

## Abstract

Planning for and considering animals is a growing area within emergency and disaster planning. As people adapt to the changing risks of disaster events that are increasing in magnitude and frequency, communities, particularly those in regional and remote areas of Australia, face challenges that are very different from other more populated areas. These communities are often home to pets, which pose unique challenges during evacuation, response and recovery phases of emergency management. Australian state and territory government emergency management plans give varied considerations to animal management. In the Northern Territory, the *Territory Emergency Plan* (Northern Territory Government 2022) serves as a base for animal management in disasters. However, significant reform is required to fill gaps in considerations of animals in remote communities, especially First Nations communities, given the strong socio-cultural connections within family structures and contributions to wellbeing under First Nations health worldviews and the human-animal bond. Such reform requires consultation and collaboration with First Nations Australians to promote ‘right-way’ science, build local capacity and support community resilience. Considerations of the interplay between people and their pets in disaster planning, response and recovery contributes to ongoing advances in the ‘One Health’ and ‘One Welfare’ paradigms.

In this paper, Aboriginal and Torres Strait Islander peoples and the rural and remote communities in which many reside are respectfully referred to as ‘First Nations Australians’ and ‘First Nations communities’, respectively.

# Pets are family, keep them safe: a review of emergency animal management in remote First Nations communities

Peer reviewed

**Chelsea Smart**<sup>1</sup> 

ORCID: 0009-0004-7944-0865

**Tida Nou**<sup>2</sup> 

ORCID: 0009-0009-5958-1173

**Jonatan Lassa**<sup>1</sup> 

ORCID: 0000-0002-8432-842X

1. Charles Darwin University, Darwin, Larrakia Country, Northern Territory.
2. Animal Management in Rural and Remote Indigenous Communities, Darwin, Larrakia Country, Northern Territory.

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## Introduction

Animals are noted as a significant decision-making influencing factor for animal and human welfare considerations, and pets commonly have implications for community evacuation compliance (Chadwin 2017, Glassey 2018, Thompson 2013, Westcott 2021). Hurricane Katrina response efforts were widely criticised for the lack of consideration for animal welfare and prompted emergency animal management reform in the US (Babcock and Smith 2020, Chadwin 2017, Glassey 2018). According to Wu *et al.* (2023), there are knowledge gaps surrounding the practical integration of animals in disaster planning and response despite a growing understanding of the importance of pets within One Health models.

The One Health concept encompasses a multi-disciplinary approach to health across and within facets of human, animal and environmental health (Kahn 2021, Sqaunce 2021). One Welfare expands on the One Health model to consider general optimisations of animal welfare, human wellbeing, environmental conservation and sustainability (Pinillos *et al.* 2016). One Welfare can be conceptually applied alongside the paradigm of the human-animal bond and its place within human mental health and wellbeing in the current context during extreme life events such as disasters and technological hazards (Sqaunce *et al.* 2021). Thus, effective response and recovery should consider the interconnectedness of human and animal welfare especially considering the human-animal bond (Vroegindewey 2014).

The One Rescue paradigm supports coordination of emergency services to include animal management to improve collaborative effort and capitalise on response training and expertise (Glassey 2022). Therefore, establishing connection and interoperability between human- and animal-centric emergency response within planning, response and recovery is imperative to meet objectives of human, animal and environmental protection (Pinillos *et al.* 2016, Wu *et al.* 2023, Glassey 2022, Vroegindewey 2014).

Cats and dogs are common pets in Western societies, although atypical pets are increasingly common, including fish, birds, reptiles, livestock and wildlife (Chur-Hansen 2010; Chur-Hansen, Winefield and Beckwith 2008). Broadly, pets are termed as companion animals within the broader literature describing the human-animal bond (Chur-Hansen 2010). Overgaauw *et al.* (2020) define a companion animal as one that 'lives in or around the house and is fed and cared for by humans'. This definition is useful to describe companion animals and, by extension, pet ownership, in the context of First Nations communities. Pets in these communities are common although their management differs in that these animals may be free-roaming and have multi-household ownership (Brookes *et al.* 2020, Ma *et al.* 2020). The responsibility for decision-making regarding a pet can be held by one person of any age and may be confounded by trust in the animal's free will or choices (Brookes *et al.* 2020, Kennedy *et al.* 2020, Ma *et al.* 2020).

Pets can provide companionship in the form of comfort, security, pleasure and emotional attachment (Chur-Hansen 2010), a sentiment that is enhanced as cultural, social and spiritual ties among First Nations Australians (Brookes *et al.* 2020, Kennedy *et al.* 2020). Dogs especially are often highly regarded as important in First Nations communities with some having skin names, indicating a place within a kinship system that defines familial relationships, totem status and valued spiritual figures (Chenhall *et al.* 2006, Smith and Litchfield 2015, Ma *et al.* 2020).

Climate change and associated disasters are expected to increase and the communities most identified at risk include isolated groups that are vulnerable to complex socio-cultural, environmental and ecological effects of climate change such as remote First Nations communities in Australia (Voss 2018; Cresswell, Janke and Johnston 2022). Animal groups, particularly livestock and wildlife, are often excluded from existing emergency management plans (Taylor *et al.* 2015). While pets in First Nations communities are culturally and socially important (Brookes *et al.* 2020, Kennedy *et al.* 2020), their common free-roaming nature presents difficulties in the practicalities of emergency management, especially considering sheltering and evacuation.

Some jurisdictions in Australia have specific emergency animal management plans, but none exist in the Northern Territory outside of the *Territory Emergency Plan* (Northern Territory Government 2022). There are no known examples of emergency management plans in Australia that consider specific First Nations communities to lead recovery efforts and to promote disaster risk reduction and community resilience (Russell-Smith *et al.* 2022, Sithole *et al.* 2021, Van Niekerk *et al.* 2018, Williamson and Weir 2021).

## Aims

This paper identifies challenges of emergency animal management in First Nations communities to answer the following questions: *How to empower Australian remote First Nations communities in emergency animal management? How to strategically embed animal emergency management and application in the Territory Emergency Plan?*

The paper offers a framework for emergency animal management that can be used to analyse animal management within the Territory Emergency Plan with recommendations for identified knowledge gaps.

## Literature review

A literature review on the incorporation of companion animals in emergency management was undertaken in March 2023. The scope of the review included Australian and international literature with a focus on Australian academic literature and emergency plans for companion animals as well as emergency management in remote First Nations communities. The literature review was confined to emergency management planning documents and peer reviewed research papers published in English.

## Pioneering animal disaster management: lessons from Hurricane Katrina

Hurricane Katrina affected the United States Gulf Coast in 2005 and resulted in 1,245 human deaths (Glassey 2018). Evacuation efforts attracted extensive criticism given the general exclusion of planning for pets and the resulting widespread evacuation noncompliance of people (Babcock and Smith 2020, Chadwin 2017, Glassey 2018). Large numbers of New Orleans residents sheltered in place with their animals and put their lives at further risk (Chadwin 2017). Following evaluation of Hurricane Katrina evacuation and other disaster response failures, the role of pets as contributors to loss of human life was considered so great that the *Pets Evacuation and Transportation Standards (PETS) Act of 2006*<sup>1</sup> was implemented (Babcock and Smith 2020, Glassey 2018). The PETS Act ensures that US state and local emergency plans include operations for evacuating people and their pets (Babcock and Smith 2020, Chadwin 2017, Glassey 2018).

The PETS Act was enacted during Hurricane Gustav in 2008 and Hurricane Harvey in 2017 (Babcock and Smith 2020). The Hurricane Gustav response appeared largely effective in implementing the PETS Act as the plan was functional, there was widespread notice and compliance from the public, resourcing was adequate and few pets and human lives were lost (Babcock and Smith 2020). Pet owners were active during evacuations by bringing pets with them or transporting pets to appropriate drop-off locations. This reduced the load on first responders (Babcock and Smith 2020). A key success was the use of barcoded wristbands for people and their animals in conjunction with close sheltering of humans and animals, which provided ease of reuniting evacuated parties (Babcock and Smith 2020).

In contrast, Hurricane Harvey emergency management efforts have been criticised for lacking commitment to on-ground action, despite PETS-compliant plans being in place (Glassey 2018). Failures and challenges related to a lack of centralised database systems for connecting and reuniting people with their pets, lack of training in animal emergency management for service workers implementing PETS Act plans, confusion due

1. *Pets Evacuation and Transportation Standards (PETS) Act of 2006*, at [www.congress.gov/bill/109th-congress/house-bill/3858](http://www.congress.gov/bill/109th-congress/house-bill/3858)

to large-scale involvement of rescue groups and the public in unregulated animal relocations and oversupply of donations that required diversion of logistical attention and resources (Glasse 2018). Following analysis of the pitfalls of the Hurricane Harvey response, the City of New Orleans revised plans in conjunction with lessons learnt from Hurricane Katrina and in compliance with the PETS Act. This provided a sound guide for communities to develop animal management plans as part of disaster and emergency management (Babcock and Smith 2020). Key to these plans was inclusion of a pet registry with provisions for service animals (Babcock and Smith 2020). Protocols for staff, volunteer and public involvement are available and regular training is carried out in conjunction with veterinary teams to enable streamlined animal triage, tracking and movement during a response (Babcock and Smith 2020). The US National Fire Protection Association<sup>2</sup> has since implemented an appendix for *Service Animals and Pets* within the *Standard for Mass Evacuation and Sheltering* (Heath and Linnabary 2015). These plans reinforce the strength of the human-animal bond and highlight the risks to human life if animal inclusion in evacuation is ignored. It supports the joint evacuation of people and pets as the norm in emergency and disaster management standards (Babcock and Smith 2020, Chadwin 2017).

### Existing plans: emergency animal management within First Nations communities

Emergency management planning in Australia generally falls to state and territory governments and, in the Northern Territory, the lead agency is the Department of Industry Tourism and Trade (Northern Territory Government 2022). Across jurisdictions, there are varied emergency management plans for remote First Nations communities, some of which contain references to management of animals (Table 1). Specific animal emergency management plans exist in South Australia, Victoria and Western Australia (Table 1). The South Australian plan provides a framework of roles and responsibilities of government agencies, not-for-profit organisations, businesses, animal owners and the community to manage animal welfare through emergency phases of preparedness, response and recovery (PIRSA 2018). Within this, local knowledge, especially considering cultural sites of significance, is referenced as important in response planning and implementation (PIRSA 2018). The Western Australian plan names local governments as having key roles in supporting animal welfare activities in emergencies while making animal owners responsible for animal evacuation and ongoing

2. National Fire Protection Association, at [www.nfpa.org](http://www.nfpa.org).

Table 1: Summary of emergency management plans by Australian jurisdiction considering specific indicators.

Jurisdiction	Are there formal emergency management frameworks specifically for remote First Nations communities?	Are there specific emergency animal management plans?	Are there specific recommendations for animals in remote communities?
Australian Capital Territory	No	No	No
New South Wales	No	No – advice only: ‘Animal Emergency Plan’ template available for pet owners.	No
Northern Territory	No Embedded within local area plans.	No – advice included in other plans: <ul style="list-style-type: none"> <li>• pets not to accompany owners in mass community evacuations.</li> </ul>	No
Queensland	Yes	No – advice included in other plans: <ul style="list-style-type: none"> <li>• pets listed as at risk by hazards</li> <li>• pets given thought within preparedness community education.</li> </ul>	No
South Australia	No State Emergency Management Plan includes a ‘People at Risk in Emergencies’ section that includes consideration of Aboriginal and Torres Strait Islander peoples.	Yes ‘Managing Animals in Emergencies: A Framework for South Australia 2018’.	No
Tasmania	No	No	No
Victoria	No	Yes ‘Victorian Emergency Animal Welfare Plan 2019’.	No
Western Australia	No Remote communities are included as part of state level plan.	Yes ‘Animal Welfare in Emergencies: State Support Plan 2021’.	No

Table 2: Membership of the Biosecurity and Animal Welfare Group within the *Territory Emergency Plan*.

Participating Northern Territory organisations	Supporting organisations
Department of the Chief Minister and Cabinet	Interstate and Australian Government primary industry departments
Department of Health	Primary industry peak bodies (e.g. Northern Territory Cattlemen's Association, Northern Territory Farmers Association, Northern Territory Seafood Council)
Department of Environment, Parks and Water Security	Animal welfare and not-for-profit organisations (e.g. RSPCA, PAWS Darwin, Animal Management in Rural and Remote Indigenous Communities)
Department of Infrastructure, Planning and Logistics	Private veterinary clinics
Local governments	Wildlife care groups
Northern Territory Police, Fire and Emergency Services	Nil
Department of Treasury and Finance	Nil

management during the event (DPIRD 2021). The Victorian plan includes a key difference to other plans in that it describes the relocation of animals to emergency evacuation centres and includes provisions for animal registration, treatment and short-term housing (Department of Jobs, Precincts and Regions 2019). The Victorian plan also highlights local governments and municipal services as being responsible for many animal welfare and management outputs.

Within the Northern Territory, many local governments have emergency management plans, however, remoteness and associated challenges influence the practicality of such plans. Northern Territory local governments do not hold legislative powers within management and control of emergency events and emergency management plans are held by local police (Northern Territory Government 2022). No Australian animal emergency management plans contain specific recommendations for animals in remote First Nations communities (Table 1).

In the Northern Territory, the Department of Industry, Tourism and Trade is the lead agency for management of animal welfare in disasters (Northern Territory Government 2022). Within the *Territory Emergency Plan* a functional group is responsible for advising animal welfare operations; the Biosecurity and Animal Welfare Group (BAWG) (Table 2). The BAWG must consider potential disaster implications for companion animals, livestock and wildlife and coordinate evacuation, veterinary treatment and other care of animals, as appropriate (Northern Territory Government 2022). BAWG membership is comprised of government and non-government organisations as well as local veterinary centres and rescue groups.

## Findings

### First Nations communities and emergency animal management

First Nations communities are commonly home to large populations of pet dogs and growing populations of pet cats (Kennedy *et al.* 2020). Dogs and cats have been given strong

cultural and social connections such as family and skin names and totem status, despite their free-roaming nature, which is in contrast to Western animal management practices (Brookes *et al.* 2020; Kennedy *et al.* 2020, Ma *et al.* 2020). First Nations Australians worldviews for health and wellbeing can include kinship, spirituality and Country (Butler *et al.* 2019). Often key to these paradigms are pets, especially dogs historically, which means that they are held tightly within family and community structures and are contributors to mental health and overall wellbeing (Butler *et al.* 2019, Chenhall *et al.* 2006). Recent Northern Territory emergency response operation efforts have included mass community evacuations of residents with pets being left behind. The pets were supplied food, water and veterinary treatment as appropriate during initial response actions, through there was no known reunification procedure.

There have been studies published in the literature highlighting the importance of empowerment of indigenous peoples globally to increase community resilience. There is evidence that environmental disasters as direct and indirect results of climate change will disproportionately affect minority peoples, particularly indigenous peoples (Russell-Smith *et al.* 2022). Petheram *et al.* (2010) recorded the frustrations of the Yolngu people in North-East Arnhem Land surrounding forecasted effects of climate change such as a lack of transparency by driving powers and a lack of communication and First Nations knowledges input. Similar sentiments are echoed in the literature considering emergency management in indigenous communities, where themes of working in partnership (in contrast to working 'for' or 'on') are paramount to build local response capacity and overall resilience (Ellemor 2005; Howitt, Havnen and Veland 2012; Knight and Price-Robertson 2012).

Globally, respect for indigenous land-use practices, language, leadership and institutions, in conjunction with culturally appropriate incentives and appropriate and ethical data collection, make up the essential pillars of disaster risk reduction (Lambert and Scott 2019, Rahman *et al.* 2018, Thomassin *et al.* 2019). Specifically, emergency management organisations should use local knowledge to reprioritise vulnerabilities and risks as

part of collaborative decision-making (Thomassin *et al.* 2019). A multi-sphere framework for disaster risk reduction proposed by Niekerk (2005) included indigenous knowledges as a key component to indicative risk profiles in minority communities in South Africa. The sharing of Smong Indigenous knowledge in Aceh, Indonesia was shown to enhance community resilience and reduce future tsunami risk (Rahman *et al.* 2018). Integration of Māori insights and mainstream approaches in New Zealand/Aotearoa proved beneficial to disaster risk mitigation as well as community recovery and social resilience (Kenney and Phibbs 2014). The Coordinated Incident Management System<sup>3</sup> prioritises Iwi/Māori representation within its local incident control response and states that Iwi/Māori ‘traditional knowledge, values and practices’ as ‘indispensable to effective disaster response and recovery’ (New Zealand Government 2019).

In Australia, historical colonisation and the imposition of a Western culture has infiltrated indigenous governance structures using top-down government systems that undermine local capabilities (Ali *et al.* 2021). Hazard assessment, preparation and response should be collectively and equitably managed to maximise emergency management outcomes, noting that specific actions will likely be unique to locations (Sithole *et al.* 2021). Common chain-of-command processes, language and other cultural barriers held within existing plans can reduce collaboration with local communities and detract from incorporation of indigenous knowledge (Russell-Smith *et al.* 2022, Williamson and Weir 2021). Optimising outcomes at community levels requires the review of leadership structures and emergency management processes (Williamson and Weir 2021). Further, equitable analysis of indigenous methods of management requires reimagining of performance monitoring, process evaluation and reporting outside of a Western worldview (Williamson and Weir 2021). Considering on-ground capacity, Russell-Smith *et al.* (2022) argue that First Nations communities are already well-resourced to deliver contracted emergency management services via existing ranger groups. Use of these groups can enhance local capacity, enterprise and employment and build community leadership and decision-making to reduce any vulnerabilities and improve resilience (Russell-Smith *et al.* 2022, Van Niekerk 2005, Williamson and Weir 2021).

### Framework for animal emergency management and application to the Territory Emergency Plan

Heath and Linnabary (2015) proposed an animal-specific risk management procedure through phases of planning, preparedness, mitigation, response and recovery. An understanding of each of phase is important to design an animal emergency management strategy (Heath and Linnabary 2015). These phases are used as a framework for analysis of current emergency animal management in the Northern Territory with suggestions for improvements.

Heath and Linnabary (2015) identify components to the planning stage that relate to effective disaster mitigation, preparedness and response and recovery. These cover mobilising legislative actions (especially through a specialised group) that designs and promotes protocols, develops and oversees training exercises to build response capabilities and plans for disaster recovery and ongoing community development (Heath and Linnabary 2015). Next, is a focus on disaster preparedness, which can be hindered by groups outside of the central response team, that is, animal rescue groups and volunteers. Drawbacks of the involvement of untrained people, especially when ad hoc and uncoordinated, is an obstacle to emergency animal management (Babcock and Smith 2020, Chadwin 2017, Glassey 2018, Heath and Linnabary 2015, Thompson 2013).

Heath and Linnabary (2015) describe mitigation actions related to animal control regulations to mainstream health and care of pets and also to reduce the burdens of lost animals on communities. They highlight specific component operations of commands and directions during the response, evacuating animals with their owners, short and long-term accommodation for lost animals and dealing with fundraising and media campaigns. The recovery phase is considered, whereby Heath and Linnabary (2015) point to improving animal health infrastructure as the foundation for overall community development and disaster resilience. The framework, brief analysis, gaps and recommendations for applications in Northern Territory First Nations communities are summarised in Table 3.

3. Coordinated Incident Management System, at [www.civildefence.govt.nz/resources/coordinated-incident-management-system-cims-third-edition](http://www.civildefence.govt.nz/resources/coordinated-incident-management-system-cims-third-edition).

Table 3: Summary of approach to emergency animal management within the *Territory Emergency Plan*.

Emergency management phase	Heath and Linnabary (2015) review as a suggested framework	Territory Emergency Plan approach to emergency animal management	Gaps in First Nations communities	Recommendations
Planning	Legislative action group	Exists as BAWG.	Lack of First Nations consultation and representation.	Incorporate First Nations advisory groups.
	Protocols for animal evacuation and care	No protocols.	Limited data available (e.g. animal numbers).	<ul style="list-style-type: none"> <li>Upscale data collection efforts such as regular animal census.</li> <li>Develop protocols with expert input including that of local veterinary service providers.</li> </ul>

	Education and training	<ul style="list-style-type: none"> <li>Coordinated by NTES<sup>4</sup> Emergency Management Training Unit and overseen by BAWG.</li> <li>Veterinarians have been invited to participate in exercising.</li> <li>Overseen by BAWG.</li> <li>Included as part of NTES Emergency Management Training Unit.</li> </ul>	<ul style="list-style-type: none"> <li>Limited knowledge of community-specific needs for animal management.</li> <li>Limited specific animal management training for emergency workers.</li> </ul>	<ul style="list-style-type: none"> <li>Develop specific animal management and care training within NTES.</li> <li>Coordinate with local veterinary service providers.</li> <li>Consider input from industry groups such as Australian Veterinary Association.</li> </ul>
	Resources	Overseen by BAWG.	Limited knowledge of community-specific needs.	Develop register of resources for mobilisation in disaster event.
	Community Development	Nil	Opportunities for community engagement in planning not identified.	Empower communities to contribute to design and implementation of management plans.
Preparedness	Public awareness	BAWG create and distribute media campaigns for public awareness.	Limited knowledge of community-specific needs.	Consult with local communities for contextually appropriate engagement.
	Volunteers	Nil	Limited local and existing veterinary workforce.	Take lead from local and existing community veterinary service providers to: <ul style="list-style-type: none"> <li>consider practicalities and training needs.</li> <li>consider scope to mobilise interstate veterinary and/or paraveterinary workforce.</li> </ul>
Mitigation	Legislation – regulated pet ownership (animal control)	Nil	Inadequate local government power and resourcing.	Lobby for increased local government animal management power and support.
			Sporadic veterinary service programs with varied funding structures.	Lobby for regular data collection as part of veterinary service programs to improve disaster planning and resource allocation.
			Scope of available veterinary service programs likely inadequate for optimal community animal health.	Continue to upscale with regular performance monitoring and consideration of community input in program design, implementation and evaluation.
Response	Clear command and direction	Conducted by NTES in consultation with BAWG.	Limited knowledge of community-specific needs.	<ul style="list-style-type: none"> <li>Continue to upscale power of BAWG in partnership with NTES.</li> <li>Develop BAWG protocols for initial response incorporating First Nations advisory and local community voice.</li> </ul>
	Evacuation compliance	Mass community evacuations.	Consider implications. <sup>5</sup>	Empower communities to contribute to planning and implementation of evacuation protocols.
	Animals stranded in place	Nil	Limited suitable infrastructure and provisions for animals left behind.	Consider design of purpose-built holding areas and provision of food, water and veterinary services.

4. NTES is Northern Territory Emergency Services.

5. Evidence of enforced evacuation leading to community disempowerment and associated negative effects on resilience (Mercer and Kelman 2010).

	Animal rescues	Nil	Difficulties for practicalities (risks) considering remoteness, general free-roaming nature, reduced handleability (safety) and reduced veterinary care (health, safety and zoonoses).	Prioritise management of animals stranded in place over animal rescues.
	Stray animals	Nil	Free-roaming animals in First Nations communities rarely considered strays.	Consult with local communities for plans relating to animals considered as stray.
	Fostering animals	Nil	Largely inappropriate in First Nations communities.	Consult with local communities for plans relating to fostering animals.
	Fundraising	Nil	Often poor coordination of fundraising efforts. Potential of misalignment of donated goods with community wants and needs.	Develop protocols for receiving and distribution donated goods and services in consultation with BAWG First Nations advisory. Include communication strategy with stakeholders and general public.
	Media and social media	Some coordination by BAWG.	Limited knowledge of community-specific challenges among the public.	Develop culturally appropriate and strengths-based media and photo protocols that empower communities.
Recovery	Animal health infrastructure	Limited	Limited community-specific infrastructure and animal management programs.	Advocate for increased animal management power at local government level and increased veterinary services in remote areas.
	Community development	Limited	Limited knowledge of community-specific needs.	Empower communities to contribute to design and implementation of recovery plans.

## Recommendations

The *Territory Emergency Plan* is a comprehensive framework for emergency and disaster preparedness, response and recovery in the Northern Territory. The plan excels in its detailed list of hazards with allocated responsibilities and inclusion of perspectives in the form of advisory committees and working groups that is in line with multi- and inter-disciplinary collaborative agency necessary for animal emergency management plans (Austin 2013, Taylor *et al.* 2015, Pinillos *et al.* 2016). However, development of protocols and procedures is required under the functions of animal/livestock management, either within the plan or as an accompanying guide authored and maintained by the BAWG. Considering emergency management of companion animals in remote First Nations communities, it is recommended that BAWG recruit an advisory committee made up of First Nations people representatives to develop culturally appropriate animal management protocols and supporting documents. Protocols for animal evacuation and care should be developed with input from appropriate stakeholders and analysis of animal management and welfare outcomes of previous disaster incidents, particularly cyclones Lam and Trevor in the Northern Territory. Preparedness plans and response actions should be data-driven (Austin 2013) via regular animal census data collection coordinated by local governments and relevant local organisations.

Specific animal care training in a disaster management context should be developed with input from key stakeholders such as

local and existing community veterinary service providers and representatives from Animal Management in Rural and Remote Indigenous Communities.<sup>6</sup> Provision of such training across jurisdictions should be considered in the interest of collaborative knowledge sharing and beneficence but also as a means for potential skilled volunteer recruitment for assistance in disaster events. Care and consideration must be given in the training of veterinary personnel to prioritise and manage health and safety during response activities (Vroegindewey and Kertis 2020).

Evacuation of animals during disaster events is controversial (Chadwin 2017, Mercer and Kelman 2010) and has been trialled in the Northern Territory with varied anecdotal success. Remote communities do not usually have designated evacuation centres. Instead, mass community evacuation of residents, with transport and temporary housing facilitated by government, is common and return to communities rigidly managed. There is evidence that enforced evacuation of indigenous peoples from their communities is detrimental to community resilience (Mercer and Kelman 2010). Enforced evacuation without provision for concurrent evacuation of pets, as is common in the Northern Territory, contributes to the debate of responsibility of animal management in disaster response (Travers, Degeling and Rock 2017) in both disempowering community members and inter-agency buck-passing. While debate of the discourse of enforced evacuation is outside the scope of this paper, it is worth noting

6. Animal Management in Rural and Remote Indigenous Communities, at [www.amrric.org](http://www.amrric.org).

as a precursor to disempowerment of First Nations peoples in developing and implementing animal management in their communities. Knowledge sharing with an advisory committee in response plans and actions has great importance in building community resilience (Russell-Smith *et al.* 2022, Thomassin *et al.* 2019, Van Niekerk 2005, Williamson and Weir 2021). This is an example of 'right-way science', a significant emerging component in research methodology for First Nations peoples that encourages collaboration, counters colonialism and challenges the deficit discourse common to science and health research of communities (McKemey *et al.* 2022). Close coordination of emergency management (human and animal) during disaster events could be improved by construction of purposely designed evacuation centres and improving integration of services in alignment with the One Rescue model (Glasse 2022).

Considering practical responses to animals in remote First Nations communities, there are many differences to current approaches. Firstly, the cultural and social differences in animal housing and husbandry are prominent, whereby animal overcrowding and free-roaming are common, despite strong human-animal bonds prevailing (Brookes *et al.* 2020, Kennedy *et al.* 2020). This is likely to impede existing evacuation and sheltering protocols. Similarly, free-roaming animals are not likely to be used to being handled or restrained for transport or treatment. Thus, specialised protocols for safety are required and may include distance examinations (whereby experienced veterinarians make assessments of health and treatment needs by sight from a distance in place of physical examination) and chemical restraint by darts to reduce risks of dog bites and other injuries (Chadwin 2017). Potential health implications must be considered both for communicable disease spread between animals and zoonotic disease spread to responders and the public (Chadwin 2017). Animals sheltering in place is likely the safest and most practical solution and procedures to supporting this will need to include provisions for clean food and water and other welfare concerns during the response through to the recovery phase. Integration of procedures within purpose-built evacuation facilities is highly recommended. In addition, local community veterinary service providers must be able to return to communities for rapid veterinary assessment and treatment and this should be upscaled through response and recovery phases. Practicalities of human-pet reunification in First Nations communities needs to be further explored.

Remoteness in the Northern Territory, levels of funding and other resourcing issues regularly hinder veterinary services to remote First Nations communities. This is a significant limitation to emergency animal response. Veterinarians and support staff should be recruited and adequately trained for a disaster response, in collaboration with local and existing veterinary services where possible. Long-term support for animal health infrastructure in communities must be prioritised as part of resilience and disaster risk reduction. Further support for local government and communities in partnership, in enacting and maintaining animal management legislated powers is needed as part of disaster preparedness and mitigation.

## Conclusion

This paper highlighted improvements to the *Territory Emergency Plan* to consider animals in remote communities. It also identified gaps in similar plans in other jurisdictions in Australia. Evaluations of the response failures during Hurricane Katrina and other disasters were used to inform future emergency management planning, especially considering emergency animal management as a growing area for inclusion. In Australia, emergency management for companion animals in remote First Nations communities presents challenges, especially considering their family and social importance. The *Territory Response Plan* is a useful base to build such plans, however, requires rethinking and extra work to address operational practicalities related to health and safety, zoonoses and skilled responder capacities. It is imperative that right-way science and other collaborative methodologies are adopted to give remote First Nations communities ownership of their disaster risk reduction priorities and activities. Research and workplans within One Health, One Welfare and One Rescue models of care that are specific to disaster planning and resilience would greatly assist the progress of resilience in all communities, particular remote areas of Australia.

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## About the authors

**Chelsea Smart** is a practicing veterinarian who has worked in remote communities throughout the Northern Territory, South Australia and northern Western Australia. She completed a Master of Public Health at Charles Darwin University in 2023. She is based in Adelaide and works in emergency animal disease preparedness for Primary Industries and Regions South Australia.

**Tida Nou** is a science communications officer with Animal Management in Rural and Remote Indigenous Communities. Her work includes management of companion animals during disaster situations in remote communities of the Northern Territory.

**Jonatan Lassa** is an interdisciplinary disaster scientist who teaches emergency and disaster risk management studies at Charles Darwin University. He is a fellow and researcher associated with research institutions in Australia, New Zealand and Indonesia. He works on biosecurity risk governance with a geographical focus on Southeast Asia.