



The Wildlife Industry: Trends and Diseases Issues

"The shift over the last 25 years is nothing short of revolutionary. The [Endangered Species] Act alone is not responsible, but it has been the catalyst for a profound change in how we view and treat the land. The Act has impressed on the public mind the plight of wildlife, the loss of habitat, and the need to take action and demand accountability for the living things that share the landscape with us."¹

The expanding popularity of wildlife conservation and the increased interest in domestically rearing traditionally wild animals have resulted in many changes in the wildlife industry in the last several decades. This information sheet provides a brief description of the varied and changing wildlife industry and the impact this may have on disease transmission. The wildlife industry as used here includes captive wildlife production, free-ranging wildlife, relocation of wildlife, and exotic animal imports.

Captive wildlife - The captive wildlife and alternative livestock industries have seen unprecedented growth in the last few decades. The exotic hoofstock population in Texas in 1966 was 37,500, and by 1996 this population had grown to 198,000. The North American Elk Breeders Association, founded in 1990 with 300 members, had grown to 1,400 members with 90,000 farmed elk by 1997. In just four years, from 1992 to 1996, the estimated number of farmed deer in the US grew from 44,000 to 126,000, for an estimated value of almost \$80 million. The American bison industry is reported to be growing by 30% a year, with more than 250,000 farmed bison in 1997, compared to 30,000 bison in 1972. The number of llamas in the US was reported at over 123,000 in 1999, up from 53,000 in 1992.



Regulations regarding captive wildlife vary by state. Concern about disease transmission from captive wildlife to traditional livestock or to free-ranging wildlife has led 4 states to prohibit all new deer and elk farms, and an additional 14 states to restrict the farming of Cervidae to certain species, e.g, fallow deer only. Minnesota and Oregon have enacted legislation banning the hunting of deer, elk, or exotic game on commercial shooting preserves, thereby shutting off markets for deer and elk ranchers.

Captive wildlife are also present in zoos and other animal exhibits. The total number of exhibitors in the US decreased marginally from 2,268 in 1994 to 2,249 in 1999. Florida and California have the most animal exhibitors, with over 200 each.

Free-ranging wildlife - Since the early 1900's, increasing federal interest in wildlife conservation has resulted in large tracts of land being returned to a condition suitable for maintaining free-ranging wildlife. The National Wildlife Refuge System, administered by the US Fish and Wildlife Service, was

made up of 514 refuges in 1998, encompassing 93 million acres. The Endangered Species Act of 1973 remains the most important regulation protecting endangered and threatened species worldwide. Among other provisions, this act requires all federal agencies to undertake programs for the conservation of endangered and threatened species, and provides authority for the acquisition of land for listed plants and animals.

The federal government also administers programs aimed at encouraging individuals to participate in wildlife conservation. The Habitat Conservation Plan allows landowners to build homes or other developments where preservation of wildlife habitat would otherwise take precedence, in exchange for other conservation measures taken by the landowner. Under another conservation initiative, the Wildlife Habitat Incentives Program, landowners are eligible for financial assistance to improve wildlife habitat on their property.

Numerous private organizations attest to the public interest in wildlife conservation. Some of the larger organizations are the National Wildlife Federation, reporting 4.4 million members; the World Wildlife Fund, with more than 1 million members in the US; the National Audubon Society, with 550,000 members; the Nature Conservancy, with 900,000 members, and the Defenders of Wildlife, with 250,000 members. These organizations also sponsor many wildlife-related initiatives. In one such program, introduced in 1973 by the National Wildlife Federation, individuals may receive certification for having a wildlife-friendly backyard. As of early 1998, over a half-million people had requested information to help create wildlife-friendly yards.



As a result of federal and private initiatives, many free-ranging wildlife populations have grown dramatically in number. In Colorado alone, numbers of deer have increased 67% from 310 thousand in 1975 to 516 thousand in 1997. Elk populations have grown 90% from 115 thousand to 218 thousand over the same time span. The American bald eagle, after being listed as an endangered species for decades, is now being removed from the endangered species list. The number of breeding pairs in the lower 48 states has grown from 417 in 1963 to 5,800 in

1999.

Along with ecological and aesthetic functions, free-ranging wildlife also has enormous economic benefits. A 1996 survey by the US Fish and Wildlife Service found that 77 million Americans aged 16 and older (nearly 40% of adults) either fished, hunted, or watched wildlife in 1996. This survey documented that approximately \$104 billion is spent each year on fishing, hunting, and wildlife-associated recreation. By comparison, the US horse industry produces goods and services valued at \$25.3 billion annually, and 1996 total agricultural exports were valued at \$60 billion.

Relocated wildlife - When a wildlife species is either too low in numbers or not present at all, deliberate release of animals in the wild is used as a tool to increase population numbers. State-sponsored relocation efforts in the US, usually involving game species desired by hunters and trappers, date back to the turn of the century. In the late 1930's, federal money for wildlife relocation became available through the Federal Aid in Wildlife Restoration Act.

Over the last three decades, relocation efforts have escalated. A survey of biologists, zoos, and conservation agencies found that about 500 relocation programs were conducted annually from 1973-1986 in North America. By the late 1980s, an estimated 700 relocations were conducted annually, more than 90% of which were game species.

A survey of US state wildlife agencies in 1986 found that 29 of the 45 responding states had relocated

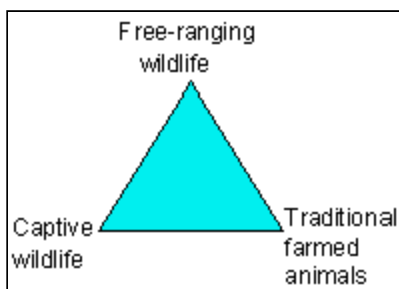
mammals during 1985. While the top reason given for relocation was to restore native animals to historic habitat (25 states), the second most common reason was to establish new populations, including exotics (15 states). Another survey in 1990-1991 showed that pronghorn, deer, or bison were restored in 233 areas of the US; wolves, bears, weasels, or cats were restored in 114 areas; bighorn sheep in 182 areas; elk in 88 areas; and the gray wolf in 17 areas of the US.

Exotic animal imports - The exotic pet trade has grown as more individuals develop an interest in owning wildlife species as pets or investments. The number of small pet mammals in the US, including exotics such as hedgehogs, was estimated at 14 million in the mid 1990's (does not include cats and dogs). A pet industry trade association reported that the number of pet reptiles and amphibians in the US increased from 2 million in 1990 to 7.3 million in 1996. More recently, the number of pet snake and other reptile owners was estimated at nearly 20 million.

Although many pet reptiles and amphibians are raised domestically, a minimum estimate of the number of live reptiles imported into the US in 1997 is 1.3 million.² These reptiles came from 85 different countries and were valued at \$5.1 million. A minimum estimate of live mammal imports in 1997 is 68,500, from 68 different countries, at a value of \$13.3 million.

Disease transmission - Along with the increased interest in wildlife is a growing concern over the part that wildlife, both free-ranging and captive, plays in disease transmission. Interaction and transmission can occur within wildlife populations, between wildlife and traditional domestic animals, and between animals and humans. A few diseases of relevance to US livestock and poultry industries are presented in the accompanying table.

Several examples illustrate the potential for disease transmission associated with relocation of animals. Introduction of the brushtail possum resulted in transmission of bovine TB to farmed cattle and deer in New Zealand. Raccoon rabies spread to the mid-Atlantic area of the US when infected raccoons were relocated from the southeastern US. The infection of wood bison at the Wood Buffalo National Park in Canada with bovine TB and brucellosis was attributed to the relocation of infected plains bison from the US. Relocated bighorn sheep from Arizona introduced viral pneumonia to local bighorns in New Mexico. A study conducted to review potential disease transmission as a result of animal relocation found that animals in nearly 25% of relocations were not given a physical examination by a biologist or veterinarian prior to release.³



Summary - This information sheet provides a perspective of the diverse and economically significant wildlife industry in the US. The industry is changing the way we use the land, and the way we envision livestock. Those involved in protecting free-ranging wildlife, raising captive wildlife, and farming traditional animals must recognize the connections between their activities. All have a stake in each others' trends and events.

Disease agents found in captive or free-ranging wildlife which have potential significance for domestic animals, humans, or other wildlife populations		
Disease or agent	Wildlife in which disease agent has been found	Potential significance

Bovine tuberculosis	Captive cervids; Free-ranging white-tailed deer in MI	Transmission to cattle
Bovine brucellosis	Free-ranging elk & bison in the Yellowstone National Park area	Transmission to cattle
Chronic wasting disease	Captive deer & elk; Free-ranging deer & elk in CO and WY	Transmission between captive and free-ranging cervids
<i>E. coli O157:H7</i>	Free-ranging deer	Human infection; transmission to cattle
Epizootic hemorrhagic disease	Free-ranging deer	Transmission to cattle
Paratuberculosis	Free-ranging deer; Rocky Mountain bighorn sheep in CO; Captive deer & llamas	Transmission to cattle
Pseudorabies	Feral swine	Transmission to domestic swine
Sparganosis	Feral swine in FL and TX	Human infection; transmission to domestic swine
Swine brucellosis	Feral swine	Transmission to domestic swine
Velogenic newcastle disease	Cormorant, pelican, gull, pheasant, quail, pigeon, and other wild bird species	Transmission to domestic poultry
Vesicular stomatitis	Feral swine on Ossabaw Island, GA	Transmission to horses, cattle, and swine

¹ From a speech given by the president of the National Wildlife Federation to the National Press Club, Dec, 1998.

² This estimate comes from a database maintained

by the US Fish and Wildlife Service, which does not capture all wildlife imports.

³ The study included relocations in Australia, Canada, New Zealand, and the US.

A more comprehensive document describing these issues in greater detail is available. For a copy of the document or for more information, contact:

Christine Koprak or Katherine Marshall
 Centers for Epidemiology and Animal Health
 555 So. Howes, Ft. Collins, CO 80521
 (970) 490-7819 or (970) 490-7801

Christine.A.Kopral@usda.gov
Katherine.L.Marshall@usda.gov