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Disaster response veterinary training: the Massey University animal welfare emergency management veterinary curriculum

Recent notable events, such as Cyclone Gabrielle (2023) in New Zealand and the Black Summer Bushfires in Australia (2019/2020), have highlighted the impact of disasters on animals and on the wider veterinary profession. Challenges to managing animals in disasters are well documented and include immediate issues such as the practicalities of evacuation and the influence of the human–animal bond (Brackenridge *et al.* 2012; Heath and Linnabary 2015; Squance *et al.* 2017), and longer-term impacts such as widespread disease outbreaks and water contamination (Levy *et al.* 2011). In the event of a disaster, emergency response teams may have little or no geographical knowledge of the area into which they are deployed. Veterinarians, in both urban and rural communities, typically know their community well, and so they are often an early point of contact.

There is a general assumption that veterinarians and allied veterinary professionals are trained in disaster preparedness and emergency response. Historically, the role of veterinary professionals in disaster response has not been included in veterinary curricula in New Zealand. Since the implementation of an elective course in 2011, students have had the opportunity to study animal welfare emergency management (AWEM) at Massey University (Palmerston North, NZ). Several veterinary schools in North America have also integrated elements of disaster preparation into their undergraduate programmes, including Texas A&M (Bissett *et al.* 2013) and North Carolina State University (Dunning *et al.* 2009). This article describes Massey's animal welfare emergency management course and its wider application in the profession.

In 2011, the first elective course in animal emergency management was offered at Massey University's School of Veterinary Science. This course was identified as an educational need, developed (Squance 2011), then offered, at third year undergraduate level, to both Bachelor of Veterinary Technology (BVetTech) students and those studying Emergency Management. The BVetTech programme was disestablished in 2021. In the current BVSc curriculum, students in the final year of the programme choose an elective course alongside their core courses. Emergency management has been offered as one of these elective courses since 2020, and is a shortened version of the previous course offered to BVetTech students. The course is offered twice a year with a capacity of 12 each time. From 2020–2026, a median of 12 (min 8, max 22) students per year have enrolled.

The animal welfare emergency management course is taught face-to-face over 5 days and is designed to provide awareness-level training in several key areas (Table 1). These include emergency management in New Zealand, animal welfare management in emergencies, animal behaviour in rescue and disaster settings, problem-solving in rescue or disaster settings, safety, communication, and responder wellbeing. The course learning outcomes are: (1) to understand and practice the roles of responders in an animal rescue or disaster under the New Zealand's emergency response framework (Coordinated Incident Management System; CIMS); (2) to develop the skills required to assess a rescue or disaster scene involving animals; and (3) to develop and demonstrate technical and problem-solving skills for the successful resolution of animal welfare issues arising in rescue or disaster situations. The course is divided into two sections: animals in disasters and technical large animal rescue (TLAR).

The first 2 days of the course cover the role of veterinarians in disaster response, starting with an introduction to animals in disasters and covering historical events that have shaped the current response framework. The impacts of extreme weather and disaster events (e.g. earthquakes, flooding and volcanic eruptions) on animals are discussed, as well as the human–animal bond and its impacts on the safety of people and animals in an event. The emergency management cycle is introduced, with emphasis on the role of veterinarians in each phase (response, recovery, reduction, readiness). The second session covers CIMS, with emphasis on the role of lead and support agencies in animal welfare. In the third session, students are provided with practical information about temporarily housing animals and considerations for setting up a shelter in the field. Companion animal behaviour is discussed, along with appropriate methods for safe handling and restraint of companion animals.

On the second day, students are presented with considerations for animals in flood water or other contaminants, and consequent complications. Wildlife considerations and handling of avian species are discussed, with particular emphasis on oiled wildlife. The final theory session navigates responder wellbeing, including moral distress and the killing/caring paradox. Students are introduced to several tools, including the "Four A's", a tool developed to guide critical care nursing teams

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Table 1. Overview of the subjects taught in the elective animal welfare emergency management course as part of the Bachelor of Veterinary Science degree at Massey University (Palmerston North, NZ).

Day	Subject	Contact hours	Content and delivery
1	Animals in disasters	2	Didactic lecture introducing animal welfare emergency management, and the role of veterinarians in an event.
1	CIMS	1	Didactic lecture introducing the NZ emergency management framework.
1	Temporary animal sheltering	1	Didactic lecture on considerations for temporary housing of animals.
1	Small animal handling	2	Didactic lecture on small animal behaviour and handling considerations in an emergency event. Use of restraint methods discussed, and equipment for cats and dogs displayed.
2	Decontamination and floods	2	Didactic lecture discussing hazardous environments, and management of animals in a response.
2	Oiled wildlife response	1.5	Didactic lecture introducing avian considerations in an oil spill response, volunteer management and media complexities examined.
2	Responder wellbeing	1	Didactic lecture on moral distress, compassion fatigue and an introduction to management tools including the "Four A's".
2	CIMS scenario	2	Tabletop exercise where students are presented with a scenario and tasked with planning and organising temporary accommodation for displaced animals using the CIMS framework.
3	TLAR	2.5	Didactic lecture on large animal behaviour and handling in emergency situations. Students are introduced to approaches to manage complex situations, equipment, and rescue techniques.
3	Veterinary triage	1.5	Didactic lecture on field assessment of animals, animal welfare, sedation protocols, and first aid considerations
3	TLAR manual skills	3	Practical workshop introducing students to rescue equipment, manual stropping skills and team roles.
4	Complex rescue and vertical lifting	1	Didactic lecture discussing problem solving complex scenarios, and equipment and methods for lifting large animals.
4	Rescue from unstable ground	0.5	Didactic lecture on considerations for mud and water rescue, including equipment, techniques, and options for veterinarians.
4	Euthanasia in emergencies	2	Didactic lecture on euthanasia theory, field euthanasia considerations, and carcass disposal.
4	TLAR skills – scenarios	4	Practical workshops allowing students to apply practical skills across a variety of rescue scenarios.
5	Assessments	6	Formative assessment of TLAR skills and application of scene management and casualty skills. Students are provided with verbal feedback at the conclusion of each simulation.

CIMS: Coordinated Incident Management System; TLAR: Technical large animal rescue

(Rushton 2006). At the conclusion of Day 2, a tabletop, CIMS-based exercise is workshopped by the group. Students are presented with a severe flood event and tasked with setting up provisions for a temporary animal shelter using the CIMS functions (intelligence, planning, operations/welfare, and logistics). The scenario requires problem-solving and application of broader veterinary knowledge, including calculation of impacted animal populations, knowledge of disease transmission, and animal housing considerations. Patient flow through a facility is discussed, including placement of quarantine and isolation facilities. Students develop an awareness of the CIMS functions and an understanding of the complexities and considerations in a response.

The second portion of the course focuses on TLAR. Students learn to apply problem-solving skills to safely and humanely extricate entrapped animals. This is reinforced by experiential learning. Behaviour and restraint of large animals are discussed. The course uses the British Animal and Rescue Trauma Association (BARTA) methodology of animal rescue. Further teaching includes safety and hazard assessment, methods to improve patient welfare outcomes, and personnel management to achieve a safe and efficient response. Specific techniques include manual skidding, vertical lifting with rescue recovery slings, rescue from unstable ground, and float extrication. The course covers the transportation of livestock and reviews approaches to a multi-animal incident caused by an overturned transporter.

On the final day of the course, the students are assessed on their ability to apply their knowledge of TLAR to problem-solve challenging scenarios. Multiple simulations (e.g. horse trapped in mud, float extrication) are run, some with multiple casualties, with students rotated through specific roles (e.g. incident controller, veterinarian, equipment manager) for each simulation. Trained members of the Massey University Veterinary Emergency Response Team assist with these simulations and provide guidance and robust feedback at the conclusion of each scenario.

At the conclusion of the course, the students provide informal feedback regarding what they have learned. Formal feedback is collated via the BVSc5 student roster software. This feedback is reviewed after the delivery of each offering of the course, and any suggested changes are taken into consideration.

Heath (2003) has posited that, as educators, veterinary schools have an important role in preparing students for emerging issues in the profession. The veterinary industry is in a suitable position to provide emergency management leadership (Garcia *et al*. 2022; Heath 2003). Holmquist *et al*. (2021) suggest utilising veterinarians in a mass disaster event as medical response support alongside doctors and medical personnel,

whilst Garcia *et al*. (2022) surveyed practitioners in North America and found that respondents considered practice preparedness and technical rescue training to be the most useful potential additions to the veterinary curriculum.

During each phase of an event (response, recovery, reduction, readiness), there are key roles and skills that veterinarians and allied veterinary professionals can use in a response. During the response phase, veterinary teams are frequently on the front line during an event and are an early point of contact for affected communities. Reduction measures include vaccination programmes, reducing farm stocking density (Madigan and Dacre 2009), and stray animal management (Heath and Linnabary 2015), while during the readiness phase, veterinary professionals can advise clients and increase awareness of evacuation planning in advance. It seems logical that veterinarians and the wider veterinary team should be equipped to provide advice in the event of an emergency such as an earthquake, drought, or flood.

Looking to the future, the School of Veterinary Science at Massey University has implemented a new competency-based veterinary education curriculum. This commenced with the BVScI class in 2023, but the curriculum for the latter years is still under development. As a component of this new curriculum, the AWEM special topic has been proposed to integrate into the core curriculum at multiple levels across both pre-clinical and clinical years. An awareness-level tutorial has been embedded in BVScII, and case-based scenarios are proposed for BVScIII in 2026. BVSc students in their clinical fifth year elect a distinct "track" (e.g. companion, equine, or production animals), and students who choose the equine track presently have a 3-hour TLAR workshop built into their rosters, while those who elect the production animal track are proposed to have a 1-day AWEM workshop. The AWEM elective course may also continue to be offered.

The keys to implementing this curriculum are two-fold. Firstly, the foundational course (that offered from 2011) was firmly grounded in evidence-based research and incorporated all facets (species, sectors, environments) of animals in disasters. Alongside this, the two key topics (AWEM and TLAR) are allocated protected course time. Secondly, the pedagogical approach is focused on experiential learning, with opportunities for students to conceptualise and apply knowledge and skills to a scenario. Crucially, implementation of this teaching does not need to be onerous or require expensive capital expenditure. Inclusion of the role of veterinarians in disasters could occur in the pre-clinical curriculum, possibly alongside an existing animal welfare module.

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