Supporting the Information Management Needs of People Helping Animals in Disasters

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ABSTRACT
Many things influence human decision-making in disasters. This work considers the information management needs and collaborative work of those focused on animal care and evacuation in disasters. Empirical ethnographic work on-site at two animal evacuation locations, as well as fieldwork responding to large animal needs, and ongoing participant observer fieldwork between events has led to both academic and practical contributions aimed at improving the ways animal advocates, animal owners and emergency responders are able to communicate and attend to the needs of animals and their owners in a disaster.

Categories and Subject Descriptors
H.5.3. Groups & Organization Interfaces—collaborative computing, computer-supported cooperative work; K.4.2. Social Issues

General Terms
Design, Human Factors.

Keywords
Animals, computer-supported cooperative work, crisis informatics, disaster, emergency, social computing.

1. INTRODUCTION
There are myriad problems associated with animals in disasters. In a disaster, people may make decisions about whether to evacuate or stay based on their ability to take their animals. People re-enter disaster zones to retrieve pets before officials deem it to be safe. If pets are left to perish, it impedes recovery for owners, particularly for the most vulnerable in society—the elderly and children. [2,7,3]

Following 2005’s Hurricane Katrina, when tens of thousands of pets and service animals were left to perish, the US Government passed The Pets Evacuation and Transportation Standards Act (2006), known as the PETS Act [8]. The Act serves to provide financial support to responders who evacuate service and companion animals alongside their owners. While effective, there are still huge challenges for people who are concerned with animals in disasters. For example, the Act does not provide assistance or direction for displaced pets, and it does not address the needs of people who own livestock.

2. RESEARCH QUESTIONS
Understanding and addressing the needs of people concerned with animals in disasters presents multiple opportunities for exploration.
First, what motivations do people have in decision-making about preparation and evacuating when they own animals? What motivates responding volunteers in attending to the needs of animals in disasters? What role does information communication technology play in the ways motivated people attend to the needs of animals in disaster? Understanding motivation will demonstrate what kind of support is needed, and how best to provide it.
Second, in what ways do information, expertise and knowledge intersect in this domain? What roles do each of these elements play in the materiality of response work focused on animals? How do we leverage the implicit knowledge of specialist animal experts in identifying the best ways to respond and in the coordination of that response?
Finally, how might we build relationships between people interested in animal advocacy and emergency responders, to assist both groups in their efforts to attend to the needs of animals in disasters?

3. METHODS
I have used ethnographic methods to investigate the above research questions. These methods were used as follows.
I observed the Hurricane Sandy Lost and Found Pets Facebook Page for a seven-month period, beginning in the first days following Hurricane Sandy in October 2012 through to May 2013. I took extensive field notes about the behaviors and content shared and organized on the Page, digitally capturing user and administrator engagements. I conducted email interviews with 12 people who had been particularly active on the Page using open-ended questions aimed at exploring their beliefs about pet advocacy and their backgrounds in disaster response.
I was a participant observer at two animal evacuation sites during the Black Forest Fire in Colorado, in June 2013. I worked at the Kiowa Fairgrounds and the El Paso County Fairgrounds assisting with animal care, intake and release. I conducted depth interviews with volunteers and evacuees, wrote extensive daily field notes and took over 200 photographs.
Following the Colorado flash floods in September 2013, I assisted during an independently organized evacuation of 38 horses from a ranch located in a remote area of the mountainous Colorado Front Range. Conducting a multi-sited ethnography, I shadowed the
ranch owner throughout the evacuation, audio recording conversations between her and the responding volunteer horsepeople. I took nearly 200 photographs and interviewed seven volunteers who had been active in the evacuation, two officials, the Ranch owners and employees, using the photographs as probes. I also reviewed personal email correspondence and social media posts related to the evacuation.

4. WORK TO DATE
Ethnographic fieldwork forms the centerpiece of my dissertation. Its analysis provides the theoretical orientation that has informed my creative work in design and development of tools aimed at supporting the information needs of those concerned with animals in disasters.

The work I have produced has been informed by continuing engagement with these responding communities. I have completed numerous FEMA training modules, and am a recognized volunteer member of the Douglas/Elbert County Community Animal Response Team, and a credentialed member of the Colorado Veterinary Medical Reserve Corps.

My experience, training and data collection have informed the following studies.

4.1 Emergency PetMatcher
In 2012, I worked with two colleagues at Project EPIC to design a tool focused on reuniting animals with owners after a disaster, called Emergency PetMatcher (EPM). The application design was intended to support crowdwork in recommending matches between lost and found pets displaced in disasters. We conducted user tests, and iterated the design. The design received 4th place in the CHI2012 Student Design Competition. EPM is being readied for deployment in Fall 2014’s hurricane season.

4.2 Hurricane Sandy Lost and Found Pets
The data collection on the Hurricane Sandy Lost and Found Pets page led to the CSCW2014 paper, “Digital Mobilization in Disaster Response: The Work and Self-Organization of On-Line Pet Advocates in Response to Hurricane Sandy” [10]. The paper’s contributions built upon previously seen online digital volunteer behavior [eg, 9] and activism [eg, 6], and provided insight to motivations of volunteers concerned with animals. We observed animal advocates pivot their usual foci on a range of pet issues to the needs of animals that were a direct result of the disaster. Admins of the Page used the albums feature of the Facebook Page as a content management system where animal flyers could be organized according to species, lost and found, and location. Users were able to use the comment thread attached to each photograph to suggest matches between lost and found pets displaced by the disaster. The aim of the Page was to reunite as many pets as possible, and rehome those pets who had to be relinquished due to the devastating effect of the hurricane on families.

4.3 Community Mapping of Evacuation Sites
My experiences and data collection at two animal evacuation sites during the 2013 Black Forest Fire informed an opportunity to conduct a participatory design exercise. Most counties in Colorado have agreements with local Fairgrounds and other animal-focused centers that state in the event of a disaster, animals being evacuated may be sheltered there. While the public may be familiar with these locations in non-disaster times, there was a need to create maps to direct people with animals via specific routes to gain access to the fairgrounds in an evacuation.

I directed 12 senior computer science students (BS/MS) in a five-week participatory design project, during which the students collaborated with official representatives of Douglas/Elbert County and Jefferson County. We used Open Street Map to create a base layer map of each site. We then met with county, volunteer and fairground representatives onsite to collaboratively identify what they needed on a map to support their work, specifically the infrastructure, resources and traffic flows they wanted the public to know in an evacuation. We walked the fairground sites and identified these locations on walking papers. The teams developed designs for the maps, as shown in Figure 1. We gathered feedback from the stakeholders and iterated the designs to final versions. The final maps were provided to the respective county and state officials, who have said they will use them in their next animal evacuation.

Figure 1: Elbert County fairgrounds base map.

Figure 2: Final Jefferson County map.
These maps will help prevent gridlock of horse trailers and other vehicles as they converge onto the Fairgrounds sites.

Additionally, Colorado State officials are interested in replicating this work to other county fairgrounds. This work included the creation of standardized map symbols specific to animal evacuations. We noted there are no standardized symbols relevant to animal evacuation centers, so these were also iterated upon, and have been submitted to The Noun Project and ReliefWeb for open access use in other humanitarian mapping endeavors.

I continue to be a trained responder on the ground in the event of an animal evacuation, and in a local event will gather data on the application of the maps we have produced.

5. FUTURE WORK
I have begun working on a high-fidelity prototype of an animal evacuation CMS and mobile phone app that will assist with the intake, shelter care and release of animals at an evacuation site (Figure 3).

Animals brought to a site are identified via paperwork, which may be destroyed over the course of an evacuation. The Animal Evacuation Management Tool will make it easy to link an animal with its paperwork, without needing to keep paper at the stall.

It will also provide realtime monitoring of animals while they are on site and is designed to leverage additional functions such as realtime reporting on collected data to provide the Emergency Operations Center with information about all the animals at each evacuation site, without state and federal officials having to call to check with barn managers. The tool will complement the paper-based systems already in use at animal evacuation centers, and provide a robust information architecture to support the needs of workers and owners during an evacuation event.

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7. REFERENCES