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MANAGING ANIMALS IN DISASTERS (MAID) **IMPROVING PREPAREDNESS, RESPONSE, AND RESILIENCE** **THROUGH INDIVIDUAL AND ORGANISATIONAL** **COLLABORATION**

Final Report

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Macquarie University





Version	Release history	Date
1.0	Initial release of document	03/04/2019



Australian Government
Department of Industry,
Innovation and Science

Business
Cooperative Research
Centres Programme

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Publisher:

Bushfire and Natural Hazards CRC

April 2019

Citation: Taylor, M. (2019) Managing Animals in Disasters: Improving Preparedness, Response and Resilience through individual and organisational collaboration. Final project report 2016-2017. Report for the Bushfire and Natural Hazards Cooperative Research Centre. Melbourne, VIC. Australia.

Cover: Giddy Ready for Evacuation. Jenny Bigelow



TABLE OF CONTENTS

ACKNOWLEDGEMENTS	4
EXECUTIVE SUMMARY	5
END USER STATEMENTS	7
PRODUCT USER TESTIMONIALS	9
INTRODUCTION	13
<i>The issue of animals in disasters and animal emergency management</i>	13
<i>Its significance</i>	13
<i>Our approach</i>	13
PROJECT BACKGROUND	15
PROJECT OVERVIEW.....	16
<i>Phase 1: Scoping, auditing, and exploration</i>	16
<i>Phase 2: Field work studies</i>	16
<i>PhD research</i>	17
RESEARCH APPROACH	18
FIELD STUDY DEVELOPMENT	18
THE INTEGRATION OF EMERGENT INFORMAL VOLUNTEER GROUPS INTO ANIMAL EMERGENCY MANAGEMENT	19
ANIMAL OWNER EXPERIENCES IN RECENT SOUTH AUSTRALIAN BUSHFIRES	20
PLANNING FOR ANIMALS: THE ROLE OF PET OWNERSHIP IN BUSHFIRE PREPARATIONS IN TASMANIA AND ITS JUXTAPOSITION WITH GEOGRAPHIC VARIATIONS IN BUSHFIRE RISK.....	22
BUILDING AN ARC: ESTABLISHING A COMMUNITY-LED ANIMAL READY COMMUNITY (ARC).....	24
INVESTIGATING THE APPLICATION OF PROTECTION MOTIVATION THEORY TO ANIMAL OWNERS AND EMERGENCY RESPONDERS IN A BUSHFIRE NATURAL HAZARD, WITH A VIEW TO DEVELOPING PUBLIC POLICY TO ENHANCE DISASTER RISK REDUCTION	26
<i>PhD Student Research</i>	26
KEY MILESTONES	28
UTILISATION OUTPUTS	30
ACHIEVEMENTS	30
<i>Utilisation</i>	30
WHERE TO FROM HERE	31
<i>Knowledge, Education & Training</i>	31
<i>End User Engagement</i>	31
<i>Impacts</i>	31
PUBLICATIONS LIST	33
PEER-REVIEWED PUBLICATIONS	33
PEER-REVIEWED PUBLICATIONS CURRENTLY UNDERWAY	34
BNHCRC REPORTS.....	34
PEER-REVIEWED CONFERENCE PAPERS	35
CONFERENCE PRESENTATIONS (ORAL).....	35
CONFERENCE PRESENTATIONS (POSTERS)	37
ADDITIONAL OUTPUTS: PODCASTS, BLOGS, THESES, NON-PEER REVIEWED ARTICLES, NEWSLETTERS.....	38
REPORTS/INVESTIGATIONS/REVIEWS INCLUDING MAID KNOWLEDGE AND/OR INFORMATION	40
ADDITIONAL PEER-REVIEWED PUBLICATIONS.....	41
TEAM MEMBERS	42
REFERENCES	43



ACKNOWLEDGEMENTS

The MAiD project team would like to thank all the formal end users, the many and varied stakeholders, and the emergency service agency contacts who have supported and helped us with the research, and who have motivated us in our quest to understand the challenges of, and seek improvements in, animal emergency management (AEM) in Australia.

We would also like to thank the pet owners, animal carers, farmers, veterinarians, emergency services personnel, and all other people who have taken part in our surveys, interviews, and other research activities and who have contributed to our findings.

We would like to acknowledge the contribution of our broader network of PhD and other researchers and practitioners in this area; those in Australia, New Zealand, the United States of America, and Europe. We have appreciated your contributions to our project, and the ways you have helped us review and consider the many different aspects of AEM.

Finally, we would like to thank the Bushfire and Natural Hazards CRC team which has supported us in all aspects of the project; facilitating important connections and contact with end users, promoting the research to a broader audience, and herding our special team of cats! We have appreciated the opportunity to focus on people and their animals, and to shine a spotlight on the many challenges and the potential benefits of AEM. This report marks the end of the project, but this is really just the beginning of the next stage.



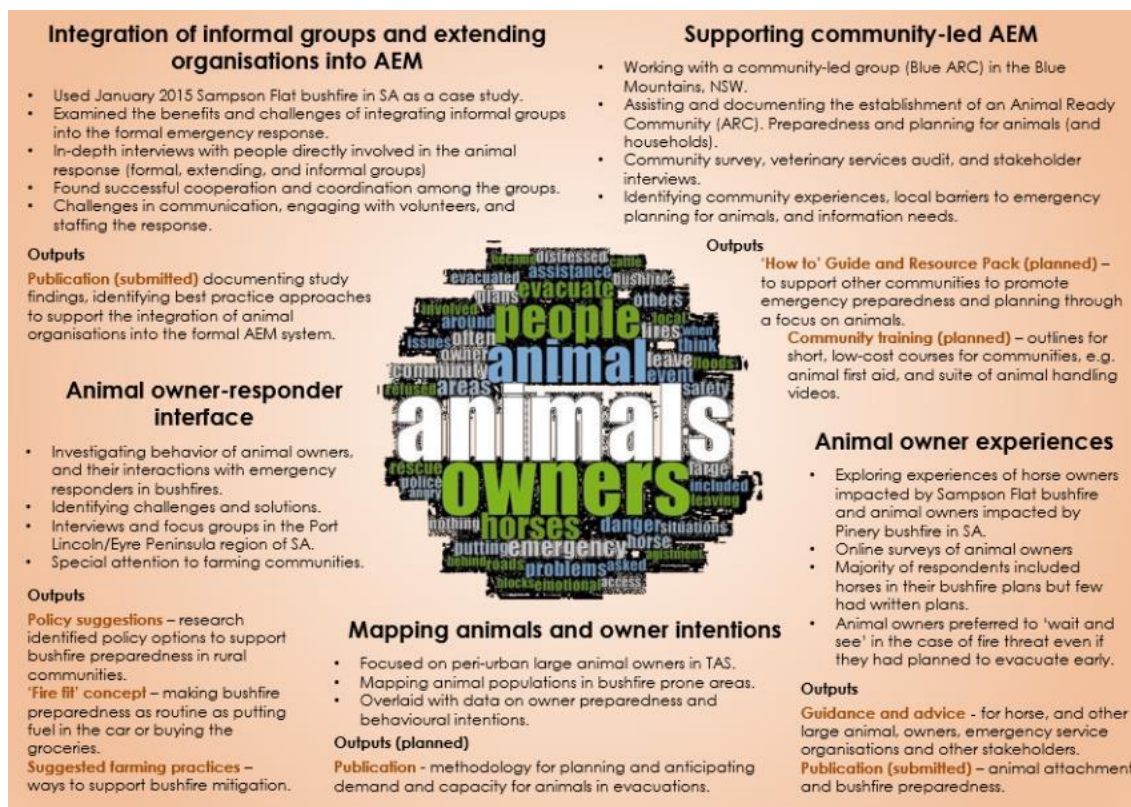
EXECUTIVE SUMMARY

The Managing Animals in Disasters (MAiD) project was a three-year research project focusing on the challenges for end users, stakeholders, and community members in preparing for, planning for, and responding to the needs of animals in emergencies. The aim of the project was to identify and build best practice approaches to animal emergency management (AEM) to enable engagement with animal owners and other stakeholders in disasters and emergencies.

The project was divided into two phases. The first phase was one of scoping, auditing, and exploration of the area. The second phase comprised a suite of four individual projects. In addition, we had an experienced veterinarian as a PhD student, conducting a programme of research on the responder-owner interface.

In the first phase of the project, the team surveyed a range of responders and stakeholders to understand their various challenges and priorities, we conducted an audit of legislation, planning, initiatives, and resources, and we held a stakeholder knowledge exchange workshop.

The second phase of the project was driven by the needs of our end users. We focused on four different aspects of AEM in the main project, plus the PhD research area. These five sub-projects and the planned and actual outputs of each are summarised in the figure below.



Most of the sub-projects were successfully completed by the close of the project. However, some components, most notable in the community-led AEM



sub-project will be continuing to completion beyond the formal end of the MAiD project. In addition, more research outputs are planned in the coming year, to ensure that as much project data as possible are captured and disseminated.

The MAiD project has made a significant contribution to the area of AEM, both nationally and internationally. Most of the project outputs to date have been knowledge-based; reports, journal manuscripts, and practitioner outputs, e.g. blogs, podcasts, magazine articles. Utilisation of the research has been occurring throughout the project lifecycle, with stakeholder testimonies outlining some of the more direct impacts of the research findings on their roles.

The future will see more direct utilisation of the project, especially in subject-area contributions to revisions of the AIDR Handbook series, and in community-led AEM. The latter has the potential to empower communities to take greater responsibility for their animals, and could provide improved channels for community engagement for emergency service organisations.

Finally, the potential for new emergency service volunteering roles is also present if AEM is embraced. If the concept of animal ready communities were promoted and supported, a new community animal-liaison role within emergency services could be established. This role could form a bridge between communities and emergency services; sustaining community action and providing expert guidance, whilst providing a link back to the formal emergency management system to ensure a degree of quality control and monitoring. At a time when volunteer numbers are declining and targets for volunteers are increasing, such a role could, potentially, attract a new demographic to volunteering.

The future for AEM is positive. With 62% of households owning pets, and the majority considering these animals to be family members there is an ongoing demand for support in preparing and planning for animals in emergencies. Coupled with a future strategy of community-centred emergency management, it is hard to see how AEM won't become mainstream.



END USER STATEMENTS

Andrew Richards, NSW State Emergency Service, NSW

The Managing Animals in Disasters (MAiD) Project has provided some valuable insights for the Emergency Management Industry about how animals affect people's decision making and behaviour in disasters and how we can all work collectively towards better coordination and clarity.

The team adopted a range of different innovative approaches targeting different fire agencies and animal owners across Australia including:

1. Exploring animal owner experiences in bushfires in South Australia and New South Wales
2. Coordination of volunteer and other informal groups in bushfires in South Australia
3. Community-led animal planning and preparation for bushfires in New South Wales
4. Mapping animal populations in Tasmania
5. The interface between animal owners and emergency services in bushfires in South Australia

In addition to papers, posters, journal articles and presentations, some of the utilisation outputs included animal population maps, plans, a national survey, workshops and audit of animal emergency management in Australia. Such resources will contribute to a greater awareness and knowledge base that can be drawn upon by emergency managers, stakeholders and communities as we plan for future disasters. Opportunities to work with agencies to enhance existing preparedness campaigns has also led to some shared knowledge and greater community development.

End-user engagement throughout the project has been characterised by teleconferences, interviews, meetings, presentations to working groups and journal articles, but it has not always been easy. The willingness of the Industry to engage with the research has often been dependent on available personnel and the relative priority of animal management when compared to loss of human lives and damage to property. Conversely with animal owners emotional attachment to a specific pet or livestock, to manage expectations and navigating a maze of interest groups and animal support services has presented numerous challenges.

I believe the MAiD project team has had the most positive influence where they have been able to demonstrate the connection between animals and their influence on the decision making and behaviour of their owners.

Proposed changes to formal emergency arrangements should help provide clarity, roles and responsibilities to assist animal owners, stakeholders and the Emergency Management industry in future disasters. Some of the emerging benefits are being seen in the collaborative community-led work with the emergency managers, responders and a diverse group stakeholders to find shared solutions to these complex issues.

Well done team!



Mark Townend, CEO, Royal Society for the Prevention of Cruelty to Animals (Queensland) Ltd.

The Royal Society for the Prevention of Cruelty to Animals (Queensland) Limited (RSPCA Qld) is pleased to be associated with the BNHCRC Managing Animals in Disasters project. RSPCA Qld as a BNHCRC research partner has taken the opportunity to contribute to project research, planning tools and/or outcomes.

The research and planning tools assist RSPCA Qld as a reference point to influence strategic thinking, policy and legislation relating to animal emergency management.

RSPCA Qld has raised awareness of the resources produced throughout the project such as academic publications, presentations, podcasts and surveys to assist stakeholders with shared responsibility for animal welfare.

RSPCA Qld participates in the Qld Disaster Management Arrangements by;

- Monitoring the responsible care of animals, provide standards of care for animals and protect animals from unjustifiable, unnecessary or unreasonable pain;
- Collaboration with stakeholders with shared responsibilities and others to ensure that there is effective prevention, preparedness, response and recovery strategies and priorities for disaster management within a community;
- Assisting in identifying and addressing immediate, medium and long-term animal welfare recovery needs so as to enhance the capacity of the local community to recover from a disaster.

Subsequently, the utilisation of the research greatly assists improved planning for animals in emergencies by stakeholders as there have been many challenges identified during the disastrous 2011 Queensland Floods and other natural disasters.

Following the 2011 Queensland Floods, RSPCA Qld made a submission to the Queensland Flood Commission of Inquiry which resulted in a number of animal welfare recommendations. Consequently, RSPCA Qld has collaborated with stakeholders with shared responsibility which included presentations to Local Disaster Management Groups and RSPCA funded and facilitated Managing Pets in Disasters Workshops for Local Government utilising MAiD resources.

RSPCA Qld has contributed to Queensland Government reviews in the interest of public safety and animal welfare for the enhancement of community resilience.

RSPCA Qld has renewed its partnership with the BNHCRC from 2017 to 2021, and encourages research utilisation.



PRODUCT USER TESTIMONIALS

This project has produced many knowledge-based outputs, such as reports, academic papers, and practitioner-directed articles. We have provided general advice to various agencies and groups in emergency management, and we have been involved in discussions and workshops in which we have provided input to other areas of emergency management, such as plans, scenarios, and guidance documents.

In addition to these knowledge outputs, we have been actively engaged with many animal-related groups and communities; most notably Horse SA and horse owners in South Australia (SA), farmers and landholders in the Eyre Peninsula in SA, and community organisations, representatives, and community members in the NSW Blue Mountains. In these contexts, we are supporting, informing, and finding ways to utilize the outputs of the research. These activities are in various stages of activation currently, and include contributions to community guidance, workshops and training, and community awareness raising for the need to plan and prepare for animals in emergencies.

The following statements have been collected from a number of formal end users, stakeholders, and community contacts who have followed our work and/or have used outputs from the project.

“MAiD has been partnering with the Bushfire-Ready Neighbourhoods (BRN) program of TFS since 2016, when Community Development Officers met with researchers to discuss new communities for the Bushfire Ready Neighbourhoods (BRN) program. Specifically, communities with a high-density horse owners were of interest to the MAiD researchers. Their participation in BRN events were offered, with horse specific emergency information and the opportunity to engage with these stakeholders for their research.

A ‘Giddy-up Get Ready!’ workshop was developed and presented in December 2016. The partnership between TFS Bushfire-Ready Neighbourhoods, Sandford Volunteer Brigade, DPIWVE Biosecurity, SES and the MAiD researcher provided all emergency planning, response, and recovery information. It also provided the opportunity for the researcher to engage with horse owners with a mapping exercise and research survey. The MAiD Tasmania survey results and research outputs will in future support BRN emergency management information to horse owners across the state.”

Sandra Barber, (Project End User), Manager Community Development and Education, Tasmania Fire Service

“The valuable research work of the MAiD project has stimulated a lot of discussion with the many groups that NSW DPI works with about the interactions of animals and humans during emergencies.

Dr Mel Taylor engaged with regional emergency management groups and communities. This critically increased their understanding that the strong bonds between people and animals need to be recognised when; preparing for, responding to and helping communities to recover from, emergencies.



The projects research outputs and posters will additionally provide an ongoing resource to support the emergency management functions of NSW DPI as well as our partners and supporting groups such as NSW Local Land Services and NSW RSPCA."

Glenda Briggs, Regional Director, Hunter and Greater Sydney,
Department of Industry

"Thanks to the Managing Animals in Disasters project, the recently republished national Evacuation Planning Handbook includes principles and considerations on animal management for evacuation planning. This will guide evacuation planners to maintain a broad perspective on what people value and ensure they are agile and flexible to the varying needs of their communities during evacuations. The Evacuation Planning Handbook now includes a section on animal management. Guidance is given to evacuation planning - including messaging, withdrawal, shelter and return - which takes into account the specific needs of owners of pets, companion and assistance animals, farmers and others with animal welfare responsibilities including boarding kennels, horse racing or agistment facilities. The MAiD project is listed as a reference in the handbook for users to access further information."

Amanda Lamont, Director Engagement and Projects,
Australian Institute for Disaster Resilience

"As animal ownership is one of the greatest factors in evacuation compliance, the work undertaken by the MAiD team has been critical in advancing the animal emergency management body of knowledge. In doing so, more emergency management practitioners are aware of the need to improve arrangements to protect animals during disasters, and by doing so improve public safety and reduce political risk."

Steve Glassey, Chief Executive Officer, Wellington SPCA

"The research work Mel and the MAiD project have undertaken has directly benefitted the work of Blue ARC (a local community group concerned about animals in emergencies), which has utilised the outcomes to develop resources for Blue Mountains residents – to raise awareness of the issue of pets in emergencies, but also to offer practical resources to keep both pets and residents safe.

It's also been extremely valuable to the Resilience & Preparedness (R&P) Group which we convene (a cross-sectoral interagency focussed on building a more prepared and resilient community in the Blue Mountains) – for example, in developing our Get Ready! BM campaign for the coming fire season. The survey results have also given the R&P Group (and our Local Emergency Management Committee) valuable insights we previously did not have into residents' behaviour around animals."

Kris Newton, Manager,
Mountain Community Resource Network



"My involvement in this project has informed my research perspectives with respect to the human-animal bond and the complex risks and rewards associated with this relationship. This experience has consolidated my belief that human and animal welfare are inseparably linked, and I am now more actively engaged as a researcher in investigating the risks around the human-animal bond with the goal of ensuring that this special relationship is maintained while ensuring the health and safety of both participants".

Professor Chris Riley, Professor of Equine Clinical Studies,
Massey University, New Zealand

"I work in the Department of Environment, Land, Water and Planning in the Victorian Government, in the bushfire management area. We were looking to better understand issues related to animal welfare in the management of bushfires. We knew that animal welfare was a significant issue for people but we didn't have a good sense of the specific risks. We used the research to improve our understanding of the risks and we incorporated information into our risk assessment processes. This has meant that we are now better able to consider animal welfare issues in our assessment of bushfire risks."

Laura Little, Senior Project Officer,
Community Partnerships and Engagement Support Unit,
Strategy, Capability & Innovation, Forest, Fire & Regions,
Department of Environment, Land, Water & Planning, Victoria

"The BNHCRC Managing Animals in Disasters project has supported our education and advocacy work and our partnerships with the CFS, SES and PIRSA. The project has grown our understanding about the interface between people and animals in relation to disasters, including how to 'shape' messages, with animals becoming the trigger to take action. We have incorporated this approach into the ways we advertise and promote bushfire ready workshops for horse owners. The evidence provided in their reports, infographics and journal articles has been used in our government advocacy and grant submissions. In particular, the open access articles 'Helping Hands, Hurting Hooves: Large Animal Rescue' and 'What's the Big Deal? Responder Experiences of Large Animal Rescue in Australia' helped us make the case for securing funding for equipment and training of Emergency Services in SA."

Julie Fiedler, Executive Officer,
Horse Federation of South Australia

"In my role as Safety officer of my local Adult Riding club (Mt Barker or MBARC) I invited Associate Professor Kirrilly Thompson to do a lunchtime seminar at one of our club rallies on Sunday 26 February this year. Her subject was her latest research on horses, bushfire and risk reduction/behaviour change. Attendance was excellent, with many members staying after their lessons to hear the presentation. The session was lively, with members engaging and asking questions. Many horse owners don't realise what's going on in the very active research space on safety in Australia at the moment, and we were all curious to hear from someone at the centre of this. Later many posted on our closed Facebook Club group page about how much they had enjoyed the day. We



would not hesitate to have Kirrilly back as it was such a pleasure and so informative."

Dr Georgina Downey, Visiting Research Fellow,
University of Adelaide, SA, and
Safety Officer at Mt. Barker Adult Riding Club

"This project is such an important part of planning for all animal owners. Without this information and project, many people remain less knowledgeable to make self-reliant and responsible decisions that will not only save their lives, but also the lives of their animals, which are family members."

Jenna Kelley, Founder and President,
Walking Forward Disaster Relief Team Inc.
(National Equine Database, Resilient Australia Award Recipient)



INTRODUCTION

The issue of animals in disasters and animal emergency management

Consideration of animals (pets, commercial animals, livestock and other animals, including wildlife) can impact on people's decision making and behaviour during disasters and emergencies. Added to this, the management of animals in disasters is complex; involving many stakeholders and requiring clear roles and responsibilities for all concerned and a high degree of co-ordination. In Australia, despite increasing levels of interest and activity in this area there is a general lack of integration of animal emergency management in the emergency management system and no nationally-agreed approach.

Its significance

A lack of preparedness by some animal owners combined with the severity of the emergency situation and strong attachment to animals can lead to issues for public and responder safety. Animal owners may risk their lives to save animals, may fail or refuse to evacuate, may abandon or release animals, may have unrealistic expectations if they evacuate with their animals, and may try to return before it is safe to rescue or tend to their animals.

The interface between animal owners/wildlife-concerned general public and response agencies is important in preparedness and response. Engagement materials for some owner groups, specifically households with pets, is widely available; although their effectiveness in terms of improved preparedness and planning is not clear. However, in emergency response, responders can be faced with difficult dilemmas and highly emotionally-charged situations. In addition, if there is a lack of co-ordination in response there can be confusion for animal owners and responders and further potential for risky or impulsive decision-making and poor animal welfare outcomes.

Communities frequently perceive gaps in animal emergency management response and this leads to emergent informal volunteering to rescue or move animals. Sometimes this occurs in risky conditions and by well-intended, but chaotic means, and can add to the workload of, and cause distraction to, official response agencies at critical times.

Finally, animal rescues and animal-related issues generate a great deal of media interest, in mainstream/traditional media as well as social media. This can lead to sporadic public outrage when expectations around the emergency response to, or recovery of, animals are not met.

Our approach

Given the breadth of the problem and the lack of a body of Australian research in this area the Managing Animals in Disasters (MAiD) project team has been actively working to establish an evidence-base in this emerging research area in Australia. Although this dissemination is still progressing, and will do for some time to come, outputs from the project are providing support for informed dialogues, and decision-making and are leading to improvements in policy and practice.



At the outset of the project we anticipated that aspects of human behaviour and decision-making would be similar in Australia to other western countries and cultures; and therefore comparable to findings from research in the United States, where most research in this area to date has been centred. However, the organisational contexts, operational emergency management systems, and funding and governance structures are quite different leading to different impacts and requiring different solutions. We deliberately kept our research Australia-centric so that our findings are relevant to our end users and are practically-focussed.

Through our focus on animal emergency management in the MAiD project, we have advocated for greater acknowledgement of animal emergency management as a 'people' issue. We have sought to assist in the national dialogue and the production of plans and community engagement materials to support shared responsibility with communities in this area, and to support better integration of animal emergency management into the Australian emergency management system.



PROJECT BACKGROUND

Research in this area was required as there is a paucity of evidence to guide policy development, planning, and training needs. This project leveraged off recent initiatives and programs, nationally, and existing research on prevention and preparedness by providing complementary research on the impact of animals on response and recovery for the community as well as responders.

In this project 'animals' included domestic pets, commercial animals, livestock, and wildlife. 'Animal owners' could include pet owners, small-scale animal-related business owners, livestock producers, and those concerned with and interested in wildlife (e.g. wildlife carers, rural dwellers).

Similarly, responders could be drawn from a broad range of groups, such as emergency services, Local Government, RSPCA officers, Parks and Wildlife rangers, NGOs (Red Cross, Salvos), GPs, veterinarians, established volunteer organisations, and spontaneous (emergent) responders.

Within these groups there is a wide variation in preparedness and potential vulnerabilities. The project was designed to provide the empirical evidence required to determine what constitutes best practice and to start to develop approaches to identified gaps and needs.

The MAiD project commenced in January 2014 and ran for three and a half years.

The project was divided into a number of sequential, but overlapping, stages.

- Scoping and exploration: to review, explore, and scope issues. Identify priorities and needs suitable for development of support tools/materials.
- Field work: to gain an in-depth understanding of priority areas and inform support tools/materials development.
- Project utilisation planning - identifying and prioritising project outputs and making plans for maximising the impact of the research.

Note: As many outputs from the project have been knowledge-based (papers, reports, information), the project outputs have been utilised throughout the lifespan of the project.

Project Aim and Goal

The MAiD project is seeking to identify and build best practice approaches to animal emergency management to enable engagement with animal owners and other stakeholders in disasters and emergencies.

The goal is to improve outcomes for public safety and the resilience of responders, animal owners, those with animal-related businesses, and their communities.



PROJECT OVERVIEW

Phase 1: Scoping, auditing, and exploration

The project was designed to be broad in its initial scope to enable a comprehensive audit of current research, initiatives, and programs across Australia (and internationally) in relation to animal emergency management across the emergency management system¹. The project has identified what is currently known, what is already underway, and what gaps still remain.

This information was supplemented with data from four exploratory studies:

- The preparedness and evacuation behaviour of Australian pet owners in disasters and emergencies (undertaken ahead of the MAiD project)²,
- The preparedness, planning and experiences of South Australian livestock owners in bushfire³,
- A scoping survey of the experiences of emergency services personnel in supporting animals and their owners in disasters⁴, and
- A national survey of Australian response organisations and stakeholders on the challenges of managing animals and their owners⁵.



Many of our scoping study outputs were included in a special edition of the Australian Journal of Emergency Management on Animals in Emergency Management.

In addition, the audit report incorporated findings from a knowledge exchange workshop where we explored and discussed the perceived needs and priorities in this area with a broad range of stakeholders⁶.

Phase 2: Field work studies

Field work study areas were identified through discussion with end-users regarding their preferences and priorities, the outcomes of the knowledge exchange workshop, and the surveys noted above.

A set of four field work studies were conducted; each focussed on different animal emergency management-related issues.

These were

- **Collaboration, communication, and integration in animal emergency management.** A study of the integration of emergent informal volunteer groups into animal emergency management.



- **Animal owner experiences in recent South Australian bushfires.** A study investigating the experiences of horse owners impacted by the Sampson Flat bushfire in January 2015 and, more broadly, animal owners impacted by the Pinery bushfire in November 2015.
- **Planning for animals: pet ownership, bushfire preparedness, and geographic bushfire risk in Tasmania.** A study in which we were developing a method to collect data to map animal ownership distributions with an overlay of owners' preparedness and intentions in bushfires.
- **Building an ARC: establishing a community-led Animal Ready Community (ARC).** A study working alongside a community group in the Blue Mountains in NSW (Blue ARC) to facilitate, support, and evaluate the impacts of a community-led push to raise awareness of, and engagement in, animal-related emergency preparedness and planning.

The field work studies involved mixed methods approaches, including surveys, interviews, workshops, data-mining, GIS mapping, and field-based data collection.

PhD research

In addition to the scoping and field study research in the MAiD project plan of work, outlined above, another important component of the project has been the work conducted by our BNHCRC PhD scholar and animal emergency management practitioner Rachel Westcott.

Rachel has been investigating the interactions between, and challenges facing, animal owners and emergency responders in bushfire situations, to determine if new or enhanced mitigation measures can be integrated into arrangements to promote human safety and support community well-being.

Rachel conducted her research field work in the Port Lincoln/Eyre Peninsula area in South Australia. She has been active in publishing her research in peer-reviewed journals and conference papers, in conference presentations, and in blogs.



Rachel Westcott presenting at the ANZDMC Conference, Gold Coast, May 2017.



RESEARCH APPROACH

In this section of the report the approach to the Phase 2 of the project is outlined. This phase comprised four field work studies.

Field study development

The field study phase of the project followed-on from the Phase 1 scoping studies, the AEM audit report, and the Knowledge Exchange workshop conducted in the first 12 months of the project.

At the end of this period a set of potential field study ideas was generated by the MAiD team and these were discussed and prioritized with the project end users. Initially two field studies were chosen for further development, but with a lack of clear consensus about priorities, numerous issues worthy of attention, and a generally willingness to support the research, four field studies were eventually identified and were undertaken.

Table 1 below shows a mapping of challenges encountered in animal emergency management (identified in scoping surveys) to the four field studies that were conducted, and the MAiD PhD research.

Challenges in AEM	1. Informal volunteers	2. SA animal owners	3. Planning for animals	4. Building an ARC	5. Owner-responder Interface (PhD)
a. The physical management/rescue of animals in natural disasters	X	X			X
b. Interactions with animal owners during disaster response		X		X	X
c. Interactions with animal owners in disaster preparedness and planning		X	X	X	
d. Interactions with members of the general public	X				
e. Post-disaster impacts in management of animals or their owners				X	
f. The logistics available to respond to animals in natural disasters	X			X	X
g. Unclear policy or operational responsibilities	X		X		X
h. Inter-agency coordination around the management of animals or their owners in natural disasters	X		X		X
i. Co-ordination with non-emergency service agencies	X				X
j. Managing/dealing with untrained /spontaneous animal-related responders	X				X

TABLE 1. MAPPING ANIMAL EMERGENCY MANAGEMENT CHALLENGES TO RESEARCH PROGRAM
(CROSSES INDICATE AREAS ADDRESSED IN STUDY, RED CROSSES INDICATE MAJOR FOCUS)



Field studies commenced from March 2015 and were completed at various times, up to June 2017. Each required Human Ethics approvals.

The integration of emergent informal volunteer groups into animal emergency management

Focus: Response, co-ordination, communication

Aim: To investigate the integration of formal and informal organisations/groups in animal emergency management.

Overview: Initially, this study began as an interview-based study of a broad range of formal response agencies, extending organisations, and informal emergent volunteer groups who were involved in the animal emergency management response to the Sampson Flat bushfire in January 2015.

The study primarily looked at the roles of, communication with, and integration of, informal groups and the benefits and challenges encountered. Twelve in-depth interviews were completed with representatives from formal response organisations: SAPOL, PIRSA, CFS, and SAVEM. Interviews were also undertaken with established animal-related organisations that extended their activities into AEM, e.g. RSPCA, Animal Welfare League, Horse SA, and Adelaide Zoo, and three fully volunteer groups.

Identification and access to volunteer groups was problematic, which reduced the representation of these groups in the study. Therefore we decided to extend the study, using an online survey to reach people who volunteered to help animals during recent disaster events, e.g. bushfire events in SA (Pinery), VIC (Wye River), WA (Waroona), and floods in Dungog/Hunter Region.



The survey content was developed from the initial findings of the interview study. The survey gained a further 26 responses from mostly informal volunteers. Although this isn't a large number, a combination of sampling conditions; 'recent emergency events' and the specific roles targeted by the survey, mean that this

number of responses is still a useful sample of this specialist group.

Outputs and future plans: The main interview study findings were presented at the BNHCRC forum/AFAC 2015, and a peer-reviewed paper has been accepted for publication AJEM. The survey results have not been written up at this point. We are considering re-opening the survey for completion by more recent volunteers to gain a larger sample, with a view to publish the findings in 2018.

Animal owner experiences in recent South Australian bushfires

Focus: Preparedness and Response



Aim: To assess the preparedness and actions of horse owners impacted by the January 2015 Sampson Flat bushfire and the preparedness and actions of a broader set of animal owners impacted by the November 2015 Pinery bushfire.

Overview: These studies were undertaken with support from Horse SA, and built on data collected in post bushfire research conducted with the SA Country Fire Service in 2014. Horse owners are a group identified by emergency responders as a priority group due to their strong bonds to their animals and logistical and practical issues related to the size of their animals.

The studies involved the use of online surveys of horse owners affected by the two SA bushfires.

The Sampson Flat bushfire study was used to assess ownership and

property characteristics, owners' levels of preparedness, and the actions taken during the bushfire. The infographic (left) includes some summary data from the study and is available at

<https://www.facebook.com/SavingAnimalAndHumanLives/photos/a.151844781634500.35442.149774535174858/582750865210554/?type=3&theater>



The main survey findings from the Sampson Flat study were that

- A large majority of respondents included their horses in their bushfire plan, but few had their plan in written format.
- Most people did not actually evacuate but preferred to wait and see.
- Horse owners had high levels of attachment to their horses.
- Most had some form of ID for their horses and
- Most had the means of transporting their horses if necessary.

Following the Sampson Flat survey administration, the Pinery bushfire occurred. The team modified and extended the Sampson Flat study questionnaire to include all animals, not just horses, and invited animal owners affected by the Pinery bushfire to take part in the study. Thirty four animal owners impacted by the fire took part in this study.

A paper has been written exploring the relationship between attachment to animals and the bushfire preparedness, planning, and response of owners. This is being submitted for publication currently.

Output/s: Project researchers have been actively working with Horse SA, as a research stakeholder to translate research findings into guidance, advice, and training for horse owners.

Planning for animals: the role of pet ownership in bushfire preparations in Tasmania and its juxtaposition with geographic variations in bushfire risk

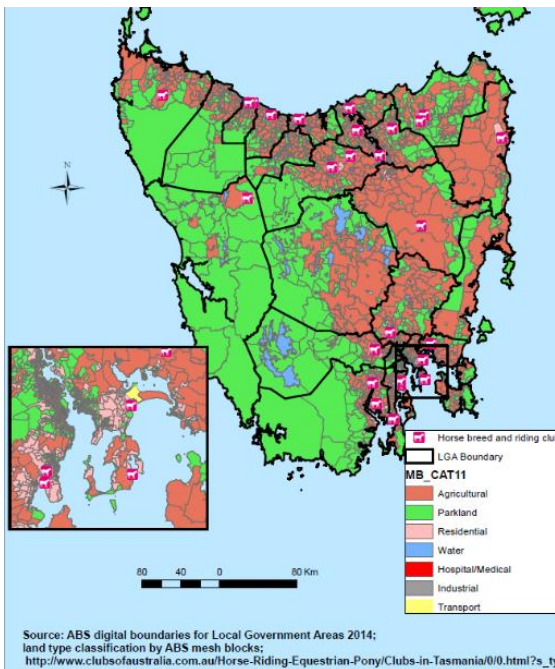
Focus: Planning, logistics, community preparedness

Aim: To map peri-urban animal populations in a bushfire prone area with an overlay of owners' behavioural intentions.

Overview: Successful animal emergency management requires community engagement and the integration of multiple stakeholders. This study involves collaboration between MAiD, Tasmania Fire Service (TFS), Department of Primary Industries, Parks, Water and Environment (DPIPWE), local councils, and pet owners.



We worked with TFS initially to identify one or two LGAs with high peri-urban animal ownership that were also going to be part of their Bushfire Ready Neighbourhoods program to form the research sample. In addition the mapping of animal ownership using existing DPIPWE and Census data was undertaken to explore the distribution of animals in Tasmania.



A community level survey was launched to explore household bushfire preparedness and evacuation planning intentions for people and their animals.

This study encountered a number of hurdles, with ownership data formatting being incompatible and needing additional manipulation. The response to the community survey was not as strong as expected, which led to the sample being extended to all of Tasmania, and extended to include non-pet owners – to allow for comparisons to be made between these two main groups.

The survey now has a sample of approximately 500 respondents, with a pet ownership rate of 49%, allowing for comparisons of planned actions between pet owners and non-pet owners.

Selected findings:

- The demographic profile of pet owners is quite different from non-pet owners in terms of employment status, household type, and presence of family members with a vulnerability, but pet owners and non-pet owners have similar geographic, age, and gender distributions and have similar housing arrangements.



- The pattern of species owned as pets was similar to other reported studies of pet ownership in Australia but horses appear to be more commonly owned in Tasmania and fish less so in comparison with Australia as a whole.
- Length of time spent in an area indicates familiarity with routes and locations of key facilities such as safe places or refuges of last resort and proximity of high risk areas such as bushland. Most pet owners have lived in their current location for more than one year. They are more likely than non-pet owners to have lived in their current location between 6 to 20 years but less likely than non-pet owners to have lived there for more than 20 years.
- About half of both groups (pet owners and non-pet owners) had been affected either directly or indirectly by at least one bushfire in the past.
- Three quarters (76%) of pet owners and 60% of non-pet owners had a bushfire plan at the time of the most recent bushfire they had experienced, although not necessarily written down (non-pet owners were much more likely to have written plans – 25% vs 10% for pet owners). The difference between pet owners and non-pet owners in whether they had plans in the past was statistically significant ($z= 2.5$, $p=0.013$, CI 3.4 – 28.6).
- Pet owners were much more likely to plan to evacuate early than non-pet owners (30% vs 17%) while non-pet owners were much more likely to plan to stay and defend (52% vs 19%). Pet owners were nearly twice as likely to plan for some household members to leave while others stay and defend (29% vs 16% of non-pet owners) but these differences were not statistically significant.
- In general, neither group practiced their plans but pet owners were even less likely to do so than non-pet owners (11.4% of pet owners had practised their plan compared to 29% of non-pet owners). This difference was statistically significant ($z=2.9$, $p=0.0032$, CI 0.0576 - 0.2864).

A qualitative mapping exercise was also undertaken with a convenience sample of horse owners attending Bushfire Ready Neighbourhoods seminars conducted by TFS in November 2016. This exercise indicated that many properties on acreage had inadequate accessibility via gates (often only one way out) and that large animals were often housed close to bushland, while small animals living outdoors were located close to the dwelling. Participants expressed frustration with neighbours who did not take appropriate actions such as mowing long grass, but also were confident in their own knowledge of their local area in terms of escape routes and refuge places. They were able to indicate directions and estimated distances and travel times from their homes to places they intended to go with their animals.

Expected output/s: a methodology for planning – anticipating demand and capacity for animals in evacuations suitable for use in bushfires.



Building an ARC: establishing a community-led Animal Ready Community (ARC).

Focus: Awareness, preparedness, planning and recovery. Peer-to-peer/Community-to-community approach

Aim: To assist with, and document, the setting-up of an Animal Ready Community initiative.

Overview: This study is embedded within a community-setting in the Blue Mountains. We are working with the Blue ARC community group, Springwood Neighbourhood Centre, the Mountains Community Resilience Network and the City of Blue Mountains Council.



In this study we have been working to support and document the setting-up of a community-led group that is looking to progress animal emergency management in the mountains, working directly with the community.



Cat cooling its paws in water following 2013 bushfires

Activities have included identifying community needs – through their experiences of the 2013 bushfires. Identifying and liaising with official emergency management stakeholders and identifying key community contacts.

The team has been supporting the development of resources for local animal owners.

Ethics approval for this study was

granted in May 2016. Interviews have been held with people in key positions in the local council, NSW RFS, NGOs, and a number of community organisations; mostly those who had responsibilities during the 2013 bushfire, and those tasked with similar roles for any future emergency.

A survey for local animal owners was conducted in early 2017 to identify their level of preparedness and planning and their information needs and any perceived local (or other) barriers to preparedness. More than 300 residents took part in the survey and the team has been analysing the data and feeding back results to local groups, and will be reporting back to residents shortly.

In addition to the community survey, and to complement other work in the MAiD project, the team assisted with conducting an audit of local veterinary practices; investigating the availability of services, boarding, and special treatment options (such as burns treatment,

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For all other enquiries contact:
 Mel Taylor, Bushfire & Natural Hazards CRC – mel.taylor@mq.edu.au
 Blue ARC is assisted by Springwood Neighbourhood Centre Co-operative Ltd.

Logos for HAZARDS CRC, Springwood Neighbourhood Centre, and Blue ARC.



treatment of wildlife), as well as investigating the role that these practices consider they have in the event of a local emergency, and in general preparedness activities. Information from the survey will be used to create a community resource.

In addition to these activities, the team has been working with Blue ARC to help run an art competition at a local school, with an animal (human-animal bond) theme. This artwork will be turned into a book in October 2017 for the children to sell to raise money for the school and for Blue ARC, and this initiative will be evaluated to consider its expansion to more schools in 2018. A number of schools have expressed interest in taking part.

Activity is currently underway to prepare resources for the 2017 'Get Ready' weekend, highlighting bushfire preparedness. Posters and flyers have been produced for distribution, focussed on animal preparedness and planning as part of planning for the *whole* family. Further plans are in place for the development of low-/no-cost community training on animal first aid, emergency preparedness, and wildlife care, and factsheets will be developed with locally-relevant information and links to local organisations to assist people to prepare and seek information about emergency planning for their animals.

Expected and planned output/s: Activity on this project is still increasing, and will continue to do so beyond the life of the current project. Outputs identified above will be rolled-out over time and evaluated. This will lead to development of a generic 'how to' guide for communities to assist them in setting-up an ARC, with survey tools, checklists, information sources, hints and tips for community activities. Details of this project and its outputs were the focus of a recent BNHCRC Hazard Note⁷. Activities and outcomes of this project will be presented at the 2017 BNHCRC/AFAC conference in September 2017 and are planned for publication in AJEM later in 2017.



Investigating the application of Protection Motivation Theory to animal owners and emergency responders in a bushfire natural hazard, with a view to developing public policy to enhance disaster risk reduction

PhD Student Research

Focus: Response behavior, disaster risk reduction, public health and safety policy, decision-making

Aim: To gather data from the participant groups – emergency responders and animal owners, and their interface in the context of bushfires threats, to determine and develop public health and safety policy.

Overview: This study is being conducted by BNHCRC PhD student Rachel Westcott. Rachel is investigating the interactions between, and challenges facing, animal owners and emergency responders in bushfire situations, to determine if new or enhanced mitigation measures can be integrated into arrangements to promote human safety and support community well-being. The field work for this study is focused in the Port Lincoln area in SA – an area that has experienced several serious bushfires in the last decade.



In the qualitative phase of her research Rachel conducted a series of interviews and focus groups with a range of animal owners and emergency responders to explore their bushfire experiences, issues around preparedness and their interactions with each other. She conducted extensive field work in the Port Lincoln/Eyre Peninsula region during the period July – September 2015. The owner groups included farmers, commercial animal-related business owners, horse owners and companion and assistance animal owners. The emergency responder groups included those in emergency services, primary industries, environmental departments, and vets.

Data analysis is complete for this phase. Five peer-reviewed academic papers have been written (two published, one in-press, two submitted), as well as two peer-reviewed conference papers and many other outputs. Findings from the final part of the project, a pilot survey of primary producers on Eyre Peninsula, as a special group of interest will be included in Rachel's thesis as a draft paper. The goal of the pilot survey is twofold: to identify aspects of farmers' bushfire knowledge which can be usefully translated to assist other sectors of the community, and to identify any particular challenges or support needed by this group, including the farmer/responder interface.

During 2016 this project has been refined to focus on disaster risk reduction (DRR) and public health and safety policy. In so doing, potential applications of this research have been significantly widened. During data analysis, it became



clear that the participant demographics (Emergency responders and the owners of any kind and any number of animals), and the original intention of investigating Protection Motivation Theory could be simultaneously funnelled (with respect to DRR) and expanded (to broadly applicable public policy). This had led to developing proposals for new policy initiatives to help establish preparedness as a social norm, and thus narrow the awareness-action gap: cultivating “fire-fitness” a term Rachel has coined which may have more public appeal than the word “preparedness”. Exploring “fire-fitness”, response behaviour and the aetiology of decision-making in the context of Protection Motivation Theory has led to further proposals to enhance and establish a culture of preparedness to help save human life in natural hazard emergencies.

During 2017, Rachel has presented this work at two conferences in Australia, as well as at the BNHCRC Research Forum as a Three Minute Thesis (see right). Her first two published papers, as lead author with her supervisory panel, attracted over 5,500 on-line views at the time of writing this report, and precipitated an invitation to write for the specialist DRR Voices blog page of the United Nations International Strategy for Disaster Reduction.



Rachel is looking forward to submitting her PhD thesis (by a series of papers) before the end of 2017.



KEY MILESTONES

Over the course of the project we have delivered many milestones; some as part of formal reporting and part of the project management plan, and some opportunistic, unexpected, or additional.

The earlier sections of this report outlined activities undertaken in the two phases of the project and the four field work studies, and towards the end of the report there is a full listing of project outputs from the team.

In Phase 1 of the project, key milestones were

- Completion of a national survey of emergency services agencies and other stakeholders on the challenges of animal emergency management. This was a well-supported study, with a high response rate from state agencies, government departments, and other animal-related stakeholders and gave the team a comprehensive national picture of the challenges in the area.
- The national survey (above) helped to get raise awareness of the project and, in doing so, helped to support another key milestone; delivery of the stakeholder knowledge exchange workshop. This was a productive and insightful activity for the team and a good networking opportunity for attendees.
- Production of an audit of animal emergency management in Australia. This was a significant piece of work, and has been a useful resource throughout the project, for the team as well as for interested stakeholders and contacts. It provided an opportunity to bring all the knowledge from the scoping activities together in a single document, presenting national approaches and initiatives, as well as legislative and formal planning information for easy comparison.

An unexpected output from Phase 1, which was a major milestone for the project team, was our involvement in a special edition of the Australian Journal of Emergency Management on Animals in Emergencies. The team contributed a number of papers from the scoping phase of the project and elsewhere, assisted with identifying other individuals working in the field to contribute, and peer-reviewed some of the contributions made from outside the team. This journal edition has been a useful resource for the project team to distribute to others interested in the area and I understand it has been a widely accessed edition of the journal.

In Phase 2 of the project, key milestones were related to completing or undertaking research in various jurisdictions, as part of the field work studies.

- Undertaking and completing research activities related to bushfires in South Australia; the Sampson Flat and Pinery bushfires. Our PhD scholar Rachel Westcott was directly involved in the animal emergency response to both bushfires, as the coordinator of SAVEM (South Australia Veterinary Emergency Management). Rachel provided valuable insights



to the team about the response/s and assisted part of the team with follow-on research looking at the roles of various formal, formally assisting, and spontaneous responders. In addition, support from Horse SA, and having half the project team located locally, also assisted with follow-on work with horse owners and pet owners following the fires.

- Undertaking and progressing research activities in Tasmania with TFS and DPIPWE. The Tasmanian project was more complex than originally anticipated, due to mapping issues and poor community response rates. Project constraints resulted in less on-the-ground research with communities than perhaps originally envisaged. However, extending the research to a broader target sample has resulted in a good dataset that is still being worked through.
- Undertaking research work and achieving community collaboration in co-creating resources in the Blue Mountains in NSW. As noted, many activities have been undertaken and are planned in this study area. This activity will be underway for some time before being completed as a BNHCRC task.



UTILISATION OUTPUTS

Achievements

Utilisation

As outlined earlier in the report, a large part of the project output, which has enabled utilisation of the research, has come from publication of the research and the establishment of a knowledge base in Australian AEM. This has enabled greater understanding of a range of issues in AEM and, as evidenced in the stakeholder testimonials, has influenced emergency management discussions, better informed decision-making, been incorporated into guidance documents, and has contributed to planning and policy development – in Australia and internationally.

During the life of the project (March 2014 – to date) the team has published

- 10 peer-reviewed journal articles, with a further four currently under review, and four in preparation,
- 2 peer-reviewed conference papers,
- 5 BNHCRC reviewed reports, and
- 11 RSPCA reports that have referenced the project and its outputs.

And has presented, at national and international conferences,

- 21 oral presentations, and
- 11 posters presentations.

In addition to these formal written outputs, the team has provided numerous radio interviews, blogs, podcasts, and non-peer reviewed outputs, such as practitioner magazine articles, BNHCRC Hazard Notes, seminar presentations, and newsletters. (See full list of project outputs later in the report.)

In the latter months of the project the community-led work in the Blue Mountains to support the development of an animal-ready community, has co-produced a range of emergency planning and awareness outputs. These have included emergency preparedness posters and information flyers. The flyers have been distributed to NSW RFS Blue Mountains brigades (23 brigades) for their 'Get Ready' weekend events, and these outputs have been used in supporting additional community activities with the Springwood Neighbourhood Centre and the Mountains Community Resource Network. In addition, we have been involved in running a children's art competition (which will produce a book in October 2017), and we have been attending community events with the Blue ARC group ahead of the 2017 bushfire season.





WHERE TO FROM HERE

Following the end of the formal project contract there are still several activities that will be completed and embarked upon that relate directly to the MAiD project.

Knowledge, Education & Training

Research data for some components of the research are still being analysed and will be written up for end user/practitioner use and peer-reviewed publication. Specifically, research data from the TAS research and the Blue Mountains survey research. Both sets of data require further attention to provide valuable additional information to end users, stakeholders, and community.

The research in the Blue Mountains still has a way to go, with utilisation outputs only now starting to flow. Partly this has been due to the pace of working with community, but also in the time taken to gather data, agree collectively on directions and activities, and co-produce initial outputs. Plans for low-/no-cost community training are underway with the help of a local veterinarian and a generous offer of free-assistance from an online training company. This training will include seminar/workshop-style instruction in pet first aid, emergency preparedness, and wildlife care, as well as online video resources for simple/quick emergency-related animal activities, such as handling stressed animals, putting a muzzle on a dog and a harness on a horse, initial triage and treatment of burns and injuries, and getting a possum/wildlife into a crate/carrier safely (both for handler and animal).

The final product from the Blue ARC work will be a community 'how to' guide to setting up a successful animal-ready community. Some elements are already in draft form, but the final product will require further time to enable additional co-production of outputs (e.g. factsheets, training) and the opportunity to conduct evaluation of these.

End User Engagement

As a greater suite of outputs from the Blue ARC community work are produced there will be additional opportunities and reasons to engage with emergency service end users and other stakeholders, including other community groups.

Similarly, all members of the team have had engagement with end users and stakeholders in the development of state plans, or for provision of advice. This engagement is not expected to decline, especially as further data from the project become available and interest in AEM increases.

Impacts

Interest in AEM and all related animal in emergency contexts is expected to continue to increase, as communities expect more from emergency management agencies, and have more say, and as community-led approaches to emergency management becomes a more established approach (e.g. where communities get to choose what assets are protected).



Changes in culture are often slow moving but the MAiD project legacy, in the form of its knowledge base, can provide an ongoing source of reference for informed decision-making and best practice approaches in AEM.



PUBLICATIONS LIST

Full List of MAiD Project Outputs (at September 2017)

Peer-reviewed publications

Westcott R, Ronan K, Bambrick H, Taylor M. (2017) Don't Just Do Something...Stand There! Emergency Responders' Peri-Incident Perceptions of Animal Owners in Bushfire. *Frontiers in Veterinary Science* 4(34). doi: 10.3389/fvets.2017.00034

Westcott R, Ronan K, Bambrick H, Taylor M. (2017) Expanding protection motivation theory: investigating an application to animal owners and emergency responders in bushfire emergencies. *BMC Psychology* 5(1):13. doi: 10.1186/s40359-017-0182-3

Thompson K, Trigg J, Smith B. (2017) Animal Ownership among Vulnerable Populations in Regional South Australia: Implications for Natural Disaster Preparedness and Resilience. *Journal of Public Health Management & Practice*, 23:1, 59-63.

Trigg J, Smith B, Bennett P, Thompson K. (2017) Developing a Scale to Understand Willingness to Sacrifice Personal Safety for Companion Animals: The Pet-Owner Risk Propensity Scale (PORPS). *International Journal of Disaster Risk Reduction*, 21, 205-212.

Trigg, J. L., Thompson, K., Smith, B., & Bennett, P. (2016) A Moveable Beast: Subjective Influence of Human-Animal Relationships on Risk Perception, and Risk Behaviour during Bushfire Threat. *The Qualitative Report*, 21(10), 1881-1903.

Westcott R. (2015) Animal Emergency Management: Response and Recovery Experience and lessons from the Sampson Flat Fire, South Australia, January 2015. *Proceedings of the Australia and New Zealand Disaster and Emergency Management Conference*. Gold Coast, Queensland.

Taylor M, McCarthy M, Burns P, Thompson K, Smith B, Eustace G. (2015) The challenges of managing animals and their owners in disasters: The perspectives of Australian Response Organisations and Stakeholders. *Australian Journal of Emergency Management*, 30:2, 31-37.

<https://ajem.infoservices.com.au/items/AJEM-30-02>

Smith B, Thompson K, Taylor M. (2015) Risk perception, preparedness and response of livestock producers to bushfires: A South Australian case study. *Australian Journal of Emergency Management*, 30:2, 38-42.

<https://ajem.infoservices.com.au/items/AJEM-30-02>

Smith B, Thompson K, Taylor M. (2015) What's the Big Deal? Responder Experiences of Large Animal Rescue in Australia. *PLoS Currents Disasters*. 2015 Jan 22. Edition 1. doi: 10.1371/currents.dis.71d34082943fa239dbfbf9597232c8a5.

<http://currents.plos.org/disasters/article/whats-the-big-deal-responder-experiences-of-large-animal-rescue-in-australia/>



Taylor M, Eustace G, Smith B, Thompson K, Westcott R, Burns P. (2015) Managing Animals in Disasters (MAiD): The experiences of emergency services personnel in supporting animals and their owners in disasters. Proceedings of the Bushfire and Natural Hazards CRC Research Forum. Wellington, New Zealand. (1 September 2014) <http://www.bnhcrc.com.au/publications/biblio/bnh-1562>

Peer-reviewed publications currently underway

Submitted/In press papers:

Westcott R. Narrowing the awareness-action gap: cultivating fire-fitness as a social norm through public policy initiatives. (Accepted, AJEM, October 2017)

Westcott R, Ronan K, Bambrick H, Taylor M. Public Health and Natural Hazards: New Policies and Preparedness Initiatives Developed from an Australian Bushfire Case Study. (Submitted to Frontiers in Public Health)

McCarthy M, Taylor M. Animal Emergency Management in South Australia: A case study of the Sampson Flat bushfire. (Accepted, AJEM, October 2017)

Thompson K, Haigh L, Smith B. Plans and ultimate actions of horse guardians in response to a bushfire threat: Implications for natural disaster preparedness and survivability. (Submitted to International Journal of Disaster Risk Reduction).

Westcott R, Ronan K, Bambrick H, Taylor M. Bushfire preparedness, response behaviour and the aetiology of decision-making: the emergency responder-animal owner interface. (Global Environmental Change)

To be submitted shortly (advanced drafts):

Thompson K, Haigh L and Smith B. Factors influencing pre-emptive relocation of horses during bushfire threat based on three 2014 Adelaide fires. (AJEM)

O'Dwyer L, Thompson, K, Taylor M. How does animal attachment characterize the bushfire preparedness, planning, and response of animal guardians? Findings from a small case study in South Australia (PLoS Currents: Disasters)

Westcott R, Ronan K, Bambrick H, Taylor M. The Survey: Farmers, fire and animals on Lower Eyre Peninsula (TBD)

BNHCRC Reports

Taylor, M. (2016) Managing Animals in Disasters: Improving Preparedness, Response, and Resilience through individual and organisational collaboration. Annual project report 2015-2016. Report for the Bushfire and Natural Hazards Cooperative Research Centre. Melbourne, VIC. Australia.

Taylor M, Eustace G, McCarthy M. (2015) Animal Emergency Management in Australia: An audit of current legislation, plans, policy, community engagement resources, initiatives, needs, and research dissemination. Report for the Bushfire and Natural Hazards Cooperative Research Centre. Melbourne, VIC. Australia.



Taylor, M. (2015) Managing Animals in Disasters: Improving Preparedness, Response and Resilience through individual and organisational collaboration. Annual project report 2014-2015. Report for the Bushfire and Natural Hazards Cooperative Research Centre. Melbourne, VIC. Australia.

Taylor, M. (2014) Managing Animals in Disasters: Improving Preparedness, Response and Resilience through individual and organisational collaboration. Annual project report 2013-2014. Report for the Bushfire and Natural Hazards Cooperative Research Centre. Melbourne, VIC. Australia.

Taylor M, Eustace G, McCarthy M (2014) Knowledge Exchange Workshop Summary Report. Report for the Bushfire and Natural Hazards Cooperative Research Centre. Melbourne, VIC. Australia.

Peer-reviewed conference papers

Westcott R. (2017) Mitigating Action Inertia and the Bushfire Awareness-Action Gap: Findings from a South Australian Case Study. Australian and New Zealand Disaster and Emergency Management Conference, Broadbeach, Gold Coast (QLD), 22 – 23 May 2017

Westcott R. (2017) Narrowing the awareness-action gap: cultivating a culture of routine all-hazards preparedness through public policy initiatives. Australasian Fire and Emergency Services Authorities Council (AFAC) Conference 2017, Sydney, September 2017.

Conference presentations (Oral)

Taylor M, McCarthy M, Bigelow J. Building an ARC in the Mountains: A community-led initiative to build an Animal Ready Community (ARC) in the NSW Blue Mountains and to provide a template for similar initiatives. Australasian Fire and Emergency Services Authorities Council (AFAC) Conference Sydney, September 2017.

O'Dwyer L A and Thompson K. (2017) Patterns in human attachment to pets. Animal Intersections Conference, University of Adelaide, South Australia, July 2-5.

Taylor M, McCarthy M, Eustace G, Glassey S. (2017) *Tracking Debbie's Track – One Weather System, Two Countries, Four Disasters, Seven Local Councils and more than 100,000 animal owning households*, ANZDMC Conference Gold Coast. May 2017.

Thompson K. (2016) Being cruel or being kind. Human Behaviour Change for Animal Welfare conference, Dorking, England. September, 2016.

Thompson K. (2016) Theorising human-horse relationships: horses as social actors? Equine Cultures in Transition conference, Stockholm, Sweden. October, 2016.

O'Dwyer L. (2016) The risks of evacuating with animals. Society for Risk Analysis Australia and New Zealand conference, Adelaide. November, 2016.



Westcott R. (2016) Don't just do something, stand there! Emergency responders' peri-incident perceptions of animal owners in bushfire. Presentation at Western Sydney University HDR conference.

O'Dwyer L, Thompson K. (2016). Understanding SA Horse Owners' Plans and Actions in the 2015 Sampson Flat Bushfire - Implications for Emergency Responders. Frontiers in Hazard, Risk and Disaster Research Session, Institute of Australian Geographers National Conference, Adelaide. June 29 June – 1 July 2016.

Taylor M. (2016) Communicating to animal owners. Presentation and workshop exercise in the use of narrative in communication. Emergency Media and Public Affairs Annual Conference, Melbourne, VIC. May 2016.

Westcott R. (2016) Triage, treat and then what? Bushfire, wildlife and SAVEM. Australian Veterinary Association Annual Conference. Adelaide, SA. May 2016.

Taylor M. (2016) How to build an ARC (and other animal business). NSW Rural Fire Service Conference. Australian Community Engagement and Fire Awareness Conference, Albury, NSW. May 2016.

Taylor M, Eustace G, Burns P, McCarthy M. (2016) The Importance of managing animals in disasters to improve human outcomes: from response to recovery. People in Disasters Conference – Response, Recovery, Resilience. Christchurch, New Zealand. February 2016.

Thompson K. (2015) How do Horse Guardians Respond to Bushfire Threat – Lessons Learnt from Five South Australian Fires, 6th International Large Animal Rescue Conference, British Animal Rescue and Trauma Care Association. Prague. December 2015.

Westcott R. (2015) Investigating the application of protection motivation theory to the behaviour of animal owners and emergency responders in bushfire natural hazards. Presentation at Western Sydney University HDR conference, November 2015.

Westcott R. (2015) The Sampson Flat fire January 2015: real world experience meets ground-breaking research. Australian Natural Hazard Management Conference, Perth. October 2015.

Taylor M, McCarthy M, Eustace G. (2015) The integration of informal volunteers into Animal Emergency Management: Experiences from the 2015 South Australian Sampson Flat bushfire. Bushfire and Natural Hazards Cooperative Research Centre Forum, Adelaide, SA. September 2015.

Westcott, R. (2015) Veterinary emergency management at the Sampson Flat bushfire in South Australia, January 2015. Australasian Fire and Emergency Services Authorities Council (AFAC) Conference, Adelaide, SA. September 2015.

McCarthy M, Taylor M, Thompson K, Smith B, Burns P, Eustace G. (2015) Stakeholder perspectives on the management of animals and their owners in



disasters. Australia and New Zealand Disaster and Emergency Management Conference. Gold Coast, Queensland. May 2015.

Westcott R. (2015) Animal emergency management: response and recovery experience and lessons from the Sampson Flat fire, South Australia, January 2015. Australia and New Zealand Disaster and Emergency Management Conference. Gold Coast, Queensland. May 2015.

Taylor M, Burns P, Thompson K, Smith B, Eustace G. (2014) Managing Animals in Disasters (MAiD): The experiences of emergency services personnel in supporting animals and their owners in disasters. Bushfire and Natural Hazards Cooperative Research Centre Forum. Wellington, New Zealand. September 2014.

Smith B, Taylor M, Thompson K. (2014) Risk management for livestock producers during natural disasters. Society for Risk Analysis – Australia and New Zealand 8th Annual Conference. Palmerston North, New Zealand. August 2014.

Taylor M, Burns P, Lynch E, Fogarty C, Eustace G, Thompson K. (2014) Having pets does influence decision making: Recent studies of the preparedness, expectations, and experiences of pet owners in natural disasters. Australian Community Engagement and Fire Awareness Conference. Wollongong, NSW. May 2014.

Conference presentations (Posters)

Westcott R. (2017) Bushfire preparedness: how to become 'fire-fit' without really noticing. Narrowing the awareness-action gap: cultivating a culture of routine all-hazards preparedness through public policy initiatives – a case study from South Australia, the "driest state in the driest continent". BNHCRC Research Showcase, Adelaide, July 2017 and AFAC Conference, Sydney September 2017.

Taylor M, McCarthy M, Thompson K, O'Dwyer L, Eustace G, Burns P. (2017) Managing Animals in Disasters – Project Summary. BNHCRC Research Showcase, Adelaide, July 2017 and AFAC Conference, Sydney September 2017.

Taylor M and Moore S. (2017) Livelihoods, leisure, and love on the floodplain: Challenges for animal emergency management. Floodplain Management Association Conference, Newcastle, May 2017.

McCarthy M and Taylor M. (2016) The integration of informal volunteers into animal emergency management. AFAC, Brisbane Convention Centre, August 30-September 1 2016.

O'Dwyer L A and Thompson, K. (2016) Sampson Flat bushfire, SA 2015: survey of horse owners' preparedness and attachment to horses. AFAC, Brisbane Convention Centre, August 30-September 1 2016.



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Westcott R. (2016) Narrowing the awareness-preparedness gap: investigating an other-directed application of protection motivation theory (PMT) for animal owners and emergency responders in bushfire emergencies. BNHCRC Research Advisory Forum, Hobart, TAS. May 2016.

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TEAM MEMBERS

The integrated project team comprised the academic research team, a senior advisory panel and practitioner end users from relevant end user organisations.

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