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Shelter from the Storm: Companion Animal Emergency Planning in Nine States

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Failure to evacuate pets in an emergency has negative implications for public health, the economy, emotional well-being of pet owners, and physical health of animals. These effects may be at least partially mitigated by a robust plan to accommodate pets. Nine state companion animal emergency plans were reviewed to determine the extent to which they addressed the needs of companion animals, utilizing characteristics of a model emergency plan. States were compared utilizing variables such as population, pet friendliness, and emergency preparedness funding in order to explain differences in plan composition. This comprehensive review produced a list of recommendations for emergency managers as they create future versions of their plans.

Key words: *Companion animals, emergency planning, animal welfare, disaster management*

The percentage of households in the United States that own pets exceeds the percentage of households with children. In 2007, over 37 percent of households owned dogs and over 32 percent owned cats, while just over 31 percent of households in 2005 had children under the age of 18 years (American Veterinary Medical Association [AVMA], 2007; United States Census Bureau [USCB], 2009). The extraordinary number of households with pets demonstrates just how ubiquitous companion animals are in humans' lives. Additionally, pet owners overwhelmingly consider their animals to be family members. A recent Pew Research Center poll found that 85 percent of dog owners consider their pets to be family, while 78 percent of cat owners said the same (Pew Research Center, 2006). It is

unsurprising, then, that pet owners are reluctant to leave their companion animals behind when emergency strikes and evacuation becomes necessary.

In order to alleviate concerns about animal well-being and emotional trauma to pet owners, it is incumbent upon emergency management officials at all levels of government to ensure that animal welfare and care are taken into account when designing plans for emergency response. In the aftermath of Hurricane Katrina, when it was evident that thousands of pets were lost or abandoned, the United States Congress passed the Pets Evacuation and Transportation Standards (PETS) Act of 2006, an amendment to the Robert T. Stafford Disaster Relief and Emergency Assistance Act. The PETS Act requires that states receiving federal funding for emergency operations incorporate provisions for companion animals into their emergency plans. States may have chosen to do so independently prior to implementation of the requirement, but as officials are forced to shift priorities due to economic hardship or political environment, some states may have skipped the planning process altogether.

Whereas previous exploration of this subject has tended to focus on the reasons why emergency planning for animals is prudent, no study has attempted to gauge the quality of companion animal plans as devised by state emergency management officials and their partner agencies. To achieve congruence between plans for companion animals and the goal of safety and well-being of citizens, emergency management officials must be armed with the knowledge necessary to construct an effective plan. Examining the variables that differentiate states may highlight areas and best practices not previously considered in similarly situated states. The recommendations devised will help guide officials as they create or modify their states' plans, eventually resulting in more standardized, robust plans for the entire nation and its companion animals.

Literature Review

The Case for Companion Animal Planning

As with planning for humans in an emergency, planning for animals is prudent, even from a purely economic standpoint. A thorough plan will encourage efficiency through a

decrease in duplication of effort among agencies involved in emergency operations (Perry & Lindell, 2003; University of California, Division of Agriculture and Natural Resources [UC DANR], 1999). Without a clear, all-inclusive emergency plan, public officials, as well as their nonprofit partners, may find themselves in an inefficient tangle of disorganized sheltering operations. This makes caring for animals difficult at best (Hudson, Berschneider, Ferris, & Vivrette, 2001) and heightens frustration and fear for pet owners.

Accurately quantifying the costs and benefits of disaster planning for companion animals may be nearly impossible due to subjective measurements of human and animal suffering. However, these elements should not be discarded, but rather regarded as supportive narrative in the conversation surrounding resource allocation for emergency planning. Leonard and Scammon (2007) suggest a structure for classifying the various implications of neglecting companion animal preparedness: public health concerns; the well-being of companion animals; the emotional toll on individuals who have a close relationship with their pets; and economic impacts, which are derived largely from the other three categories of consideration.

Public health. Public health is of concern in evacuating animals. Uncontained bodily waste may spread disease among live animals that are left to wander. In limited cases, when the disaster involves water, communicable diseases may also transfer to humans via animal carcasses (Pan American Health Organization, 2004). Contact with wildlife and vermin may expose unvaccinated companion animals to the rabies virus. These potentially harmful illnesses could affect not only animals and evacuees in the immediate area, but also rescue workers who are essential to recovery efforts. Roaming animals, even those whose history includes no prior aggression toward humans, may become fearful and lash out. A risk to public health also exists when desperate pet owners evacuate without their animals, then return to an unsafe situation to rescue them, often illegally (Cattafi, 2008). In the most extreme cases, owners who choose to stay behind with their animals may find themselves in inescapable situations wherein they choose to remain in their homes at great risk to their lives.

Welfare of companion animals. If animals are left behind when owners evacuate, they are more vulnerable to harm, illness,

and death, in addition to the diseases discussed in relation to public health. In the case of Hurricane Katrina, rescued pets were found to have chemical burns from wading in contaminated flood water; emaciation; and heartworm (Raymond, as quoted in Harris & Reeves, 2006). Those who are not able to escape face drowning or starvation in the absence of an owner to care for them. Even pets who are rescued may face an untimely death. In the case of shelter overcrowding and no designated space in which to house displaced pets, perfectly healthy animals have been euthanized, as was the case for approximately 1,000 animals during Hurricane Andrew (Cattafi, 2008).

Emotional toll on pet owners. Detrimental psychological effects of leaving a companion animal behind, or worse, losing an animal to disaster, are well-documented. Lowe, Rhodes, Zwiebach, and Chan (2009) found that pet loss in a disaster was highly predictive of depressive symptoms, especially among those without a strong social support network. Hunt Al-Awadi, and Johnson (2008) found that pet loss in a disaster situation was associated with higher levels of depression, post-traumatic stress disorder, and anxiety. This pattern held even when the researchers controlled for losing one's home.

In addition, companion animals may serve as a source of comfort in times of hardship, elevating their value for individuals in stressful situations. In times of stress, animals serve as a calming presence, lowering strain among family members (Hall et al., 2004). Children have demonstrated lower stress levels during times of anxiety if a companion animal is present (Bryant, 1990), and lower cardiovascular reactivity has been demonstrated in adults who interact with dogs as well (Vormbrock & Grossberg, 1988). Pets, therefore, very likely serve as a source of comfort in times of disaster, when the threat of losing one's home, possessions, or livelihood threatens emotional well-being.

Economic concerns. Economic considerations are mostly drawn from the three previously discussed factors, especially in relation to public and mental health. The high costs of treating disease transmitted by contaminated water systems, bodily waste, parasites, or attacks by frightened animals have an economic impact on the health care system, which may already be overwhelmed in times of disaster. Hunt and colleagues (2008)

suggest that emergency planners consider the high costs of providing mental health care to those afflicted with depression or post-traumatic stress disorder due to pet loss or abandonment. Additional costs to be considered include: rescue worker time spent liberating animals from abandoned homes; costs to local or county government for carcass disposal; and costs of caring for injured or ill animals. There are additional costs to consider when arranging accommodations for animals during emergencies, such as building and maintaining shelters. However, the benefits to pet owners' emotional health, animals' physical health, and public safety, while difficult to quantify, may justify these costs in the long run.

Emergency Planning for Companion Animals

Though this study focuses on emergency preparedness for animals at the state level, emergency planning is an essential activity at every level of government. A comprehensive plan should include a written document, which may quickly become outdated if not reviewed on a regular basis (Perry & Lindell, 2003). Alexander (2005) allows that though each event is unique and no particular plan can address every eventuality, enough commonalities exist to justify planning activities such as hazard analysis and contingency arrangements. However, emergency plans may vary widely among localities, even among elements that may seem as if they should be standardized.

Variations in emergency plans. Differences between emergency plans may be explained by an assortment of variables unique to each region's political situation, geography, and resources. States with fewer resources may view emergency planning as an additional burden, unimportant relative to other essential functions, and therefore low on the priority list (Waugh & Streib, 2006). A state's size may determine the availability of written emergency documentation, as smaller localities tend to be less formalized and more dependent on personal relationships as the basis for planning activity (Perry & Lindell, 2003). Geography and a history of frequent emergency situations also play a role in variability among state emergency planning procedures (Federal Emergency Management Agency [FEMA], 2010b). States that are more frequently inundated with emergencies—such as those prone to hurricanes, earthquakes, and

wildfires—are more likely to view their plans as a routine skill rather than a document of intent (Perry & Lindell, 2003). Therefore, plans are less likely to be formalized in documentation, and more likely to be a result of having been through the procedures enough times that they are considered rote. This assertion may seem paradoxical to logic suggesting that repetition of plan implementation would result in stronger plans due to lessons learned. However, this assumption is subject to time and budget constraints that may hinder continual plan revision and improvement. Finally, and specific to emergency planning for companion animals, states may vary in the extent to which they are considered animal-friendly. States with existing laws protecting animal welfare may be expected to consider pets among their emergency planning priorities.

Nevertheless, conventional wisdom suggests that development of a comprehensive emergency plan for each state is essential, regardless of these variables. Perry and Lindell (2003) speak of formalization—generally resulting in a written document—helping to ensure a successful response to an emergency, with increased likelihood of several layers of response and fewer concerns about overlooking necessary information. As concerns about litigation arise, a comprehensive written plan can serve as a record of the state's efforts in protecting its citizens (Perry & Lindell, 2003; Waugh & Streib, 2006). In addition, state planning documents are required to be submitted to FEMA as a condition of receiving federal funding for preparedness activities (FEMA, 2007). These principles translate easily to the portions of emergency plans germane to companion animal welfare.

Attributes of a State Emergency Plan for Animal Preparedness

A detailed collection of instructions for mobilization can ensure at least a basic level of aid for companion animals and their owners in the event of an emergency. The following suggestions, though given for emergency plans in general, are easily extrapolated to companion animal planning as an element of a full plan, and specifically, the written document available for public consumption. These characteristics will be used to analyze companion animal emergency plans in selected states.

Data-driven. Emergency planners should use data gathered from hazard analysis to form the basis of planning efforts

(Alexander, 2005; Perry & Lindell, 2003). In the case of companion animal planning, an estimate of the number of animals in the state may be obtained in order to accurately gauge necessary supplies and human resources. The AVMA (2007) has devised a methodology for determining the number of animals in a given region, utilizing statistics it gathers regarding the number of households with pets and the number of pets per household. Edmonds and Cutter (2008) have further devised a methodology for calculation of the number of animals that may need assistance in an emergency situation. Through analysis of 29 evacuation studies from the years 1990 to 2005, Edmonds and Cutter arrived at 2.6 percent of households refusing to evacuate solely due to concerns about their pets. By multiplying this percentage and the number of households in a community, emergency planners will arrive at an estimate of the number of households needing evacuation assistance. Furthermore, since many households contain more than one pet, figures from the AVMA may be used to glean the average number of pets per household. This number can be multiplied by the number of households derived from the calculation above to arrive at an approximation of the number of pets needing assistance. This method of estimation is imperfect due to the difficulty of assessing the true number of pet owners who will refuse evacuation, but it provides a starting point for approximation.

Legislation. Plans must consider state laws, as well as any applicable federal legislation (Alexander, 2005; UC DANR, 1999). If plans do not follow guidelines set forth by legislation, or worse yet, contradict them, confusion may arise among emergency responders and other involved stakeholders. In addition, conflicting statements send a negative message about planning personnel and their review of applicable statutes and guidance, as well as the importance placed on companion animal planning.

Procedures and resources. Although an essential component of any emergency plan (FEMA, 2010b), guidance documents should not merely contain a list of supplies or other resources available to responders. The plan should also specify the processes to be undertaken in the event of an emergency (Alexander, 2005). Essential procedures to be detailed in an emergency plan for companion animals include provisions for housing pets during a disaster; transportation; equipment; and

tending to ill or injured animals (UC DANR, 1999).

Clarity of authority. Plans should contain unambiguous identification of not only which agency—whether public or private—is responsible for initiating action once an emergency becomes imminent, but which state agency has authority for any governmental decision making (FEMA, 2010b).

Collaboration. Collaboration among interested parties, as well as those with relevant expertise, is crucial in emergency situations (FEMA, 2010b; Perry & Lindell, 2003; Waugh & Streib, 2006). One agency simply cannot provide all functions involved in emergency response. In addition to government agencies, nonprofit organizations often play a large role in emergency operations (Waugh & Streib, 2006). Consequently, compilation of a response team that draws from various sectors interested in animal health and welfare is an essential task to undertake when planning for companion animals (UC DANR, 1999).

Public information. Communicating preparedness information to the general public is an essential function before and during a disaster, and may alleviate some of the strain on emergency responders as households plan for the care and evacuation of their pets (UC DANR, 1999). Perry and Lindell (2003) caution, however, that individuals are more likely to consult sources other than government for information in a disaster situation. Therefore, while it may be important for states to advise pet owners on steps to take during an emergency, it is at least equally important for local entities to accurately educate the public on matters of preparedness prior to disaster (Irvine, 2009).

Methods

Sampling Procedure

In order to ensure geographic diversity among the states studied, one state was randomly chosen from each of FEMA's ten planning regions (FEMA, 2010c). Random selection was accomplished using the list randomizer from the website random.org, which has been declared reliable by two independent studies (Haahr, 2010).

Document retrieval. Only publicly available documents were used for this analysis. Companion animal emergency planning

documents were downloaded from state governmental websites. In cases where a plan is not readily identifiable on the website, the researcher contacted the official State Veterinarian through electronic mail for information as to where the plan could be found.

Qualitative Coding

In order to identify similarities and differences among emergency plans for companion animals, a qualitative approach was taken to analyze content. An examination of state planning documents was conducted to compare each plan's components to a set of standard best practices as identified in the literature review. Specifically, each plan was analyzed to indicate the presence or absence of the following elements.

Data-driven. Plans were examined to determine if they are based on a methodology to calculate the number of household companion animals in the area.

Legislation. If a state has passed legislation relevant to companion animal planning, the plan was analyzed for compliance with the state's law.

Procedures and resources. Each plan was analyzed to determine the extent to which it incorporated planning for processes in addition to providing an inventory of accessible resources. A plan was considered stronger if it contained identifiable action steps and considered procurement and inventory of requisite resources. Plans were analyzed for inclusion of information regarding housing, transportation, equipment, and medical care for companion animals.

Clarity of authority. Plans were analyzed for the presence or absence of a designated lead agency for companion animals and the state agency in charge of government operations, which may sometimes be the same entity.

Collaboration. Plans were evaluated for the extent to which partners and their respective roles are identified. Strength of collaborative relationships is difficult to measure in a written document of intent; therefore, the presence or absence of collaborative relationships was documented for purposes of this analysis.

Public information. Each plan was examined to determine if provisions were made for release of information to the public. Particularly, the analysis indicated whether the plan detailed

an authority for informing the public about animal care before, during, and after an emergency. In addition, plans were analyzed for mention of preparedness information to aid households prior to an emergency.

Supplemental information. Any themes that emerged from the analysis that are not included in the descriptive elements above were identified and their relevance discussed.

Analysis and Reporting

After each plan was dissected for the characteristics above, a report was constructed detailing each component, examining its overall frequency and strength. Further discussion includes a description of how each element dovetails with the variables described in the literature review. The differences between plans for each characteristic were reviewed and explanations as to their specificity—or lack thereof—will be offered using several variables, including financial resources, population size, vulnerability to disasters, and the extent to which they are considered animal welfare-friendly. Best practices, as well as gaps in planning were utilized as a basis to provide recommendations regarding how future plans should be constructed and of what elements they should be composed. Emergency managers or other officials tasked with plan development and modification may use the resulting suggestions.

Results and Discussion

Nine of the ten states chosen for the analysis either had plans available publicly through their websites, or a planning official responded to the author's request for information. These nine states include Alabama (n.d.), Hawaii (2009), Illinois (n.d.), Iowa (2007), Louisiana (n.d.), New York (2010), Rhode Island (n.d.), Utah (2005), and Washington (2006). The tenth state chosen, Delaware, did not have planning documents publicly available, nor did emergency management officials respond to a request for information.

Elements of Emergency Plans

Overall, the states with the most detailed, most useful provisions included Illinois, Iowa, Louisiana, New York, and Rhode Island. The plan with the least detail was provided

by Utah, with the rest falling approximately in the middle of the spectrum. Discussions of each of the elements analyzed follows, with reflections on how emergency planners may wish to address these components.

Data availability. Only two of the nine states studied provided data figures as to the number of animals in the applicable jurisdiction. Furthermore, only one state based the actual planning number on the anticipated number of pets needing evacuation, though the methodology for approximating the figure was undefined.

Due to the aforementioned difficulty of calculating exactly how many pets will need assistance, a standard methodology such as that used by Edmonds and Cutter (2008) is necessary to arrive at a figure that can drive planning efforts. This method is not foolproof, due to local variations in pet ownership. A pet census or registry may assist with determining demand and location of shelters (Edmonds & Cutter, 2008; Leonard & Scammon, 2007; UC DANR, 1999). However, the costs and difficulty of collecting and maintaining registry data may outweigh the benefits of greater accuracy in estimating pet ownership figures. Planning officials should take this into account before implementing a registry that may prove unwieldy, or even inaccurate.

Legislation. Of the nine states studied, four have passed laws related to provisions for companion animals in emergency plans. While the majority of these laws were fairly vague, the Louisiana law required specificity with regard to shelter facilities and their operations; pets and owners evacuating together when possible; reunification policies; and public education regarding preparedness for pet owners. All plans technically displayed compliance with the federal PETS Act of 2006. The Act is fairly broad and does not specify a compendium of features that must be present in order for a state to fulfill the mandate or a requirement for separate state legislation. All states studied reflected compliance to their respective laws; however, this could reflect a lack of specificity rather than a robust planning process.

Clarity of authority. Six states' plans emphasized counties as the front-line responders in an emergency, stating that counties should plan as they see fit, and that the state's plan is to be activated in widespread emergencies or when local resources

are exhausted. Eight out of nine states identified the state agriculture agency as maintaining some or all authority in matters relating to companion animals, while Hawaii places authority solely with its department of civil defense. Other agencies with which state agriculture authorities share power in an emergency include the state emergency management agency (Rhode Island); department of public health (Iowa); and an interagency animal response team (Washington). The remaining states specify their respective agriculture departments as the sole lead agency in an emergency. Specifying authority in multistate disasters may be better suited to general emergency planning documents rather than specific animal care annexes.

Public information. Seven of the states identified multiple agencies responsible for communicating with the public during an emergency, while one state identified a single entity and the other delegated responsibility solely to individual county Public Information Officers. State emergency management agencies were most frequently assigned at least partial responsibility for public communications, along with state departments of agriculture, while nonprofits were granted authority in just two states and the state department of health was utilized in just one state. UC DANR (1999) suggests appointing just one liaison; however, in situations involving both animals and humans, this may not be the most feasible approach. All states except one specified that their emergency management agencies would have at least a partial role in public release of information, as would be expected in any disaster situation. However, four state plans indicated that their departments of agriculture would also be involved. This suggests that animal-specific information is provided alongside general information, but by a different entity.

Six states' plans contained provisions or suggestions for providing the public with preparedness information for pets prior to an emergency. This information typically includes suggestions regarding evacuating with pets and recommendations for items to include in an emergency preparedness kit. Irvine (2009) recommends production and distribution of a brochure that includes a list of equipment necessary to care for pets in an emergency, as well as a directory of pet-friendly hotels or alternate housing. Furthermore, Irvine recommends incorporating the provision of this message via veterinary

offices during routine animal care, thus rendering veterinarians suppliers of information, rather than relying on pet owners to actively seek out the necessary information. However, some pet owners do not seek regular medical attention for their animals and will not receive the information via their veterinarian. Leonard and Scammon (2007) therefore suggest that public service announcements also be used to promote emergency readiness for animals. Heath, Beck, Kass, and Glickman (2001a) concur, recommending that such campaigns dovetail with general pet care awareness messages.

Collaboration. All state plans studied reflected the intertwined nature of public agencies in an emergency and assignment of roles and responsibilities to appropriate departments as necessary. In addition, all state plans enlisted help from local and national nonprofit organizations, or at least recommended doing so. The American Red Cross (ARC) was frequently called upon, as coordinating animal care with human care is essential. In addition, national animal welfare organizations such as the Humane Society of the United States (HSUS) and the American Society for the Prevention of Cruelty to Animals (ASPCA) were involved, mostly in housing and sheltering operations. Collaboration with nonprofits is essential to emergency response and recovery due to the mission-driven nature and community involvement inherent in these organizations.

Hawaii's and Louisiana's plans both mention contributions from other states. Louisiana refers to volunteers coming from North Carolina's and Connecticut's animal response teams, while Hawaii's Department of Commerce and Consumer Affairs is responsible for devising procedures for credentialing out-of-state veterinary personnel. The remaining states in this analysis did not account for volunteer teams from other jurisdictions, nor did they address credentialing procedures for out-of-state veterinary practitioners. Neglecting to authorize the practice of out-of-state veterinary personnel could become problematic in an emergency. Hudson et al. (2001) encountered difficulty while attempting to access additional veterinary services from out of state after Hurricane Floyd. The groups providing assistance to animals were not officially incorporated into North Carolina's emergency plan. The implication of this omission was that out-of-state veterinary personnel were not able to practice legally in North Carolina, which could have

been alleviated with a simple governor's order suspending licensure rules in emergency. It may, therefore, behoove states to develop a process—and detail that process, along with information regarding potential partners—to credential out-of-state veterinary professionals.

Four states' plans specifically mentioned memoranda of understanding or mutual aid agreements to solidify arrangements for aid in an emergency, while the remaining states failed to recommend these measures. These agreements are essential to ensure continuity of plan operations and response; additionally, they provide a measure of accountability and commitment on the part of participating agencies (Beaver, Gros, Bailey, & Lovern, 2006; UC DANR, 1999). States may wish to develop and implement a standard contract for assistance, at least with agencies that agree to provide critical services, such as pet sheltering and medical care.

Collaboration with the private sector, especially in crafting and executing preparedness plans, is more common than in the past. Private companies receive contracts from governmental entities to complete work such as improving structural integrity of buildings in areas vulnerable to earthquakes (Waugh & Streib, 2006). Public and nonprofit collaboration with private businesses may exist solely on a transactional basis (Austin, 2000). For example, the one-time contracting situation described by Waugh and Streib could be utilized to construct shelters or retrofit them to accommodate animal cages. In addition, pet supply retailers could partner with states to provide equipment. Despite the benefits of partnering with private industry, fewer than half of states studied mentioned partnerships with private organizations, mainly in terms of obtaining provisions.

Equipment, housing, transportation, and medical care. Only two states produced at least a partial inventory of supplies on hand. In the case of Louisiana, the list of supplies on hand was limited to the number of crates in various regions of the state. Arguably, this is one of the more important supplies of which to ensure availability, but other critical items, such as pet food and clean water, were not present.

Precisely which supplies are necessary to care for animals in a disaster may not be readily apparent. Four states provided lists of supplies that would be necessary for shelters to obtain

to adequately care for animals. All state plans except one specified the entity responsible for procurement of equipment. As Heath, Kass, Beck, and Glickman (2001b) point out, some pet owners may not have equipment suitable for evacuating their animals, such as carriers. This may prove to be a challenge in states such as Iowa and Louisiana, where animals are required to arrive at shelters with this equipment. Heath and colleagues recommend, therefore, that officials tasked with emergency operations equip themselves with cages, leashes, and other supplies to aid in catching and transporting animals to safe areas.

All states specified the entities in charge of providing and/or arranging housing for animals in an emergency evacuation. Responsible entities included state government agencies, such as Hawaii's State Civil Defense, and nonprofit organizations, such as the Utah Humane Society. While most plans did not specify exact sheltering locations, Rhode Island suggests that the Lincoln Greyhound Park racing track be used as an emergency site. In addition, some plans suggested generic facilities to be considered. For example, Iowa's plan suggests fairgrounds, kennels, and veterinary offices as potential housing areas for animals, while Illinois's plan suggests schools and parking ramps. Only four state plans went so far as to specify, or recommend, procedures to be used in housing animals. Local animal shelters or welfare organizations may have conflicting ideas as to how to most effectively house pets, thus fostering confusion at a time when consistency is crucial. Ideally, lead organizations will work with adjunct agencies to ensure uniformity of operations. However, as Perry and Lindell (2003) state, a prescribed plan will help to establish a reliable response. Therefore, emergency planners may wish to specify at least basic housing operations in order to standardize operations and alleviate uncertainty.

Eight out of nine states specified either agencies responsible or procedures to be undertaken for transport of companion animals. Transportation for animals in emergencies can be problematic, especially in urban areas where residents are less likely to own cars (Cutter & Emrich, 2006). Accessible transportation needs to be available, even if pets and owners must be separated for a short time. Assembling a fleet of vehicles to transport companion animals for special needs populations—

such as the elderly, infirm, or indigent—will help to evacuate pets.

Access to medical care for animals is important in shelter situations, for several reasons. First, dogs in the first few days of shelter residence have demonstrated high levels of cortisol, a hormone that is more pronounced under situations of stress (Hennessy, Davis, Williams, Mellott, & Douglas, 1997). Veterinary staff may administer medications to calm animals suffering severe stress or separation anxiety. In addition, Iowa's plan states that animals who are not current on their rabies vaccines must receive one from veterinary staff prior to entering a shelter. Parasites such as fleas and ticks may spread from animal to animal in a mass housing situation, in which case veterinary staff should be present to diagnose as necessary and apply treatment. Finally, having veterinary care on hand in case an animal falls ill or becomes injured during the course of housing should be standard procedure. All state plans specified entities responsible for coordination of medical care.

Supplemental Information. Seven states addressed the importance of procedures for reuniting pet owners with their pets during the recovery phase of emergency operations. Some plans included suggestions for incorporating these processes, such as photographing pets with their owners or assigning matching barcode wristbands and collars, into sheltering operations. Others simply stated that those responsible for housing should develop such procedures in the manner most feasible. In addition, six states accounted for procedures to address the needs of unclaimed animals or those who could not be reunited with their owners, generally assigning the task to the authority responsible for housing, or specifying that such animals would be turned over to shelters for care. Beaver and colleagues (2006) state that though rescuing is important, reuniting pets with their owners is equally important, and suggest that sheltering authorities use such technologies as digital photography and microchip implantation to assist with the task. Whichever methodology is utilized, plans should specify reunification procedures in order to avoid liability and reduce anxiety among pet owners. Inevitably, some animals will be unclaimed, however. Beaver and colleagues (2006) state the importance of processes to care for abandoned animals, recommending that state laws should be uniform with respect

to the definition of "abandoned" and allow leeway in emergency situations.

Five states recommended tracking of costs in emergencies, with some advocating appointment of a financial manager for the duration of disaster operations. Presumably, this information is helpful for state accounting purposes. However, demonstrable financial data may also be useful for procuring federal funding. The PETS Act of 2006 allows states to apply for funding for animal emergency preparedness purposes, which includes construction or renovation to existing shelters. These data may also be used to support grant requests for animal emergency preparedness from large animal welfare groups such as the HSUS.

Accounting for Variability

Despite slight correlations, comparison among the most prepared and least prepared states suggests that the following factors actually have little to do with a state's overall readiness in relation to companion animals. For purposes of analysis, states with plans adhering to the highest number of model characteristics are classified as "most prepared" and the state with the plan containing the lowest number of model characteristics is referred to as "least prepared." States with plans that fall between the two extremes will be categorized as "semi-prepared." Financial resources were determined by each state's allocation for emergency planning, reported on a per capita basis, for the year 2007, while size was determined by July 1, 2007 Census population estimates (USCB, 2007), and levels of vulnerability to disasters were indexed by data from FEMA (2010a) that indicate the number of disasters from 1953 through 2010. Animal welfare-friendliness was gauged using the Humane State Ranking generated by the HSUS. The Humane State Ranking counts the number of "strong" animal welfare laws in each state, drawn from a reference list of 65 ideal domains of animal protection (HSUS, 2010c).

Financial resources. Perry and Lindell (2003) contend that disparity in the amount of resources a region devotes to emergency preparedness is a stark reality. It may be a logical conclusion, then, that states with fewer monetary resources devoted to planning may in turn produce leaner plans. This analysis produced mixed results with regard to the states studied and

their emergency management budgets. The second lowest budget for emergency management—Utah, at 30 cents per person—did correlate with the least prepared state, overall. The state with the highest budget for emergency management—Illinois, at $2.72 per person—was identified as one of the most effective plans. However, the state with the lowest per capita amount devoted to emergency management, just 28 cents per person in 2007, was New York, which was also identified as having one of the strongest plans. Some of the discrepancies related to financial resources may be due to the fact that the budget figures included only state budget allocations, not federal or other financial assistance (National Emergency Management Association, 2008). These results may suggest that states are using their emergency management budget for priorities other than planning, or that within the planning budget, animals are not as high a priority as other factors.

Size. Perry and Lindell (2003) offer that larger states may have more formalized plans in place, while smaller states rely on more informal agreements and relationships. The two states with the highest population do indeed correspond to two of the most effectual animal emergency plans among those studied; the state with the lowest population also falls at the high end of the spectrum with regard to preparedness. Utah, the least prepared state in this analysis, is near the top of the less populous states as well. However, Louisiana and Iowa, two of the most prepared states, are much more sparsely populated than their other well-prepared counterparts. A small correlation exists with size, agreeing only slightly with Perry and Lindell's (2003) assertion that larger states tend to be more formalized. Perry and Lindell's theory may therefore apply more to counties than to states.

Vulnerability to disasters. States that are more vulnerable to disasters may be less likely to have formalized plans in place. This is because they are more accustomed to dealing with disasters, and may therefore view planning as unnecessary. Perry and Lindell's (2003) hypothesis of states having less formalized plans the more vulnerable they are to disasters does not appear to correlate with the states analyzed. Illinois, Louisiana, and New York—three of the most complete plans for the purposes of this study—are listed at or near the top of

the number of disasters in the past 57 years. Utah is second only to Rhode Island in terms of fewest disasters, and they correspond with the least and most prepared states, respectively. The third and fourth states in order of number of disasters, Hawaii and Washington, fared average in the analysis of preparedness. This theory, while sensible in the aspect of intimate knowledge of one's procedures in an emergency, fails to account for liability concerns. In addition, failure to plan could defy the expectations of citizens, who may believe that the government in a susceptible area would be remiss, should they fail to plan for what is a fairly known quantity.

Animal friendliness. The HSUS (2010a, 2010b) released its Humane State Ranking in February 2010. The Humane State Ranking assigns each state a rank in terms of animal-related legislation, looking at laws spanning pets—including emergency preparedness—and animal cruelty, along with provisions for wildlife, research animals, and farm animals. Attempting to associate plan effectiveness with this variable produces a moderate correlation. Illinois and New York, two of the most prepared states with regard to companion animals, place near the top of the Humane State Ranking, and in fact, tie with each other. Only Washington, a semi-prepared state in this analysis, breaks the pattern of most prepared states placing at the top of the list. Utah—the least prepared state in this analysis—places near the bottom of the list with respect to animal friendliness. This correlation may suggest that animals and their welfare are a higher priority among better-prepared states, and thus their plans tend to reflect this precedence.

Recommendations and Conclusion

Recommendations

Several attributes of state emergency plans for companion animals appeared universally or nearly so among all nine states, and therefore produced little or no gap in this analysis. Provisions for medical care and assignment of an entity to arrange housing were present in all plans. In addition, designation of agencies to communicate with the public was common to all plans, though no plans specified how agencies would coordinate for uniformity of message. All states delegate a lead

agency; however, in the three states that do not assign responsibility specifically to counties, local authority is not specifically granted. In addition, all states enumerated collaborative relationships between government and nonprofit organizations, though only four specified connections with private industry, and only four mentioned formalized agreements. Most states—eight in both cases—specified entities or procedures associated with obtainment of supplies and transportation.

Some deficiencies in planning become more evident, however, in other aspects studied. Six states specified that information regarding pet preparedness will be released to the public in order to encourage readiness prior to an emergency situation. Four states specified procedures to be utilized at emergency shelters, and four states also provided a list of supplies necessary to carry out sheltering operations. Only two states specified equipment inventory on hand at the time of the plan's composition, and only two states made mention of the number of animals that may need assistance, both of which should be present in order to drive planning efforts. These deficiencies, along with suggestions regarding how to remedy them, are elaborated upon below.

In order to compose the most efficient and orderly plan for animals in an emergency, plans should first and foremost be data-driven. The estimation procedure used by Edmonds and Cutter (2008)—using data from the AVMA and a multiplier of pets left behind—can provide a basic snapshot of how many households may need assistance. Pet ownership censuses may be more accurate for local purposes than even the best estimates produced by the AVMA, but their implementation may not be feasible, or data may be difficult to gather. Either method will provide emergency planners with better information on which to base operations. One additional recommendation is to identify the most likely disasters and their potential effects in order to plan for contingencies. Alabama is the only state in this analysis that includes this in their plan. The Alabama Department of Agriculture and Industries maintains a list of key areas where emergencies are more likely to strike, providing justification for focusing resources on these areas specifically. Specifying the disasters most likely to affect an area will aid in identifying problems that may surface— including those brought about by human behavior—and devising potential

solutions. In addition, the average duration of area disasters may help to calculate necessary resources and personnel (Perry & Lindell, 2003; UC DANR, 1999).

While such an undertaking may be time-consuming, inventorying a state's animal care equipment should also drive planning efforts so that gaps may be addressed. A recommended list of supplies can help to prepare individual shelters for animal needs, ensuring that they are not without essential equipment at a time when it may be unavailable through conventional means. Furthermore, specifying a set of basic operating principles will preserve uniformity among all participating shelters, which dispels uncertainty or disagreement in times of potential confusion, as well as in situations where animals must transfer between shelters. Ideally, designation of a lead agency would alleviate confusion. However, cementing operating procedures into a written emergency plan prior to implementation would dispel any doubt.

Multiple avenues of providing information to the public in an emergency situation should be expected, as agencies caring for humans and those caring for animals may be different entities. State plans should indicate, however, how these entities would coordinate with one another for unity of message. Prior to an emergency, it is essential that pet owners receive important information, such as how to prepare their pets, what to include in an emergency kit, and the locations of shelters, transportation, and pet-friendly hotels. Including veterinarians in the process, as well as releasing general public service announcements coupled with general pet care campaigns, will help to ensure that pet owners receive the message.

Emergency managers should also ensure that plans specifically grant local authority, encouraging continuity of response and county preparedness efforts. States that do not explicitly grant authority to local entities, though they may be mentioned elsewhere in the plans, should formally recognize the powers and duties of local officials, especially regarding equipment and housing resources that may be dependent on community businesses such as veterinarian offices, pet supply retailers, and shelters.

These community businesses can form the basis of a robust network of animal care organizations. Public and private entities alike should be enlisted to take part in caring for

animals in an emergency. Public entities offer resources, command structures, and formalized planning efforts, while nonprofit animal care organizations offer specialized expertise, equipment, and positive identification with local communities. While most states specified relationships between public and nonprofit entities, private businesses should not be overlooked as potential partners in arranging emergency animal care, as they can provide necessary supplies and serve as a conduit for information for public preparedness. In addition, as governments at all levels continue to pursue public-private partnerships in an endeavor to increase efficiency and effectiveness, private companies may provide services important to accommodating the needs of animals. All partnerships established by state planning documents should be cemented by a written agreement, such as a memorandum of understanding, a mutual aid agreement, or a contract. An example of this type of agreement is when a state plans to seek aid from other states as part of its preparedness efforts. In this instance, a credentialing procedure should be established for emergency situations to allow veterinary professionals from other states to practice across state lines. This eventuality is only discussed in Hawaii's plan.

Limitations

While this study ideally aims for universal value, there are several limitations that hinder its widespread applicability. First and foremost, this study took place over a period of ten weeks, which limited the feasibility of studying more states in order to gain a more complete sample size. In addition, time and space constraints precluded studying state emergency plans in their entirety, which may have provided better context for understanding the companion animal portions of the plan. Other areas of emergency plans, such as the human mass care section, may address some animal sheltering needs.

Another limit of this study is its inherent subjectivity. The qualitative nature of this analysis as performed by only one author precludes tests of reliability. The data in this study are difficult to quantify, and the tests for correlation among the variables are based on the author's judgment, not a statistical measure of significance. This study should therefore be considered observational and utilized as supportive, not

conclusive, evidence. Finally, the data collected were accurate as of late 2010, and may have changed in the interim.

Conclusion

The nine states studied in this analysis provide a snapshot of how the nation prepares for companion animals in emergency situations. Though mandated by law, companion animal emergency planning varies quite widely among states, with some producing mature, complex plans and others producing very rudimentary plans, or no plans at all. Though most of the elements that comprise an ideal emergency plan were present in the majority of the plans, some gaps in planning became evident and could become problematic during an emergency situation. Planners should utilize the recommendations detailed above to present a more unified, all-inclusive plan in order to reduce the number of evacuation failures. This will in turn lighten the burden on the economy, public health, and public safety, while reducing animal suffering and the emotional toll on pet owners faced with the decision to leave their animals or stay in a dangerous situation. As the State of New York (2010) concludes, "It is clear through analysis of these local and national disasters that planning for animal welfare is planning for human welfare."

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