

## The veterinarian's role in conservation

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During the 1990s and early 2000s, many Americans, including veterinarians, became familiar with such terms and concepts as ecosystem health<sup>1</sup> and conservation initiatives. During this same time, the roles that veterinarians can play in conservation initiatives became much more appreciated.<sup>2,4</sup> These roles vary from making clients aware of ecologic concerns and assisting in wildlife rehabilitation and feral cat control programs to full-time employment in zoologic and wildlife medicine.

The knowledge and skills that veterinarians have can be particularly useful in studies of wildlife ecology and conservation. The present report describes the author's role in 3 such studies to highlight the important part that veterinarians can play.

### Forest Elephants

Unlike their savanna relatives, little is known of the forest elephants (*Loxodonta africana cyclotis*) of Central Africa. During the past 20 years, however, studies of the ecology of this subspecies have begun to unravel some of its mysteries. As part of a larger ecologic study,<sup>3</sup> the importance of determining forest elephant home ranges was realized.<sup>3</sup> Such data are crucial in efforts to petition governments, nongovernmental organizations, and other funding agencies in the region to develop national parks and protected areas necessary for the long-term survival of forest elephants. My role, as one of the veterinarians involved in the project, was to immobilize elephants so that telemetry collars containing a global positioning satellite system could safely be placed.

During a 3-month period, 6 forest elephants, consisting of 2 cows and 4 bulls, were immobilized for placement of telemetry collars. My knowledge of basic anesthetic principles, including how to use carfentanil, a potent opioid agonist, and of the anatomy and physiology of elephants was instrumental in performing safe anesthesia in these elephants. In addition to delivering the anesthetic agent once an elephant was located by the trackers, I also had to determine whether the elephant was adequately anesthetized to allow safe handling for collar application, collect specimens for laboratory testing, and administer the anesthetic antidote naltrexone.

Veterinarians are well trained in anesthetic and

immobilization techniques, and even though this is truer for domestic animals than for wild species such as forest elephants, all veterinarians have basic knowledge on how anesthetics work. Whether this knowledge is applied to the capture of feral dogs or raccoons or is used to assist in the rehabilitation of injured wildlife or to provide services for ecologic studies such as the tracking of forest elephants, veterinarians have a vital role in the successful outcome of these conservation initiatives.

### Marine Turtles

Studies that address the health of marine animals are increasingly important, as marine ecosystems are under increasing pressure from factors such as coastal development, pollutants, and global warming.<sup>6</sup> In addition to the obvious threats posed by shrinking habitat (ie, loss of beach nesting sites) and harvesting pressures by humans, marine turtles face a number of less obvious threats to their long-term survival. Such threats range from exposure to pollutants, such as petroleum products and other toxins resulting from industrial manufacturing, and ocean-borne debris (ie, garbage) to physical threats such as boat-strike injuries to increased exposure to parasitic, bacterial, and viral pathogens. Increased exposure to infectious agents is most likely a consequence of anthropogenic changes in the oceans and on the shorelines.

Recently, a pandemic of fibropapillomatosis has been causing high morbidity and mortality rates among marine turtles throughout the world,<sup>7</sup> and baseline data on the health of marine turtle species and populations are needed so that changes in the prevalence of this and other diseases can be recognized. As a part of a marine turtle health assessment program in the Caribbean and Atlantic, specimens and data were collected from a number of marine turtle species to help determine the health status of various populations. In collaboration with others, I collected samples from swimming turtles captured in nets, recently dead turtles, and adult female turtles during the few minutes they were in an egg-laying trance. Samples were tested for baseline hematologic and serum biochemical values, exposure to infectious agents and toxins, and parasitic infestations.

Whether involved in a field survey of the health of marine turtles, monitoring the number of raptors that test positive for West Nile Virus, or evaluating the number of dogs with clinical leptospirosis examined

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each year, veterinarians can all contribute to efforts involved in gathering the baseline health data necessary for better understanding how changes in landscapes and habitats, wildlife population dynamics, and disease ecology are affecting domestic animal and wildlife health.

### Jaguars

Several programs have been directed at better understanding the ecology of free-ranging jaguars (*Panthera onca*). Veterinarians play important roles in these projects by providing information to biologists working with jaguars in the field, studying diseases of concern at the domestic animal-jaguar interface, and lobbying to have health issues considered during the development of policies that affect this species.<sup>8</sup> Currently, the biggest threats for jaguars are habitat fragmentation and the hunting of problem jaguars that prey on or are believed to prey on livestock. Some individuals, rather than killing jaguars they perceive to be a problem, capture and illegally sell them. Zoologic parks and rehabilitation centers throughout Latin America are burdened with caring for animals confiscated from illegal traders, often with the goal of placing them back into the wild. However, few of these programs consider the health of these jaguars prior to moving them, and therefore, many programs may inadvertently translocate infectious agents (ie, parasites, viruses, and bacteria). Through educating and working with those involved in the final disposition of these jaguars, veterinarians can play a vital role in minimizing the potential negative impacts of such programs.

Through their knowledge of infectious diseases and herd health, veterinarians are well prepared to minimize disease risks associated with the movement of wild animals. Whether monitoring songbirds for mycoplasmosis or jaguars for exposure to FIV, veterinarians have a role in minimizing the negative impact associated with conservation projects that reintroduce animals back into the wild.

### Conclusions

Wildlife health is crucial for wildlife conservation, and the skills and knowledge that veterinarians have, ranging from anesthesia and clinical skills to knowledge on disease ecology and epidemiology, allow them to play a vital role in conservation initiatives. The increasing demands we place on the planet's natural resources have negative effects on many of the planet's species: forest elephants are threatened by logging and the extraction of other forest products, marine turtles

by overharvesting of the oceans for protein sources, and jaguars by deforestation for cattle grazing. Veterinarians are held in high esteem in the United States and, in the course of their daily jobs, have contact with a wide range of people, from city dwellers to suburbanites to rural individuals, farmers, schoolchildren, teachers, government officials, wildlife biologists, and politicians. Veterinarians can, and do, effect change through their interactions with others.

It is now evident that in today's world, ecosystem health is as important as public health for the long-term survival of our species. It is estimated that 59 species of mammals and 116 species of birds have become extinct since the year 1600, representing 1.3% of known mammal species and 1.2% of known bird species.<sup>9</sup> Veterinarians can help slow the trend of animal extinctions by using their common sense, knowledge, and skills to advance ecosystem health locally and globally. Regardless of their particular area of practice, all veterinarians have a great deal to offer to ensure the health of animals, people, and ultimately ecosystems.

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