

## **Protecting Animals from Hurricanes**

The highest priority after hurricanes is to reestablish the veterinary infrastructure. This includes ensuring that veterinary practices are operational to care for injured animals and to coordinate relief efforts. Animal shelters need to be functional to house stray animals, to set up fostering and adoption programs, and to provide a base for the participation of public service and health veterinarians in the diagnosis and surveillance for zoonotic and food-borne diseases.

Veterinary practices and animal shelters should be viewed as critical facilities without which human and animal health is compromised and stray animals become a nuisance. After large-scale disasters such as a hurricane the Department of Health and Human Services, Public Health Service, and Veterinary Services can assume responsibility for vector control. The Centers for Disease Control and Prevention, Epidemiologic Intelligence Service, can assess medical and nutritional needs and conduct disease surveillance.

## **Veterinary Public Health**

Vector-borne diseases are usually the greatest veterinary public health concern after a hurricane. This is because the storm often leaves suitable breeding grounds for mosquitoes. After a hurricane hit Haiti in 1963, malaria cases increased, and after Hurricane Agnes in 1972 an increase in the number of cases of California encephalitis was recorded. Outbreaks of contagious zoonotic disease are rare. Intense monitoring for an increase in the number of cases of dengue fever, St. Louis encephalitis, or malaria after Hurricane Andrew in 1992 did not reveal any more cases than would be expected at that time of year.

The most common “zoonotic disease” is insect bites (hornets, wasps, bees). These were among the most common injuries after Hurricane Hugo in 1989. This is probably because of the high prevalence of these insects in the environments affected by the hurricane and where people had to work. Snakebites are also a concern, but only a few cases are ever reported. Although it is often rumored that dog bites become a problem after disasters, this has not been documented.

Traditional veterinary public health concerns have been food safety and supply. Although food contamination has been a rare occurrence, the cost was large when it occurred. For example, after Hurricane Agnes over 8 million pounds of beef and poultry had to be destroyed because it had become contaminated and could no longer be refrigerated. Other than this incident, the food supply after disasters in the United States has not been seriously compromised since World War II.

Similarly, infectious disease outbreaks do not necessarily follow a hurricane because several preexisting conditions must be present for an outbreak to occur. They include the following:

- The disease must be present at the time of the disaster.
- Susceptible animals must be exposed to the agent of disease.
- There must be a method by which the disease is propagated.

After Hurricane Andrew these conditions were met. At a care facility that housed approximately 300 “healthy” horses an outbreak of respiratory disease occurred approximately 1 month after the storm. Respiratory disease was probably present already or was introduced by carrier animals or by donated used (contaminated) halters and lead ropes. Probably many animals were susceptible because they had not been vaccinated and the stress of the storm may have compromised their immune systems. Finally, overgrazing of limited pasture space led to

amplification of the disease through its spread among horses that were in forced contact with one another.



Hurricane Andrew had winds strong enough to blow horses into drainage ditches. Several of these horses were not able to climb out because the walls were too steep. (Photo by Rocky Bigbie.)

### **Animal Health**

The most common problems in animals after hurricanes appear to be the result of trauma. Otherwise it's business as usual.

#### **Problems encountered after Hurricane Fran**

After Hurricane Fran hit South Carolina in 1996, the most common clinical veterinary problems were foot abrasions and heat stress (caused by a lack of electricity to power air conditioners). Some owners reported that their pets were more nervous in response to loud noises. A very small number of deaths in older animals were also reported.

#### **Problems encountered after Hurricane Andrew**

In the month following Hurricane Andrew an estimated 2000 pets were treated for lacerations, a few for broken legs, and many for urinary tract infections, vomiting, and diarrhea. The exact proportion of conditions is not known. Also unknown is whether these were conditions that resulted from the immediate impact of the storm or during the recovery period. It is possible that many of the medical conditions would have occurred without the hurricane.

Although there are verbal reports of hundreds of horses being killed by the storm, the only reliable report I could find was of a "few horses" seen dead in ditches. Apparently these horses had been blown into the ditches and could not get back out up the steep embankment. Collapsing barns may have killed a few others. At the emergency hospital only two horses were euthanized. In one a systemic fungal infection developed, which the owners could not afford to treat. The other was killed because it was dangerously aggressive toward people and was not reclaimed by an owner. Altogether probably fewer than 20 horses died as a result of Hurricane Andrew. In

addition, a significant, and perhaps the largest, cause of death in horses after a hurricane was horse thievery. Within a few days horses living in the hurricane-affected areas were being delivered by thieves to feedlots out of the state.

**Table 6-8** Location of reported injuries (lacerations) to horses in emergency care facility after Hurricane Andrew

Injury	Number	Percent
Lower hind limb	32	30.8
Torso	26	25.0
Upper hind limb	16	15.4
Head and neck	16	15.4
Upper forelimb	7	6.7
Eyes	7	6.7

Several of the 122 horses at the facility had multiple injuries, and others had no injuries.

The only quantitative report on injuries in animals was my report on the injuries of horses, which are summarized in Table 6-8. Although the number of horses treated was large, it represented only a small proportion of the horses affected (less than 0.5% in south Florida). The need for treating these horses arose primarily out of organizational problems, not out of a need for more resources. With the help of many volunteers on site the greatest progress in the care of these horses was made by coordinating available manpower and standardizing treatments. The application of these simple management principles allowed workers within 10 days to go from treating 40 to 50 horses a day to treating fewer than 12 each day. Other clinical problems included a few cases of rain scald, colic, and injuries sustained after the storm (e.g., stepping on sharp objects, bite wounds from other animals). Refeeding horses that were malnourished was a common concern. This was necessary because many horses were true backyard horses and in poor condition at the time the storm hit. (A common rumor at the time was that the storm caused horses' poor condition. This likely was true only for a few cases.)

Injuries were fairly common in horses months after the storm, when they were turned out to pasture that had become contaminated with debris. This resulted in hoof puncture wounds.

### **Miscellaneous reports**

After Hurricane Iniki, Kauai veterinarians frequently were asked to prepare health certificates for pets belonging to owners wanting to leave the island. The most common injuries to pets resulted from vehicular accidents after the storm.

After Hurricane Cesar affected Costa Rica, a humane group reported providing care to approximately 9000 animals. Most commonly this was in the form of vaccination of livestock against anthrax and leptospirosis and vaccination of dogs against rabies, distemper, parvo, and hepatitis. There were no reports that any of these diseases actually occurred or were a threat to the animal populations.



A horse that sustained injuries in Hurricane Andrew. Upper limb injuries were common. (Photo by Richard Templeton.)

Another concern reported has been the disruption of preventive medical supplies such as heartworm medication. This is probably a real need partly because supplies or medical records are often lost and partly because of the possible increased exposure to mosquitoes after hurricanes and floods. Providing a continuous supply of these medications helps prevent much greater costs later.

New species of animals may be introduced into the environment in a hurricane. These may be brought in by the winds (insects) or released from people's private collections. Small species (e.g., insects, reptiles, rodents, and birds) are probably the greatest concern because large animals are usually killed on the roads, by animal control officers, or by alligators (in Florida). An example is the introduction of birds that escaped from private collections and zoos in Hurricane Andrew. Damage to native flora and fauna in hurricanes may make the environment particularly susceptible to invasion by nonnative species.

Hurricanes have been implicated in the transmission of ticks and diseases they carry. For example, *Amblyomma variegatum* may have been introduced to Dominica after Hurricane David in 1979. Tick-borne diseases have also emerged after hurricanes in which surveillance and eradication programs had to take a back seat to rebuilding other aspects of the island's infrastructure.



## A temporary animal care unit set up after Hurricane Andrew

### **Stray Animals**

Stray animals are by far the largest problem with animals after most disasters. In hurricanes, because extensive areas can be affected, the number of stray animals can be staggering. Although it is often assumed that many pets are tragically separated from their owners in hurricanes, most found animals have probably been abandoned or were already strays.

After Hurricane Agnes in 1972 large areas of Pennsylvania were flooded. As a result the Luzerne County Society for the Prevention of Cruelty to Animals (SPCA) rescued and sheltered 2249 pets. Of these, 543 dogs, 474 cats, and 51 animals of other types (47.5% of total) were rescued from the flooded areas. The remaining 617 dogs and 564 cats (52.5% of total) were from adjacent areas. Although no information was given on the number of animals that were reunited with their owners, the conspicuous absence of reported reunions is an indicator that the majority of found pets were strays or had been abandoned. After Hurricane Andrew it was estimated that 30,000 to 100,000 pets had been displaced. Although this number is likely a gross exaggeration of the true number of animals found, again no reports were made on how many of these were reunited with their owners and again reports of reunions were scant. Successful reunions are often reported as encouraging, human interest stories, so the lack of reports probably indicates that many of these found pets were not reunited with owners. By comparison, owners reclaimed nearly all of the approximately 500 horses that were pastured in emergency facilities after Hurricane Andrew. The situation is probably the same for livestock owners, who are the persons least likely to abandon their animals.

At least 15 different groups became involved in animal rescue after Hurricane Andrew. Most were ad hoc groups with little appreciation for local needs and resources. This led to considerable confusion, competition, and ineffective use and misappropriation of resources, which could have been avoided had a single authority been in charge, as recommended in Chapter 18, which explains the Incident Management System (IMS).

Pet owners' preparation for the arrival of Hurricane Fran stands in contrast to the problem of abandoned pets. One animal shelter reported boarding 153 pets brought in by their owners. This was primarily in response to public service announcements before landfall.

### **Veterinary Practices**

#### **Problems reported after Hurricane Fran, 1996**

In preparation for the arrival of Hurricane Fran veterinarians stopped booking clients for elective procedures and returned animals that had been admitted to the hospitals as soon as they could.

After the storm the greatest losses to practices were roof damage and lack of electricity and water. As a result clients had to be referred to other practices. Some veterinarians estimated that their practices took 1 to 2 months to recover.

#### **Problems reported after Hurricane Andrew, 1992**

Hurricane Andrew destroyed about a dozen veterinary practices, which had to be completely rebuilt. Another 10 to 15 practices sustained severe damage. Many others sustained moderate and minor damage. Several practices were not able to function fully because staff and employees had to attend to their own homes and could not come to work. Inadequate business disruption insurance was a problem for many practices.

One of the greatest concerns of veterinarians was the change in client base that had been caused by the storm. An estimated 83,000 Floridians lost their jobs. Therefore there was legitimate reason for concern that clients had moved away and that the client base could no longer support a practice.

Concern also was expressed that business was slow because pet owners simply did not have the money to pay for animal care. A year later, however, most affected practices had been rebuilt, and those that were well insured are doing better than before the storm. Therefore it is more likely that business decreased because people were temporarily preoccupied with rebuilding their lives than that they were unwilling or unable to pay their veterinary bills. Notably no veterinarians reported being concerned about losing clientele because clients' animals had been killed.

The greatest need identified by veterinarians during the recovery period was for generators. Also in demand were mobile clinics, increased cash flow for repairs, accountants, architects, access to communications, and mental health counseling.

The greatest mental stresses for veterinarians were their feeling that their relationships with their clients had been "severed," their community responsibilities and accompanying arguments over control of the relief efforts, out-of-state veterinarians treating animals already under the care of a local veterinarian, and free clinics set up in competition with functional hospitals (Fig. 6-9).

At the large-animal care facilities set up after Hurricane Andrew volunteers carried out most of the work. On weekends there often were so many volunteers that efforts were confused and ineffective, whereas during the week there often were insufficient numbers to help. This indicates the need to have volunteer personnel coordinators (see Chapter 18). An experienced stable manager is essential to supervise the care of horses.