



Prologue


Avian Conservation: The Veterinarian's Role

Robert Groskin

What is the role of the avian practitioner in avian conservation? How can a conservation philosophy be integrated into veterinary practices? What are the current issues in avian conservation science?


A conservationist is an individual who advocates for the planned preservation of natural resources. The roots of conservation can be found with early man, who lived at a time when there was ample food and land. A hunter's success was believed to be based not on his skill, but on his ability to show ample respect for his prey, whereupon his prey would present itself to him. In return, the hunter would perform a ceremony, releasing the animal's spirit. In this way the animal could return to replenish the herds of antelope or schools of fish. Joseph Campbell characterizes this concept as the beginning of religion.³ Perhaps it was also the beginning of conservation.

Early Native Americans correctly saw no difference between man and animals. They believed that all beings were brothers and sisters. All creatures had knowledge to impart. Man, being the youngest creature, had the most to learn. The Plains Indians considered the two-legged creatures (eg, man, birds, bears) to be healers, and these creatures needed to work together to correct the imbalances of nature.⁴ By demonstrating humility and respect toward their brothers, man believed the other animals would share their knowledge.⁴ The three concepts of 1) oneness with nature, 2) humility and respect for nature and 3) a desire to care for and protect one's brother or sister have become fundamental ideas of contemporary conservation philosophy and stewardship.



*“In the end we will
conserve only what we
love, we will love only
what we understand,
we will understand
only what we are
taught.”*

Baba Dioum, Senegal



Modern conservation philosophy is expressed in many of the ideas of Aldo Leopold, forester, writer and conservationist. He recognized man's increasing isolation from nature and his need to relate in some way to nature and to life on earth, from both an evolutionary and ecological perspective (defining to some extent the human-animal bond).^{12,14} Leopold had a strong love and respect for the forest, and as a landowner maintaining his property, he had to choose which trees needed to be felled. To him, the best definition of a conservationist was "written not with a pen, but with an axe. It is a matter of what a man thinks about while chopping, or while deciding what to chop. A conservationist is one who is humbly aware that with each stroke he is writing his signature on the face of his land. Signatures of course differ, whether written with axe or pen, and this is as it should be."¹⁴

As avian practitioners, what do we think about when we are treating our patients? Are we aware of the connection between ourselves and our patients? When we treat our avian patients, do we see them as brothers and sisters? Do we demonstrate humility and respect for them such that we in our role as healers may learn from them? Do we see our role as stewards extending beyond the examination table? How can we help ourselves, each other and our clients develop an ethic "to correct the imbalances in nature" that we have created?



Man and Birds

Humans have related to birds primarily as consumers, using birds for recreation, as food and as religious symbols.

■ Historical Affinity

In Medieval times, falcons were symbols of authority and were used for recreation and hunting. In the 18th and 19th centuries as European cities grew, wealthy landowners wanted their estates to resemble more "natural" settings. They collected live birds, especially waterfowl, and established private mini-zoological gardens.

Colonialism exposed wealthy Europeans to birds from other continents, and large outdoor aviaries

were built for non-indigenous species. Commercialization of trade in live birds for indoor and outdoor exhibits and bird products (eg, skins, feathers, eggs) grew during this period. In the mid-19th century, curators were hired to manage some of the largest collections of bird skins. Their studies heralded the emergence of ornithology as a separate biological science.¹¹

Ornithology attracted considerable attention among the scientists of that time. Some of the basic questions that were asked in the early 1800's dealt with the distinction between varieties and species, what determined the distribution of the various species, and what was the relationship between extinct and living species. The discussion of these topics set the framework for much of Darwin's hallmark thesis, "The Origin of Species."⁹

The consumption of birds purely for collection still exists today, but on a much more limited basis. As avian veterinarians, one of our primary responsibilities is to educate our clients about the responsibility of individual companion bird stewards and to discourage the "collection" mentality.

The ornithological community is currently debating the need for collecting and killing birds for scientific study.⁷ Some ornithologists have captured new species to study them in the laboratory and later released the birds back into the wild.⁸

■ Modern Relationships

The common thread for recreational use of birds today, which includes hunting, falconry, watching and photographing activities, feeding, pet ownership, rehabilitation and aviculture, is the individual's desire to contact nature. People seek to contact their roots and appreciate the oneness of life around them. Conservation reflects a "state of harmony of man and the world he lives in."¹⁴ It provides an understanding of man's past and present roles on earth, which guides the future roles. The recreational uses of birds can enhance conservation when they increase that understanding. Recreational uses of birds have the greatest value when they do not impact on free-ranging bird populations.

Bird watching, photographing and feeding have minimal effects on bird populations and benefit both humans and birds.

Approximately 34% of Americans either photograph birds or watch birds. Bird watchers have been re-

PROLOGUE

sponsible for the collection of large databases concerning bird populations, habitats, breeding sites and numbers, migratory patterns and other biologically related statistics.²⁰ As a result of their amateur wildlife research, bird watchers provide invaluable scientific information and simultaneously enhance their own appreciation for the integrity of our entire ecology.

A 1989 survey of non-hunting recreational activities revealed that 46% of Americans feed birds either in parks or at backyard feeders.⁹ This activity helps children develop an appreciation for wildlife and a conservation ethic. Seasonal group bird counts and surveys provide demographic data regarding wintering species.²⁰

Rehabilitation

Because of their interest in birds, avian veterinarians are often called upon to treat injured native birds. Assisting injured wildlife offers an opportunity for the veterinarian to expand the public's understanding of avian conservation. Many native birds are protected by federal and state laws and permits are required for veterinary care and even short-term possession of these species. Developing a relationship with a qualified rehabilitator could be helpful to both the rehabilitator and the veterinarian. The care of certain native species, ie, endangered or threatened species, should be undertaken only by veterinarians experienced in the care of these birds and with suitable facilities. Wildlife rehabilitation centers are always in need of volunteers. Clients who have demonstrated a strong interest in wildlife should be encouraged to volunteer at these facilities.

Hunting

Hunting as a recreational use of birds consists of two categories: hunting free-ranging wildlife and hunting stocked species. In terms of conservation ethics, hunting stocked wildlife is similar to the consumptive use of birds for food. Contemporary hunting of free-ranging birds initially was useful as a conservation management tool. Bag limits today, however, function to preserve the species, not to help reduce excess populations. Hunting has conservation value when the hunter appreciates both his prey and the environment of the animal. With the use of high-tech equipment, the hunter has become more isolated from his prey; consequently, the experience provides less conservation value. Some hunting groups (eg, Ducks Unlimited) are actively engaged in habitat preservation.

Falconry is one of the oldest recreational uses of birds. Falconers have been successful in breeding and reintroducing falcons. Of the 566 raptors bred in captivity in the United States in 1988, 25% were used for reintroduction programs, 50% for falconry and 25% were returned to captive-breeding programs.⁶

Aviculture

Aviculturists support avian conservation by using birds already in captivity for their breeding programs to decrease the need for importation. The chicks they produce for the companion bird market will further reduce the pressure on wild populations. In addition, the knowledge they gain from captive breeding efforts is used by field biologists to more effectively evaluate and manage native populations. Avian veterinarians can bridge the gap between aviculturists, biologists and conservationists by encouraging the sharing of knowledge and experience.

The success of the Peregrine Falcon, California Condor and Whooping Crane breeding programs is due, in part, to the commitment of aviculturists to conducting in-depth studies of a single species. This focus saves time and money and prevents the dilution of energies that often occurs with aviculture programs that involve a variety of different species.

Some areas of the United States seem to be better suited for the breeding of some species. The concept of focusing avicultural efforts on bird species that breed well in a certain geographic region needs to be carefully considered.

Companion Birds

The recreational use of birds as pets has had a profound and permanent effect on the population of many free-ranging bird species.⁶ From a conservation perspective avian veterinarians should encourage clients to continue to buy domestically raised or ranched birds, thereby supporting captive breeding and sustained harvesting, and thus relieving pressures on native populations.

In addition, clients should be educated about the physical and emotional needs of their companion birds, thereby ensuring the health and welfare of the birds and increasing the involvement of the owners with their bird. The goal is to change the nature of the relationship from one of consumptive ownership to a companionship/stewardship relationship.

Conservation Biology

Conservation is a science as well as a philosophy. Avian populations, especially psittacines, have experienced recent dramatic declines. Of the nearly 330 Psittacidae species that are seriously threatened or at risk of extinction, most are a result of habitat loss and the pet trade.⁶ Considerable efforts are being made by conservation biologists to halt these losses. Figure 1 summarizes the current approaches to parrot conservation.¹⁴ Many of these methods are equally valuable to other species.

One of the key approaches to conservation of neotropical parrots involves aviculture. Working with the aviculturist, veterinarians can help provide healthy birds for the pet trade. The advances in avian theriogenology, neonatology and pediatrics discussed in this text are not only useful for the pet trade but are essential for the success of species survival plans (SSP) for endangered species, sustained harvesting of parrots and reserve management. Some species exist today only in captivity. Maintaining a viable genetic pool of these birds is essential.

There are many questions regarding captive breeding. Are the progeny of these birds releasable in their native habitat or non-native habitats? Are there genetic changes that result from captive breeding that might affect the ability of captive-bred birds to survive in the wild? What are the risks of introducing diseases to native populations or altering the ecology of the habitat with the introduction of captive-bred birds?

Domestication of Companion Bird Species

With the exception of budgerigars, cockatiels, canaries, pigeons and lovebirds, the psittacine birds we see in practice today are a blend between free-ranging and domestic. As a consequence of domestication, there are behavioral and anatomic changes which become evident within the first few generations. The behavioral changes include three major characteristics: docility, curiosity and a disrespect of species barriers.¹⁵ All three of these characteristics are considered neotenic, ie, youthful, traits.

In an avicultural setting, individuals displaying neotenic behavioral characteristics would most likely be favored by the aviculturist.

What effects does domestication have on resistance to disease? Younger animals tend to have an increased susceptibility to disease. Will domestication and the favoring of neotenic traits also lead to an increase in disease? Are more diseases being found in companion birds than in their free-ranging counterparts because companion birds are more easily studied, or is the effect of captivity and domestication increasing susceptibility or exposure to disease?

Infection is difficult to assess in free-ranging birds. The relationship between parasite and host is carefully balanced in nature. What effect will domestication have on this relationship? Will, for example, subclinical parasites such as *Haemoproteus* sp. become more significant diseases with increased domestication?

Are the reproductive problems associated with cockatiels a result of their domestication? Why are there so few flocks of budgerigars and cockatiels found in non-native habitats? Escape from homes is very common, yet flocks of these birds are established only in limited areas. Have these domesticated birds lost much of their ability to survive?

Research on White-naped Crane eggs has shown that the microclimate surrounding these large eggs is actually a substantial thermal gradient. Incubated eggs do not have any temperature gradient. Is this microclimate essential for successful hatching of

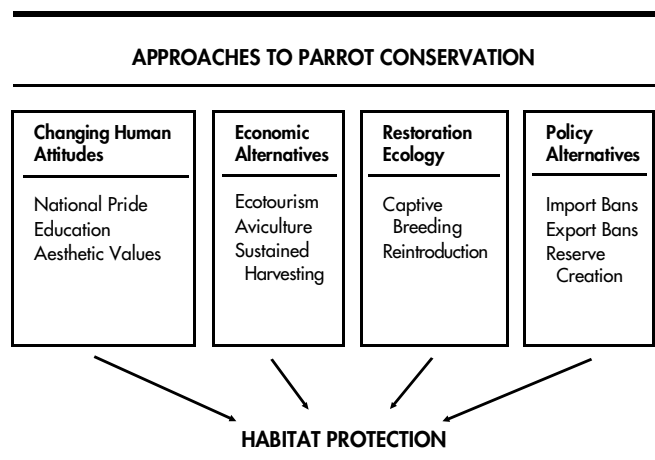


FIG 1 A general scheme of approaches to conserving neotropical parrots (courtesy of Bessinger SR, Snyder N (eds): *New World Parrots in Crisis*. Washington DC, Smithsonian Institute Press, pp xiii, 1992).



FIG 2 Preservation of native habitat is a major challenge in the conservation of bird species.

large eggs? Does this thermal gradient have a specific function? How is the phylogeny of incubator-hatched birds being affected?¹⁷

Over a century ago, Darwin and Wallace proposed conflicting views about the origin and function of prominent male secondary sexual features and their effects on the female's choice of a mate. Research and debate on this subject is still very intense today.^{18,19} How are genetics, resistance to disease and reproductive strength of avian species being altered when birds are artificially paired? How large a flock is needed to allow mate selection and adequately protect the genetic pool? Is valuable genetic stock being removed by hybridization of easily bred species? Should this practice be discouraged in order to preserve as much of the gene pool as possible?

Aviculturists who intend to provide birds for reintroduction programs will need to establish specific flocks for this purpose that are separate from birds intended for pet trade purposes. These birds must be maintained and managed differently from companion birds to minimize the effects of domestication. Individuals who have committed themselves to such

an endeavor face difficult economic and scientific obstacles. As avian veterinarians, we need to acknowledge, encourage and support these valiant efforts.

Harvesting

Avian veterinarians will need to play a significant role in the sustained harvest, or ranching, of birds. Ranching differs from captive breeding in that the breeder flock is not removed from its native habitat. The number of offspring "harvested" is based on the local site biological data.

Parrots appear to have considerable potential as a sustainable harvest. They can be harvested as nestlings (low reproductive value) and require minimal captivity time before reaching the market. Both large and small landowners can participate, and there is considerable potential to increase harvests through existing management techniques.

Because habitat protection is an integral part of successful ranching, this method of conservation has the

potential to protect not only the species being ranched but the entire ecology.

Some of the problems associated with harvesting include the social and political structures needed to allow for the lawful export of the harvest, protection of the birds from poaching and over-exploitation, fluctuations in demand for birds, ensuring that importation of these birds does not increase the level of young taken from the wild and the need to develop adequate data upon which to base harvesting levels.

Avian veterinarians may play an important role in the prevention of disease on the ranch and during the collecting and shipping stages. The use of herpesvirus and poxvirus vaccines and DNA probes to detect birds subclinically infected with PBFD virus or polyomavirus are examples of contributions avian veterinarians can make to enhance sustained harvesting.

Captive Breeding and Reintroduction

When faced with imminent extinction, captive breeding with the goal of reintroduction remains the only alternative for preservation of a species. The conservation community is not in full agreement about captive breeding of endangered and threatened species because of the many scientific, economic and political considerations involved.

However, before a captive breeding program for a species can be established, several questions need to be asked. What is the appropriate time to start a program? How many founding members are needed to ensure an adequate gene pool? Where will this program be based and is the institution willing to provide sufficient economic and administrative commitment to sustain such a program for the period of time needed for reintroduction? If not based in a public institution, does sufficient cooperation and accountability exist among private breeders to ensure a successful breeding program? How has the issue of ownership of progeny been resolved?

Although many technologies exist to aid these programs, the species that require captive breeding assistance often have a poor level of reproductive success in captivity. As mentioned above, genetic changes in captive breeding may develop within the first few generations, necessitating reintroduction as soon as possible to ensure the maintenance of wild-type breeding stock.

The potential for introducing diseases common in captive populations into native populations as a result of releasing birds is a significant consideration. To prevent losses, the flock must be divided into viable groups, managers must be attentive to husbandry and sanitation and movements must be restricted between populations. Avian veterinarians will be important members of the management teams.

With a decrease in available habitat, all the factors for disease transmission among free-ranging birds (eg, nutrition, increased proximity, stress) become more significant. Conservation biologists are concerned that these aspects not be neglected.¹⁸ The role of the avian veterinarian will become more important in helping to assess disease in free-ranging avian populations.

Psittacines have the potential for reintroduction once appropriate criteria have been met. Factors that contributed to the decline of the native population must be modified sufficiently in order for the newly released birds to survive. Habitat protection, predator control, harvest of free-ranging birds and reduction of human activity, both recreational and commercial, must also be considered. Until we have a greater understanding of how these and other factors affect populations, release of captive-bred psittacine birds may not be an effective conservation method.

Under some circumstances it may be preferable to establish new populations in previously non-native but suitable habitats. The impact of these introductions needs to be thoroughly evaluated to minimize any risks to the native species and habitat.

Treaties and Legislation

Trade in neotropical parrots has played a significant role in the decline of these species, affecting perhaps as many as 17% of the endangered neotropical parrots. Trade and habitat destruction affects an additional 36% of these species.⁵ Attempts to control this trade include legislation designed to decrease or eliminate the import and export of these species. The Convention on International Trade in Endangered Species (CITES) is the most important international treaty affecting avian conservation. The 1992 CITES meeting in Japan focused on the issue of bird trade. New procedures enacted at that meeting allow the Standing Committee of CITES to immediately halt trade in an Appendix II species (species for which careful management is required to ensure that trade

PROLOGUE

remains sustainable) or to stop trade altogether from a treaty member of CITES. These changes have the potential to significantly improve the situation for these endangered and threatened species.

Until 1992, all United States legislation effecting trade in wild-caught birds was at the state level. In 1984, New York State was the first state to enact legislation banning the importation and sale of wild-caught birds. This ground-breaking law sought to establish importation restrictions that would be enforceable, not result in an increased rate of smuggling or diseased birds and allow for the growth of the avicultural industry. One of the major impacts of this type of legislation was to increase the public's awareness of avian conservation.

Wild Bird Conservation Act

Ultimately the conservation community, aviculturists and the pet industry realized it was in the interest of all parties' to ensure the continued survival of wild bird species. After several years of discussions and negotiations, the Wild Bird Conservation Act of 1992 was enacted. This is the most significant legislation affecting the importation into the United States of wild-caught birds. Avian veterinarians contributed to the passage of this act. Provisions of this act require certification of foreign breeding facilities by the U.S. Fish and Wildlife Service. Input by avian veterinarians will continue to be needed in this area.

One important goal of these types of legislation is to help ensure protection for wildlife in foreign countries equal to the protection we provide for our own wildlife.

No single act will have as much influence on the avian practitioner as the Wild Bird Conservation Act. What will be the effect of domestic breeding on the population of companion birds? What will be the effect on diseases of pet birds as a result of their increasing domestication? How will the pet bird differ from the wild bird? With a shrinking habitat and increasing human population, almost all species are feeling the presence of humans, both directly and indirectly. By watching carefully the effects of domestication on "wild" species of birds, we might be able to anticipate and prevent those changes in other species we want to keep "wild." The avian veterinarian is observing in practice what ecologists in the field have only been able to theorize. These observations can be of extreme importance to the conservation of many species.

In summary, conservation is both a science and a philosophy. Only when avian veterinarians have defined their own conservation ethic, can they help companion bird clients and aviculturists better understand their roles in conservation biology. Avian veterinarians can work together with conservationists, aviculturists and biologists to continue to improve the welfare of all birds.

References and Suggested Reading

1. **Bessinger SR, Bucher EH:** Sustainable harvesting of parrots for conservation. In Bessinger SR, Snyder N (ed): *New World Parrots in Crisis*. Washington DC, Smithsonian Institution Press, 1992.
2. **Budiansky S:** *The Covenant of the Wild*. New York, William Morrow and Co, 1992.
3. **Campbell J:** *The Power of Myth with Bill Moyers*. New York, Doubleday, 1988.
4. **Caduto MJ, Bruchac J:** *Keepers of the Animals*. Golden, Fulcrum Publishing, 1991.
5. **Collar NJ, Juniper AT:** Dimensions and causes of the parrot conservation crisis. In Bessinger SR, Snyder N (ed): *New World Parrots in Crisis*. Washington DC, Smithsonian Institution Press, 1992.
6. **Clubb S:** Private Aviculture in Conservation of Neotropical Psittacines. In Bessinger SR, Snyder N (ed): *New World Parrots in Crisis*. Washington DC, Smithsonian Institution Press, 1992.
7. **Clutton-Brock J:** *A Natural History of Domesticated Mammals*. Austin, University of Texas Press, 1987.
8. **Collar NJ, Andrew P:** *Birds to Watch, the ICBP World Checklist of Threatened Birds*. Washington DC, Smithsonian Institution Press, International Council for Bird Preservation Tech. Publ No. 8, 1988.
9. **Darwin C:** *The Origin of the Species*. New York, Penguin Group, 1958.
10. **Derrickson SR, Snyder N:** Potentials and limits of captive breeding in parrot conservation. In Bessinger SR, Snyder N (ed): *New World Parrots in Crisis*. Washington DC, Smithsonian Institution Press, 1992.
11. **Farber PL:** The Emergence of Ornithology as a Scientific Discipline: 1760-1850. Dordrecht, Holland, D. Reidel Publishing Co, 1982.
12. **Flader SL, Callicott JB:** *The River of the Mother of God and Other Essays* by Aldo Leopold. Madison, Wisconsin, The University of Wisconsin Press, 1991.
13. **Keller SR:** Human-Animal Interactions. In Rowan AN (ed): *Animals and People Sharing the World*. Hanover, University Press of New England, pp 137-175.
14. **Leopold A:** *A Sand County Almanac*. New York, Oxford University Press, 1949.
15. **McLennan DA, Brooks DR:** Parasites and Sexual Selection. *Quarterly Review of Biology* 66(3): 255-286, 1991.
16. **Nettles Jr VF:** Wildlife diseases and population medicine. *J Am Vet Med Assoc* 200(5):648-658, 1992.
17. **Rennie J:** *Living Together*. Scientific American, Jan, 1992.
18. **Scott M:** The Impact of Infection and Disease on Animal Populations. *Conservation Biology* 2(1):40-56, 1988.
19. **Simon L:** *New York's Crusade for Exotic Birds*. Defenders, Nov/Dec, 1990, pp 26-30.
20. **Socha LO:** *Birding for the Amateur Naturalist*. Chester CT, The Globe Pequot Press, 1989.
21. **Wall Street Journal:** April 11, 1989, pB1(W).