planning response encompassing such planning measures would become a significant recurring theme of subsequent bushfire inquiry reports, particularly the 2009 Victorian Bushfire Royal Commission report. Planning measures that have been identified to reduce bushfire risk include land use zoning and sub-division design and layout; restrictions on minimum lot size and sub-divisions of bush blocks; siting and aspect issues for dwellings (such as avoiding steep slopes, ridgelines and heavy vegetated areas); and designated community safer areas, minimum defensible space requirements, buffer zones and fire abatement areas (open spaces such as golf courses, grazing properties, horse paddocks and playing fields). Other measures include infrastructure planning for reliable water supply; underground cabling for electricity supply (failure of electricity assets has resulted in a number of bushfires); access and evacuation routes for residents and fire ground response; siting of roads for firebreaks; and wide perimeter roads located between housing blocks and bushland.

The 1984 House of Representatives report also recognised the importance of combining planning and development approval processes with improved **mapping and zoning approaches**, to identify high bushfire risk areas and high biodiversity areas. Mapping and zoning were raised as major issues in the 2009 Victorian Bushfire Royal Commission report. It noted that mapping and designation processes in Victoria differed between the building and planning systems and pointed to the need to integrate mapping systems; improve the mapping criteria used to determine bushfire hazard; identify low, medium and high levels of bushfire risk for planning and building purposes; consider how the various risk levels could best be used to align building and planning 'triggers'; broaden risk mapping to include all vegetation types that carry a risk of bushfire (grassland and heath, as well as bushland); and centralise the mapping process to ensure a clear and transparent process of mapping that can be applied consistently across regions (Teague et al, 2010c, page 222). The commission also noted the importance of high-resolution biodiversity mapping (Teague et al, 2010c, page 246). In addition, the 2004 national bushfire inquiry emphasised the importance of identifying fuel management zones across the landscape and having clear objectives for each zone (Ellis et al, page 125).

While major bushfires across South Australia and Victoria in 1983 ushered in a new appreciation of the need to integrate spatial planning and bushfire risk, the New South Wales 1993-94 bushfires further reinforced the need for action in this area. The 1993-94 Sydney bushfires resulted in four deaths and the loss of over 200 homes. A 1994 New South Wales parliamentary committee report flagged the topic of “landuse decisions, development planning and the responsibilities of property owners” as an area requiring “a great deal of further attention” and recommended that the parliament establish a standing committee on natural disasters in the next parliament to examine the issues in greater depth (Parliament of NSW, 1994, page 56).

A series of bushfire inquiry reports followed as a result of major bushfires in 2001-02, 2003, 2009 and 2011. Interestingly, three bushfires inquiries over this period (Esplin et al, 2003; Victorian Parliament, 2008; House of Representatives, 2003) made no significant comments about spatial planning – these reports are not further discussed here. The 2002 New South Wales Joint Select Committee report on the Sydney 2001-02 bushfires, which resulted in the loss of over 100 homes, pointed to inconsistencies among local councils in their approach to specifying bushfire protection measures within planning instruments (2002, page 12). This was to emerge as a major issue in the 2009 Victorian Bushfire Royal Commission report.

The Australian Capital Territory inquiry reports into the 2003 Canberra bushfires (Doogan, 2006; McLeod, 2003) are of particular interest in terms of spatial planning and bushfire risk for the **suburban fringe**. The Canberra bushfires resulted in four deaths and the loss of over 480 homes. As a modern planned city, Canberra has perhaps seen more integration of spatial planning and bushfire risk. Urban development in Canberra is not permitted on bushfire vulnerable hills and ridges, and it has a clearly defined suburban edge rather than the scattered urban fringe found in many other towns and cities. However, while this lowered the bushfire risk, it arguably gave a false sense of security, as the risk still remained relatively high because of the close proximity of bush and grass land on the suburban edge. As the 2003 report noted, “the fact that no urban houses had been lost to bushfire since 1952 had given rise to a belief that the houses of suburban Canberra were not vulnerable to bushfire” (McLeod, 2003, page 172).

The **layout and density of suburban development** also emerged as a major issue in the Canberra bushfires. The 2006 review of the Canberra fires noted that the houses were all sited on their blocks with the same setback so that they were in a close linear alignment, leading to house-to-house fire spread (Doogan, 2006, page 371).

A significant national inquiry into bushfires followed in 2004, under the auspices of the Council of Australian Governments (Ellis et al). Before turning to this inquiry,

however, it is useful to first briefly consider an influential report on natural disasters in Australia, completed by the Council of Australian Governments in 2002. This report was the first to explicitly recommend mainstreaming of emergency management across policy sectors (COAG, 2002, page 11) and the first to identify land use planning as having a major contribution to make to reducing disaster risk (2002, page 17). The report recommended that all levels of government take action to ensure “more effective” statutory land use planning, development and building control regimes that “systematically identify natural hazards and include measures to reduce the risk of damage from these natural hazards” and that natural hazards, including bushfire management objectives, be “fully considered in the land use planning legislative frameworks” (COAG, 2002, page 80).

Each of these significant spatial planning reform recommendations was supported by the 2004 national bushfires inquiry report (Ellis et al, page xxiv). A major focus of the 2004 report was planning for bushfire risk at the **urban-rural interface**, and the changing nature of land uses and settlement patterns. The report noted that, as cities and other settlements “continue to expand into bushland areas across Australia and as small-acreage estates continue to develop, the potential impact of bushfires grows” (Ellis et al, 2004, page 9). Earlier bushfire inquiry reports had also reflected on “the increasing popularity of semi-rural developments and subdivisions in bushland areas” (House of Representatives, 1984) and the “large numbers of people living in areas adjacent to bushfire prone parklands, forests and reserves” (NSW Joint Select Committee, 2002, page 61).

The increasing bushfire risk at the urban-rural interface was also of major concern to the Victorian Bushfire Royal Commission. Significantly, the commission highlighted two key spatial planning mechanisms to manage urban growth and land fragmentation in high bushfire risk areas – **urban growth boundaries** for capital cities and **regional settlement policies** to manage urban growth of regional cities and towns (Teague, 2010c, page 226). Of particular concern to the commission was the proliferation of small rural lots in fragmented settlements around major cities and towns.

This leads into a discussion of more recent bushfire inquiry reports – the Victorian Bushfire Royal Commission inquiry into the 2009 Victorian bushfires (Teague et al), the 2009 Australian Senate bushfires inquiry (Australian Senate) and the inquiry into the 2011 WA bushfires (Keelty).

The Victorian Bushfire Royal Commission report into the 2009 Victorian bushfires (Teague et al) represents the most comprehensive inquiry into Australian bushfires to date. Planning and building were a major focus of the report. Many of the findings and recommendations of this report have already been discussed above. However, a critical theme of this report not yet discussed at length is the need to restrict development in areas of extremely high bushfire risk. The commission

concluded that there are “some areas where the bushfire risk is so high that development should be restricted” (2010a, page 13). This raises different issues for spatial planning in relation to **existing and new developments in high risk bushfire areas**.

In terms of existing developments in high bushfire risk areas, the Victorian Bushfire Royal Commission observed that land use planning has limited capacity to mitigate bushfire risk for such developments, including townships, in high-risk areas – “planning and building systems, which seek to reduce risk to communities in the long term, operate prospectively and have little capacity to deal with past decisions in relation to existing settlements or buildings in bushfire-prone areas” (Teague et al, 2010c, page 214). The commission recommended that the Victorian state government “develop and implement a retreat and resettlement strategy for existing developments in areas of unacceptably high bushfire risk, including a scheme for non-compulsory acquisition by the State of land in these areas” (2011c, page 252).

The issue of new developments raises more specific matters relating to **strategic and statutory planning systems – planning instruments and development approval processes, and resourcing and capacity building of local government**. The Victorian Bushfire Royal Commission concluded that land use planning schemes could make a more significant contribution in terms of new developments by setting conditions that would reduce risk in bushfire prone areas and by substantially restricting development in the areas of highest risk, including new subdivision of existing areas. Accordingly, it recommended that planning provisions relating to bushfire risk be amended “to ensure that the provisions give priority to the protection of human life, adopt a clear objective of substantially restricting development in the areas of highest bushfire risk – giving due consideration to biodiversity conservation – and provide clear guidance for decision makers” (Teague et al, 2011c, page 240).

The problem of some local councils in high bushfire risk areas not adopting bushfire risk planning controls in their planning schemes was raised as a major issue by the Victorian Bushfire Royal Commission. The commission found that some Victorian local councils did not consistently include in their local planning policy framework local bushfire policies to supplement the high-level strategic policy in the state planning framework. It therefore recommended that the planning provisions be amended to require a specific bushfire policy in the local planning policy framework of every council in high bushfire risk areas, based on a model policy to ensure consistency between councils, to ensure that bushfire risk management is given more appropriate consideration (Teague et al, 2011c, page 248).

The Victorian Bushfire Royal Commission further recommended that the bushfire provisions of the state and local frameworks should be “more closely linked” and that councils should receive “better support to develop local bushfire strategies” (Teague et al, 2010c, page 230). A 2004 national report on bushfire risk also looked at the challenges for local government in this area as the determining authority for development applications. It noted that, as more formal processes of risk management are implemented in bushfire-prone areas, “local government is being expected to take on extra roles and responsibilities, which it is not always equipped or resourced to do effectively” (Ellis et al, 2004, page 93). It also pointed to “a tension between good-practice planning decisions and commercial pressures for development” (Ellis et al, 2004, page 93).

The Victorian Bushfire Royal Commission also looked at the related area of **balancing biodiversity and bushfire risk** in the planning system. It noted that in areas where the bushfire risk is very high “it is not possible to allow people to live safely without clearing land around dwellings and beyond” (Teague et al, 2010c, page 230). The commission recommended that the state government amend the Victorian planning provisions to require that, when assessing a permit to remove native vegetation around an existing dwelling, authorities “take into account fire hazard” and “give weight to fire protection purposes” (Teague et al, 2010c, page 245).

Another significant aspect of the Victorian Bushfire Royal Commission report was its focus on the needs of **vulnerable communities** living in high bushfire risk areas. This raises issues about planning for vulnerable communities and the need to consider the demographic profile of the urban edge, as well as future demographic trends. The commission report found that 44 per cent of people who died as a result of the 2009 Victorian bushfires were vulnerable by one measure or a combination of measures – “29 per cent had chronic or acute clinical health conditions that would have been likely to affect their mobility, judgment or stamina; 16 per cent were aged 70 or more; and 9 per cent were aged less than 12 years” (Teague et al, 2010b, page 338). It noted that vulnerable people living in bushfire prone areas “face particular challenges because they might need more time, and sometimes extra support, to relocate” in the event of a bushfire (Teague et al, 2010b, page 49).

The 2009 Senate inquiry report noted the importance of **infrastructure planning for vulnerable communities**. It called for the assessment of high risk communities to be incorporated into state and regional planning regulations and the need to restrict developments such as schools, hospitals, tourist facilities and aged care facilities from being built in areas of high bushfire risk where evacuation would be difficult (Senate Select Committee, 2009, page 96).

The Western Australian inquiry into the 2011 Perth bushfires is significant as it was the first to make detailed reference to **climate change** and the need to factor climate

change impacts into spatial planning and bushfire risk management. The 2004 national bushfire inquiry and the Victorian Bushfire Royal Commission briefly noted this point, but did not consider this area in detail. The Western Australian inquiry concluded that:

Some recognition should be given to the changes in climate that might require a new approach to prevention against bushfires ... The Special Inquiry makes the point that there must be a limit to the time that it has taken for governments at the State and Local level to act upon the reality of climate change and reflect this reality in town planning and building approvals (Keelty, 2011, page 11-12).

Planning education and training

This section of the literature review looks at the following key research theme and literature sources:

- **Planning education and capacity building:** building professional capacity in the planning sector to respond to projected extreme weather events in the context of climate change and establishment of a tertiary education module on planning for bushfire risk, with application more broadly for emergency management in the context of climate change
 - Literature review scope: International and Australian peer- and non-peer reviewed literature on planning education

Of interest here is planning education and training literature, with a focus on bushfire risk, emergency management and climate change. Professional capacity building, and education and training, provide a significant means of encouraging integration of spatial planning, bushfire risk and emergency management.

Key research questions of interest include:

- whether current planning education and training priorities adequately reflect risk – in particular, bushfire risk and emergency management in the context of climate change
- whether there is professional capacity in the planning sector to respond to projected extreme weather events in the context of climate change

Flowing from these research questions, if a gap is identified in Australian education and training priorities and professional capacity in this regard, the broader research project is then concerned with how this issue might best be addressed.

A recent Australian bushfire inquiry, the 2009 Victorian Bushfire Royal Commission, pointed to a gap in planning education and training for bushfire risk and recommended that the state “initiate the development of education and training options to improve understanding of bushfire risk management in the building and planning regimes by providing regular training and guidance material to planning and building practitioners and helping a suitable tertiary institution design and implement a course on bushfire planning and design in Victoria” (Teague et al, 2010, page 35). The submission of the Planning Institute of Australia (PIA), the national body representing planning professionals, to the inquiry noted the need for “training and education of those within the planning profession to recognise and appropriately assess bushfire risks” (PIA, 2009b, page 3 – see also Witherby, 2003). This perceived gap requires further investigation. For example, there is a need to consider more recent developments – such as any professional

development or tertiary planning courses on bushfire risk that have been established subsequent to this inquiry.

Another issue of interest here concerns national/local coverage of such courses (Gurran & Phibbs, 2003; Vipond, 2000) – to what extent they need to be tailored to suit the particular planning system and fire ecology of a particular state/territory or can be more generally focused. As Gurran, Norman and Gleeson note, “there is often a tension between whether students should develop the skills and knowledge needed for competence within a particular system or professional context, or the skills, knowledge, innovation and adaptability to commence practice within any planning system or professional setting” (2008, page 14).

This raises the related issue as to what extent current planning education and training also adequately encompasses broader risk related to bushfire and emergency management in the context of climate change (Campbell 2006). A number of commentators have noted that issues like climate change have “clear, if as yet infrequently acknowledged and discussed, implications for the profession and its education and training” (Gurran et al, 2008, page 14 – see also Hurlimann, 2009; Lyth et al, 2007; Meng, 2009; PIA, 2007). However, it is noted that some aspects of planning for risk, natural hazards and climate change are currently covered under environmental planning components of planning courses (PIA 2009a). Further research is required to determine the extent of the gap in this area in terms of education and training for planners. Questions for further research also include what key skills and capabilities are required of planners in this area and how planning education and training can best develop the necessary skills. There is also a mis-match here, in training planners in bushfire risk and emergency management in the context of climate change, if appropriate planning controls do not exist within the relevant planning schemes.

Gurran, Norman and Gleeson’s recent discussion paper on planning education provides a comprehensive overview of future directions in education planning and major debates in planning education theory and practice (2008; see also Klosterman, 2011). Many of the issues raised in this paper and in the work of other commentators who have examined this area are of direct relevance to the question of how planning education and training might be further developed to address planning for risk, with a focus on bushfire and emergency management in the context of climate change. Relevant issues raised include the critical role of the PIA in terms of its education policy in this area and accreditation of courses (PIA, 2009a), and an understanding of how planning courses may be differently perceived by the academy and by different sectors of industry and the profession (Dalton, 2007; Feldman, 1994; Frank, 2006; Guzzetta et al, 2003; Hamnett, 1999; Perloff, 1956; Poxon 2000; Reeves, 2009; Zehner, 2002). Gurran, Norman and Gleeson, for example, note the “tensions between the needs and expectations of

industry and the broader role of planning education in driving policy agendas and research” (2008, page 18 – see also Budge, 2009).

It is also important to recognise a continuum of planning education, ranging from the secondary sector through to the tertiary and continuing professional education sectors (Gurran et al, 2008), and distinct categories of educational provider (Heywood 2006). Another critical issue here is to bridge the gap between theory and practice (Phibbs et al, 2002). This points to the need for further research on industry, community and academic expectations of such courses.

A further fundamental issue to take into account concerns changing definitions of planning and the profession, a common concern of much of the literature on planning education (Dalton, 2001; Frank, 2006), and how this might influence perceptions about planning practice and expectations about curriculum design in this area.

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