Title: Readiness of New Zealand horse owners to evacuate in the event of disaster

Principal Researcher: Assoc. Prof Naomi Cogger

Scholarship Recipient: Kylie Legg

Date Funded: December 2018

Status: Completed

Amount Funded: $5000

Introduction

This summer scholarship was undertaken with the supervision of Assoc. Prof. Naomi Cogger. It was part of a larger project aiming to amalgamate the areas of disaster planning, epidemiology, animal behaviour and animal welfare to increase the resilience of New Zealand pet owners to natural hazards. Pet owners are less likely to evacuate in the event of a natural disaster, and when they do evacuate without their pets, they are likely to return for their animals, endangering their lives and others including family, friends and relief personnel. Therefore, to preserve human life and build resilience to natural disaster, helping people include pets in their personal disaster plans is paramount. This could be achieved by leveraging the human-animal bond to increase individuals' preparedness and providing organisations with the frameworks to develop response plans that support pet owners. There are three stages to this research; evaluation of current levels of preparedness, determination of a pet focused disaster programme's motivation potential to pet owners preparedness and identification of the key issues and challenges for CDEM (Civil Defence and Emergency Management) organisations to manage pets and their owners evacuation procedures). This research will help explore whether animal attachment can be used to enhance peoples' readiness for natural hazards and help to provide frameworks for CDEM organisations to plan for responses that support the safe evacuation of people with their pets.

My role in the project was to determine the current level of preparedness of New Zealand horse owners to evacuate in a natural disaster. This involved the collation, processing and interpretation of data gathered in a New Zealand wide equine survey distributed in May-July 2018. Participants were 836 respondents recruited across New Zealand through social media, print media and New Zealand websites focusing on horses, with strategic placement of survey information in veterinary clinics and equine shops and outreach to local community groups.

This survey comprised 47 questions. It captured information on number of people and horses in a household, housing arrangements and the current level of preparedness planning of respondents (both in relation to themselves and their pets).

Data Analysis

The survey data were collated into an excel file for evaluation, and so that further analysis could be undertaken. These data were cleaned and ordered using the statistical package 'R'. Responses for each question were analysed and tables drawn to compare the number and percentages of respondents.

Respondents were characterised by determining their age range, gender and household arrangements. The region and area in which they lived was analysed, and their knowledge of where to find information on disaster preparation.

The horse population of these respondents was determined by defining the number of horses owned and where and how they were kept. Horse activities were categorised into similar groups of activities, with many households participating in more than one activity with their horse or horses.

The major and secondary water sources available to respondents' horses were determined, and the percentages of respondents with a ready supply of water stored in the event of failure of these systems. The number of respondents with flood prone properties was determined, and their access to relocation options investigated.

Evacuation readiness was evaluated by assessing the most important equipment able to be collected within 10 minutes, horse transport options, catchability and loadability of horses.

Results

The majority of the 719 respondents that lived in NZ, were over 18 years of age and owned horses, were female (97%) with representation across all age groups. A 2 adult household was most common with 64% of respondents having no children and only 10% having an infant under 5 years old. Table 1 summarises the mean number of adults and infants (under 5 years old) per household of horse owners and the percentages of each age group that had children and knew where to find information on disaster preparation. In total, 76% of 653 respondents knew where to access information on disaster preparation.

Table 1. Population characteristics of survey respondents

Age (Years)	**Number of respondents**	**Mean number of adults per household**	**Mean number of infants per household**	**% with children**	**% Know where to find info on disaster prep.**
18 - 24	126	3	0	31%	53%
25 - 29	49	3	0	20%	61%
30 - 39	102	2	1	64%	81%
40 - 49	123	2	0	65%	85%
50 - 59	94	2	0	26%	88%
60 +	44	2	0	2%	95%

Most respondents came from Canterbury and Otago regions (38%) with the least found in Gisborne, Nelson-Tasman areas and the West Coast (2.7%). Across all regions, the majority of respondents lived in rural or semi-rural areas as shown in Figure 1.

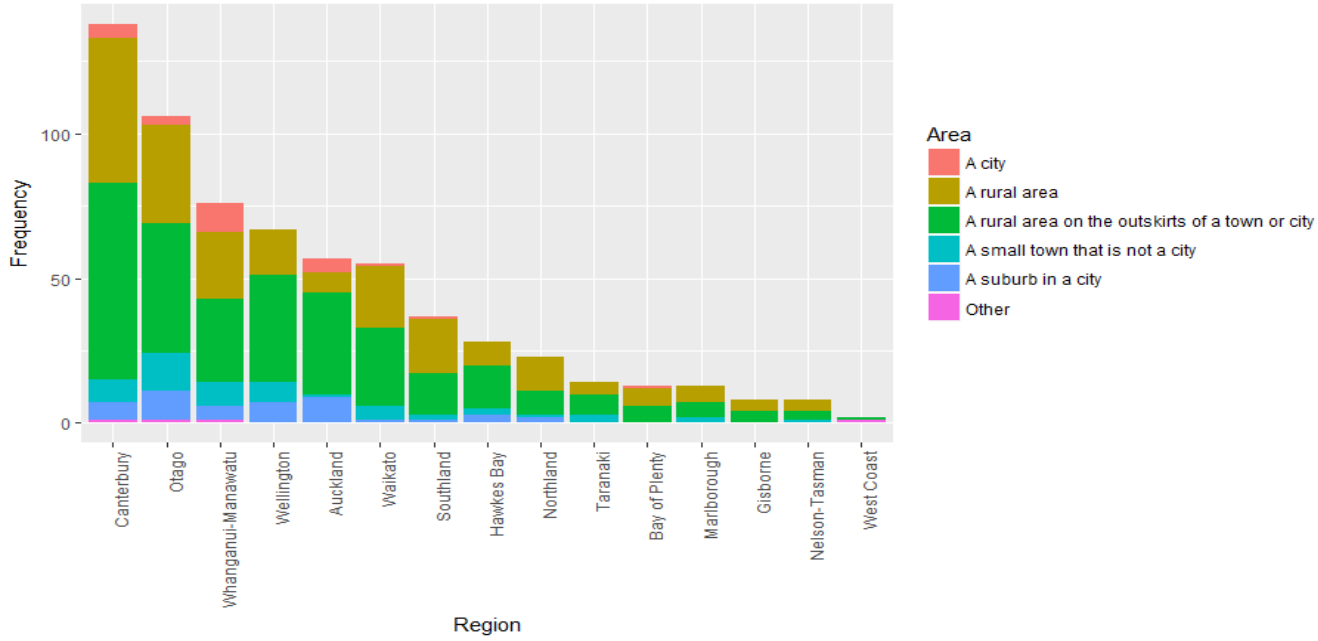

Figure 1. Area distribution of survey respondents.

Horses

The majority of respondents owned 1-3 horses, with 2 the most commonly owned number of horses. 72% of respondents (510/713) kept their horses at a property on which they lived. Of those that kept their horses at work or elsewhere (n = 203), 76% took under 20 mins to travel to their horse property and 2% took over an hour (both kept their horses at a place they neither lived nor worked). Sport (including show jumping, dressage and eventing) was the most common use of horses from 688 respondents as shown in Table 2. Ridden activities included sport, competition (showing, western, driving, endurance, jousting, polocrosse), pleasure (hacking, farm work, hunting, riding school) and racing (thoroughbred and standardbred). Unridden activities included breeding, retired or paddock mates and unbroken horses. More than one horse activity was conducted by 74% of respondents (511/688).

Table 2. Common activity uses of horses from 688 respondents

	Activity	n	Percentage
Ridden	Sport	438	64%
	Competition	118	17%
	Pleasure	299	43%
	Racing	41	6%
Unridden	Breeding	113	16%
	Retired/Paddock	266	39%
	Unbroken	134	19%

The major uses of horses owned (whether they were ridden, unridden or have a mixture of both), if they participate in more than one ridden activity and where they are kept during both the day and night are described in Table 3 (688 respondents). The majority of horses were kept in large or small

paddocks during the day and night (90% and 81% respectively) with stables accounting for 12% total night accommodation for horses.

Table 3. Description of horse activities and housing arrangements for the day and night

Activity	Multi Ridden Activity*	n	%	Mean number of horses	DAY**		NIGHT**	
					Paddock	Yard/Stable	Paddock	Yard/Stable
Ridden	yes	189	27%	3	90%	0%	80%	4%
	no	135	20%	2	93%	1%	79%	8%
Mixed	yes	187	27%	6	87%	1%	75%	2%
	no	130	19%	5	93%	1%	78%	1%
Unridden	-	47	7%	4	94%	0%	85%	2%

*Multi Ridden activity indicates whether the respondent indicated more than one ridden use (sport, pleasure, competition or racing) for horses on their property.

** For the balance of the percentages in day and night housing arrangements, respondents chose both paddock and yard/stable options for their horses.

Race horses were mainly housed solely in a paddock at night (63%); however 37% of race horse owners housed some or all of their horses in a mixture of yard, stable or paddock. This is more than for sport horse owners of which 76% were kept in paddocks overnight, and 24% had mixed housing for their horses.

Water, flood and evacuation

Half of the respondents (375/672, 56%) had four or more days of water available if both their main and alternative water supplies were compromised. The percentage of those with one day or less supply of water rose from 4.6% to 21% if both main and alternative water supplies were compromised. Power was required in order for animals to access the main water supply on 42% of properties (298 of 702 respondents) and a further 52 were unsure. In contrast, only 10% of respondents indicated power was necessary if animals required water from an alternative source (64 of 666 respondents), but 62 (9%) were unsure if power was needed. The sources of main and alternative water supplies are described in Table 4.

Table 4. Main and alternative water sources for NZ horse owners

Water Source	Main		Alternative	
	n	%	n	%
Bore water	300	46	69	11
Town water supply	137	21	69	11
Rain/Tank water	112	17	128	21
Natural Source	87	13	336	55
Rural Water Scheme	11	2	0	0
Unsure	0	0	5	1
Off site	0	0	3	0
None	0	0	3	0
Total	647	100	613	100

Flood

A minority (143/680, 21%) of respondents lived on flood prone properties. Of these, 81% (n = 115) could move some or all of their horses to higher ground on their property in the event of a flood.

In total, 79% of respondents with flood prone properties had access to higher ground at an alternative property, to which approximately half were within walking/riding distance and half would need vehicular transportation. The horses could be relocated in under an hour in 65% of cases, with 2% of respondents taking over 4 hours for horse relocation. Of those that had no access to higher ground on their property, 5/24 (4% of all flood prone properties) had no options to relocate to higher ground. All 5 owned 1-5 horses for sport and 2 of these 5 did not know where to find information regarding natural disaster preparation.

Evacuation

98% of respondents (643/655) had the appropriate equipment to restrain the horses in their care in the event of an emergency. The majority (10/12) of those that didn't have enough equipment for all the horses in their care, kept their horses at the property they were living. Horses were reported as easy or very easy to catch in 95% of cases (619/653) with only 0.5% of horses difficult to catch. However, in the event of an emergency, 21% respondents (134/652) did not have a suitable relocation place for their horses.

Transport was available on the properties of 82% of respondents (527/645), with 3% having over an hour to travel to acquire the mode of transport. Approximately half (53%) of the respondents could move all their horses in one trip. Estimated ease of horse loading under normal and difficult conditions is described in Figure 2. 62% of horses owners estimated their horse was excellent to load (walked directly onto transporter) under normal conditions, this dropped to 30% when faced with difficult conditions.

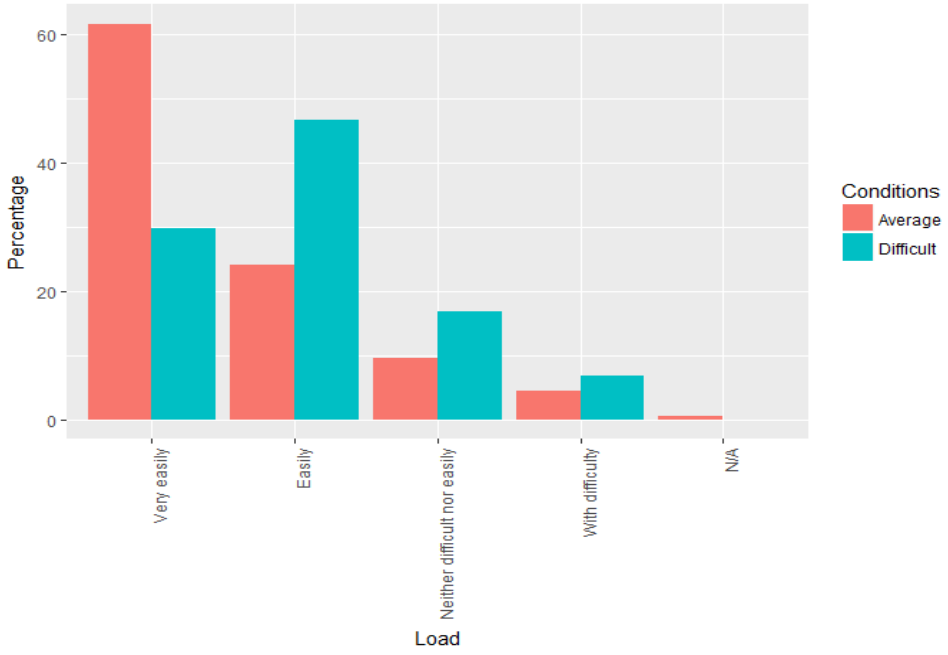

Figure 2: Estimated ease of horse loading under average and difficult conditions

Estimated times by respondents to gather enough food and water for all the horses under the respondents' care to last three days are given in Table 5. Water was deemed more time consuming to collect than food.

Table 5. Estimated time taken to gather sufficient food and water for horses to last three days

Time Taken	Food		Water	
mins	n	%	n	%
<10	290	47%	143	23%
10-20	201	33%	199	32%
20-30	50	8%	81	13%
30-40	46	8%	77	12%
40-50	6	1%	14	2%
50-60	2	0%	3	0%
60-120	14	2%	33	5%
120+	3	0%	12	2%
Unsure	0	0%	36	6%
Impossible	0	0%	23	4%
sum	612	100%	621	100%

The three most common items gathered in less than 10 minutes when leaving the property in an emergency were halter (99%), lead rope (98%) and protective footwear (86%). Rubbish bags (43%) and water to last 3 days (35%) were the least common items able to be obtained in 10 mins, as described in Figure 3.

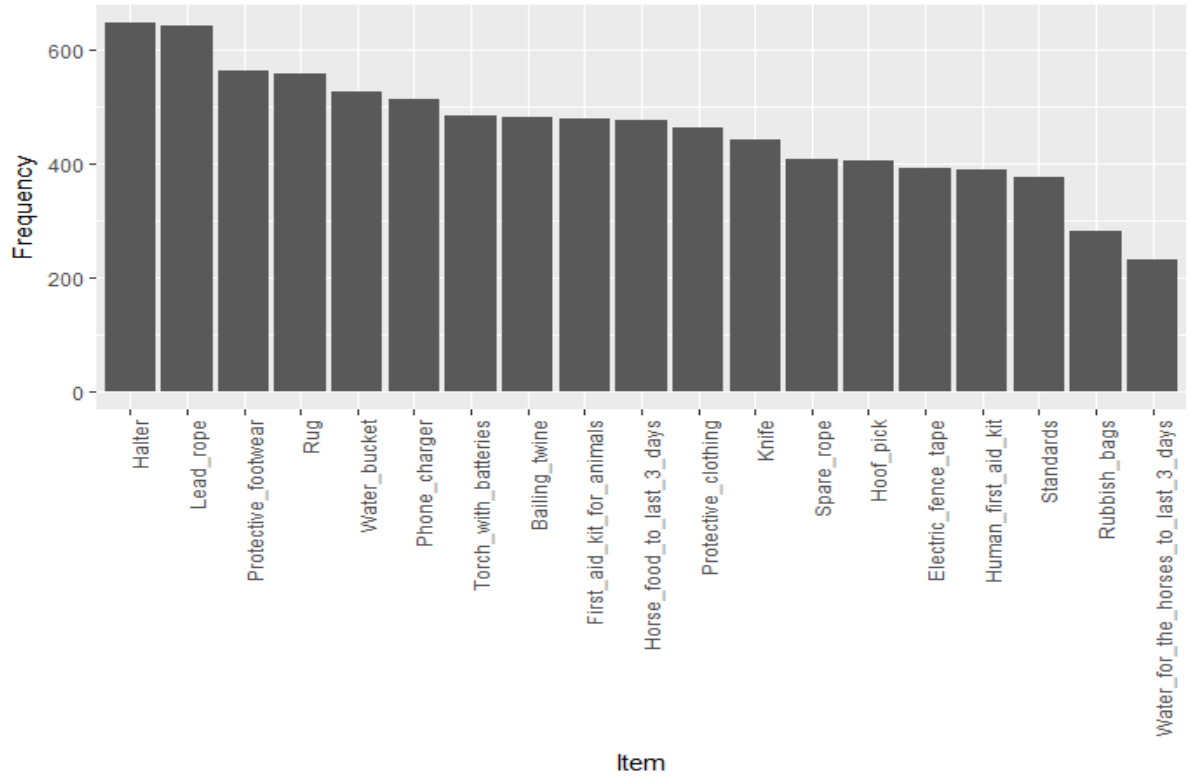

Figure 3. Items able to be gathered in less than 10 mins when leaving the property, n=653

Conclusions

The majority of respondents were female, from Canterbury or Otago and owned 2 sport horses (show jumping, eventing, dressage) in a paddock at a property where they lived. Most of these respondents were reasonably well prepared with multiple water sources available, though only half had enough water ready to hand to supply their horses for 4 days if their main sources were compromised. The majority of respondents did not live on flood prone properties, and of those that did, 81% could move their horses to an alternative property.

In the event of an emergency evacuation, 98% of respondents reported that they had the appropriate equipment at hand to restrain their horses and 82% had transport available on their or a neighbouring property. Horses were considered relatively easy to catch and load. Collection of enough food and water for horses to last 4 days required time to gather, and in 4% of cases it was deemed impossible.

These data indicated that the majority of horse owners were reasonably well prepared to evacuate in the event of a natural disaster. However, access to appropriate safe areas with access to food and especially water for horses could help decrease the time required to evacuate horses to safety. For the minority that have no alternative housing for their horses available in flood prone areas, safe areas with transportation options available could provide a haven to those in need.

A full paper is in preparation for publication in a peer reviewed academic journal.