

Review of the Bushfire and Natural Hazards Cooperative Research Centre

Commissioned by the CRC Board

May 2018

1. Introduction

This review was commissioned by the Board of the Bushfire and Natural Hazards CRC (BNHCRC) to be an independent review of the CRC's operations and plans mid-way into its eight-year term which finishes in July 2021.

2. Evaluation process

The review was conducted on 9 and 10 May 2018 by a review team comprising Mary O'Kane (chair), Tracey Arklay and Euan Ferguson (biographies in Annex A; agenda for the two days at Annex B). The CRC prepared a report to the review and provided, through SharePoint, extensive background material. Eight written submissions were received, all from CRC end-user partners. On the review days, the review team met with and received presentations from the CRC's board, management and staff, researchers and PhD students working on CRC projects in partner universities, and representatives of end-user partners. It also spoke by phone to several Commissioners and CEOs of end-user partners. Before the review days, evaluators also spoke individually to a range of stakeholders. The review team thanks the CRC's management team and all those who spoke with it or otherwise provided information for the review.

The review's terms of reference (Annex C) asked it to look at the CRC's governance and management arrangements, the quality of its research and nature of its research outputs, its end-user focus and its utilisation activities, and to provide suggestions for the current operations and on opportunities for its future structure.

3. Long-term vision, mission and strategy

At its commencement, the CRC used an extensive process of consultation, especially with its end-user partners, to develop a clearly articulated Strategy with appropriate Vision (goal: 'The preferred and trusted source of research and knowledge in bushfire and natural hazards') and Mission ('to provide valued, high-quality research and advice on bushfire and natural hazards to ...'). A set of values was also adopted. These were all appropriate but, as noted below, could well have included encouraging diversity, given the problems of lack of diversity in the areas this CRC serves.

While the CRC's Strategic Plan provides general guidance to the CRC's activities, it was not clear, from presentations to and discussions with the review, that the strategy underpins the CRC's day-to-day thinking and decisions. The review team did note, however, extensive references to the need to ensure good utilisation of the CRC's research.

4. Centre Partners – public sector agencies and universities

The CRC does not operate alone in emergency and post-disaster knowledge management. One measure of the success of the CRC can be seen in its networks and relationships with its end users, partners, collaborators and competitors.

The CRC refers to its partners in a number of classes: core participants (who contribute in cash and/or in-kind); end-user partners; and research providers. The review panel was impressed at the number of universities who are core participants of the CRC. There are also end users who do not make contributions but utilise the research to inform their activities.

The review panel noted that a strength of the CRC is the networks that have been established. Notwithstanding this, the review panel was surprised during discussion on the review days at the lack of significant mention of collaboration networks with kindred

organisations — in New Zealand (especially), the Asia-Pacific region, and globally (for example, the United Kingdom, Europe, China and North America) — even though material about some linkages was provided in the background material.

The relationship and interaction between the BNHCRC and other national research centres was not clear (for example, should there be a partnership with the ARC Centre of Excellence for Climate Extremes?).

The research is focused on end-user partner needs. This has resulted in a strong focus on end-user partners. The review panel did note comments that research is weighted towards fire agencies (versus other hazard agencies), and is weighted to bushfire (as distinct from urban fire). This creates some tension.

A major question for the future is: How to engage and involve entities which are not the traditional 'emergency management' agencies? This includes utilities, operators of critical infrastructure, the insurance industry, finance institutions and local governments.

As the CRC moves to broaden networks and partnerships, it will be important to maintain focus on the needs of core partners who will continue to expect a return on their investment. The review panel noted that the CRC does not seem to be building strong partnerships with other research providers which might be beneficial, for example, in health, or through international research organisations.

Finding 1.

The major end-user partners have found the CRC's work an important factor in building their appreciation of the value of research, particularly strategically focussed research.

4.1 Relationship with AIDR

From interviews it became clear to the panel that, in exploring future options, the future relationship between the BNHCRC and the Australian Institute for Disaster Resilience (AIDR) needs to be further considered. AIDR was established in 2015 following a divestment from Emergency Management Australia. The CRC is one of the three partners in AIDR along with AFAC and the Australian Red Cross. The AIDR's specific role is to 'develop, maintain and share knowledge and learning to support a disaster-resilient Australia', which is largely complementary to the role of the CRC.

The panel believes that there could be synergies from a unified arrangement between the CRC and AIDR in the future. In any event their relationship needs to be more explicit.

5. Research and education

The research program was settled at the start of the CRC through a consultative process with end-users. Between 2014 and 2016 it had a 'refresh and refocus' process that confirmed its current approach to research generation but extended the focus to include diversity, urban planning and mental health. The CRC has separately established a Tactical Research Fund (\$750,000) to respond to requests from end-users, and it also has a small Quick Response Fund to enable it to collect data immediately on critical events.

The CRC's research is assessed by its International Science Advisory Panel (ISAP), which comprises two Australian social science members (including the chair, Professor the Hon Carmen Lawrence) and two US scientists.

The review panel notes that there have been ongoing reports on the CRC's research outputs throughout its life. The most recent was conducted in February 2018 by ISAP and concluded that the quality of the CRC's research 'is very positive'. Another report, on research utilisation, was led by Dr Tamika Heiden in April 2018.

The review panel notes the communication and dissemination of research findings by the CRC. These include the regular reporting of research insights through the publication of Hazard Notes, the peer-reviewed publication *Australian Journal of Emergency Management* which is managed in conjunction with its partner Australian Institute for Disaster Resilience (AIDR), and other magazines including Fire Australia.

The review panel explored outputs, utilisation and questions of impact and sought to understand the CRC's areas of focus and achievement. The panel explored with the CRC which areas of study are within its ambit and which are outside its scope. The review panel also discussed issues of ethics approval processes, data collection and management, and the opportunities for training beyond PhDs based on CRC research findings. It noted that the CRC data is a valuable and vital part of the CRC's intellectual capital and important to the national agenda, most notably the post-incident data.

A lot of work was done at the commencement of the CRC to put a research program into place. Overall, the research appears to be at a level expected from this type of centre.

The PhD program is strong. There have been 8 PhD completions associated with the Bushfire and Natural Hazards CRC, and there are 41 current students. The review panel was informed that students typically have a supervisor from their university and one from the end-user partners. However, at the review panel's meeting with the PhD students, most students indicated they did not have an end-user partner supervisor, but did have close contact with end-users.

The CRC conducts regular bi-annual research forums that bring together PhD students to discuss research and to network with other researchers and end-users. The students clearly value the forums and other opportunities provided by the CRC to attend conferences, but also indicated they would value reinstatement of a regular opportunity for all PhD students to meet. The review panel suggests that mentoring be formalised to ensure that students are job-ready for the sector, and have access to broader sector networks.

International students are potential ambassadors for, and potential contributors to, the CRC on return to their home country, and accordingly the review panel suggests they need special attention, particularly through appropriate job placements.

A key contribution of the CRC is in the links it has forged between PhD students and end-users and its work in further disseminating research findings to the wider emergency management sector. The review panel noted that several projects will have long lasting benefits (for example, the research conducted into hazard warnings and fire patterns).

The CRC acknowledged the importance of measuring the impact of its research, but said this was problematic due to its long-term nature. However, the review panel suggests there are ways to assess impact even while the research is still on foot. This includes ongoing economic and social impact and impact on the evolution of public policy and the generation of public value. The review panel notes that the CRC has a major opportunity to look at impact, due to its access to research from its predecessor, the Bushfire CRC, and that it has three years to decide whether to draw on this work as well as its own. The review panel also discussed with the CRC the possibility of setting up a project using the Strategic Research Fund to explore measuring impact.

The centre's ability to connect end-users to researchers quickly is an important strength that should be encouraged. We note the existence of a Quick Response Fund, which enables researchers to travel quickly to areas impacted by natural hazards.

Finding 2.

Research is generally of very good quality on important topics with admirable emphasis on utilisation, and a recognition of the need to understand impact. Examples of excellent research include the research on warnings and fire behaviour.

Finding 3.

Research processes are good, with appropriate attention to ethics approval and research management, though a sound data management strategy is lacking.

Finding 4.

The CRC did not articulate to the review what is unique about its core capability and offerings; how its current research program is linked to its vision and mission; where the major research challenges still lie; and what the research landscape looks like overall, including other competing and complementary research groups and centres here and overseas. Understanding this is vital to the strategic narrative required to position the CRC for its next phase.

Finding 5.

The PhD students associated with the CRC strongly valued their experience in the CRC projects and being exposed to critical end-user issues.

6. Communication

The review panel was impressed by the material supplied by the CRC on its general communication strategies, including dissemination of information through journals and notes. It was impressed by the work undertaken in primary schools to communicate and inform students about natural hazards and personal responsibility, and believes that this activity may be profitably continued and might even lead to furthering ties with, and buy-in from, various Education Departments across Australia.

7. Governance, management and culture of the CRC

The CRC is established as a not-for-profit company limited by guarantee. All board members are nominated by and, where necessary, voted on by members. The board's charter commits it to having at least one-third of its directors meeting the "generally accepted" criteria for an independent director. Currently five members meet this criterion, and five are employees of member organisations. The charter also commits the board to having gender balance "over the period in which BNHCRC is currently funded". The website shows that currently only two of the 10 members are women.

The board has two active sub-committees: an Audit, Risk and Compliance Committee, chaired by an independent board member, Kathy Gramp; and a Research and Utilisation Committee, chaired by an independent board member, Professor Alistar Robertson. Documentation shows that both are carrying out their roles diligently, and it was clear from the review panel's discussion with Professor Robertson that the Research Utilisation Committee is very active in research oversight.

The review panel notes that the fire and emergency services sector is not a diverse one, and that the CRC is giving attention to this through a range of activities, including through a "Diversity and Inclusion: Building Strength and Capability" research project, and its stated focus of ensuring diversity and inclusiveness in the selection of research papers and presenters in conferences, workshops and panels.

The management team is led by the CEO, Dr Richard Thornton. The management structure is quite flat. There are four direct reports to the CEO. The Research Director is Dr John Bates. The review panel noted that financial management is conducted through a shared services arrangement with AFAC, with whom the CRC is co-located.

However, the lack of gender balance currently on the board and the absence of a commitment to diversity in the CRC's stated values (though it is mentioned in the charter) suggests that more needs to be done, given the importance of a research organisation being exemplary.

Finding 6.

Overall the governance and management processes of the CRC are sound, and the work of the Research Utilisation Committee is particularly valued. However, there is still work to do to model and value a genuinely diverse and inclusive management and governance culture.

8. Plans for Development

The Commonwealth funding for the CRC ends in June 2021. The Board and management are actively considering the future (particularly examining how to establish a successor

organisation/institute) and encouraging widespread constructive conversations across the CRC on this issue. The review panel was impressed by the contributions to this discussion, especially from those working in end-user organisations.

The Commissioners and CEOs of end-user partners were clear that the CRC and its predecessor (the Bushfire CRC) had helped them understand the value of strategically-focused research both in contributing to evidence-based policy and practice and in contributing to building cases for new funding for example when preparing New Policy Proposals. They pointed out that they found the CRC research outputs valuable and that they now confidently commissioned new research from a range of organisations. They also appreciated the increased cohort of researchers with experience in their areas of interest.

The Commissioner/CEO group all acknowledged the value of having a national research capability of critical size addressing the major research issues (especially wicked problems) associated with bushfires and natural hazards. Most (but not all) of them saw value in this being an extension in some form of the CRC. They made it clear that their organisations would be highly likely to contribute to such a capability although they would continue also to commission research directly from other research providers as well.

As well as indicating support for an ongoing concentrated national research capability, various of those interviewed raised the following issues:

- the need for any new organisation to be a thought leader about how to address major challenges to the sector
- the need for the organisation to be able to carry out major pieces of contract research in a timely manner
- possible new partners could come from the insurance and finance industries, the telecommunications industry and operators of critical infrastructure
- considering a different discipline mix
- how any future organisation might draw strength by building and developing strong working relationships with research organisations in cognate and complementary fields in Australia and around the world
- the possible significant benefits of working in Asia and the Pacific and possibly looking to research, education and training opportunities through international organisations such as the multilateral development banks and UN organisations
- the need for clear, dynamic and effective relationships with organisations with which the CRC has close ties, including AIDR, AFAC and the Department of Home Affairs
- whether there is a need to re-think the partnership structure of the organisation, including whether end-user representation should be at a jurisdictional rather than an agency level with a view to keeping a focus and funding research on the big and wicked problems.

The review panel suggest that all these issues are important considerations and opportunities for the discussions of future structure and funding.

9. Conclusion and recommendations

The CRC is operating well in terms of the definition of a CRC under the Commonwealth Program. It has a laudable focus on research utilisation and is clearly appreciated by its end-user partners. The CRC board and management, and the organisation more generally, is appropriately focussing at present on what should happen at the cessation of CRC program funding.

The recommendations below go to strengthening the current organisation and helping it prepare to position itself for the future.

Recommendations on current operations

Recommendation 1 – Strengthen education pathways:

That the CRC ensure its students are maximally job ready and sector-informed, through structured mentoring, placements and network-building.

Recommendation 2 – Model diversity:

The CRC must model exemplary diversity and cultural values in the way it operates and is managed. In particular, it is important that the Board and management aim for gender balance within the next 12 months.

Recommendation 3 – Manage data:

That there be a CRC policy on how data is curated and managed. To operationalise this it might profitably partner with another organisation.

Future focus recommendations

Recommendation 4 – Map the landscape:

As part of its focus on future structures, that the CRC answers the following questions:

- a. What are the big research questions with national significance (top six, say)?
- b. Who is doing and has done what and where?
- c. What research questions are not being addressed at all anywhere in the world?
- d. Who are potential end-user players who don't seem to be active, for example, insurance and banks?
- e. Who are active and potential end-user partners?
- f. Who are actual and potential research providers and education and training providers?
- g. What disciplines are needed that aren't currently included? Economics? Health?
- h. What training and education options should there be, including systematic and widespread community outreach programs, short courses for professionals, schools education?

Recommendation 5 – Explore the options:

That the CRC examine all options for the future, including one or more combinations of the following:

- a. Continue the CRC (probably only possible with a change of government)
- b. Replace CRC Program funding through the Department of Home Affairs or another Commonwealth department (Defence CRC model)
- c. Take better advantage of synergies from a unified arrangement between the CRC and AIDR
- d. Have all the jurisdictions call for a review to advise the COAG on the issues and how to address them
- e. Become a research and knowledge broker organisation
- f. Become a self-funded research institute, without CRC program funding but with funding from partners and/or contract research
- g. Build a strong capacity for high quality contract research, knowledge application and management consulting that responds to urgent sector needs
- h. Being a prime provider of education in the sector.

Recommendation 6 – Understand the impact on society:

That the CRC engage a top economics research group from one or more of its research providers (maybe funded as a special project from the Strategic Fund) to:

- build a strong understanding of the ongoing impact of the CRC, factoring in the tangible and intangible benefits of its research and education programs, and
- build capability for end-users to make policy and treasury arguments for new policy proposals.

Mary O'Kane, Chair
Euan Ferguson
Tracey Arklay

17 May 2018

Annex A — Review team

Professor Mary O’Kane AC: is the Chair of the Independent Planning Commission of NSW, a company director, and Executive Chairman of O’Kane Associates, a Sydney-based consulting practice specialising in government reviews and research and innovation matters. She is also Chair of the boards of CRC for Spatial Information, the Space Environment Management CRC and the Institute of Marine and Antarctic Studies at the University of Tasmania. As well, she is a director of the Capital Markets CRC and the Innovative Manufacturing CRC. Professor O’Kane was NSW Chief Scientist & Engineer from 2008-2018; and Vice-Chancellor of the University of Adelaide from 1996-2001. She is a former Chair of the board of Australian Centre for Renewable Energy, a former member of the Commonwealth’s Review of the National Innovation System, the Australian Research Council and the Cooperative Research Centres Committee, the board of FH Faulding & Co Ltd and the board of CSIRO. She is a fellow of the Australian Academy of Technology and Engineering and an Honorary Fellow of Engineers Australia.

Mr Euan Ferguson AFSM: is a forester and fire emergency manager with over 40 years’ experience in forestry, fire and fuels risk management, community engagement and emergency management leadership. He is a former Chief Officer of the Victorian Country Fire Authority and Chief Officer and CEO of the South Australian Country Fire Service. He provides leadership and advice in the fields of forestry, fire, emergency, crisis and consequence management.

Dr Tracey Arklay: is a Senior Lecturer and Program Director at the Business School, Griffith University. Her research interests include disaster management, state and federal politics and public policy. She is review editor for the Australian Journal of Political Science and currently sits on the Advisory Panel of the Inspector-General Emergency Management, Queensland.

Annex B — Agenda

Day 1 – 9 May 2018 – Achievements and impact of current CRC				
Time		Activity	Staff	Phone Meeting blocks
8:15-8:30	15 Mins	Panel arrives. Set up in Board room, ground floor, 340 Albert Street, East Melbourne	All	
8:30-8:50	20 Mins	Panel <i>in camera</i> session	Panel	
8:50-9:00	10 Mins	Review Panel Welcome		
9:00-9:15	15 mins	Overview of review and house-keeping and structure of review days	AR, RT	
9:15-10:30	75 mins	Overview of vision, strategy, achievements, impact/utilisation and lessons learned in ‘industry’, policy, research, education, consulting and commercialisation of the current CRC Governance, management, collaboration, strategic planning, direction [40 min presentation followed by 35 min questions]	AR, RT & other senior staff	
10:30-10:45	15 Mins	Break		
10:45 - 11:30	45 mins	Structure, partners, governance, management, collaboration, planning, direction, finances [20 min presentation + 25 mins questions]	AR, RT, TE, KE, JB	11:00-11:10 Doug Smith
11:30-12:20	50 Mins	Meeting with PhD students [no preparation needed]	RT JB	Steve Sutton, Rachael Westcott, Graham Dwyer & Yang Chen Graeme Riddell, Matt Henry & Mayeda Rashid
12:20 – 13:00	40 Mins	Lunch		12:30-12:40 Katarina Carroll
13:00-	4 hours	Research Portfolio including more on research utilisation –	JB DB2	13:00 JB and DB2

17:00		overview of all research clusters Discussions with researchers, students and end-users (Includes 20 min Break)	LB	13:10 Jane Sexton 13:25 Michael Griffiths 13:40 Blythe McLennan 13:55 Paul Fox-Hughes 14:10 Steve Dovers 14:25 Holger Maier 14:40 Mel Parsons 15:00 Paul Baxter 15:10 Break 15:15 Trent Penman 15:30 Tina Bell 15:45 Chris Bearman 16:00 Mark Croweller
17:00-18:00	1 hr or as long as necessary	Panel <i>in camera</i> discussion		
Day 2 – 10 May 2018 – The future				
Time	Activity	Staff	Phone meeting blocks	
8:30-9:30	1 hour	DB1, RT	8:45 - Shane Fitzsimmons, Commissioner, NSW RFS; 8:55 - DB1	
9:30-10:15	45 Mins	AR, RT		
10:15-10:45	30 Mins			
10:45-12:45	2 hours	JB	10:45 JB and MH In room Ed Pikusa, Corey Shackleton, Roger	

			DB2 MH LB	<p>Mentha, Naomi Stephens, Felipe Aires, Andrew Stark, Stuart Ellis, John Schauble</p> <p>10:45 – 11:30 Andrew Richards</p> <p>11am Carmen Lawrence</p> <p>11:50 Craig Lapsley, Mark Stephens & John Schauble, Simon Hemstra</p> <p>12:00 Andy Barnicoat</p> <table border="1"> <tr> <td>Lead and Key End-Users</td> <td></td> </tr> <tr> <td>Leesa Carson (phone) (May join via phone)</td> <td>Hardening Buildings and Infrastructure</td> </tr> <tr> <td>John Schauble</td> <td>Governance and Institutional knowledge</td> </tr> </table>	Lead and Key End-Users		Leesa Carson (phone) (May join via phone)	Hardening Buildings and Infrastructure	John Schauble	Governance and Institutional knowledge
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John Schauble	Governance and Institutional knowledge									
12:45-13:15	30 mins	Lunch								
13:15-14:00	45 mins	Partnership development and Contract Research	SM, LB							
14:00-14:45	45 Mins	Beyond 2021 – An Institute?	LH, RT							
14:45-17:15	2.5 hours	Panel deliberations								
17:15-18:15	1 hour	Feedback to CRC								
Day 3 – 11 May										
9:30-13:00	3.5 hours	Completion of write up								

Annex C — Terms of Reference

Bushfire and Natural Hazards CRC CRC Performance Review 2018

Terms of Reference

Purpose

The CRC Board has decided that the CRC should undertake an independent review of its operations and future plans. This review will provide a report on the CRC's achievements after four years and its plans and prospects for further research and utilisation over the remaining 4 years.

Structure and operation

The review panel will comprise three members, with complementary experience in emergency management, utilisation of research in policy and practice, and the operation of collaborative, user-driven research organisations.

The panel will have access to the CRC's CEO and staff and Chairman during the review. The CRC's foundation documents, policies, strategic plans and reports will be available. Interviews by phone with particular Lead End-Users will be arranged.

The review is expected to require 4 days of each panel members' time including 2.5 days in Melbourne.

Support

The CRC management will provide the secretariat function.

Role

The role of the Committee may include, but is not limited to, providing advice on:

- **Tracking against vision and mission** – examine the degree to which the CRC:
 - Has effective governance and management arrangements
 - Is undertaking excellent quality research that addresses issues of economic, environmental and/or social significance to Australia
 - Has an end-user focused education and training program that complements the research programs and has built capacity and capability for the sector
 - Has research outputs that will deliver high levels of economic, environmental and/or social benefits to Australia
 - Is undertaking utilisation activities to deploy research outputs and encourage take up by end users
- **Recommendations for changes during the current funding period**
 - What changes to governance and management could improve the impact of the work of the CRC
- **Suggestions regarding sustainability**
 - Any comments on opportunities for sustainable funding beyond the current funding period.

Timing and Reporting

The review will take place during late early May 2018, with a report to be tabled at the next Board Meeting. The report will be confidential to the CRC but will be used in discussions with stakeholders, and may be published on the CRC's website.

Authorisation

The review will report directly to the CRC Board through the Chairman.