

Persecution and Hunting

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Roman Slaughters

The tradition of killing animals for pleasure has a long history in Asia and Europe. So popular was hunting in ancient Rome that mosaics and paintings often depicted this pastime as a heroic activity. Slaughtering animals was considered a form of entertainment, and people scoured the countryside for bears, Lions, stags and boars to pursue with spears and dogs (Attenborough 1987). As the Roman Empire grew to encompass the entire Mediterranean basin, its citizens traveled throughout the region to hunt and bring back animals to be killed in primitive contests in the coliseums of Rome and other cities. The coliseum games continued for more than 400 years in more than 70 amphitheaters, the largest seating up to 50,000 people on stone benches arranged around a central arena (Attenborough 1987).

Roman emperors curried favor with the public by upstaging their predecessors in killing more animals and producing more spectacular displays of slaughter (Morris 1990). Emperor Titus inaugurated the Roman Coliseum by declaring 100 days of celebration, during which enormous numbers of animals were speared by gladiators. On the opening day, 5,000 animals were slaughtered, and over the next two days, 3,000 more were killed (Morris 1990). The caged animals were kept underground in dungeons where they were not fed, and on the day of the festival, they were hauled in their cages onto lifts that brought them into the center of the arena. As the crowd roared with excitement, drums were beaten, trumpets blown, and the terrified animals were set loose (Attenborough 1987). Sometimes the animals were goaded to attack one another, and at other times, men armed with spears and tridents pursued them around barriers made from shrubs in imitation of hunts in the wild (Attenborough 1987). One arena hunt resulted in the killing of 300 Ostriches and 200 Alpine Chamois (Morris 1990).

Lions, Tigers, bears, bulls, Leopards, Giraffes and deer died after being tormented, stabbed and gored (Morris 1990). Big cats that had been starved were released into the ring where a human slave or prisoner of war was lashed to a post; the animals clawed at the person before they themselves were speared and stabbed by gladiators (Attenborough 1987). In some of the larger slaughters, 500 Lions, more than 400 Leopards, or 100 bears would be killed in a single day (Morris 1990). Hippos, even rhinoceroses and crocodiles, were brought into these arenas, and sometimes gladiators employed bizarre methods of killing such as decapitating fleeing ostriches with crescent-shaped arrows (Morris 1990).

The Roman audiences cheered these brutal slaughters enthusiastically as a rule, but when 20 elephants were pitted against heavily armed warriors, the screaming of these gentle animals as they were wounded caused the crowd to boo the emperor for his cruelty (Morris 1990). This did not stop their use in the games however. These slaughters virtually eliminated large mammals from the Mediterranean area. North African Elephants (*Loxodonta africana*) were exterminated, having been hunted and captured to die in these arenas (Leakey and Lewin 1995). Elephants were also used by the Romans for transport and even conscripted for battle by Hannibal, a Carthaginian general who used them in a deadly march across the Alps, in which all the elephants died of exposure. Romans were probably the key element in the disappearances of the Asian Elephant (*Elephas maximus*) from West Asia as well (Leakey and Lewin 1995).

Prior to the expansion of the Roman Empire, Atlas Bears (*Ursus arctos crowtheri*) lived in the mountains and forests of North Africa, the only bears on the African continent. Named for their last refuge in the Atlas Mountains of Morocco, they were a race of the Brown Bear which is native to Eurasia and North America. North Africa was the species' most southerly distribution. When Romans entered North Africa, they cut the forest habitat of this bear and slaughtered thousands for sport. Others were collected for coliseum combat, where they were attacked by smaller animals, or gladiators wielding axes, spears and other weapons. Over the centuries, the Atlas Mountain forests were leveled for building materials, and colonial landowners used the cleared land for grazing livestock (Day 1981). The

Atlas Bear became restricted to Mount Atlas, where an 18th century French naturalist discovered a fresh skin, upon which the first scientific description was based (Day 1981). Even as late as 1830, the bears were common enough to be captured and sent to French zoos. In 1840, an English scientist concluded that this bear, smaller than the American Black Bear (*Ursus americanus*), was a distinct subspecies. It was stocky, with a short face, blackish-brown, shaggy fur on its back, and orange-rufous fur on its belly (Day 1981). This differentiates it so much from the Brown Bear that modern taxonomists might consider the two distinct species. Although Atlas Bears became increasingly rare, they received no protection from hunting, and the last of these bears were shot around 1870 (Day 1981).

Herodotus and Aristotle, philosophers of ancient Greece, wrote that Lions once lived in that country (Attenborough 1987). Two thousand years ago, the range of these big cats extended eastward in a continuous band to India and Pakistan and throughout the African continent. The Lion disappeared at an early time from Italy and Greece after being hunted and captured by the thousands for gladiator spectacles. When European Lions had been killed off, Romans turned to North Africa. The Barbary or Atlas Lion (*Panthera leo leo*), once distributed through much of the region north of the Sahara, fell victim to hunting and Roman Coliseum games. Known for its enormous mane, which covered virtually half its body, the male Barbary Lion was one of the largest of all races of Lions (Day 1981). It was also the nominate, or first subspecies named. This massive animal weighed as much as 500 pounds and measured up to 10 feet long from the tip of his nose to the tip of his tail (Day 1981). After centuries of hunting, persecution and habitat loss, these Lions withdrew to remote forests, where the last of them were systematically hunted down. Arabian tribesmen in Tunisia and Algeria chased them for sport, and later, French colonial governments paid bounties for their skins; by the 19th century, hunters had exterminated the last of the lions in Algeria (Day 1981). Government lists recorded the bounty fees paid, with fewer each year; only one skin was submitted for payment in Algeria in 1884 (Day 1981). Their final refuge, like the Atlas Bear's, was the wilderness forest of Morocco's Atlas Mountains, where hunters killed the last one around 1922 (Day 1981). Although officially extinct, some of these Lions may still survive in captivity. Certain circus and zoo Lions resembling the original Barbary Lion have been identified, and an effort is being made to gather a breeding colony of these animals. Whether they are, in fact, direct blood lines from the original North African Lions remains to be seen.

By the 13th century, Lions had been eliminated in the eastern Mediterranean; they disappeared from Iraq, Iran and Pakistan by the 1800s (McClung 1976). The last Lion in the Saudi Arabian peninsula was killed in 1923. For most ancient cultures of the Middle East and West Asia, killing one of these great cats, especially a large male, was considered a heroic deed worthy of being recorded in paintings and mosaics. Many such art works remain from Assyrian and other West Asian cultures. By the mid-19th century, Asiatic Lions (*Panthera leo persica*) had become confined to India, but were still widespread in that country (McClung 1976). During the last half of the 19th century, however, Indian Lions came under siege by British Colonial officers, who traditionally proudly took a Lion pelt back to England; a single hunter boasted of shooting 300 Indian Lions in 1860 (IUCN 1978). Under such pressure, Lions disappeared from all of India, save the Gir Forest in the southwest, by 1884 (IUCN 1978). In 1900, protection was finally accorded the last of these Lions, when their populations had been reduced to fewer than 100 animals (McClung 1976). Today, the Gir Forest Lions number a few hundred animals, all that remain of these proud cats on the Eurasian continent. Confined to a habitat that was rapidly being whittled away by villagers cutting firewood, and overgrazed by livestock, the Gir Lions are now protected in the Sasan Gir National Park of western India where, in recent years their population has increased.

Hunting by Romans and later peoples, combined with capture for the colosseum games, devastated the wildlife of North Africa and the entire Mediterranean region. Large predators, as well as deer and other ungulates, disappeared altogether or become endangered. Few conservation programs exist to protect remaining populations from hunting and persecution.

Predator Prejudice

The Roman tradition of persecuting predators spread throughout Europe and intensified in proceeding centuries, reaching superstitious depths in the Middle Ages. Beliefs that werewolves existed resulted in the persecution of wolves in Europe and Russia that continues today. Fairy tales are still recounted to children, in which wolves and bears are depicted as voracious killers. These stories, especially those by the Grimm brothers, frighten small children with tales of wolves, that pursued and ate small children and adults alike. "Little Red Riding Hood" and other stories instilled horror and hatred of predators. In Russia, the destruction of wolves was considered a great benefit to people, as well, with folklore embodied in tales such as "Peter and the Wolf." Persecution of wolves in that country continues to this day. With the spread of domestic livestock throughout Europe, official programs were instituted to destroy wolves (McIntyre 1995). Wolves were not the only animals killed in these programs. Lynx and Brown Bear were also eliminated from all but the most remote areas of Western Europe.

When Europeans settled in America, they brought these prejudices with them, treating native predators as vermin. Most colonies passed laws similar to Massachusetts' 1630 law requiring that "every English man that killeth a wolf . . . shall have allowed him one penny" (McIntyre 1995), and South Carolina's 1695 "Act for Destroying Beasts of Prey," which mandated that all Native American braves be required to bring in one skin of a wolf, panther, or bear, or two Bobcat skins each year. If he failed to do so, he would be "severely whipped," but if more than one skin was provided, he would receive a reward (Nowak 1972). In the East, these programs systematically killed off Gray Wolves, bears and Cougars. Large predators were effectively eliminated in the eastern states by the early 1800s, except for the Black Bear, which became greatly reduced in range and numbers.

The US government ran predator control programs throughout the country. Traps and poisons were the major tools used. Poison was liberally spread over most of the West. Thallium sulfate, strychnine, Compound 1080, and cyanide were distributed in great quantities, killing not only wolves, bears, and Coyotes, but foxes, weasels, ferrets, eagles and other birds. Any animals that ate the poisoned bait died, as well as those feeding on their carcasses. All these poisons caused a painful death, and most killed slowly. Poisoned animals could take hours to die from Compound 1080, and sometimes days after ingesting thallium sulfate. Strychnine, an extremely painful poison, can make water supplies lethal, killing humans, dogs and livestock. The wild predators that consumed Strychnine would vomit while dying from convulsions. Their bodies spread more poison, which remained toxic for a year or more.

Trapping was equally indiscriminate in its victims. Irrational prejudices against predators resulted in the total extermination, even in remote wilderness areas, of America's wolves and almost all its bears through bounty systems, federal subsidies and government control programs. Trappers and poisoners combed the countryside, randomly placing poison and traps.

Prejudice against predators affects a wide spectrum of animals, from foxes and bears to bats and birds of prey. Although the number of species that have become threatened as a result of control programs and random killing is less than those threatened by habitat destruction, the ecological consequences have affected a host of species within their habitats. These animals have co-evolved with their prey, the wolf making the deer fleet; wild cats making gazelles, zebras and hundreds of other ungulates agile. Although there is dispute as to the effect that predators have on the populations of their prey, overpopulations of deer and other ungulates have occurred in many parts of the world where predators have been eliminated. When ungulates overpopulate, they tend to overgraze their habitats, eliminating many types of vegetation, as well as birds and other wildlife dependent on that vegetation for feeding and habitat. Thus, thousands of species may be adversely affected when predators are destroyed.

Many species of snakes, as well as small carnivores such as foxes, eat large numbers of rodents, performing

important roles in preventing population explosions of these prey animals. Bats, as the most important predator of insects, control insect populations, as documented by many scientific studies. These mammals, although more abundant in number and diversity than carnivores, have declined radically in recent years, as evidenced by the enormous number now listed in the *2000 IUCN Red List of Threatened Species*. From a humane point of view, predator control has brought out the worst in human character, suppressing reason and compassion to allow fear and hate to dominate. As science has learned more about the importance of predators, and they are being protected and reintroduced in a growing number of areas in the world, prejudices remain, as do centuries-old ways of raising livestock that involve killing predators. These latter problems need to be addressed with the same vigor that has elevated predators to their rightful place at the top of their food chains in the eyes of conservationists and scientists.

Wolves, Wild Dogs and Foxes

Wolves have suffered more inhumane treatment and loss of range and populations than any other predator. The history of their survival and disappearance in various parts of the world is a reflection of the overwhelming importance of people's attitudes toward animals. When emotions, especially fear and negative superstition, rule people's minds, wolves can be destroyed on the basis of ignorance about their real threats to people and livestock. On the other hand, when people are aware of biological facts about the wolf and its ecological role, behavior, value to ecosystems, and the truth about its history of not attacking people, prejudices tend to dissipate. Native Americans had a natural affinity and respect for wolves, calling them "brother." The wolf's very survival as a species depends on its being treated with tolerance and respect. Gradually, this is happening in many parts of the world. Education and a change in government attitudes in many countries are needed to conserve this species, along with better ways of raising livestock.

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Wolves, Wild Dogs and Foxes: Page 1

Prior to European settlement of North America, two wolf species lived throughout the forests of the East: the widespread Gray Wolf (*Canis lupus*), the same species that is native to Eurasia, and the Red Wolf (*Canis rufus*), a uniquely American species of the Southeast. Some biologists estimate that there were 2 million wolves on the continent at this time. European settlers entered the American wilderness and set about killing off these animals. The book, *War Against the Wolf. America's Campaign to Exterminate the Wolf*, by Rick McIntyre (1995), chronicles the history of this extermination program, based on historical and modern documents. Colonists dug pit traps and filled them with vertical stakes, which impaled wolves falling onto them. When hunters found an animal in the pit, they would leap in and ham-string the cowering wolf. John James Audubon described a farmer who captured wolves in a pit trap, severed the tendons in their hind legs, then tossed the crippled animals into a pack of dogs which tore them

apart (McIntyre 1995). The new colonists and their professional hunters set toothed traps that held the animal's leg while the teeth broke through its skin, wounding and breaking bones. Some who captured wolves cut off the lower jaw and turned the animal free to starve (Laycock 1990). Others set them afire, or started forest fires to rid the woods of wolves (Laycock 1990). Strychnine and thallium were placed in meat baits. Wolf pups were ripped apart by dogs, stomped to death, or burned alive in their dens. One predator hunter threw baited fish hooks, attached to lines, into wolf dens, waited until the pups swallowed the hooks, which embedded in their stomachs, then dragged them out of the den and killed them (McIntyre 1995).

Europeans were convinced that wolves hunted humans, even entering towns to kill children as they slept. In truth, wolves are neither ferocious nor killers of people. No case of a non-rabid North American wolf killing a human has ever been documented (McIntyre 1995, Nowak 1999). Very passive when trapped, they do not even attack the trapper as other predators might. Native Americans took wolf pups out of dens for pets without ever being attacked by the parents.

Red Wolves, named for their reddish-brown coats, had other color phases as well. Prior to their near-extinction, they exhibited a range of colors from black to gray and brown. The genes for these color phases were eliminated along with the wolves themselves in predator-control programs. Originally, this wolf inhabited the United States as far west as Oklahoma and eastern Texas, north to Indiana, as well as the southeast. The Red Wolf is the only surviving wolf that evolved in North America. This species and its ancestor, *Canis edwardii*, had been resident in forests as far north as Pennsylvania since the middle Quaternary epoch (Nowak 1979). Dr. Ronald Nowak, an expert on wild canids, maintains that the Red Wolf is a far more ancient species than the Gray Wolf. The latter species is thought to have evolved more recently in Eurasia, during the early Pleistocene, and migrated into North America across the Bering land bridge that linked the continents (Nowak 1979).

Weighing only 20 to 40 kilograms (44 to 88 pounds), and 660 to 790 millimeters (26 to 31 inches) tall at the shoulder, the Red Wolf is larger than the Coyote (*Canis latrans*), but smaller than the Gray Wolf. Mating for life, it breeds in February or March, producing two to six pups in March or April. The pair dens in hollow logs or along banks of canals or ditches. These wolves did not usually form packs, but were most often seen in pairs or small family groups. They were systematically trapped, shot and poisoned out of their range. From the 17th century onward, in state after state, these wolves were exterminated to the last animal, pushing this species toward extinction. Federal predator-control programs took some 50,000 Red Wolves from 1937 onward, until they were virtually extinct in the wild (Laycock 1990). It was not until 1962 that this wolf's highly endangered status received any attention from biologists and wildlife officials. Still, no action was taken to stop state trapping and predator-control programs for another 11 years.

By the 1970s, the Red Wolf had been completely exterminated, except a small population that survived in one county in southwestern Louisiana and in adjoining areas of eastern Texas (Carley 1975). Coyotes had moved into the range of the Red Wolf and interbred with some of the last members of the species. This hybridization spelled the demise of wild Red Wolves. It has been suggested that this interbreeding occurred only because Red Wolves had become so rare that they were unable to find mates of their own species. A live-trapping program to capture the last, pure-blooded specimens, as the only way of saving the species, began in 1973 in Texas, funded by the US Endangered Species Act (ESA). Fewer than 100 animals remained. After capture, X-rays were taken of these animals' skulls to determine which were pure-bred and which were hybrids, based on their skull shape and dimensions.

A number of these hybrids, as well as the pure-blooded Red Wolves, were in poor health from mange, heartworm and other parasites when captured (Carley 1975). Their last attempt to survive in the wild had obviously been a difficult one. Their remaining habitat in Texas and Louisiana had become a mosaic of agricultural and residential development, leaving little natural forest. Moreover, they were under constant threat from trappers and hunters. After five years of live-trapping, only 40 pure-blooded Red Wolves were identified, and they were sent for captive breeding at the Point Defiance Zoo in Tacoma, Washington. No further Red Wolves were found, and in 1979, Howard McCarley and Curtis Carley of the Red Wolf Recovery Team, authorized under the US Endangered Species Act, announced in a status

report, "Recent findings indicate that the only extant subspecies (*Canis rufus gregoryi*), once occurring from eastern Texas to eastern Mississippi, for all practical purposes is extinct in the wild" (McCarley and Carley 1979). The other subspecies of the Red Wolf, the Florida Red Wolf (*Canis rufus floridanus*), had become extinct by 1917 (Day 1981). So many wolves of the Florida race, which once ranged into Georgia and southern Tennessee, were black, that this wolf was originally named the Black Wolf. This genetic strain is now lost.

Of the 40 captive Red Wolves, 14 were selected to form the nucleus of a Fish and Wildlife Service-sponsored captive-breeding colony (Nowak 1999). In 1977, offspring were successfully produced, and by 1989, there were 83 descendants, and the last surviving wild-caught Red Wolf died (Nowak 1991). In 1993, the captive colony consisted of more than 187 animals in 31 breeding facilities. By 1995, there were 289 living descendants from the original wild Red Wolves, the majority in Point Defiance Zoo in Tacoma, Washington (Nowak 1999). In the mid-1980s, reintroduction programs began with the release of several of the captive-bred wolves to the wild. This was the first time the American government had ever sought to introduce and protect wild populations of wolves, instead of eliminating them. Since the Coyote is now present throughout the Red Wolf's original range, attempts were made to find reintroduction areas without Coyotes to prevent hybridization and competition. In 1987, four pairs of Red Wolves were reintroduced into the 120,000-acre Alligator River National Wildlife Refuge, an island in North Carolina without resident Coyotes. A pair released on Bulls Island in Cape Romain National Wildlife Refuge in South Carolina produced two pups in 1988. These pups were captured and released in the Alligator River Refuge in 1989. Another pair, introduced to Horn Island off the Mississippi Coast, produced seven pups in May 1989. By the close of 1993, 46 to 60 animals survived in these newly wild populations by Fish and Wildlife Service counts.

In 1991, a pair of Red Wolves and their two pups were set free in Great Smoky Mountains National Park in Tennessee. Jan DeBlieu, a writer on endangered species, witnessed the release of the wolf family (McIntyre 1995). This area has resident Coyotes, which arrived in the mid-1980s, and the interaction between the two species will be closely watched. Several Coyotes and the adult Red Wolves have radio transmitters and were tracked by a number of biologists after their release. DeBlieu was present when, soon after their release, the male and pups traveled 2 miles away from the female, who lay quietly in a field. Suddenly the researchers heard the prolonged, low howl of the male wolf and high-pitched yaps of the pups, a song "not heard in the Smokies for one hundred years" (McIntyre 1995). They were calling the female, who ran toward them. This national park receives 8.6 million visitors a year--more than any other park in the system. The visitors tend to stay near roads, however, and most of the park is roadless wilderness. Prey is abundant, and both the adults and pups began catching rodents and rabbits, hunting at dawn to avoid tourists during the day (McIntyre 1995). By late summer 1994, there were seven Red Wolves in Great Smoky Mountains National Park. Two more family groups were released the following year, but the available prey in Great Smoky Mountains National Park is limited in the mountainous terrain (Rancourt 1997). As many as 26 wolves lived in the park in 1997 (Rancourt 1997). A few pairs have produced young.

For the most part, these reintroduced wolves have survived with few conflicts with local people, mainly due to the extensive education programs and hearings held by the Fish and Wildlife Service in each area prior to releases. Some private landowners in North Carolina became apprehensive about the potential threat to children and livestock. The Fish and Wildlife Service has paid claimants for losses even when no proof was submitted that it was, in fact, a wolf at fault. One livestock owner admitted that the Red Wolves had become "good neighbors." Yet even these limited reintroductions have provoked resentment in some local communities which harbor ancient prejudices about wolves. The North Carolina state legislature passed a law early in 1995 that defied the US Endangered Species Act, allowing people to kill wolves that attacked livestock. The Fish and Wildlife Service accommodated these concerns by changing its policy in April 1995 to allow killing of Red Wolves thought, but not proven, to be attacking livestock in North Carolina and Tennessee. One of the first wolves killed, male number 464, was shot in 1995 in North Carolina by a landowner who caught him digging under his dog's pen. This wolf had been released the previous year near Alligator River National Wildlife Refuge, but prey was scarce, so Fish and Wildlife Service personnel recaptured him and freed him on the mainland. Number 464 had not been guilty of preying on livestock.

Further incidents between residents and Red Wolves occurred in 1997 and 1998, with wolf pups that were attempting

to disperse into new territory being trapped. One young wolf that had been taken in a leghold trap in North Carolina was rescued by the Fish and Wildlife Service and returned to a penned enclosure in 1998. The local county representative stated that wolves were unwanted intruders and would be dealt with by residents. This does not bode well for reestablishment of these wolves.

If the Red Wolf survives this irrational prejudice, it may reoccupy many of its original haunts. The threat of hybridization with the Coyote will remain, however, and without corridors of habitat to link reintroduced populations, these wolves risk becoming inbred. With education of the public, one day the Red Wolf may be restored as a natural predator, benefiting its prey and ecosystem.

Wolves, Wild Dogs and Foxes: Page 2

Unlike the Red Wolf, Gray Wolves traveled in large packs in the Great Plains of the West. Many of the wolves painted by George Catlin, the great 19th-century artist of Native Americans and wildlife of the Plains, were beige or pure white, as are many of the wolves of the grasslands of northern Canada. Early hunters killed wolves for their pelts by trapping, poisoning and shooting. Many were used for target practice in the open country. When livestock ranchers took over huge tracts of land in the West, the Gray Wolf became a target for total extermination. Cowboys often roped wolves and dragged them to their deaths across rough ground (McIntyre 1995). Federal trappers used even more brutal killing methods (McIntyre 1995).

James Josiah Webb, who wrote a memoir of events in the Santa Fe, New Mexico, area from 1844 to 1861, recounted that two men conducted a wolf-killing operation by spreading strychnine bait placed in chunks of bison meat around the prairie. The number of wolves that once inhabited the region was so dense that they found 64 dead wolves within 1.5 miles of their camp in a single day after a poisoning; they bragged that they earned \$4,000, an enormous sum in those days, by selling wolf pelts (McIntyre 1995).

As wolves were exterminated in one state or territory after another, a few of these intelligent animals managed to escape traps, guns and poison, earning the label of "outlaws." These wolves ranged alone or in small packs, and in the last days of the western wolf, some trappers spent months or years in determined pursuit of them. The ability of these wolves to elude their persecutors were truly amazing. One of the most famous such cases was described by Ernest Thompson Seton, an English artist and writer, in *Wild Animals I Have Known* (1899). Based on fact and documented by photographs, it concerned Lobo, an enormous wolf, called "The King" by Mexican residents who lived near a huge cattle ranch in northern New Mexico. For many years in the 1890s, Lobo led a pack of five wolves. He had a distinctive, deep howl that ranchmen recognized among the howls of the other wolves. He was by far the largest wolf in the pack and exceeded the size of other wolves in the region. Whereas most wolf paws measured 4 3/4 inches, Lobo's were 5 1/2 inches long. His mate, whom the Mexicans called Blanca, was a large, magnificent white wolf.

These wolves, like many others of the West during this period, had been deprived of their natural prey, White-tailed and Mule Deer and Elk, which had been hunted out by settlers and replaced with livestock. The wolves turned to livestock as the only large prey available and, in doing so, became the target of ranchers' wrath. Western ranchers, like many livestock owners in Europe, believed that they should be able to release cattle to roam free without herding them into shelter at night. This situation had existed in Western Europe after large predators were eliminated from all but the most remote areas. In their new ranches, allocated to them by the government, ranchers sought to recreate the European model. This required the destruction of large predators.

Lobo and his pack refused to eat dead animals that they encountered, apparently to avoid poison, and survived on calves and sheep that they killed themselves. When Lobo and his pack killed a cow, ranchers immediately put poison in the carcass. But when the wolves returned the next day to eat, they somehow knew which parts of the carcass were

poisoned, and pulled out the poisoned chunks, throwing them aside, eating only the unpoisoned portions. Lobo also avoided the traps set for him and hid from hunters on horseback who pursued him. Trappers came from great distances to claim the high bounty on Lobo, but all failed to kill him. Ernest Thompson Seton decided to try to kill Lobo himself for the \$1,000 bounty. He scattered poisoned baits, covering the human scent with other odors, and the following day, found that one after another of the baits was gone. Assuming that he would come upon the body of Lobo, he was surprised to find his five baits in a pile. Lobo had picked them up, one after another without eating them, and left them as a message to Seton. Seton obtained special steel jaw leghold wolf traps and set them in concealed places in Lobo's territory. When he came out to check the traps, he found Lobo's tracks leading from trap to trap. The canny wolf had discovered each of the traps during the night, scratching earth away to reveal the chain and trap, continuing from trap to trap until he encountered one in the center of the trail. Lobo then retraced his steps, placing each paw exactly in its old track until he found no more traps, using his paw to flip stones and earth clods to spring every trap.

Seton finally succeeded in trapping Blanca by setting hidden traps among parts of a cow carcass and covering the area with Coyote scent. Lobo avoided the traps, but Blanca made a fatal error and blundered into one. When Seton and the others found her dragging the heavy trap, she turned to fight, howling across the canyon. Lobo howled back, while Seton and the others brutally killed her. Throwing lassos over her neck and holding the ends of the ropes, they galloped horses in opposite directions until her body was torn apart. When he wrote of the event years later, Seton (1899) called the killing a tragedy. They heard the howls of Lobo for days afterward. Seton described it as having "an unmistakable note of sorrow in it, now. It was no longer the loud, defiant howl, but a long, plaintive wail." When they found Lobo's tracks at the spot where Blanca had been killed, Seton reflected, "Now, indeed I truly know that Blanca was his mate."

Soon afterward, Lobo came near the ranch house. His tracks showed that he had galloped about in a reckless manner before he blundered into a trap set in a pasture. He was able to pull out of it, but Seton then set 130 steel jaw leghold wolf traps in groups of four on every trail leading into Lobo's home canyon, and dragged Blanca's body around the area to leave her scent. He even removed one of her paws, with which he made a line of tracks on the soil covering each trap. Within days, Lobo was caught with all four legs in a trap set, having followed Blanca's scent and forgetting all caution. When Seton approached the trapped wolf, Lobo managed to stand, in spite of severe injuries, and howled his deep call, but no members of his pack responded. Seton and others wrapped ropes around his neck, put a stick in his mouth and lashed his jaws closed. His feet were tied, and when he was placed on Seton's horse, he refused to look at any of his captors. At the ranch, Seton placed a collar around his neck, secured him to the pasture with a strong chain, and Lobo lay calmly, gazing across the prairie.

When Seton came out the next morning, Lobo was dead. On measuring his body, Seton found that Lobo weighed 150 pounds and was 3 feet tall at the shoulder. He was one of the largest wolves ever trapped in the Southwest. The largest Gray Wolves are native to northern Canada and Alaska and weigh up to 176 pounds, but most wolves of the Southwest were far smaller and lighter (Nowak 1991). Scientists who measured the skulls of the pair estimated that Lobo was 4 to 5 years old when he was killed, and Blanca was 7 (McIntyre 1995). Photos of Lobo and Blanca caught in traps are reproduced in Rick McIntyre's 1995 book, *War Against the Wolf*. Lobo and Blanca were exceptional specimens, and their slaughter represented an irreplaceable genetic loss. The treatment they received will remain a blot on human "kind." Lobo was killed on January 31, 1894, near Currumpaw, and his pelt is kept at the Ernest Thompson Seton Memorial Library and Museum at the Philmont Scout Ranch near Cimarron, New Mexico (McIntyre 1995). This experience changed Seton's attitude, and he expressed strong feelings of guilt in his description of his treatment of these wolves.

Government programs did not reflect Seton's newfound sympathy for wolves. In fact, predator-control programs intensified in the early years of the 20th century. Ranchers convinced the federal government to launch an all-out attack on predators, primarily wolves. The Forest Service and the Bureau of Biological Survey used poisons and traps to kill adult animals and many cruel methods to kill the pups in dens in their efforts to try to exterminate the wolf. In 1907 alone, the Forest Service killed more than 1,800 Gray Wolves and 23,000 Coyotes, among other animals

(Laycock 1990). After the US Congress authorized the first substantial appropriation for hiring government hunters in 1915, federal wolf-control programs achieved an unprecedented level. Hundreds of agents combed the most remote wildernesses, spreading poison even where no cattle or livestock grazed. A point system was established; the highest number of points, 15, was accorded for killing a Mountain Lion or a Gray Wolf (Laycock 1990). Hired hunters earning high point totals made the Honor Roll, while others might be fired; they were expected to kill virtually every predator in their assigned area (Laycock 1990).

Within a few decades, many thousands of Gray Wolves had been killed. They were eliminated from more than 95 percent of their range in the lower 48 states by the 1930s (Robbins 1997). A few wolves, using their intelligence and survival senses, managed, like Lobo and his pack, to survive somewhat longer, but they were killed in the end. The Custer Wolf, a large female also known as "Old Three-Toes" because she had lost a toe in a steel jaw leghold trap set by a government trapper, became as infamous as Lobo and Blanca. After her mate and pups were killed, the Custer Wolf survived until caught in a trap that became snagged on rocks (McIntyre 1995).

Vernon Bailey, a biologist with the US Biological Survey, the government agency that later became the Fish and Wildlife Service, conducted wildlife and plant studies as well as predator-control programs. He noted early in the century that the Biological Survey had conducted "the most systematic and successful war on these pests ever undertaken" (McIntyre 1995). The loss of virtually all wolves in the vast area encompassing the lower 48 states may be the most devastating predator-control campaign in history.

If not for the fact that the predator-control programs of the territorial and provincial governments of Alaska and Canada did not succeed in totally exterminating the wolf, the species might be extinct on the continent. Although wolves were persecuted and trapped for their fur in the latter areas, they survived in the far north and in the eastern forests of Ontario and Quebec and have now reoccupied most of their original range in Canada.

The Gray Wolf is able to adapt to a wide variety of habitats and climates, whether searing deserts, shrublands, grasslands, forests of all types, frozen tundra or even marshlands. It had the largest range of any terrestrial mammal on Earth, other than humans (Nowak 1999). Wolves had lived for thousands of years on the continent, their environment and prey altering drastically through the Ice Ages, needing only the presence of large prey to survive. Wolf intelligence, in fact, exceeds that of the domestic dog, which has a brain 31 percent smaller (Busch 1995). In spite of the wolf's survival abilities, the fragmentation of packs by predator-control agents prevented them from hunting normally and hastened their disappearance soon after control methods began. This need to live in a pack for hunting and companionship made the species vulnerable to extermination. When persecuted, Gray Wolves do not desert one another, and many cases have been documented of wolves sacrificing their lives in an effort to save a pack mate. This altruistic trait also contributed to their extermination. The traits that humans most admire about domestic dogs were inherited from the wolf--loyalty, intelligence, playfulness and affection. Wolf pups were first domesticated by hunter gatherers tens of thousands of years ago, and even after selective breeding by humans in the intervening centuries, they still retain many of the wolf's best qualities.

Wolf packs have a lead pair, known to biologists as the alpha male and female, who are the only members of the pack that produce cubs. They mate for life, and dominate other wolves in the pack. They are usually the fittest and largest. Other pack members challenge for leadership, which can result in a change in the alpha pair. The entire pack, which includes adult females and males and pups from the previous year's litter, cares for the pups, ensuring that the strongest pass on their genes to future generations. Young unmated females and males "baby-sit" the pups when the alpha pair and the rest of the pack are out hunting. When the pups are about six weeks old, their baby-sitters spend hours with them in wrestling matches, games of tag and other rambunctious activities. Within the pack, wolves are extremely friendly and devoted to one another, barking and yipping with delight on meeting, and before and after hunts. They howl at night, communicating with other wolf packs which howl back. Bonds between wolves, especially mated pairs, are very strong, as illustrated by the saga of Lobo and Blanca, and many other cases of wolves in apparent mourning for lost mates have been documented. For many days, one male Mexican wolf, howling plaintively, followed a government trapper who had killed the wolf's mate and carried off her pelt.

Other species of canids show similar behavior. The African Wild Dog (*Lycaeon pictus*), a highly endangered wild canid, hunts on the African plains in even larger packs than Gray Wolves, numbering up to 26 animals, yet only one female in the pack has pups. The alpha female might have 16 pups, and if another female in the pack has a litter, the alpha female will steal the cubs and nurse them, even if the litter size reaches 20 or more. Fewer than 5,000 of these beautiful animals, sometimes called Painted Wolves because of their black-and-yellow spotted coats, remain in the wild, and they are in steep decline (Nowak 1991). In Zimbabwe, where there are only about 300 to 500 animals, they are still persecuted by farmers. Even in national parks, they often lose prey when chased off by Spotted Hyenas or Lions.

The ecology of the Gray Wolf has been studied since the 1940s, revealing it to be completely different from the prejudicial folklore of Europe. Adolph Murie, one of America's greatest biologists, conducted studies of wolves in Mount McKinley (now known as Denali) National Park, where they were neither persecuted nor hunted. In his study, *The Wolves of Mount McKinley* (Murie 1944), he revealed: "It appears that wolves prey mainly on the weak classes of sheep, that is, the old, the diseased, and the young in their first year. Such predation would seem to benefit the species over a long period of time and indicates a normal prey-predator adjustment in Mount McKinley National Park." By examining the carcasses of Caribou and other mammals killed by wolves in the park, Dr. Murie found that most were in poor physical condition. Wolf packs test their prey by isolating and then chasing individual animals to detect weaknesses, and the majority of their chases do not result in a kill.

In spite of more than 50 years of biological studies of wolves that have shown them to be a positive rather than a negative influence on their prey, there are still many who disagree. Predator-control programs have been authorized in Alaska, Canada and parts of Eurasia in misguided attempts to protect deer, Elk, Moose, American Bison and Caribou. A trophy hunting organization, Safari Club International, paid the British Columbia government to kill wolves in that province (Williams 1991). The real motivation for these eradication programs is often to promote artificial increases in populations of ungulates, such as Moose, Caribou and deer, for sport hunting.

Over the ages, prey species of wolves have evolved to survive their attacks by becoming faster and stronger. The largest and healthiest deer on the North American continent have been found in areas where wolves are resident predators. The number of wolves in a pack varies according to the size of the prey: packs of up to 15 are needed to bring down bison, while packs of seven or fewer hunt deer (Nowak 1999). Wolves hunting large prey run in shifts, with tired members of the pack replaced by rested wolves. They will sometimes need to run for many miles after Caribou, Moose, American Bison or deer before they succeed in singling out one they are able to bring down; an average of only one in 10 chases is successful. Native Americans have always been aware of the important relationship between the wolf and its prey. The Keewatin Inuits have an ancient saying: "The caribou feeds the wolf, but it is the wolf who keeps the caribou strong" (Busch 1995). The healthiest members of each prey species are able to fend off wolf packs, and only in unusual circumstances can wolves kill them. For the vast majority of prey species, wolves sense weakness in their prey, evidenced by body stance, uncoordinated movements, the smell of wounds or, most often, by their lack of endurance when being chased (McIntyre 1995).

When wolves are hunted out of an area with deer and other ungulates, the latter animals often increase in numbers to such great levels that they strip their habitat of vegetation. The overpopulation of White-tailed Deer in many parts of the northeastern United States, especially in suburban locations, has resulted from a lack of natural predators. Their absence has created a major imbalance in eastern forest ecosystems, where they have become so numerous that they consume young trees and new growth on mature trees.

Wolves, Wild Dogs and Foxes: Page 3

Although Gray Wolves were completely eliminated from the eastern states south of Canada and east of Minnesota by 1930 (McIntyre 1995), a few remnant populations survived in northern Minnesota and northern Montana. The first US Endangered Species Act in 1967 listed all wolves in the lower 48 states and Mexico as Endangered. In 1973, another Endangered Species Act was enacted, replacing the 1967 Act. Five years later, the category for the wolves of Minnesota was changed to Threatened. In subsequent years, wolves were reintroduced to the southwest, Wyoming, Montana and Idaho, listed as Threatened experimental populations. All other wolves south of Canada are still listed as Endangered. Wolves have wandered from Minnesota and south from Canada to neighboring Wisconsin and Michigan, with about 50 wolves living in each state (Nowak 1999). Prior to eradication programs beginning in the 19th century, between 9,000 and 16,000 wolves were estimated to have occupied these three states (Savage 1996). Bounty programs killed 150 wolves a year in Minnesota alone between 1949 and 1954, and this state did not withdraw its bounty until 1965; Wisconsin stopped bountying wolves in 1957, and Michigan in 1960 (Savage 1996).

The wolves of Minnesota have gradually increased in range in the past 30 years, but they remain thinly distributed in the northern portion of the state. State regulations allow them to be killed if found preying on domestic livestock, with little or no proof of depredation. Minnesota has a compensation program for livestock owners but does not attempt to relocate wolves, even though depredations have occurred on only 1 percent of farms in that state (Savage 1996). In Wisconsin, large areas have been closed to Coyote hunting during the deer season, which has greatly decreased wolf mortality there, since many wolves were shot--either mistakenly or intentionally--by hunters (Savage 1996). Unlike Minnesota, Wisconsin relocates wolves found preying on livestock and compensates owners of livestock killed by wolves; Michigan's Upper Peninsula, where wolves are found, has no livestock (Savage 1996).

Although many Minnesota residents consider wolves to be threats to livestock and resent the protection they receive from the US Endangered Species Act, for others, they are a thrilling symbol of wilderness and the America that existed several hundred years ago. Ellen Hawkins and her husband Gary live in a wilderness cabin surrounded by Superior National Forest land, prime wolf country in northern Minnesota. Because they are avid wildlife watchers, they put out food for birds, foxes, Fishers, Martens and weasels, and state officials bring the couple road-killed deer which they place in a clearing 200 yards below their house for wildlife to feed on. They saw wolves very rarely and felt lucky to hear their howls or find their tracks (Hawkins 1988). One December day, they spotted a wolf feeding on a deer carcass on their property and noticed that he was wearing a radio collar, placed by the Fish and Wildlife Service to track many of Minnesota's wolves.

Their excitement at seeing the wolf, who brought "magic to the place," dimmed when they realized he was injured. He limped, holding up his right front foot, and they saw him fall in the snow (Hawkins 1988). He kept his tail down, a sign of subservience and fear, and moved stiffly and awkwardly. He spent five days feeding on the deer, lying in the snow near it, and seemed weaker each day. On the sixth day, he disappeared from the clearing, and in the middle of the night, an amazing event occurred: "We were confronted by his face pressed against our window" (Hawkins 1988). As they stood gaping at him, they heard him thump his nose on the glass, still staring at them. The wolf then went to another window, and they found themselves again eye-to-eye with him. He had climbed a snowdrift onto their greenhouse roof and now sat leaning against the window, looking back over his shoulder at them. The Hawkinses found some chicken and tossed it onto the roof next to him, while offering him a pan of gravy. The wolf looked at the food, and then at them, but did not eat.

The temperature was 25 degrees below zero F., and they decided the wolf needed warmth. Gary got a blanket and put it around the wolf, who jumped at first, and then quieted down. His passive response made them think that he should be brought indoors. They got an old quilt, and Gary picked up the sick wolf, carrying him into their living room. The wolf was somewhat dazed, but hardly moved. They called their neighbor, who came 12 miles to see the frail and sickly wolf sitting near the stove in their living room. Uninterested in food, the wolf looked about and seemed to warm up, leaning against the stove until his fur singed. They saw that he had lost part of his front foot, and they heard him wheezing as he breathed. Within minutes, his condition deteriorated, and he began pawing at his mouth. His wheezing grew into a "terrible, deep gurgling" (Hawkins 1988). Gary moved close to the wolf and began to stroke its

head. The wolf stood up with effort, but then slumped down to lie beside the stove. Gary removed the collar so that the wolf could breathe more easily, and they saw that it had a number--6530--with the address of the Fish and Wildlife Service. The wolf suddenly staggered into the middle of the room, spasmed and struggled for breath. Gradually they saw his eyes become unfocussed, and the light faded out as he died (Hawkins 1988).

They later learned that Wolf 6530 left his pack when he was nearly 2 years old and wandered for eight months before he returned to his family. He stayed with them only two months before walking 40 miles to another hunting area. Finally, fatally ill, he came to the Hawkins' house, which was 45 miles from his pack. An autopsy revealed that he had died of a fungal pneumonia, the first such case of wolf mortality. The disease may have been brought on by stress and lack of nourishment (Hawkins 1988). Although his coat was thick, he was emaciated, weighing only 55 pounds. At his age he should have weighed at least 75 pounds. He had a tear on his lower lip, had lost three pads on his right foot, and one pad was mutilated on his left foot (Hawkins 1988). A biologist with the Fish and Wildlife Service was contacted about Wolf 6530 and, in his opinion, the wolf's foot wounds were probably the result of getting caught in a fox trap and dragging the trap about until its toes rotted off (Hawkins 1988). As long as he was dragging the trap, he was unable to hunt with the pack, and this may have explained why he was forced to wander in search of carrion.

Many Minnesota wolves and those dispersing to neighboring states and southern Canada have been trapped in leghold traps. In fact, Wolf 6530's brother had been killed by a trapper in Ontario, 115 miles to the northeast, at the age of 18 months (Hawkins 1988). Wolf 6530 had suffered for many months, and his life ended prematurely. Wolves can live 10 years or more in the wild. Only because he had turned to people during his last days did his story come to light. Ellen Hawkins reflected on the extraordinary event: "We'll never know what motivated him to come our way. I can only say that I'm grateful to Wolf 6530 for sharing his last, desperate moments of life. His act gave us a sense of connection with his world that we would never have had, and our commitment to live in harmony with that world has been strengthened. We will always carry with us the vivid image of the wolf at the window" (Hawkins 1988). The dying wolf may have sensed that the Hawkinses were friends of wildlife, having seen them put out food and watch him without taking any aggressive action toward him. Because he was a highly social animal who had been forced into solitude for most of his short life, he may have sought their company, sensing that he was close to death, preferring humans to an isolated and painful death without his pack mates. Whatever his motivation, his appeal to the Hawkinses' prior to dying was evidence of the complexity of this fascinating creature, and an indictment of the continued use of the inhumane steel jaw leghold trap.

Wolves, Wild Dogs and Foxes: Page 4

To counter the strong anti-wolf prejudice, a new organization called the International Wolf Center in Ely, Minnesota, has live wolves in an enclosure, museum exhibits and field classes. The 50,000 visitors it has received in the past few years brought \$3 million to the local economy (Chadwick 1998). But wolves in Minnesota and elsewhere continue to be taken in traps set for other types of animals, causing injury or death. One study on wolves taken in various types of traps was published in the *Journal of Wildlife Management* (Ballenberghe 1984). It investigated injuries and mortality of 126 wolves trapped in northeastern Minnesota and Alaska. Traps used included steel jaw leghold traps of various types, some with teeth, others with smooth offset jaws; steel cable foot snares; and cable neck snares equipped with devices that prevented the loop from fully closing (Ballenberghe 1984). The results confirmed that steel jaw leghold traps caused the greatest number of injuries and mortalities: 41 percent of 109 adults, yearlings and pups caught in these traps incurred serious foot and leg injuries, defined as lacerations, damage to tissue, bone breakage, and joint dislocations (Ballenberghe 1984). Three wolves, including a pup, had broken leg bones; two others lost front feet after they were nearly amputated by the trap. One young male with broken radius and ulna bones in his foreleg was released in this study to stumble off; this wolf was caught by a trapper several months later (Ballenberghe 1984).

Other injuries resulted when trapped animals gnawed their own feet off and chewed on the traps, breaking teeth and

splitting lips. The steel jaw leghold traps caused tissue, muscle and tendon injuries, even when checked daily (Ballenberghe 1984). Since the observations carried out were not done by a veterinarian, or with aid of X-rays and other sophisticated tools to arrive at diagnoses, many unnoticed or undetectable damage to nerves, ligaments and other body parts almost certainly went undetected. Other effects of trapping noted in his study were heat and water stress; stress from risk of discovery and killing by people happening upon them; killing by other predators finding them trapped; and undiagnosed trauma (Ballenberghe 1984). In the same study, a wolf was killed by a cable neck snare when it passed over his chest and closed around his stomach. Long-term effects from broken teeth, severed tendons and poorly healed bones made survival unlikely. This was the case with Wolf 6530, described above, who suffered for many months with an injured paw after pulling free from a leghold trap, becoming weaker and weaker until he died.

Another method tested involved darting animals with tranquilizers from helicopters, which resulted in the euthanizing of a wolf after it became paralyzed when the dart penetrated its spinal column (Ballenberghe 1984). Of the animals darted, 85 percent sustained injuries and soft tissue damage. The Ballenberghe study also cited other research projects with even higher mortalities, and commented, "None of the wolf capture methods discussed here resulted in study animals that were free of injuries, but some methods clearly had more potential to inflict serious injuries than others."

The steel jaw leghold traps that Ballenberghe found to be the most injurious are the very traps that are still used by the Fish and Wildlife Service, Animal Damage Control (ADC)*, state game departments and others, killing wolves and many non-target animals. The US Department of Agriculture's Animal Damage Control program, which traps hundreds of thousands of Coyotes, Cougars and other predators for the benefit of livestock owners, has been responsible for the incidental trapping of endangered and threatened species, from Bald Eagles (*Haliaeetus leucocephalus*) to Gray Wolves.

*Animal Damage Control (ADC) has since been changed to Wildlife Services.

Many wolves are trapped by wire snares. A loop of wire pulls tight and cuts through the skin when the animal steps into it or, in the case of a neck snare, it is placed a few feet off the ground and strangles and cuts through the flesh of an animal blundering into it. Most US states allow wire snares, and wolves are taken in them in Alaska. The Alaska Department of Fish and Game has sponsored various control programs or "studies" on wolves, using airplanes, steel jaw leghold traps and, most often, wire snares. The avowed purpose of recent state research, which involved trapping wolves in a large wildlife management area near Fairbanks, was to determine their population and effect on ungulate prey, such as Moose, Caribou and Elk. In fact, this and similar "studies" have been launched after hunters urged the state to eliminate wolves in order to leave more prey species. The rationale of the trapping program is based on the premise that killing wolves will result in increases in the population of these prey animals. A program in the 1970s involved the elimination of wolves from a 3,000-square-mile area, but according to Warren Ballard, a retired game biologist from Alaska, the Moose population did not rebound after wolves were exterminated (Egan 1992). Moreover, it creates an imbalance in the ecosystem. Killing of ungulates by human hunters does not cull the sick and old, but rather the fittest and largest.

In 1992, such a wolf "research" program, involving the setting of thousands of wire snares, was carried out south of Fairbanks. Gordon Haber, a conservationist and wolf biologist who has worked for decades on behalf of Alaska's wolves, brought television crews to film the snaring operation in December 1994. They were shocked by the scene that awaited them. Four wolves had been caught in wire snares, two of them pups. One was dead, and three were still alive, terrified and in great pain. A 6-month-old pup, with its paw caught in a neck snare, had chewed off its foreleg in a futile effort to escape. Another had been snared around the chest, causing deep wounds. The other two had been snared by the leg. All these snares had been set to catch the wolves by the neck and kill them, yet none did. Members of the pack milled about nearby, unwilling to leave their fellows. Two snared Caribou were lying dead nearby. A trapper was filmed as he attempted to shoot the wolves, repeatedly missing or wounding them because he used the wrong caliber ammunition in his gun. He shot one pup five times in the head and body at point-blank range with the

wrong gauge ammunition. The pup, wounded, remained standing. The trapper then reloaded with other ammunition, and this time shot all three wolves fatally.

The film of this massacre was shown on national news programs, causing outrage around the country. Alaska Governor Tony Knowles called off the hunt, ordered a review and stated, "That's no way to treat an animal." Six hundred and eighty-five snares set for this program were removed from state lands, but not before 12 more wolves had been killed. More than 1,000 snares had been set by the state for this "study," which lasted two years. On February 2, 1995, Governor Knowles made public the results of the Gray Wolf kill review. During the program, 134 wolves were snared, 37 of which were found alive and had to be shot. Also caught in the neck snares were Moose, Caribou, Grizzly Bears, Wolverines, Coyotes, Red Foxes, Arctic Hares, Common Ravens and Golden Eagles (AWI 1995). This gruesome haul of non-target animals is typical of the indiscriminate nature of snares.

Governor Knowles canceled the wolf kill indefinitely and ordered a review of Alaska's entire predator-control policy. This "research" program was permanently canceled in February 1995. A biologist with the Alaska Department of Fish and Game admitted in 1997, while appraising the program, that it had been ill-conceived, poorly run and politically motivated. He insisted, however, that wolves had suffered no pain from the snaring and even from chewing off their own paws. This failure to acknowledge proven neurological effects of such injuries is not unusual among state game department officials.

In 1996, the Alaska Department of Fish and Game began a new program to curtail the wolf population in the Fortymile region near Fairbanks. This time, the program consisted of sterilizing the alpha male and female of each of the 15 wolf packs in the area, with plans to relocate all "subordinate" wolves (Trost 1998). The plan to reduce all 15 packs to a single sterile pair was intended to increase the number of Caribou for hunters (Trost 1998). The Alaska Wildlife Alliance strongly opposed this project, and Gordon Haber expressed the opinion that it would reduce the wolves of the area to the brink of extinction (Trost 1998). This research program was described as "based on assumptions" by the National Academy of Sciences.

Alaska's trapping regulations are the laxest in the country, with no visitation requirement, meaning that trappers are not required, as in most states, to check traps daily for animals. Animals suffer in steel jaw leghold traps or snares for days. One case is known of a trapped Lynx--brought food by its mate--that lived for six weeks with its leg caught in a leghold trap.

No state regulations govern the manner in which trapped animals are killed, and trappers often stomp trapped animals to death to obtain pelts without damage--such as that caused by bullet holes--to the pelt. The Alaska Game Department takes advantage of the strong ties between wolf pack mates by requiring trappers of wolves to count the number of wolves in the packs of the animals they trap. Pack mates will usually remain by their trapped pack mate, even when it is dead in a trap.

Wolves, Wild Dogs and Foxes: Page 5

Aerial hunting of wolves was carried out for decades in Alaska by private parties and the Alaska Department of Fish and Game itself. Prior to 1972, wolves could be hunted from airplanes for sport, or by state predator-control agents. Federal legislation was enacted in that year to ban such hunting, with high penalties including confiscation of aircraft, large fines and even jail terms. In fact, Director of Wildlife Conservation David Kelleyhouse, known as "Machine Gun Kelleyhouse," suggested that the best way to control wolves was to machine-gun them. In 1991, a state law was passed in Alaska that allowed shooting of wolves if the aircraft landed 330 feet away from the animals. This legislation was virtually impossible to enforce. Many hunters flew over wolf packs, hazing them until the wolves were too exhausted to escape. Then they would land and kill the wolves. The law failed to protect wolves from this type of

harassment and killing. Among the misuses alleged were trappers checking their trap lines by flying from one set to another, and killing wolves and other predators they saw. Another common practice that was targeted was the "recreational" aerial hunting of wolves. Conservationists in Alaska began a petition campaign to change the law through voter ballot referendum for the November 1996 national election, having failed to persuade the legislature to enact a stricter law. This ballot was openly opposed by many members of the Alaska Department of Fish and Game, who were then chastised for this lobbying by the Governor. The ballot was voted into law by the Alaskan public. The new law states that no one who flies an aircraft to an area and lands, may shoot a Gray Wolf, fox, Lynx or Wolverine on the ground the same day. This closed the loophole left by the previous law.

Wolf hunting is carried out by snowmobilers in many parts of Alaska. Brenda Peterson, an eyewitness to one of these hunts, described it, and photos taken of the event documented the wolves being chased into a tight group and killed (McIntyre 1995). Six black wolves, an entire family, died "splayfooted against one another," having run for their lives at a gallop of 35 miles per hour as the snowmobilers herded them into a terrified, dense mass, and then shot them at point-blank range (McIntyre 1995).

The total kill of wolves by hunters and trappers in Alaska in recent years has declined from 1,600 taken in the winter 1993 to 1994 to 1,180 taken in 1995 to 1996, according to the Alaska Department of Fish and Game. With a total wolf population in the state in late 1995 estimated at about 7,000, the kill represents 17 percent of the total population. This is probably threatening some populations. One race of Alaskan wolves, the Alexander Archipelago Wolf (*Canis lupus ligoni*), an extremely rare subspecies, resides in the heavily logged Tongass National Forest. In spite of various threats, the US Department of the Interior has refused to list the wolf on the US Endangered Species Act (see Forests chapter).

Within the past few decades, wolves have again become resident in several western states. Beginning in the 1970s, a few Gray Wolves crossed the border from Canada into Montana's Glacier National Park where a population of about 100 wolves in 10 packs now lives (Stevens 1997).

Wolves, Wild Dogs and Foxes: Page 6

In the 1990s, the Fish and Wildlife Service began a reintroduction program of wolves into Yellowstone National Park and portions of Idaho and Montana to the north. Historically, wolves were killed to the last individual in Yellowstone National Park by park service personnel under predator-control laws. Their return is a vindication of their importance in the ecosystem. From the start, the project was fraught with difficulties and controversy, with conservationists pitted against one another as to methods and regulations, and many cattle and sheep ranchers opposing the entire project, vowing to kill any wolves that strayed out of the park. Defenders of Wildlife began a fund to repay ranchers for lost livestock, which helped convince some ranchers to accept the project. Of the 14 Canadian wolves released in 1995 in Yellowstone National Park, almost all remained within the park. Two packs produced a total of nine pups, and 17 more wolves from Canada were set free in the park in 1996. The largest of the reintroduced wolves and his mate left the park, and he was gunned down by a drunken man for sport; he skinned this big male and threw the carcass into the brush. Later, the wolf's pregnant mate found the skinless carcass and dug a den beside it. The hunter who, in defiance, sported a shirt reading "Northern Rockies Wolf Reduction Project," spent six months in jail and a year of supervised probation after being found guilty of deliberately killing the wolf.

These Canadian wolves, taken from areas where they were hunted and trapped, experienced a trap- and gun-free environment in Yellowstone National Park. They have adapted well, preying mainly on Elk, which had become overpopulated. Only a few Bison have been taken. Within a few years, the wolves have had major effects on the park's ecosystem. Grizzly Bears have benefited by feeding off the remains of wolf kills, as have ravens, foxes, Bald Eagles and Golden Eagles. The park's aspen trees have also benefited. Researchers from Oregon State University determined

that until the late 1920s, young aspens were able to survive and mature within existing groves, but after the last wolves were killed off about 1926, the aspens began to die out because the overpopulated Elk browsed on these trees in the winter, stunting them. Another change that resulted from the absence of wolves was the disappearance of smaller birds, such as the Calliope Hummingbird (*Stellula calliope*) and Willow Flycatcher (*Empidonax traillii*), from brushy areas that were heavily browsed by the large populations of Elk and other ungulates. Wildlife Conservation Society (WCS) biologists have been researching the many effects of the return of wolves on the park's ecology (WCS 2000).

By 1996, three packs of wolves occupied the park, and a fourth pack of four wolves lived on the park's northwestern border. Their total population in Yellowstone has risen to about 185, exceeding the expectations of scientists (Murphy 2000). Although detractors remain, wolves have garnered a great deal of support. Scientists have come to Yellowstone National Park to study the wolves, some saying it is the best place in the world to see these animals in an open habitat, exhibiting natural behavior. Tourists, likewise, have flocked to see the Yellowstone wolves, bringing \$43 million a year to the area, according to Defenders of Wildlife (Rembert and Motavalli 1998). Visitors have been thrilled to see these wolves streak across the grasslands, meet in affectionate, playful groups and raise their melodious voices in group howls. The wolves are expected to be a major tourist attraction in the future, perhaps rivaling the world-renowned geysers. Television films have been made of the wolves, chronicling their reintroduction and pack behavior, and *The Return of the Wolf to Yellowstone*, a book by Thomas McNamee (1997), recounts their reintroduction.

The wolves were released under a special designation of the US Endangered Species Act known as "non-essential, experimental populations," a category that permits authorities to kill them if they are found preying on livestock, or even if they cause adverse effects on wild ungulates such as deer and Elk. It is not legal to kill them for sport deliberately (FWS 1994). As a result, many wolves straying outside Yellowstone National Park have not fared well. One pack of 13 that roamed the plateaus north of the park declined to a single wolf in one year; all but three, who are now back in captivity, died or were shot (Murphy 2000). Several conservation organizations sued the Fish and Wildlife Service to appeal the non-essential designation, stating that there were already some wolves present that would be killed at will because of the designation. Livestock owners also sued the government, requesting that the program be stopped and the wolves be removed. These lawsuits were not heard in federal court until late 1997, after 66 wolves had been brought from Canada to Yellowstone and Idaho in 1995 and 1996.

In December 1997, the lawsuits from both sides of the wolf issue were finally heard in a US District Court, which came to the stunning decision that the Fish and Wildlife Service had violated the US Endangered Species Act by declaring the wolves an experimental population because wolves that might already be present would be denied full protection of the law. The judge ordered that the reintroduced wolves be removed from the park, but stayed his own decision pending appeal. Secretary of the Interior Bruce Babbitt expressed the Department's support for keeping the wolves in the wild. The Fish and Wildlife Service stated that should the decision be upheld on appeal, the wolves would have to be euthanized, as there was no area where they could be released (Chadwick 1998). The decision was appealed and overturned in January 2000, allowing the wolves to remain as part of Yellowstone's ecosystem for the indefinite future.

For the long-term success of the reintroduction of Gray Wolves into this region, the entire Yellowstone ecosystem, which extends well beyond the limits of the national park and other federal lands, should be protected. Already, much prime habitat that was once occupied by wildlife has been converted for agriculture, livestock and homes. Growth of housing and spread of the urban landscape in Jackson, Wyoming, are gobbling up thousands of acres each year. At least one cattle ranch has recently been purchased as a buffer for wolves and bison straying out of Yellowstone National Park. Efforts should be made to acquire more habitat so Yellowstone's wolves and those to the north could be linked through forest corridors to avoid inbreeding and provide space for expanding populations. The Greater Yellowstone Coalition has proposed a program called Y to Y, or Yellowstone to Yukon, that seeks an even more ambitious goal: to link reserves and parks between the two areas, providing a vast wildlife corridor. Much of the land in this linkage area is already federally owned. Grizzly Bears and wolves are among the many wildlife species that

require enormous amounts of habitat, and unless action is taken now, populations of these and other wide-ranging animals will become isolated and inbred.

Central Idaho has 12 million acres of national forest land and was chosen as a release site because of the enormous potential habitat. Opposition to the reintroduction in Idaho was strong, and the state legislature blocked the involvement of the state wildlife department (Robbins 1997). The Nez Perce tribe, which has a strong commitment to preserving the wolf, stepped into the void and became the first Indian tribe to manage an endangered species in an entire state (Robbins 1997). The project is headed by a tribal leader, Jaime Pinkham, a forest biologist who returned to his tribal roots and became manager of the Nez Perce Department of Natural Resources (Robbins 1997). Conservation groups, such as the Gray Wolf Education and Research Center in Idaho, are attempting to change the anti-wolf opinions of local ranchers with films, several penned wolves and other programs. Unfortunately, wolves have been released in Idaho and in Montana, where many have been shot, trapped or died from other causes. They lack the protection of a large national park where hunting and trapping are prohibited, and many ranchers graze cows and sheep in and near the national forests.

Most wolves prefer wild prey, but because of the large number of livestock in the region, the success of these releases may depend on whether the wolves can be conditioned to keep away from livestock. Several of the reintroduced wolves have killed calves in Idaho and Montana, resulting in anger from ranchers who have convinced the Governors and many state delegates to legislate against the program. Fears have even become irrational. Some ranch mothers sent letters to Idaho's Congressional delegation demanding that children be guarded from wolf attacks at school bus stops (Corbett 2000). The Republican delegation from Idaho passed a unanimous resolution at their convention, calling for the immediate removal of all reintroduced wolves (Corbett 2000). Signs urging that wolves be killed were placed in store windows in Idaho. Fish and Wildlife Service biologists killed 82 wolves during the first five years of the program, after complaints from livestock owners (Corbett 2000). Several wolves were shot under questionable circumstances. After a calf was killed, for example, the Service ordered three adult males of the pack killed from a helicopter; sharpshooters, unable to kill the adults, ended up shooting three pups (Murphy 2000). After ranchers reported that a pack had backed a group of his horses against a cliff, the alpha male was removed, leaving his mate alone and the pack without a leader (Murphy 2000).

Some environmentalists protested these killings and threatened to interfere before more wolves were shot (Corbett 2000). David Gaillard of the Predator Conservation Alliance questioned the wisdom or purpose of introducing wolves that needed to be controlled and trained (Murphy 2000). Experiments are underway using electric shock collars that shock a wolf when it comes close to a cow or calf wearing a collar that sets it off. This is a crude approach, which inflicts pain on the wolves and may not even succeed in its intent. Some humane organizations that have protested these collars have rightly stated that almost no efforts have been made to teach ranchers to protect their livestock with sheepherding dogs, pen them in at night and before calving and lambing, and use other means of preventing predation.

Wolves, Wild Dogs and Foxes: Page 7

Historically, the critically endangered Mexican Gray Wolves (*Canis lupus baileyi*) roamed montane woodlands and drylands in northwestern Mexico and extreme southern Arizona, New Mexico and Texas. After centuries of persecution, they disappeared altogether from the United States and verged on extinction in Mexico. In 1976, the subspecies was listed on the US Endangered Species Act, and in 1982, the Fish and Wildlife Service approved a recovery plan in which a professional trapper was hired to capture the last few wild wolves in Mexico. Only five of these wolves were found, and in this 11th-hour rescue, they were live-trapped in Chihuahua and Durango for captive breeding (Brown 1995). They have bred well in captivity and, in 1998, numbered 175 distributed in a number of American zoos (Bass 1998). Through genetic testing, new strains of pure Mexican Wolves have been identified in

Mexican Wolves already in captivity; this adds to the subspecies known diversity (Brown 1995). Smaller than northern wolves, males weigh 60 to 70 pounds and females 50 to 60 pounds.

The recovery plan's major goal was to reintroduce Mexican Gray Wolves into portions of their original range in a joint project by the Fish and Wildlife Service, the ADC program which had been responsible for their demise, the US Army, and the state wildlife departments of Arizona and New Mexico (Brown 1995). Surveys conducted in the region determined that most people favored the reintroductions (Brown 1995). Ted Turner, the founder of Cable News Network (CNN) and other cable stations, is New Mexico's largest landowner with more than 1 million acres. He offered one of his ranches, Ladder Ranch, which is near the Blue Range mountains release site, as a holding area and paid an employee to oversee construction of holding pens (Bass 1998). This was supported by his organization, the Turner Endangered Species Fund (Bass 1998).

Although the public as a whole supported the wolf reintroduction, many New Mexican ranchers expressed great antipathy. The national forest release sites allow hunting and trapping. Many volunteers and a grassroots organization, Preserve Arizona's Wolves (PAWS), have worked for decades to bring about this reintroduction and volunteered their time to help on Ted Turner's ranch preparing for the arrival of wolves from two zoos (Bass 1998). In December 1997, four wolves, two sisters and two brothers from separate zoos, arrived at Turner's ranch and were paired off male-and-female in separate pens, where they stayed for several months (Bass 1998). More arrived and spent time in acclimatization pens before release. The release program failed. Of 11 Mexican wolves released in the area, five died, one disappeared and is presumed dead, and five have been returned to captivity near Alpine, Arizona (Sink 1998). One pup born in the wild is missing and presumed dead, since its mother was shot in August 1998 (Sink 1998). A New Mexican rancher is said to have offered \$35,000 to anyone who would kill all the wolves returned to the wild (Sink 1998).

Among the wolves that were shot was one of a newly formed--but strongly bonded--pair, Val and Minnie (Bodo 1999). Soon after release from the holding cage, Val was shot by a camper who claimed that the wolf charged at him; a necropsy revealed that the wolf had been killed standing still, broadside to the man (Bodo 1999). The female, Minnie, who had been born at the Rio Grande Zoo in Albuquerque, was pregnant with four pups when her mate was killed. She was returned to her holding pen and began to try frantically to dig and leap her way out of the pen (Bodo 1999). Her pups were born, but all died. At the end of 1998, she was shipped to the Living Desert Wildlife and Botanical Park in Palm Desert, California, where she paced or remained curled up in a spot of dirt, failing to interact with her surroundings or a male put in her pen (Bodo 1999). She was spayed and will remain in captivity for the rest of her life. As for the other deaths, no examples of livestock predation were found. About 140 of these wolves remain in captivity (Nowak 1999).

The reintroduction of Mexican Gray Wolves will be far more difficult than the Yellowstone National Park reintroduction, which involved transplant of wild Canadian wolves. These captive-born wolves have no knowledge of wild survival. They will need to learn how to hunt large prey as a pack, as well as how to survive the many threats humans pose to them. Their intelligence and instincts may be the deciding factors for their survival.

The legal status of the Gray Wolf in the lower 48 states seems destined to change in the near future. The Fish and Wildlife Service wants to change the status of the species from Endangered to Threatened in all but the southwest, where the Mexican subspecies is being reintroduced, and remove the Minnesota wolves altogether from the US Endangered Species Act (Revkin 2000). Minnesota wolves continue to be persecuted, and suffer from parasitic heartworms and deadly canine parovirus disease spread by domestic dogs (Nowak 1999). Delisting undoubtedly will unleash unrestricted hunting and trapping of these animals. Total legal control will revert to the state of Minnesota should this proposal be finalized.

The wolves in the West, from Yellowstone National Park to Idaho, Montana and Washington, would be listed as Threatened when removed from the experimental category. This category has much more flexibility concerning how much protection a species receives. Penalties are lower, and species may be hunted and trapped under the category.

Some ranchers in the West are prepared to eliminate wolves outside national parks. One rancher in Montana installed loud alarms that are triggered by the radio collars used to monitor most of the area's wolf packs (Revkin 2000).

The approximately 3,500 wolves south of Alaska, most of which are in Minnesota, occupy only about 5 percent of their original range, and as a result of prejudice and unfounded fear, these wolves are still being persecuted. Several states have enacted laws banning reintroduction of wolves, which would also apply to wolves crossing over the state's borders. Proposals to reintroduce wolves into Maine or New York have also been met with opposition by many (Higgins 2000). A major education program is needed to allay these fears and to train ranchers to protect their herds and flocks, compensating them for any losses. Although the detractors speak more loudly than the defenders of wolves, the latter probably far outnumber the former in the United States as a whole. It may fall to private conservation and humane organizations to turn the tide in favor of the wolves to return them to a greater percentage of their original range in the lower 48 states.

Wolves, Wild Dogs and Foxes: Page 8

Elsewhere, the history of the Gray Wolf is similar. As early as 300 B.C., Celtic people in the British Isles began breeding wolfhounds for chasing and killing wolves (McIntyre 1995). The King of Scots decreed in the second century B.C. that anyone killing a wolf would be rewarded with an ox (McIntyre 1995). In Anglo-Saxon England, January was designated Wolf Month, to be devoted to the slaughter of wolves; during the reign of King Edgar of England, beginning in 953, a tribute of 300 wolf skins per year was demanded. In 1281, King Edward I hired a man to devote himself entirely to killing wolves (McIntyre 1995). Over the next centuries, wolf extermination campaigns continued in the British Isles, and forests were leveled for livestock grazing and agriculture. The last wolf in Ireland was killed in 1821, and a wolf killed in Scotland in 1848 resulted in the extinction of the species throughout the British Isles (McIntyre 1995).

In France, Emperor Charlemagne founded an order of knights for killing wolves, called the Louveterie, about A.D. 800 (McIntyre 1995). Wolves were exterminated 1,000 years ago in all but remote forests of the French Pyrenees on the border with Spain. By the 20th century, only a handful of Gray Wolves survived in these forests, and apparently they were killed off in the 1950s. In the early 1990s, small numbers of Gray Wolves crossed over the Alps from Italy into southeastern France. In 1999, the French government decided to remove these 40 wolves, killing or caging them, after complaints by herdsmen that the wolves were killing sheep (Newman 1999). Environmentalists claimed the sheep were being killed by feral dogs (Newman 1999).

The last wolf in what is now Germany was killed in 1847 (McIntyre 1995). Within the past decade, a few wolves have entered eastern Germany from Poland, which has a population of about 1,000 wolves (McNamee 1997). Polish wolves have been heavily persecuted for centuries, and only in 1998 did the species receive official protection (Nowak and Myslajek 1999). They occur mainly in eastern mountains where they have come into conflict with livestock owners. An organization, Wolfnet, has been working with livestock owners to compensate them for losses and protect them against predation by wolves (Nowak and Myslajek 1999). Wolfnet travels around the country educating the public, government officials and students about the behavior, biology and intelligence of wolves, attempting to undo the mistaken beliefs that result in many killings of wolves (Nowak and Myslajek 1999).

Scandinavia has nearly wiped out its wolves, with only about 25 in Norway and Sweden and fewer than 100 in Finland (McNamee 1997). In 2001, the Norwegian government allowed the killing of some of the few remaining wolves because of complaints by livestock owners, despite protests from wildlife organizations in the country. An unknown--but small--number also survive in Greenland (McNamee 1997).

In Spain, wolves may total from 1,500 to 2,000, the largest population in Western Europe (McNamee 1997, Binder

2000). They are heavily persecuted there, however. At one time wolves were found throughout the Iberian peninsula, but they are now confined to the northern portions of Spain and Portugal (Bergman 1997). In Portugal, only about 150 survive. The wolves of Spain and Portugal are listed by the *2000 IUCN Red List of Threatened Species* as Conservation Dependent. At least half of rural people in areas where wolves remain in Iberia believe the animals should be exterminated altogether, while another 35 percent want them "controlled," allowing only a few to survive (Bergman 1997). Wolves may be sport hunted in Spain, resulting in the deaths of at least 300 animals a year; added to this mortality, the practice of denning, or killing pups in a den, is legal, and 25 percent of wolves are killed in this manner (Bergman 1997). Luis Mariano Barrientos, a biologist studying Spain's wolves, has documented that they kill relatively few sheep, which are usually protected by mastiff dogs and shepherds. He says that the wolves are killed because of prejudice and persecution, and laments, "It's a national disgrace. A barbarity" (Bergman 1997). A recent study recommended that a strict compensation program be set up. At present, indemnities are paid only if local administrations choose to do so, and many do not (Bergman 1997). This results in great resentment toward wolves. The wolves of Spain survive by stealth, hiding in fallow fields and moving about at night, and when they howl, they risk their lives (Bergman 1997). For long-term survival in Spain, they need a large sanctuary with natural prey species.

Small populations of Gray Wolves still remain in pockets of the Mediterranean region. About 500 wolves survive in Italy, listed as Vulnerable by the International Union for the Conservation of Nature (IUCN). Very little wilderness remains in the country, and wolves have been squeezed into agricultural and livestock grazing areas (McNamee 1997). Their survival until the 20th century is due to an attitude of tolerance, unlike the prejudice and hatred toward wolves so common in Europe. No national extermination campaign was ever launched, and herders corral their sheep at night and protect their flocks with guard dogs (McNamee 1997). Because of a lack of natural prey, such as deer, in the region, these wolves occasionally kill livestock. When this happens, herders put out poison or shoot the wolves. Italian wolves live in pairs or groups of three in most areas because there are no large ungulates to hunt in packs. This has made them quiet, nocturnal and shy. These wolves also prey on small mammals, such as rabbits and marmots (McNamee 1997). Only in a few national parks, such as the Abruzzi east of Rome where about 20 to 30 wolves hunt deer, do they exhibit natural behavior, forming packs and howling (McNamee 1997). Even there, however, sheep are allowed to graze within park boundaries, and sheep owners have been soliciting members of the public to "adopt" a sheep to contribute to the cooperative farm (Stanley 2000). By the 1970s, wolves numbered only a few hundred, but after the government accorded the species full protection in 1976, they began to increase in numbers and range (McNamee 1997). They now occupy the entire country, and if there are livestock losses, owners are compensated and are not allowed to kill the wolves (McNamee 1997). Professor Luigi Boitani, a wolf biologist at the University of Rome, commented at a wolf conference that most of the Italian public is in favor of wolves and more opposed to control programs than some wildlife managers, like himself (Binder 2000). The official protection given to these wolves is far stronger than that given to either the Gray or Red Wolf in the United States.

Southeastern Europe's wolf populations are fragmented, but increasing in some countries. The former Yugoslavia has about 930; Hungary, 50; Romania, which protects the species, 2,500; Bulgaria, fewer than 100; Slovakia, 350; and Greece, 300 to 500 (McNamee 1997). Romania is the only one of these countries where people have a tradition of honoring wolves; sheep in the country are protected by guard dogs, and wolves prey mainly on native ungulates. In some areas the wolves have taken to ranging through city trash piles for food (Binder 2000). Croatia allowed unlimited killing of wolves until 1995 when fines of up to \$6,000 were imposed for killing wolves (Binder 2000). This had the counter-effect of encouraging wolf killing, resulting in the deaths of more than 40 wolves, and no one has paid a fine; about 100 wolves remain in the country (Binder 2000).

In the eastern Mediterranean, there are estimates of a few wolves remaining in Lebanon; about 30 in Egypt; 200 in Jordan; 150 to 300 in Israel; several thousand in Turkey; and about 1,000 in Iran (McNamee 1997). In Saudi Arabia, where wolves are killed to protect livestock, hunters often string up a wolf carcass on a pole for all to see (Binder 2000). Dr. Iyad A. Nader of the King Khalid Wildfire Research Center in Riyadh, estimated that up to 700 wolves remain in three protected areas of Saudi Arabia, but elsewhere in the country they have no legal protection (Binder 2000). Wolves are persecuted by livestock herders in all the latter countries.

Just after World War II, there were between 150,000 and 200,000 wolves in the Soviet Union, but beginning in 1947, an intensive government control program drastically reduced their numbers (Nowak 1999). The annual kill was 40,000 to 50,000 until 1962, when it dropped to 15,000; in the 1970s, some 50,000 wolves were estimated to survive in the entire country, including the Central Asian Republics (Nowak 1999). After an increase in wolf populations, a sizeable bounty was paid for killing them; and in 1980, 35,573 pelts were taken through aerial hunting, poisoning and other means (Nowak 1999). The Russian Grey Wolf (1993, Anderson Video, California) chronicled this bounty hunting and other persecution. In the past 70 years, more than 1.5 million animals have been killed; about 20,000 wolf pelts are marketed in Russia every year (Busch 1995). In the early 1990s, 17,000 men were employed by the Russian government to kill wolves. Since then, the national bounty has been rescinded, and only some state governments pay the equivalent of \$25 for a female; the central government no longer encourages poisoning wolves (Binder 2000). In the Russian Far East, a bounty program to kill wolves has been in place for decades, but with the economic chaos following the fall of the Soviet Union, funds to pay the bounties dried up (Specter 1997). A 2001 Cable News Network (CNN) report profiled a government trapper who killed female wolves for the bounty, then raised the orphan cubs for release. The report suggested that persecution continued at high levels and that most Russians wanted the species exterminated.

The Wolf Almanac (Busch 1995) states that some 96 Russian wildlife reserves harbor wolves, and they are hunted actively in 41 of these. They are reported to be safest in certain large reserves, such as the Caucasian, Altai and Pechyora-Ilych reserves, unless they stray outside to prey on livestock (Busch 1995). Wrangel Island in the Arctic Ocean is to be made into a nature preserve with a wolf colony to cull the large herds of Musk Oxen and Caribou (Binder 2000).

Japan's wolves were killed off 100 years ago, and public opinion is negative about their reintroduction. Biologists want them reintroduced to control Japan's overpopulated Sika Deer, which are damaging forests (Binder 2000).

In Kazakhstan and Central Asia, wolves and Saiga antelope have coexisted for eons, but during this century, both have come under heavy hunting. A film, *The Saiga of Kazakhstan* (see Video Section), describes the detrimental effect that wolf control programs have had on Saiga. Wolves are estimated to number between 90,000 and 100,000 in the country, but biologists claim that they kill large numbers of domestic camels, cows and sheep (Binder 2000). Killing wolves is considered a sport in Kyrgyzstan, south of Kazakhstan, where Golden Eagles are used as falconry birds to hunt foxes, badgers, Lynx and wolves (Kinzer 1999).

Mongolia has an estimated 10,000 wolves; China only about 400; and Afghanistan, 1,000 (McNamee 1997). In Tibet, wolves are heavily persecuted by livestock owners, and in the vast Chang Tang Reserve, it is the only species without legal protection. Wolf carcasses can be seen lying next to roads, the animals having been shot by hunters in vehicles, and biologist George Schaller (1998) saw three wolf bodies in a village dump with their jaws wired shut.

India has fewer than 1,000 wolves by some estimates (McNamee 1997), and between 800 and 2,000 in the opinion of Dr. Yadvendradev Jhala of the Wildlife Institute of India. The species is held in great fear by many Indian people, who regard wolves as man-eaters. A century ago, a bounty program resulted in the slaying of 2,600 wolves (Burns 1996). Indian Gray Wolves (*Canis lupus pallipes*) were finally accorded official protection in India in 1992. Rudyard Kipling's *The Jungle Book* tells the story of Mowgli, an Indian orphan raised by wolves. This story may have a basis in fact because many unwanted children are abandoned and placed in the woods, according to *The Wolf Almanac*, and Indian folklore recounts many cases of small children raised by wild wolves (Busch 1995). Such a child was discovered in 1972 at the age of four, apparently having been adopted by a pack of wolves. He was placed in Mother Theresa's refuge for orphans in Lucknow, where he died after seven years (Busch 1995). In spite of such true stories, the average Indian has little but fear and loathing for wolves.

Working to help India's wolves, Dr. Jhala and the Wildlife Institute of India are conducting surveys and appraising their status. For centuries, these wolves have lost habitat and prey species to the country's growing human population. When wolves turned to livestock, persecution followed. Dr. Jhala admits, "It is extremely difficult to conserve a

species when the majority of the human population is opposed to its survival" (*Earthwatch* 1996). Beginning in 1988, Dr. Jhala conducted the first-ever ecological study of Indian wolves for his doctorate at Virginia Polytechnic Institute, with funding from the National Geographic Society and the Smithsonian Institution (*Earthwatch*, 1996). Earthwatch contributed to this research in 1996 with its volunteer program of paying participants in Dr. Jhala's studies. These volunteers followed radio-tracked wolves in the 3,400-hectare (8,401-acre) Velavadar National Park of western India, one of the wolf's last strongholds, observed Blackbuck (*Antelope cervicapra*), Nilgai (*Boselaphus tragocamelus*) and other rare wildlife, and interviewed local farmers through interpreters about their opinions of this species.

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Official protection from hunting and trapping has been accorded very few wolf populations in the world, even where they are on the verge of extinction. In some areas, however, attitudes are changing, most dramatically in the United States, where documentary films and books on their behavior and importance in ecosystems, as well as recordings of their howls can now be seen in bookstores throughout the country. Superb photography illustrates some of these, most notably *White Wolf: Living with an Arctic Legend* (Brandenburg 1992), which provides glimpses into the lives of these fascinating canids in the Canadian north. Reintroductions of wolves into portions of their former range in the American West bode well for their future, unless the prejudices of many livestock ranchers hold sway. Canada may have the largest population of wolves in the world, estimated at between 30,000 and 60,000, with about 4,000 killed for fur each year (Nowak 1999). According to genetic studies, the wolves of southern Ontario and southern Quebec have apparently hybridized with Coyotes, as have wolves in neighboring Minnesota and Isle Royale, Michigan (Nowak 1999).

The ecotourism potential for wolf viewing in many parts of the world is considerable. In Ontario, Canada, visitors to Algonquin Provincial Park have come to hear packs howl since the 1960s. One of the first wolf conservationists, Canadian wolf biologist Dr. Douglas Pimlott, initiated these tours and educated thousands of people about the biology, importance to ecosystems and behavior of wolves. Their value in attracting tourists and contributing to healthy ecosystems far exceeds that of their pelts.

For some other species of wild dogs, attitude changes may not be enough to save them. The Dhole or Asiatic Wild Dog (*Cuon alpinus*), a small canid the size of a Coyote, is native to Asia, from southern Siberia and Central Asia east to India and Indonesia (Nowak 1999). This wild dog has rusty red fur on its upper parts, and white on its chest and belly. Hunting in large packs, Dholes pursue large prey, such as deer, wild pigs, antelope and wild sheep (Nowak 1999). Their social structure is not well known but appears similar to the Gray Wolf's, with a leader and lower-ranking members of the pack (Nowak 1999). Although Dholes seldom take livestock, they have been poisoned intensively and hunted throughout their range; they are also persecuted by hunters who regard them as competitors for game species (Nowak 1999). Dholes have disappeared from much of their habitat, and the *2000 IUCN Red List of Threatened Species* lists the species as Vulnerable, the category below Endangered, indicating a serious decline.

Similar in appearance, the Simien or Ethiopian Wolf (*Canis simensis*) is endemic to Ethiopia. Scientists were unsure in the past whether this animal was a dog, a wolf, a jackal or a fox. Most zoologists now describe it as a wolf. It may be related to the small race of Gray Wolf, *Canis lupus arabs*, that inhabits the Arabian Peninsula across the Red Sea (Nowak 1999). Simien Wolves have a head and body length of about 3 feet, are about 2 feet tall at the shoulder, and weigh from 11 to 19 kilograms (Nowak 1999).

The only wolf not preying on animals larger than itself, such as deer, but living in packs, Ethiopian Wolves feed mainly on small rodents (Gottelli and Sillero-Zubiri 1994). Once their range was far greater, encompassing most of Ethiopia's highlands, but with the development of agriculture and spread of livestock grazing, these wolves lost the majority of their habitat and came under totally unmerited persecution as a threat to domestic animals (Nowak 1999).

Today, they have become restricted to only about six locations in the Ethiopian highlands. Discovered in the Simien Mountains of the northwest, the subspecies, *Canis simensis simensis*, was estimated at only about 40 animals in the 1980s. These wolves are so shy that even in the Simien Mountains National Park they have become nocturnal and stay in burrows when humans are in the vicinity. A crew from Survival Anglia, a British nature film company, spent weeks in the early 1990s seeking to photograph the Simien Wolves in this park, finally having to settle for a long-distance view of a solitary wolf.

Wolves of the Bale Mountains, separated by hundreds of miles, are larger and redder than the Simien Mountains race, and this subspecies, *Canis simensis citernii*, is somewhat more numerous than the other race. Only about 440 Simien Wolves were thought to survive in the Bale Mountains in the early 1990s, with perhaps another 100 in the Simien Mountains (Gottelli and Sillero-Zubiri 1994). Today, estimates are even lower. The Bale Mountains population is estimated at 270 to 370 animals, and 70 to 150 survive in the Simien Mountains (Nowak 1999). This species is thus at the edge of extinction. It is listed as Critical in the *2000 IUCN Red List of Threatened Species*, protected by law in Ethiopia and listed as Endangered on the US Endangered Species Act.

The Wildlife Conservation Society (formerly the New York Zoological Society) has funded research projects on the Simien Wolf for many years, including the studies of two zoologists, Dada Gottelli and Claudio Sillero-Zubiri in Bale National Park. Simien Wolves use their long legs to dig into rodent tunnels, aided by their acute senses of hearing and smell. In Bale Mountains National Park, 14 rodent species are native and three dominant species are endemic to the region, providing a huge food base for the wolves. They specialize in preying on the endemic Ethiopian Mole Rat (*Tachyoryctes macrocephalus*). The mazes of tunnels that these rats excavate aerate the soil, creating rich topsoil which nourishes the lush grasses in this highland ecosystem. The wolves have been seen hunting cooperatively, chasing young antelope and hares (Nowak 1999).

Livestock grazing is allowed in Bale Mountains National Park, and Simien Wolves wander among the cattle, presenting no threat. The wolves in this park have not been persecuted, unlike those elsewhere in Ethiopia, and do not hide from people. Filmmakers shooting the 1990 BBC film, *King Solomon's Mountains*, found the wolves in the open during the day, with adults hunting rodents, and pups playing wrestling games. Like other wolves, they are extremely affectionate with one another and yip in group choruses, sounding like Coyotes. Packs range in size from five to 13 animals, and they defend territories. As in Gray Wolf packs, only one female in the pack breeds, and because of limited habitat, nonbreeding females often stay with the pack, acting as "aunts" instead of leaving to begin their own packs (Gottelli and Sillero-Zubiri 1994).

Domestic dogs, brought into Bale Mountains National Park by the Oromo people to protect their flocks of sheep and cattle from hyenas, are a major threat to this species (Gottelli and Sillero-Zubiri 1994). Wolves have succumbed to diseases introduced by these dogs, which are not fed but set free to fend for themselves. Between 1992 and 1995, the Bale Mountains wolves were decimated by an outbreak of canine distemper acquired from these dogs, reducing the wolves from 240 to 140 (Anon. 1996). In the mid-1990s, more died of rabies. An even more ominous threat is their interbreeding with domestic dogs. The film *King Solomon's Mountains* showed a pack of wild Simien Wolves led by a large black dog that had become the lead female. Another film, *Last Wolves of Ethiopia*, shown on a National Geographic Explorer program in early 1998, recounted the story of a young female Simien Wolf who was ousted from her pack and, after a few years of wandering, paired with a hybrid wolf-dog. In general, male domestic dogs have bred with female wolves, diluting the genetic integrity of this highly endangered animal (Gottelli and Sillero-Zubiri 1994). Some populations of pure Simien Wolves are showing signs of inbreeding, due to their small genetic base. The combination of these threats has led scientists to predict imminent extinction for this beautiful wild dog.

To prevent their extinction, attempts are being made to convince the Oromo tribespeople to control their dogs, but scientists have concluded that captive-breeding may be the only way to save the species (Gottelli and Sillero-Zubiri 1994). There is no possibility of preventing these people from entering the park because of the tribe's centuries-old ties with this region and the potential of bad relations with them that could have serious repercussions on the conservation of park wildlife (Gottelli and Sillero-Zubiri 1994). As a means of controlling the domestic dogs, they could be

neutered, vaccinated against disease, and provided supplemental food to prevent their attacking native ungulates in the park. A vaccination program has recently been carried out in the Serengeti, where domestic dogs transmitted canine distemper that killed one-third of the Lions in the region.

The South American Maned Wolf (*Chrysocyon brachyurus*) has also declined, although not as drastically as the Ethiopian Wolf. This long-legged wolf, weighing only about 44 pounds, hunts in the tall grasses of pampas and llanos, and eats rodents and other small mammals, birds, reptiles, insects, fruit and other vegetation (Nowak 1999). With shaggy red fur and black legs, it has been called a Red Fox on stilts. It is the sole member of its genus and the only wolf in Latin America. The Falkland Island Wolf (*Dusicyon australis*), native to the Falkland Islands off Argentina, became extinct in 1876 after large numbers were killed by fur traders and poisoned by sheep ranchers (Allen 1942). The size of a large Coyote, it may have evolved from foxes. Maned Wolves have been falsely accused of killing livestock, and persecution has caused them to disappear from Uruguay and most of Argentina. They have become rare in Brazil and the rest of their range in south-central South America. The Maned Wolf is listed on the US Endangered Species Act as Endangered and on the 2000 IUCN Red List of Threatened Species as Near-threatened.

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Small predators also underwent persecution in North America in the late 19th and early 20th centuries. Two tiny western foxes that were once considered to be the same species, the Swift Fox (*Vulpes velox*), native to shortgrass prairie, and the Kit Fox (*Vulpes macrotis*) of intermountain and desert grasslands further west, both declined as a result of predator-control programs. Both are shades of tawny, reddish-brown and tan, stand about 1 foot tall, measure 23 to 31 inches long, and weigh less than 5 pounds (Nowak 1999). Although not considered threats to cows or sheep, foxes traditionally have been killed because of their possible threat to poultry. In wilderness areas, they have been killed merely because of predator prejudice. These foxes subsist on small rodents and even insects, such as grasshoppers, and are, therefore, beneficial.

The Swift Fox was named for its speed when streaking across the prairie, clocked at about 25 miles per hour (Turbak 1993). The Canadian populations of the Northern Swift Fox (*Vulpes velox hebes*), native to southern Saskatchewan, Alberta and Manitoba, and the northern edge of the shortgrass prairie that once stretched to Texas, are listed as Endangered on the US Endangered Species Act but are extinct. They disappeared from the wild by the 1930s, after control programs were implemented, and Canadian wildlife authorities have reintroduced Swift Foxes of a related subspecies from Colorado, Wyoming and South Dakota (Nowak 1999). Some reproduction has taken place.

Swift and Kit Foxes began to decline in the 19th century, and Ernest Thompson Seton commented on the vulnerability of this species: "Harmless to man and mankind's interests; and yet he is going fast with all the other innocent and lovely wild things. Yes, faster than most, for he is the least cunning of our foxes--so guileless that he readily takes the poisoned baits used nowadays for killing coyotes" (Seton 1899). In fact, almost none of these foxes was seen in the wild from the early 1920s to the late 1950s, a period of heavy predator-control and poison campaigns (Chambers 1978). Both species have lost the majority of their habitats to agriculture. In North Dakota, the state lists the Swift Fox as an endangered species, with no breeding populations. The last known occurrence of the Swift Fox in this state was in the mid-1980s (Turbak 1993). Further south, this species is known to survive in southwestern Kansas, Nebraska, Montana, Wyoming and South Dakota (Chambers 1978). Some areas of unplowed prairie provide refuge. This fox has been able to colonize on roadsides next to fields and in the few remaining unpoisoned prairie dog towns. Some research has been carried out on the wild behavior and habitat needs of Swift Foxes in the Midwest, and there is room for cautious optimism that increased attention to this little fox will result in strong legislation to preserve it and prevent persecution and poisoning. Author Glenn Chambers was researching an article for *Audubon* magazine, "Little Fox on the Prairie" when he saw a fox family being killed by two farmers who poured gasoline in the den entrance and set fire to it. The male fox, provider of food for the vixen and pups, was found in a ditch a few yards away, his rib

cage ripped out by a high-velocity bullet (Chambers 1978). The vixen had escaped the burning den with two of the pups, but the farmers shot her as she watched over them (Chambers 1978).

Kit Foxes occupy deserts, dry grasslands, and montane areas with scattered trees from Utah north to Washington state and west to California. They prey mainly on kangaroo rats and other small rodents. A subspecies from southern California known as the San Joaquin Kit Fox (*Vulpes macrotis mutica*) is listed on the US Endangered Species Act as Endangered. Settlement and farming of the region reduced their habitat, and predator control has eliminated entire populations, causing them to dwindle to a few thousand animals. This delicate, little buffy-yellow fox is now restricted to a tiny remnant of its once immense habitat of mixed grasslands, deserts and shrub in California. Their original range stretched from San Joaquin and Stanislaus counties in the north to Kern County in the south. They probably numbered at least 12,000 prior to settlement (Turbak 1993). Tame and trusting, they became targets for hunters; even schoolboys with rifles have been seen shooting them as sport (Turbak 1993). One hunter was seen shooting a pair's tiny cubs one after another as they played at the den entrance, then killing the mother when she emerged to protect them (Turbak 1993).

Foxes have been considered threats to livestock and domestic poultry by European settlers. The Cape Fox (*Vulpes chama*) of dry country in southern Africa was the object of control programs by European settlers under the misapprehension that it preyed on domestic poultry. This resulted in declines in the numbers and range of this small, silvery-gray fox (Nowak 1999). The Hoary Fox (*Lycalopex vetulus*) of south-central Brazil, an endemic species of savannah grasslands, is persecuted by local people for presumed predation on domestic fowl (Nowak 1999). Although very shy, it courageously defends itself and its young when threatened (Nowak 1999). Little is known of its status, listed as Data Deficient by the IUCN. Argentine Gray Foxes (*Dusicyon griseus*), native to Patagonian grasslands, have been poisoned by livestock owners who distribute strychnine bait. Their populations have declined in many areas as a result, and thousands of non-target mammals and birds have died from these poisons. Such poisoning is illegal in Argentina, and efforts are being made by biologists and conservationists to stop this senseless killing.

Eight species of foxes are listed as Data Deficient by the 2000 IUCN Red List of Threatened Species, and two species as Conservation Dependent. This is an indication of the lack of research on these ecologically important species, which perform the important role of consuming large numbers of rodents. Red Foxes (*Vulpes vulpes*), native to North America, Eurasia and northern Africa, have been persecuted as well, hunted as sport in England and parts of the United States, and killed by many farmers and livestock owners. One Midwestern town even rounded up these foxes once a year and beat them to death with sticks. After a *Life* magazine article describing this cruel persecution and the resulting public outcry, it ended. Fox hunting in England may end in the near future as the Parliament has voted to stop this cruel activity.

Bears

The immense Grizzly or Brown Bear, which once roamed the prairies and woodlands of western North America, inspired awe and fear in explorers and settlers alike. For thousands of years, Native Americans revered this bear. The Cree called it a four-legged human, and other tribes considered it a brother or cousin. They felt a kinship based on its intelligence and respected its great strength. They could not easily hunt it with bows and arrows, and when wounded, it showed great courage defending itself, able to cause severe injuries or death with its 5-inch claws.

The Grizzly reigned as the fearsome and unchallenged king of all wildlife on the continent, numbering at least 100,000 prior to the arrival of Europeans (Nowak 1999). These extremely adaptable bears lived in every western North American habitat except deserts. Arriving from Asia by way of the Bering Strait 12,000 years ago when sea levels were lower, Grizzlies gradually colonized western regions, the biggest of an array of large carnivores that inhabited the continent at that time, including dire wolves, hyenas and sabre-toothed cats. They survived the frigid and

harsh climate of the Pleistocene Ice Age. They thrived in prairies, especially those with scattered woodlands. In the 1500s, their range extended from the Arctic tundra south through the shortgrass prairie to the pine forests of northern Mexico, and west to the Pacific Ocean. In fact, the original range of the Grizzly Bear may have been larger than previously thought, reaching east to the Atlantic in Canada. A Grizzly skull has been found in a midden of the late 18th century, and pelts of these bears reportedly were taken in Labrador as late as 1927 (Nowak 1999).

Grizzly Bears of North America and Brown Bears of Eurasia were previously considered separate species, but today they are classified as a single one, *Ursus arctos*. The bears that live along the southern Alaskan coast and offshore islands, such as the Kodiak, are the world's largest carnivores (Nowak 1999). Weighing up to 780 kilograms (1,716 pounds), Kodiak Grizzlies have a shoulder height up to 1,500 millimeters (58.5 inches, or almost 5 feet), and a body length ranging up to 2,800 millimeters (109.2 inches, or 9 feet) (Nowak 1999). Standing height can be almost 12 feet. Adult males are larger than adult females. North American Grizzlies are far larger than bears of the same species native to southern Europe, which average only 70 kilograms (154 pounds) (Nowak 1999). Grizzlies of the northern portion of the lower 48 states are only somewhat smaller than the Alaskan bears, while those native to Arizona, New Mexico and Mexico, all now extinct, were smaller still, weighing less than 1,000 pounds.

Reproducing at a very slow rate, Brown Bear females have an average of two cubs only once every two to four years, and the cubs stay with their mother for this entire period (Nowak 1999). On occasion, only one cub is born, and sometimes up to four. If the mother is killed at any time before the cubs leave to be on their own, the cubs will also die because they are unable to fend for themselves, destroying two generations. The training period of these bears is extremely long, an indication of their slow maturation and the complexity of learning about food sources and other keys to survival. Another reason for this long apprenticeship is the potential of attacks by male Grizzly Bears. Until a young bear is 3 years old or older, it is not large enough to withstand an attack by an adult male, requiring the protection of its mother. Males continue to grow until they are 10 to 11 years old, and may provoke fights with younger bears to chase them from the territory, which prevents inbreeding. Females remain fertile until well into their 20s. Females in the Yellowstone region are known to live to be 25 years old, and Grizzly Bears may have the potential to live 50 years in captivity (Nowak 1999). They do not reach sexual maturity until they are at least 4 to 6 years old. These bears have a low natural death rate, and when combined with their slow reproduction, they are very vulnerable to extinction should they suffer high mortality.

A large habitat requirement is another aspect of their vulnerability. In the Arctic, a single Grizzly requires more than 100 square miles of tundra, and in the Yellowstone area, each bear occupies about 88 square kilometers (Nowak 1999). In regions where they are distributed sparsely, they can be eliminated easily, and even where they are more numerous, persecution and trophy hunting have caused local extinctions.

The strength, intelligence and size of the Grizzly, which have served it so well for thousands of years, were no match for European guns. Explorers, trappers and, later, settlers, slaughtered thousands of Grizzlies, killing them on sight. The first to disappear were the bears of the Great Plains, where the landscape was open and provided little cover. In some cases, these bears showed almost mythic strength upon being shot. Meriwether Lewis of the Lewis and Clark expedition of 1804 reported that one wounded bear ran at a fast clip for nearly a quarter of a mile before it fell dead after being shot through the heart (Peck 1990). Persecution of bears often includes the killing of their cubs. Early in the 20th century, President Theodore Roosevelt refused to kill bear cubs pointed out by his hunting guide, and when this was publicized in newspapers, he became a folk hero as a result. Toy manufacturers took advantage of the story by producing stuffed animal "Teddy Bears," which remain popular today. President Theodore Roosevelt left a legacy of destructive trophy hunting, however, including the killing of many adult bears.

Settlers moving into the West hunted these bears, and during the late 19th and early 20th centuries, government predator-control agents began campaigns to eliminate these bears. Much of the zeal with which the bears were slaughtered was based on a misconception: they were thought to be vicious man-eaters. In fact, they are mainly vegetarian and only occasionally kill animals for meat. The most common animals killed by Grizzly Bears are various types of rodents, such as ground squirrels and, in some areas, fish. Elk calves are killed as part of their diet in some

areas. The staple foods of the Grizzly diet are green shoots, sedges, clover and lilies early in the spring and, later in the summer, berries, roots, fruit, acorns and nuts, with occasional rodents (Peacock 1996). These bears do not consider humans to be natural prey, and attacks are rare. Prejudices dominated, however, and hunters who killed them were considered heroes and rewarded with bounty money. To protect their livestock, ranchers insisted that government hunters kill off every Grizzly Bear, and after several centuries of uncontrolled hunting, trapping and poisoning, the bears became extinct in their vast original realm south of Canada except for a few hundred animals protected in Yellowstone and Glacier National Parks.

All 26 subspecies of Grizzly Bears south of Canada and Alaska, except *Ursus arctos horribilis*, became extinct by the 1950s, and some disappeared during the 19th century. The latter subspecies, named from specimens obtained in northeastern Montana, barely survived. In fact, *Ursus horribilis* was the species' scientific name until recently, an indication of the prejudice against it. Now considered a subspecies, *Ursus arctos horribilis* is listed on the US Endangered Species Act as Threatened, and this subspecies is used to indicate all Brown Bears in the lower 48 states.

Grizzly populations still occupy only 1 percent of their original range in the lower 48 states and number fewer than 1,000 (Nowak 1999). This includes Yellowstone and Glacier National Parks, whose protection prevented their total extinction south of Canada, a few wilderness areas in Idaho, western Montana, and Washington. Human activities such as road building disturb them and cause them to desert otherwise prime habitat. They are no longer the fearless animals that Lewis and Clark encountered, but have become very shy outside of national parks after centuries of persecution. Although they may pose a potential threat to humans who enter their last retreats, people are a far greater threat to them.

Their rugged wilderness habitat in Montana is being developed rapidly, and Grizzly populations, which had risen somewhat after their listing on the US Endangered Species Act, are now in danger of disappearing again. Added to this, some ranchers in the region still persecute them. A prime habitat for Grizzly Bears, the 329,000-acre Swan Valley of northwestern Montana borders the Bob Marshall Wilderness area, a country of open grassland and forest with breathtaking mountain views. Until recently, this landscape remained almost unchanged from its original state. Ranching, road building and other activities, and an increasing human population in this region, however, are now ruining its wilderness character and threatening the Grizzlies (Pelletier and Servheen 1995). Through cooperation with local residents, the Fish and Wildlife Service is identifying important habitat areas and linkage corridors for the Grizzly Bears in this part of Montana to prevent conflict with humans. These zones would be a link between the small population of bears in the Mission Mountains to the west and those in the Bob Marshall Wilderness area (Pelletier and Servheen 1995). The land is a checkerboard of ownership by private individuals, state, federal and corporate entities; in an unusual project, all private and public lands will be included in a management plan, with input by local citizens (Pelletier and Servheen 1995). These bears remain under the continual threat of being shot by ranchers fearful for their livestock and apprehensive about possible land restrictions in areas where Grizzly Bears are resident. Sport hunting of this small population is also allowed.

Grizzly Bears are still depicted in the media as dangerous man-eaters, resulting in a prejudiced view by the American public. A number of television programs produced by the National Geographic Society, CBS, the Discovery Channel, Fox and others have perpetuated this image. With titles such as "Dangerous to Man!," "Bear Attacks" and "Man-eaters," these programs often demonize the bears and interview people who have been attacked while camping in the bears' habitat. Very few such attacks have occurred, and almost none has been fatal. After centuries of being shot at and harassed by humans, Grizzly Bears tend to avoid people. When camping inside national parks where Grizzlies are resident, special precautions must be taken, and it should be kept in mind that the parks are *their* home, and humans are the intruders. The national parks, where hunting is banned, are their only refuge. Some documented cases of attacks have occurred when a mother bear felt her cubs were threatened by humans, especially if they approached the cubs. Mother Grizzlies may be the fiercest protectors of their young in the animal world, a trait that should be admired from a distance. Television programs that sensationalize the potential threat of animals do not note the hundreds of Grizzly Bears killed by humans every year in North America. They also fail to show the many bears that are merely wounded by hunters and suffer a long death, or the cubs that are orphaned and die of starvation.

The irrational fear and hatred aroused by misinformation often result in mortalities to these bears by armed tourists and residents in their range who misinterpret the bears' behavior. Many bears have had to be destroyed because tourists fed them, and they became fearless, capable of swiping food or destroying tents and property. Information on avoiding Grizzly Bear encounters is available from National Park Service rangers, other federally employed biologists, and many conservation and humane organizations. Only with tolerance, respect and an informed public concerned about preserving these bears can they survive.

Ecotourism in the threatened and unprotected portions of the Grizzlies' range is in the early stages of development. Portions of the revenues from tours could be spent to acquire habitat and conduct local education programs. In Alaska, this has been highly successful, with tourists coming from around the world to see these bears fishing for salmon. Montana has some of the most spectacular scenery on the continent, sweeping vistas and vast open spaces that rival those of East Africa. They could be a magnet for tourists anxious to see Grizzly Bears and other native wildlife against a background of snow-capped peaks. Unfortunately, much of their prime valley habitats have been taken over by ranchers and private homes. The tourism in the area has been of a highly commercial and exploitative nature. For example, in some Montana towns, tourists see many stuffed Grizzlies in local businesses, and one can have one's photograph taken posed in a cutout painting of a Grizzly Bear appearing to attack.

If sizeable portions of Montana valley habitats were acquired for the Grizzly Bears, tourists could be taken on van tours, similar to those that now operate in East Africa. For the more athletic, groups of tourists could be taken on guided walks into the high country. Portions of the funds from the tours could be used to purchase privately owned land, to fund public education about these bears and their survival, and to compensate ranchers for livestock losses. The Nez Perce tribe is working with the Fish and Wildlife Service on a project to reintroduce the Grizzly Bear into the Selway Bitterroot wilderness of Idaho and Montana, another magnificent area for ecotourism (Robbins 1997).

Plans to reintroduce Grizzlies into the 1.9 million-acre San Juan National Forest in southwestern Colorado have sparked controversy and prejudice (Papich 2000). Decades after Grizzlies disappeared from the state, the Fish and Wildlife Service reintroduction project has been applauded by local conservation organizations, such as the Colorado Grizzly Project, and opposed by ranchers and even hiking groups who fear attacks (Papich 2000). Returning the Grizzly Bear to portions of its former range in the lower 48 states, even into immense wilderness areas, will be a slow process, possible only after extensive education and a change in the accepted practice of releasing livestock in national forests without sheepdogs, herders or other protections.

The Mexican Grizzly (*Ursus arctos nelsoni*) persisted in the remote mountains of northern Mexico until it was poisoned, shot and trapped to extinction in the late 1960s (Day 1981). This race was smaller than northern Grizzlies, weighing about 700 pounds. Quite numerous and widespread, the Mexican Grizzly had an enormous range in the pine forests of the northeast until efforts began to exterminate it. Only about 30 animals remained by 1960. Although some individuals tried to protect these last bears, others set out to destroy them, and a campaign of poisoning, trapping and hunting, sponsored by ranchers, resulted in the killing of the last animal in the early 1960s (Day 1981). In 1968, biologist Carl Koford conducted a three-month survey in the isolated mountain canyons of Chihuahua where they had last been seen, and he saw no sign of Grizzly Bears (Day 1981). Subsequently, they were declared extinct.

Hunters in many parts of the Grizzly Bear's range in Canada kill the species in such numbers that many biologists consider it to be threatened there. The Canadian Broadcasting Company's "Nature of Things" program produced a film, *Grizzlies: Losing Ground*, which painted a dim picture of this bear's future in Canada. They are killed by ranchers and hunted for trophies and for their gallbladders, which are used in Traditional Medicine. Many are killed by park rangers merely because they come too close to tourists. They are being driven from their wilderness homes by unrestricted logging and mining as well.

Brown Bears are already extinct in North Africa, Austria, Belgium, Denmark, Germany, Israel, Jordan, Lebanon, Liechtenstein, Luxembourg, the Netherlands, Portugal, Switzerland, Syria and the United Kingdom. They are

endangered in the few countries where they remain in Western Europe. In Scandinavia, there may be as many as 700 Brown Bears, with populations of less than 1,000 in Slovenia, Romania and Bulgaria, and possibly 2,000 in the former Yugoslavia (Nowak 1999). Fewer than a dozen Brown Bears survive in France's Pyrenees Mountains where, despite protests from around the world, a major highway was built through the center of their habitat. Brown Bears are heavily persecuted throughout Eurasia for body parts, especially gallbladders. They are considered endangered in Central Asia's mountains where *Ursus arctos isabellinus* occurs, a CITES Appendix I race, and the Tibetan Brown Bear (*U.a. pruinosus*) is listed as Endangered on the US Endangered Species Act. Outside Russia, only about 4,500 to 7,600 of these bears remain in China, and isolated populations survive in Mongolia, northern Japan and Turkey (Nowak 1999).

The South American Spectacled Bear (*Tremarctos ornatus*) is classified as Vulnerable by the IUCN, with persecution by ranchers a major cause (Nowak 1999). These 300-pound black bears have large circles of white fur around the eyes and white circular markings on the neck and chest. They feed on fruit, bamboo hearts, corn, and other vegetation with about 4 percent of their diet composed of rodents and insects (Nowak 1999). Spectacled Bears are native to the Andes of western Venezuela, Colombia, Ecuador, Peru and western Bolivia. This high-altitude, shy bear is active mainly at dusk and at night and poses no threat to livestock, yet ranchers and landowners have persecuted and hunted it in Peru and other countries because of the mistaken belief that it kills livestock (Nowak 1999).

With the destruction of their high-altitude, humid forest and grasslands replaced in many areas by agriculture, some bears have raided corn fields to survive; many of these bears have been shot by farmers (Nowak 1999). This bear is declining throughout its range, and few areas remain where it can forage without being hunted, either by livestock ranchers, farmers, or for its body parts to sell to Asian markets for traditional medicine. Only a few national parks exist within its range, and populations have become fragmented and isolated from one another. A biological study of these bears in Bolivia by British zoologist Susanna Paisley is uncovering new information about their natural history and the threats posed by radio-tracking. A film about her study and the local people helping her, *Bears of the High Andes*, was shown on a National Geographic Explorer television program in 1998, providing a unique glimpse into the lives of these rare bears.

Otters

The Eurasian or Common Otter (*Lutra lutra*) has been persecuted since the 13th century in Britain, and a dog, the Otter Hound, was bred to hunt it (Chanin 1985). This otter was officially designated as a pest by a 1566 English law, which authorized local constables to offer bounties for their destruction because of their supposed predation on fish (Chanin 1985). At that time, fish ponds on the estates of the wealthy were stocked to supply the tables of the affluent (Chanin 1985). They were also thought to be competitors with fishermen for game fish such as trout. For hundreds of years, high bounties were paid, contributing to their disappearance from many areas (Chanin 1985). Hunting otters with dogs was the only effective manner of pursuit, and in the 16th century, the Assembly of Norwich decreed that fishermen should conduct two or three otter hunts per year to avoid being fined (Chanin 1985). Estate game keepers continued over the centuries to persecute these playful animals in the British Isles, pushing them close to extinction.

In Europe, prejudices are gradually fading, but the Common Otter, despite its name, is no longer common. It has declined drastically in Britain and most of western Europe, and is rare throughout much of its range elsewhere in eastern Europe and Asia as a result of continued persecution, fur trapping, habitat loss and chemical contamination of its environment (Chanin 1985). This species is listed on Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the category designating species in danger of extinction, and in which commercial trade is not allowed between the Party nations. The *2000 IUCN Red List of Threatened Species* classifies the species as Vulnerable. An increasing number of people are becoming acquainted with this delightful

animal. Not until 1978 did the otter receive official protection from hunting and trapping in England and Wales, and in the intervening years, a strong "Save the Otter" campaign, begun by Friends of the Earth, has had positive results (Chanin 1985). Surveys completed during the 1970s found that otters had become extremely rare in England, and were in steep decline. In parts of southwestern England, otters are now increasing with legal protection, and they are being reintroduced into areas where they had been hunted or trapped out. In 1982, protection was added in Scotland, in spite of continued opposition from otter hunters and those who harbored old prejudices (Chanin 1985). In the Netherlands, reintroductions of otters are returning them to long vacant habitat.

Izaak Walton's views of the otter were not scientifically refuted until the 20th century. Best known as the author of the 17th century book, *The Compleat Angler*, a compendium of information about fishing in England, he quoted a fisherman of the times: ". . . my purpose is to bestow a day or two in helping to destroy some of those villainous vermin; for I hate them perfectly, because they love fish so well, or rather, because they destroy so much, indeed, so much, that in my judgment, all men that keep otter-dogs ought to have pensions from the King to encourage them to destroy the very breed of these base otters, they do so much mischief." Scientific studies of otter diets established that these animals did not pose threats to game fish populations. A 1942 study found that North American River Otters (*Lutra canadensis*) prefer slow-moving forage fish, such as suckers, mudminnows and sticklebacks, to fast-moving trout. Some game fish are taken, but subsequent studies established that such fish make up a small percentage of the otter's diet. A 1955 study by biologist Richard Ryder examined stomachs of River Otters (*Lutra canadensis*) trapped in Michigan and found forage fishes (primarily mudminnows) in 56 percent, crayfishes in 22 percent, amphibians in 17 percent, insects in 13 percent, and trout in 13 percent of all otters examined. Ryder concluded that otters are opportunistic feeders, catching prey items in proportion to their abundance and in inverse proportion to their swimming ability. Thus they benefit game fish by removing overpopulated fish species that compete with trout for food from streams and waterways. In a dramatic demonstration to illustrate its food preferences, a River Otter was placed in a large tank with both trout and crayfish. Ignoring the fast-moving trout, the otter went directly for the crayfish.

Other species of otters also have been found to prefer slow fish, especially bottom-dwellers not desired by either sport or commercial fishermen. Yet they are still being persecuted in many parts of the world. The Marine Otter (*Lutra felina*), a small otter native to the Pacific coast of western South America, has been so persecuted by fishermen for alleged damage to fisheries (Nowak 1999) that it is now listed as Endangered on the 2000 IUCN Red List of Threatened Species. The Sea Otter (*Enhydra lutris*), protected from previous hunting for the fur trade, began to recover its numbers in the North Pacific, but has recently declined to Endangered status as well as a result of persecution by fishermen, oil spills and predation by Killer Whales.

One young California Sea Otter filmed by Jacques Cousteau became very tame, cavorting with the cameramen and allowing itself to be petted. A few days after the Cousteau crew left the area, this young otter washed up dead on the beach, having been shot. It was conjectured that this friendly otter had approached a boat with fishermen who shot it. Fishermen have overharvested abalone beds for these extremely valuable mollusks and blamed Sea Otters for depleting them, yet abalone form only a small part of their diet. Some Sea Otters eat no abalone at all, specializing in other foods. Moreover, they eat sea creatures that prey on the kelp, without which abalone and other wildlife would not flourish. This species is considered a positive element in the ecosystem.

River Otters in North America were persecuted by European colonists, many of whom shot them on sight. These animals, described by early explorers as highly visible, bold and playful, became shy, secretive and nocturnal after centuries of persecution and fur trapping in the United States and Canada. By the 1950s, they had disappeared altogether from vast areas in the country, from Pennsylvania south to northern Georgia and throughout the Midwest south of Michigan and Minnesota, west to Utah (Nilsson 1985). Beginning in the 1970s, reintroductions of otters live-trapped in Canada, Michigan and other areas where they are still relatively common, have taken place in West Virginia, Arizona, Tennessee, upstate New York, Missouri and several other Midwestern states. In some cases, the reintroductions have failed, but for the most part, the North American River Otter is on the way to reoccupying its original range.

Otters are not regarded benignly by fish hatchery managers and commercial catfish farmers in the South. State Fish Departments and the Fish and Wildlife Service operate hundreds of hatcheries throughout the country, raising trout and other fish. Many of these are non-native species, such as Brown Trout, a European species, or native species, such as Rainbow Trout, that are released far from their natural ranges for the benefit of sport fishermen. These hatchery programs are regarded negatively by many ecologists who have documented that the released fish often cause great damage to ecosystems, outcompeting native fish and introducing diseases. Yet state and federal agencies conduct control programs on otters who raid their ponds. Rather than screen the ponds from otters, who can hardly be blamed for finding hatchery fish easy to catch, these authorities have had laws changed in many states to allow shooting and trapping of otters that come onto hatchery property. Placing screening over fish ponds and hatcheries--and fencing them--will prevent otters, as well as fish-eating birds such as egrets, herons, Ospreys and Bald Eagles, from preying on the fish being raised. This should be carried out instead of lethal methods, which also sometimes kill protected waterbirds. Such control programs do not achieve success in any case because even if depredating River Otters are killed, other otters will be attracted to the ponds, replacing those killed.

Eleven species of otters are listed by the *2000 IUCN Red List of Threatened Species*, four as Endangered, three as Vulnerable, one as Near-threatened, and three as Data Deficient. This represents a high rate of threat, 85 percent, as the otter, or Lutrinae family, has only 13 species. Otters tend to be thinly distributed in their ranges, wide-ranging, slow-reproducing and long-lived--all qualities that make them vulnerable to population declines.

Seals and Sea Lions

The Caribbean or West Indian Monk Seal (*Monachus tropicalis*) was the first animal seen by Christopher Columbus in the New World in the late 15th century, and his crew slaughtered these seals on an islet off the coast of Hispaniola (Day 1981). The only seals native to the Caribbean, they were quite large--6.5 feet long (Nowak 1999). They were heavily exploited beginning in the 17th century for their oil, which was used as a fuel for lamps and, later, for their fur. Scattered populations of the Caribbean Monk Seal survived on islets and beaches far from human habitation until the 20th century (Nowak 1999). Even these last seals were persecuted by fishermen who regarded them as competitors. The last known population of these seals lived on the Triangle Keys, small sandy islets off the Yucatan Peninsula of Mexico, and in 1911, fishermen slaughtered every one of the remaining 200 Monk Seals (Day 1981). Although a few seals were seen after that time, including the sighting of a small colony on a bank midway between Jamaica and Honduras in 1952, an aerial survey of all possible habitats carried out in 1972, and a 1980 expedition, failed to find any sign that the Caribbean Monk Seal remained alive (Nowak 1999). The species was officially declared extinct a few years later, although a few recent reports have given hope that the species may have reappeared (Nowak 1999).

The Japanese Sea Lion (*Zalophus californianus japonicus*), a subspecies of the California Sea Lion, was native to Japan, North Korea, and South Korea, and shooting by fishermen played a major role in its extinction (IUCN 1978).

Commercial fishermen have been responsible for the near-extinction of the Mediterranean Monk Seal (*Monachus monachus*). Once common along the coasts of the Mediterranean Sea, and along the Atlantic coasts of northwestern Africa, this seal is on the verge of extinction, its status listed in the *2000 IUCN Red List of Threatened Species* as Critical. Although resort and industrial development contributed to its decline, shooting by fishermen has been the major cause (Nowak 1999). Many seals drown when they become entangled in fishing nets as well. In past centuries, these seals could be seen on beaches along the Mediterranean, where they would have their pups. After severe persecution, however, they began to hide in the remote caves along the coasts and on uninhabited islets (Attenborough 1987).

In 1981, Greek fishermen threatened to kill off all the remaining Monk Seals on Greek shores if they were not paid compensation for the fish the seals would eat. The Fauna and Flora Preservation Society (now Fauna and Flora International), a London-based organization, raised the money after public appeals in newspapers, which amounted to several thousand dollars.

Fishermen throughout the region became even more intent on eliminating these seals after commercial factory fishing ships began to deplete fish stocks in the Mediterranean.

In spite of legislation protecting the seals, fishermen continue to shoot these seals, which are suffering from lost food supply in most areas. The once pristine waters are now overloaded with sewage and contaminated by chemical and oil spills (Attenborough 1987). The total population of this seal was fewer than 350 in the late 1980s (Attenborough 1987). A 1996 survey found 288 animals, mainly along the African coast in the Atlantic (*BBC Wildlife* 1996).

Unfortunately, the largest population in the African islands was decimated in 1998 by a die-off, apparently caused by toxic chemicals.

Mediterranean Monk Seals are extinct in Cyprus, Lebanon, the Canary Islands and Syria, and probably extinct in most other Mediterranean countries. Researchers are conducting radio tracking studies of young seals to discover breeding calves with the goal of reintroducing the seals in the Canary Islands where they have been extinct for over 400 years (*BBC Wildlife* 1996).

The attitude that seals and other fish-eating animals are depriving humans of food is prevalent in many parts of the world and has resulted in the killing of countless fish-eating mammals and birds. The Marine Mammal Protection Act (MMPA) of 1972, which prohibits killing marine mammals in US waters, allows killing of "depredating" seals and sea lions under permit. Such permits are given to kill seals destroying nets to steal fish and/or having a deleterious effect on commercial fish species through their predation. Some Alaskan fishermen, who net the largest fish catches in the world, still resent that the fish are taken by seals and other marine mammals in their waters, and illegal shooting of these protected mammals frequently occurs. Sea lions along the coasts of California, Oregon and Washington have been shot illegally by the hundreds since the MMPA went into effect, and many permits have been given for legal killing. These killings have had a negative effect on many populations of these sea mammals.

Wild Cats

While it may be difficult for most Americans to think of the regal Cheetah as vermin, in the southern African country of Namibia, cattle ranchers treat these endangered and beautiful cats as enemies, trapping and shooting, and even poisoning them. White South Africans have acquired huge landholdings to raise cattle at the expense of the environment in this arid land, fencing off large sections from native wildlife. The majority of Namibian ranchers lack compassion or respect for this graceful cat and, without any compunction, kill females, young kittens and any adult Cheetah on their properties, whether or not the animals pose a threat to their livestock. One rancher told American conservationist Laurie Marker, who is seeking to reverse this trend, that he personally had killed 160 Cheetahs on his property. Marker has taken on the daunting task of trying to convince ranchers of the importance of protecting these endangered cats.

Cheetahs are the world's fastest land animal, reaching 70 miles per hour in pursuit of gazelles, foals of large ungulates, such as zebra and, occasionally, smaller mammals, such as hares. For hundreds of thousands of years, they have adapted to changes in the environment of their once vast range, and are superbly designed as predators. In the North American Pleistocene, more than 10,000 years ago, a cheetah-like cat ranged over the continent, preying on the Pronghorn, the world's fastest hoofed animal. This cat became extinct, perhaps as a result of hunting by Pleistocene hunters.

Prior to the 20th century, Cheetahs remained common in savannah habitats south of the Sahara, and in 1900, their population may have totaled 100,000 animals. Since then, a steady decline in their populations and a shrinking of their range have placed them in endangered status. Cheetahs underwent a dramatic decline in the 1960s when spotted cat fur became fashionable. US imports were stopped when the species was listed on the US Endangered Species Act in the late 1960s, and commercial international trade became illegal when Cheetahs were included on Appendix I of CITES in the early 1970s. Killing them for the fur trade devastated their populations because they are distributed so sparsely over their range--even a kill of a few thousand in each country endangered them. Added to this, they have endured persecution by livestock herders and ranch owners, combined with loss of savannah habitat and their prey species. In areas where there are large populations of Lion and hyena, adult Cheetahs and their cubs are preyed upon by the latter predators, who also steal their kills (Hunter 1998). Trophy hunting also has taken a toll on these cats.

By the early 1970s, they numbered only 15,000, according to Peter Jackson, head of the Cat Specialist Group of the World Conservation Union (Newman 1997). Cheetah biologist Luke Hunter (1998) estimates their total population today at a maximum of 12,000 animals, with safe populations in only five or six of the 26 countries where they may be present. In parts of southern Africa, Cheetahs were numerous until a few decades ago when white ranchers fenced off thousands of square miles of grassland. Within these ranches, which cover much of the land area in Namibia and Botswana, landowners killed off predators as well as native ungulates. The once abundant wildebeests, zebras, oryx, gazelles and antelope that migrated in the hundreds of thousands in this region became reduced to scattered numbers.

Namibia, with its arid, open habitat, still has about 2,500 Cheetahs, perhaps the largest population in Africa, but at the present rate of killing by ranchers, they will be extinct there within a decade. In the 1980s, 1,000 Cheetahs were killed by ranchers, and the Namibian Cheetah population dropped about 50 percent between 1984 and 1994 (Schick 1994).

A 1997 PBS television special, *In the Wild*, featured actress Holly Hunter traveling to southern Africa in search of Cheetahs. A visit to Namibia's Etosha National Park, where these cats were once fairly common, failed to find a single Cheetah, in spite of expert help from native Bushmen trackers. An outbreak of Anthrax, spread by domestic livestock, had recently occurred in the park. Some 20 Cheetahs had died, and the disease also killed elephants and other wildlife.

Marker co-founded the Cheetah Conservation Fund in 1990, and since it has been in operation, it has changed many ranchers from Cheetah-haters to Cheetah-protectors. Few knew of the Cheetah's worldwide plight, and many cooperated when informed. One successful strategy to protect livestock introduced by Marker has been the use of donkeys to guard cattle herds. These animals easily fend off Cheetahs with their powerful kicking hooves (Schick 1994). Baboons have also been trained to guard livestock because of their aggression toward Cheetahs (Schick 1994). Recommendations such as bringing cows closer to homesteads during calving season have also been made to ranchers (Schick 1994). Many ranchers did not realize that Cheetahs prey on livestock only when their own natural prey, primarily gazelles and Impalas, have become scarce because of killing or fencing by the ranchers (Schick 1994).

Within the past few years, many ranchers have been convinced to use box traps to capture Cheetahs unharmed instead of killing these cats. Marker ear-tags the animals and returns them to local protected areas (Schick 1994), or arranges to have them moved. In the early 1990s alone, 75 Cheetahs were removed from ranches where they were being persecuted and were introduced into other areas. One farmer caught a female with five cubs and wanted to keep the cubs as pets. Marker convinced him to give up the female and four of her cubs, but he insisted on keeping the largest one. Although keeping Cheetahs as pets is not good for their welfare or conservation, it is an improvement over their wholesale destruction. Leghold traps are used by some ranchers, and in 1996 Marker acquired two 3-week-old Cheetah cubs whose mother had been killed in one of these traps. They will have to remain in captivity because of their young age when orphaned.

An organization known as Africat has sponsored the capture and transport of 100 wild Namibian Cheetahs to South Africa. This organization reports that ranchers capturing Cheetahs in large box traps often sell them to breeders rather than reintroduction programs, a practice that it does not condone. Translocating adult Namibian Cheetahs to South African reserves where they had become extinct has been very successful. In one case in 1995, three males were

released in Madikwe Game Reserve where four other Namibian Cheetahs had been introduced in 1994, and all survived. A male, four females and five cubs were released in Pilanesburg National Park in 1995, and there were no fatalities (*Oryx* 1996). Most of South Africa's Cheetahs were eliminated by Boers in the 19th century, and the government is now returning them to their original range within national parks. Outside of national parks, they may be in as great danger as the Cheetahs further north.

Lions have continued to decrease in Africa south of the Sahara from a variety of factors, of which persecution by livestock raisers is a major one. Outside of national parks, these big cats have become rare or absent, and in 1996, the species was first listed by the IUCN as Vulnerable. The *2000 IUCN Red List of Threatened Species* also classified the African Lion as Vulnerable. They disappeared long ago from areas with scarce ungulate populations and large numbers of herdspeople who persecuted them, such as the arid regions of southern Africa and the sub-Saharan. In recent years, they have declined throughout the continent. Outside of parks, the Maasai and other tribes with livestock herds routinely kill Lions and other predators to protect their cattle (Hunter 1998). Lions are particularly vulnerable to persecution and hunting because, like wolves, they hunt in groups. When persecuted, they may not be able to survive hunting alone or in pairs.

Some parks are not large enough to maintain healthy Lion populations, and when they leave parks to wander in search of prey, they are often killed by ranchers or hunters. In the southern African country of Namibia, for example, the 300-mile-long, 25-mile-wide Skeleton Coast National Park skirts the Atlantic coast. Two filmmakers, Jen and Des Bartlett, chronicled the disappearance of Lions from the park. A small population of Lions inhabited the park in the early 1990s, and one pair was radio-collared by park rangers. Shortly thereafter, both Lions were shot dead by livestock herders when the Lions left the park. The Bartletts had known the female for five years, and she was pregnant with four cubs when shot. The killing of Lions to protect livestock is legal in Namibia, and with the death of the last specimen in the park, an elderly and emaciated animal shown in their National Geographic Society film, *Survivors of the Skeleton Coast*, these great cats are now extinct in the area.

Wild cats have been hunted heavily and killed off throughout the Middle East. Leopards (*Panthera pardus*) still persist in small pockets, escaping detection with nocturnal hunting, and hiding in rock crevasses and trees during the day. As a general rule, wherever Leopards are seen in the Middle East, they are shot or poisoned as potential threats to the ubiquitous sheep and goats. In a few areas, such as remote portions of the Saudi Arabian Peninsula, Leopards are protected in national parks. These Leopards are very adaptable in their prey and can subsist on small animals, such as hares--unlike the Lion, which requires larger prey.

Eight subspecies of Leopards are listed on the *2000 IUCN Red List of Threatened Species*, all in Endangered or Critical categories. They range from North Africa across Asia to Java, Indonesia. Races such as the South Arabian Leopard (*Panthera pardus nimr*) of Saudi Arabia, United Arab Emirates and Yemen; North Persian (*P.p.saxicolor*) of Afghanistan, Iran and Turkmenistan; and the Anatolian Leopard (*P.p.tulliana*) of Turkey, have populations so small that they may become inbred and disappear within a few decades. The South Arabian Leopard is the focus of a conservation program organized by officials and conservationists from Saudi Arabia, Yemen, Oman and the United Arab Emirates. Only 100 to 200 of these cats survive, and they continue to be persecuted by livestock owners and hunters (*Oryx* 1996). The "Leopard Group of Arabia" was formed in 1995, and each country will prepare a plan for conservation of the Leopard, review its own wildlife legislation, conduct surveys, and make proposals for protected areas (*Oryx* 1996). This group is also working to increase populations of native prey, reduce livestock numbers in the Leopards' habitat, and conduct public education programs (*Oryx* 1996).

Snow Leopards (*Panthera uncia*), native to the mountains of Asia, from Pakistan east to China, are endangered from hunting for pelts and as trophies, and by persecution from herdspeople who kill them as a threat to their livestock. Their total population may be as low as 4,500 or as high as 7,500 (Sunquist 1997). In their stark, rocky and high desert habitats, these cats prey upon wild sheep, goats, deer and marmots (Sunquist 1997). Their original range stretched for 4,000 miles and encompassed 1.2 million square miles in a wide arc, curving from east to west in the Himalayas through former Soviet Republics, Nepal, Pakistan, Afghanistan, Bhutan, Sikkim, and Mongolia to China, including a

total of twelve countries (Baillie and Groombridge 1996). They have disappeared from vast areas within this region, however, and continue to decline.

Until the 20th century, few herdspeople roamed these remote and forbidding regions, and Snow Leopards and their prey were left unmolested in most areas. In the past 50 years, however, human populations have risen dramatically. In western China, the government has used subsidies to encourage settlement of the western steppe, and large numbers of people have entered previously uninhabited areas with their livestock. In western Nepal, villages now dot the Himalayan slopes at 9,800 feet, and people scratch out a living from meager potato, barley and wheat crops (Sunquist 1997). Each household has only a few sheep and goats and cannot afford to lose even one to predators (Sunquist 1997).

Some 1 million Mongolian herders subsist in a barren landscape, dependent on their yaks, goats and sheep. These people, whose livestock compete with wildlife for the scarce grasses, also hunt native animals which the Snow Leopard needs to survive--Blue Sheep, ibex, deer and others. Even marmots are killed in very large numbers for their meat and skins (Sunquist 1997). When their natural prey disappears, and Snow Leopards begin to prey on livestock, herders poison, trap or shoot these cats in retaliation. In many areas, herders kill Snow Leopards as a potential threat, even when they have not lost livestock, in order to sell their valuable pelts.

Dr. George Schaller of the Wildlife Conservation Society has conducted studies on the diet of Snow Leopards and, in most areas, found less than 5 percent of livestock in their diet, based on feces analyses (Schaller 1998). As numbers of livestock in the Snow Leopard's range rise and herders penetrate further into the mountains and high pastures, livestock losses occur that sometimes result in extermination campaigns (Schaller 1998). Herding practices in these areas often encourage predation by Snow Leopards, with sheep and goats, and mares with their foals left unguarded (Schaller 1998). Depletion of their prey has increased in recent years, with government policies that encourage marmot hunting, pika poisoning and, until the late 1980s, Blue Sheep market hunting (Schaller 1998).

In Tibet, Dr. Schaller has arranged with local herdspeople to pay them for any losses they incur to Snow Leopard predation, and he has hired local Tibetans to assist in field studies of these cats, giving them a financial incentive to protect the cats. Likewise, in Pakistan, a new program organized by an American conservationist, Helen Freeman, founder of the Seattle-based International Snow Leopard Trust, has sponsored some 90 projects for the species, including many field studies. Its web page (www.snowleopard.org/islt) follows the movements of radio-tracked Snow Leopards. Gary Larson, the popular *Far Side* cartoonist, created a Snow Leopard design for the organization to use on its shirts (Sunquist 1997). Grade-schoolers all over the country have raised money by selling T-shirts for the International Snow Leopard Trust. In 1988, through the education programs and compensation for livestock losses conducted by this organization, a Pakistani livestock owner trapped a young Snow Leopard found preying on livestock, contacted the government and, before news crews, set it free. In the past, it would have been killed routinely.

The International Snow Leopard Trust and the Mongolian Association for Conservation of Nature and Environment are providing tea, noodles and clothing to livestock grazers in Snow Leopard territory in the Altay Mountains of Mongolia, with the understanding that they will protect wildlife (Schaller 1998). One village requested children's clothing, flour, candles, soap and tea, and these requests were filled (Sunquist 1997). The concept of involving local people in the conservation of wildlife is extremely important and, wherever practiced, has had beneficial long-term results for all concerned.

Bats

Bats live on every continent except Antarctica and serve extremely important ecological roles as pollinators, seed

dispersers and consumers of vast quantities of insects. Although some societies value these useful animals, many persecute all bats, based on irrational prejudice and fears of rabies. The Romanian legend of Dracula, in which a man turns into a blood-thirsty vampire bat at night and flies about seeking victims, has created a ridiculous and false impression. Real vampire bats are small, only about 3 inches in length and weighing about an ounce (Wilson 1997). The three species inhabit neotropical forests and are rare in natural habitat. Only when large numbers of livestock are grazed in an area do these mammals, who suck blood from large animals such as livestock, become common (Wilson 1997). They rarely cause the livestock harm. They are capable of transmitting disease to their host animal, but very rarely do so (Wilson 1997). Bat Conservation International has worked effectively to allay fears about vampire bats and helped many people to see them in the positive light of their value to ecosystems, economies (through pollination), seed dispersal and insect control and their interest as diverse, successful species. But Dr. Merlin Tuttle, founder and Executive Director of the organization, believes that persuading the public that bats are not to be feared is still an uphill battle, in spite of progress made in education programs (Raver 2001). Exaggerated headlines about bats and rabies tend to undo rational education programs. In fact, Dr. Tuttle says that over the past 20 years, the United States has had 1.5 human cases of bat rabies per year, hardly deserving the hysteria that so many people feel at the mere mention of bats (Raver 2001).

One positive change in recent years is the increase in people who rise to the defense of bats when newspaper stories appear about the threats of vampire bats and bat control in buildings (Garvin 1999, Gross 2000). Letters to the editor often make the point that bats are basically beneficial, and articles depicting them as fearsome enemies are misleading and cause persecution of wild bats. One article in *The New York Times* (Gross 2000) profiled a bat control professional who paid house calls when people complained of bats having entered their homes. He set glue traps, which bats blundered into and then broke their necks, and sent their bodies to a laboratory in the state capital for rabies testing (Gross 2000). Experts have found that only 1 to 4 percent of bats are rabid, and conservationists suggest that bats be set free rather than killed (Gross 2000). A more humane approach to the problem of bats in the attic was developed by Cal Kosky, a wildlife biologist with the Pennsylvania Game Commission. He tapes a piece of plastic or netting over the top of the entrance hole on the outside of the house (Raver 2001). Bats are able to fly out, but are blocked on return. A bat house is placed strategically close to the old hole to provide them with a new home (Raver 2001). Bat Conservation International has an educational video, "Building Homes for Bats," which explains how to construct bat houses to attract bats to backyards where they eat mosquitoes and other insect pests (Raver 2001).^{*} Sensible advice can also be obtained from Dr. Tuttle's 1988 book, *America's Neighborhood Bats. Understanding and Learning to Live in Harmony with Them.*

Prejudice against bats has had serious consequences for many populations that roost in accessible places, such as open caves. The largest bat colony in the United States, located in Eagle Creek Cave in Arizona, had 30 to 50 million individuals until the 1960s, when vandals and human disturbance reduced them to only 30,000 (Wilson 1997). Several species of North American bats have become endangered as a result of deliberate killing by people, disturbance by spelunkers, and tourists entering the caves (Nowak 1999). The Gray Bat (*Myotis grisescens*) and the Indiana Bat (*Myotis sodalis*) of the eastern and Midwestern United States, for example, are both endangered as a result of these activities. Dr. Tuttle has found that the total number of Gray Bats in 22 major summer colonies declined from 1.2 million prior to 1968 to 293,600 in 1976, a loss of 75 percent (Nowak 1999). The Indiana Bat fell from 640,361 in 1960 to 459,876 in 1975; by 1993, 347,890 remained (Nowak 1999). Both species are listed as Endangered by both the 2000 IUCN Red List of Threatened Species and the US Endangered Species Act. In Europe, the Pond Bat (*Myotis dasycneme*), a related species, has been reduced to only 3,000 in western Europe and fewer than 7,000 in its entire range (Nowak 1999). It is listed as Vulnerable by the IUCN. Many other European myotis bats also have declined to Endangered or Threatened status from habitat loss, disturbance of hibernating colonies in caves and mines, and blocking up of nursery sites in large buildings, such as cathedrals and castles (Nowak 1999). Rather than killing bats that roost in buildings, or blocking up entries, Bat Conservation International encourages the placement of bat houses nearby, which the bats tend to occupy instead. Similar efforts are needed in Europe. Even when allowed to roost in buildings, many bats are poisoned by chemicals used to treat wood in western Europe (Nowak 1999).

Bat caves are often vandalized when bats hibernate in the winter. Vandals enter caves and knock semi-conscious bats

to the ground, killing them by the thousands, or even millions. Even entering a hibernation cave can result in mortality because disturbances can arouse them and they use up so much stored energy that they do not survive the winter (Wilson 1997). Many bat caves now have gates that allow bats to fly through the open grating, but keep people out; they have helped protect important bat hibernation areas where bats from large areas congregate (Wilson 1997).

The importance of bats as pollinators is discussed at length in *The Natural History of Pollination*, by Michael Proctor, Peter Yeo and Andrew Lack (1996). Many types of flowers have evolved to be pollinated by bats, opening only at night. Their internal pollen-carrying structures are designed to drop pollen on the bat's face when it feeds on nectar (Proctor *et al.* 1996). A great variety of bats and plants coexist, perfectly adapted to one another. Dr. Tuttle's dramatic photos of many such flowers have been published in *National Geographic* magazine and in the useful book, *Bats in Question. The Smithsonian Answer Book* (Wilson 1997). He also has made films of bats for nature documentaries. Many bats are extremely attractive, and their sonar is so complex and sensitive that it is only partially understood by scientists. *Walker's Mammals of the World*, by Ronald Nowak (1999), is another important source of information on bat biology, taxonomy, behavior, conservation and related subjects.

After rodents, bats have the greatest number of species of any mammals, with the most diversity in tropical areas. The number of threatened species has increased dramatically over the past decade as a result of persecution, killing for food, pesticides and other toxic chemicals, and loss of their habitat (see Appendix for list of threatened species). The majority of species at risk suffers from a combination of these factors.

*This video can be ordered online at www.batcon.org or by calling 1-800-538-BATS.

Birds of Prey

Birds of prey have been persecuted for hundreds of years in Europe and other parts of the world, usually as suspected predators of chickens or small livestock, such as goat kids or lambs. In most parts of the world, they still are given no official protection.

Hawks, eagles, owls, falcons and other birds of prey that breed in North America were excluded from the 1918 Migratory Bird Treaty Act (MBTA), signed with Great Britain on behalf of Canada. The Treaty covered almost all other species of native birds, banning hunting and killing as well as harassment and destruction of nests. This exposed birds of prey to continued indiscriminate shooting for sport, hunting from aircraft, poisoning and even capture in pole traps, which catch birds by the feet and hang them upside down in nooses.

Populations of birds of prey that breed in Canada and the northern United States migrate south during the fall, some to Latin America and others to southern states. Flying along thermal wind currents, they funnel into flyways as they pass through mountain chains. In the eastern United States, thousands of hawks, and a smaller number of eagles and falcons, pass over the Allegheny Mountains of Pennsylvania during October, November and December every year. Kittatinny Ridge, near the town of Kempton, came to be known as Hawk Mountain because of the huge numbers of birds of prey passing near it. For generations in the 19th and early 20th centuries, hunters gathered every fall on the rocky ridge to shoot these birds by the hundreds as they soared by. Dead hawks, falcons and eagles accumulated in huge piles, while wounded birds staggered around or lay helplessly immobile on the ground (Brett 1973).

This carnage was considered a form of sport, justified by old prejudices. Rosalie Edge, an ardent conservationist, spearheaded the movement to stop this hunt in the 1930s (Brett 1973). This courageous woman publicized the slaughter of birds of prey, and after a campaign in which she enlisted the help of influential conservationists, she succeeded in purchasing the mountain as a sanctuary (Brett 1973). Edge persuaded an ornithologist, Maurice Broun,

and his wife, to oversee the sanctuary and prevent hunting. They remained on Hawk Mountain for 32 years and served as guides for the more than 40,000 visitors who come every year to see the spectacle of hawks flying over and alongside the mountain ridge (Brett 1973). Rosalie Edge died in 1962, but the sanctuary continues as a non-profit organization staffed with ornithologists, educators, and volunteers, who chronicle by species and number the birds that fly past the ridge.

Hawk Mountain Sanctuary is one of the country's first examples of private ecotourism, and it has accomplished a great deal in teaching the public about birds of prey as useful animals in ecosystems, as well as providing exciting views of these birds as they soar past the ridge. In the morning, before the thermal winds warm up, hawks fly at low elevations, giving visitors a view of their tails and backs from above, an especially colorful sight in the case of the Red-tailed Hawk (*Buteo jamaicensis*), while in the afternoon, they fly higher, transported along by the thermals. Sometimes a visitor to Hawk Mountain can see a hawk or other bird of prey at close range, only 15 or 20 feet away, as they fly close to the ridge, the intricate patterns of their feathers in full view.

In spite of the preservation of Hawk Mountain and several other key hawk habitats, legal protection from hunting did not come in the United States until 10 years after the death of Rosalie Edge. During these years, thousands of hawks and other birds of prey were shot because of ignorance or as sport. Little was understood about their value in controlling rodents and rabbits. In 1960 alone, 12,000 Golden Eagles (*Aquila chrysaetos*) were killed in Texas in a massive campaign to eliminate them. A major victory for birds of prey was their addition to the Migratory Bird Treaty Act in 1972. The bans on hunting that have protected other native land birds were finally accorded these raptors. This was carried out through a memorandum enacted with Mexico, which had signed the Migratory Bird Treaty Act in 1936. It prohibits, except as allowed under specific conditions, the taking, possession, purchase, sale, or bartering of any migratory bird, including the feathers or other parts, nests, eggs or migratory bird products. "Taking" is defined as pursuing, hunting, shooting, shooting at, poisoning, wounding, killing, capturing, trapping, or collecting migratory birds. Individuals and organizations may be fined up to \$5,000 and \$10,000 respectively, and those convicted may face up to six months imprisonment for misdemeanor violations of the Act. Felony violations may result in fines of up to \$25,000 for individuals and \$500,000 for organizations and up to two years imprisonment for those convicted. This strong legislation has not stopped the killing of birds of prey altogether, but it has deterred the type of slaughters that were once common.

Although Bald Eagles were revered by native tribes, especially those in the Pacific Northwest, they became victims of prejudice by European colonists, who accused them of damaging fish stocks. A bounty in Alaska resulted in the killing of some 150,000 of these eagles between 1917 and 1953. This species is the national bird, the official symbol of the United States of America, yet historically it has been given little respect. Some even called them "gangster birds" because they were thought to be scavengers of fish caught by other birds. In truth, they are superb fishers with extraordinarily keen vision and are acrobatic in flight. Bounty programs and random shooting of Bald Eagles from colonial times onward caused these birds to disappear from much of their original range, which encompassed the entire continent of North America, including arid regions in the Southwest.

The Bald Eagle Protection Act was enacted in 1940 to protect it from extinction, and amended in 1962 to extend protection to Golden Eagles, primarily to protect immature Bald Eagles, which resemble them. A 1972 incident involving the slaughter of hundreds of Golden Eagles by western ranchers shooting from aircraft resulted in increasing fines under the law from \$500 to \$5,000 and/or one year imprisonment for subsequent offenses. The amendments also specifically included poisoning in the definition of taking, since both Bald and Golden Eagles had been poisoned by ranchers. These amendments also included the same high penalties for possession of eagle feathers, nests or eggs, and made federal grazing permits subject to cancellation for violations of the Act. In addition, they added a new facet to the enforcement of the Act: one-half of any fine can be paid to a person who provides information leading to a conviction. To augment this protection, the Airborne Hunting Act was enacted in 1972 to prevent the killing of wildlife from aircraft.

After 1973, the killing of a Bald Eagle constituted a violation of the US Endangered Species Act, the Bald and Golden

Eagle Protection Act, and the Migratory Bird Treaty Act, the combined penalties of which could amount to long jail sentences and very high fines. In spite of all these legal steps taken to protect eagles, killings continue. Many are deliberate and carried out in remote areas where there is little fear of prosecution, and others are done by hunters ignorant of the law or the identity of their targets. The protection of native birds, their identification, and laws applying to them should be taught in schools in North America, but such information is usually acquired by chance if at all. Each year, 300 to 400 eagles--Bald and Golden--are found dead. In some cases, hunters still believe folklore about birds of prey being destructive, and shoot them intentionally. A Bald Eagle shot in Maine in 1994 was killed by an 85-year-old man who deliberately killed the bird because he believed these birds were killing geese. He told game wardens that they should "do something about the eagles;" because of his age, he was only given a \$2,500 fine, which was suspended. Bald Eagles feed mainly on fish and are not major predators of waterfowl.

Although the majority of eagles are killed when shot, many are found wounded, some in emaciated condition, unable to fly to obtain food and near death. One such Bald Eagle was found crippled in 1983 in Georgia, having been shot in the wing. He had been on the ground for a week, his wing bone exposed. In spite of attempts to save his wing, veterinarians had to amputate it because of infection, and the eagle was taken into a rehabilitation program. Named Osceola, he has played an important role in *Wings of America*, an education program at Dollywood in Tennessee. John Stokes, Osceola's caretaker, teaches children and adults about the effects of such shooting, stressing the impoverished life that Osceola leads, unable to fly and be free. Stokes decided to bring Osceola along on his hang-gliding trips to treat the bird to some of the sights the eagle had not seen in the many years since being shot. Harnessed into a specially made sling, the pair hang-glided, with Osceola positioned above Stokes, looking intently at the ground far below, turning his head frequently in apparent fascination. The film of Osceola hang-gliding was shown on nationwide television in 1996, and some 500,000 people attend lectures featuring this maimed eagle every year. The National Audubon Society series for young people, "Audubon's Animal Adventures," featured Osceola in the program entitled "Eagle Adventures," shown on the Disney channel.

In the past, it was impossible to prosecute offenders unless there were witnesses or other direct evidence to the killing. Today, a state-of-the-art forensic laboratory run by the US Fish and Wildlife Service in Washington state is able to necropsy dead eagles for cause of death. If shot, ammunition extracted from the birds is analyzed forensically, and cases are made with as much precision and scientific evidence as criminal investigations in which people are the victims.

Prejudices against birds of prey still persist among many who wrongly believe that they harm wildlife or present major threats to domestic animals. Biological studies have documented their ecological importance as major controls on rodent populations. Some birds of prey feed on snakes, insects or other potential pests. No species of raptor poses a significant threat to domestic animals.

The continent's densest population of birds of prey breeds in the craggy canyons and sagebrush shrubland of Idaho. This area has been set aside as the Birds of Prey National Conservation Area, lining 81 miles of the Snake River and covering 485,000 acres. Prior to its protection, this land was in the process of being converted to agriculture. The birds of prey had begun a steep decline from shooting and loss of habitat. Conservationists faced strong opposition to the plan, but overcame it, establishing this area in 1971, a year prior to the inclusion of birds of prey on the Migratory Bird Treaty Act. It has since become a leading ecotourism destination for rafters and hikers, who are led on tours by naturalists from the Bureau of Land Management (BLM), which oversees the refuge. Fourteen species of raptors breed in the area or migrate through it, and the breeding population of hawks, eagles, owls and falcons has been estimated at 800 pairs. They provide exciting views of high-speed hunting of ground squirrels and birds, and their eerie shrieks resound through the canyons.

Waterfowl hunting is regulated by the Migratory Bird Treaty Act under regulations by the Fish and Wildlife Service. Unfortunately, the regulations have serious shortcomings that have resulted in many shootings of birds of prey. First, hunting can begin before dawn, when hunters are unable to identify birds by species. Each year, hundreds of birds of prey, including such endangered species as Peregrine Falcons, are shot accidentally. Second, the regulations do not

require that hunters be able to identify birds by species, including protected and endangered species. Since many ducks and geese are extremely difficult to identify, the failure of the Fish and Wildlife Service to require hunters to pass identification tests and begin hunting well after daybreak means that protected and endangered birds will continue to be shot.

In October, 1995, a Peregrine Falcon (*Falco peregrinus*) shot in Massachusetts was migrating south from Canada or Greenland during hunting season. It suffered neurological damage after being shot in the left wing while it was flying in a wildlife refuge area. The Assistant Director of the State Division of Fisheries and Wildlife, Tom French, stated that it appeared that the bird was not shot accidentally. This was the second shooting of a Peregrine Falcon in as many years. The reintroduction of captive-bred specimens of these birds into the eastern United States has been a success, with over 130 nesting pairs. Their long-term survival, however, will depend on adherence to laws prohibiting shooting or harming them.

For the future, the Migratory Bird Treaty Act would be far more effective if signed with Latin American and Caribbean nations to protect North American birds wintering in those countries. This would be especially important in view of the decline in many of the continent's birds of prey, which are persecuted and killed by pesticides and poisons in their wintering grounds.

The California Condor (*Gymnogyps californianus*), North America's largest bird of prey, once soared over most of the continent. Its bones have been found among Florida's Pleistocene fossils, and 20,000 years ago, it was very common and widespread, feeding on the carrion of mastodons, bison and other large mammals. This giant bird's superb aerodynamic flight makes the most sophisticated man-made aircraft look clumsy by comparison. Condors have a positive role to play in ecosystems, feeding on carcasses and thereby ridding the environment of these potentially infectious contaminants. Although they declined in range over the centuries, condors were still widespread from Baja California, Mexico, north to Washington state, where Lewis and Clark saw them along the Columbia River in the early 19th century. They were often observed scavenging seal and whale carcasses along the California coast, and they nested as far east as the Sierra Nevada Mountains.

Settlers looked on condors as large targets, with their 10-foot wing span, and perhaps thought they were predatory birds. Hundreds were shot. These birds feed exclusively on carrion and do not hunt live animals. When word spread in the last years of the 19th century that the condors were approaching extinction, egg and specimen collectors preyed on the remaining birds. Between 1881 and 1910, 288 birds were killed as museum specimens (ICBP 1981). By the turn of the century, only a few hundred birds remained, yet killing was still legal. The ornithological journal *The Condor* began publication at this time and recorded many instances of these killings. In one case, an individual named Frank S. Daggett reported shooting a California Condor in 1901, wounding it in the wing and then, when it fell to the ground, shooting it three more times, still not killing it. Finally he clubbed it and shot it yet again before the bird died (Daggett 1901).

The California Condor continued its decline until only 60 birds remained in 1939 (Greenway 1967). The last population survived in a wilderness area of southern California. In spite of legal protection and the establishment of the Sespe Condor Refuge, the birds suffered high mortality from shooting, ingestion of lead shot from deer killed by hunters, feeding on animals killed by predator poisons, collisions with power lines, and accidental capture in leghold traps. Biologists from the Fish and Wildlife Service and the National Audubon Society were assigned to study and protect this small population in the 1960s and 1970s, but they did not publicize its precipitous decline or insist on further protection from the threats that continued to kill these birds. As these birds headed toward imminent extinction, nothing was done to stop deer hunting in their refuge, nor to prevent the use of steel jaw leghold traps or predator poisons in their diminishing range.

One of the last nests was in a regal setting befitting this massive bird: a huge natural hole in a giant, old Sequoia tree. The eggs from this nest and others were taken by the Fish and Wildlife Service for captive hatching. In 1980, one of the last wild chicks hatched in a cave and was being weighed and tested by biologists when it suddenly died. It had

been handled for more than an hour, during which time it repeatedly hissed and jabbed at the researcher. Later it was revealed that shock caused its death. The incident was filmed and shown on national television, resulting in the cancellation of the recovery program by the state of California, followed by a long period of re-evaluation and controversy. By 1981, the state reached an agreement with the Fish and Wildlife Service to allow capture of the last nine California Condors, but the program was delayed by lawsuits and wrangling over details. By the time it was finally decided to capture all remaining condors in 1987, only six survived (BI 2000).

The sad decision to remove all wild California Condors turned out to be the correct path to preserve the species, since its wide-ranging behavior exposed it to countless perils that were beyond the control of its protectors. To the amazement of many, the captive-breeding program succeeded beyond all expectations. The eggs laid by the captive condors were artificially incubated, and chicks were fed by workers, with puppets resembling adult condors covering their hands. So many birds were captive-bred at special facilities run by the Los Angeles Zoo and other breeding centers that by 1992, a reintroduction program began with release of captive-bred birds into the wild in southern California. Some of the released birds died after striking electric power wires or were injured and had to be returned to captivity. Several landed in suburban locations, perching on the decks and roofs of private homes and even, in one case, entering someone's home. Most residents did not recognize the birds' great rarity and protected status, and put out food, such as hot dogs, for them. Finally, wildlife authorities and television news stations learned about the situation, and many Californians became aware of these giant and extremely rare birds. To many ornithologists, the behavior of these young condors indicated that the birds were tame and considered humans a source of food. The puppets apparently had not fooled them into thinking they were being fed by parent birds.

By July 1994, California Condors numbered 89 birds, 85 of which were in captive-breeding facilities, and four released birds (Collar *et al.* 1994). Six young condors were released in the Grand Canyon area in late 1996, with Fish and Wildlife Service personnel staying close to provide food and to radio-track the birds. Within a short time, one of the condors was killed by an eagle, an unexpected setback. The total California Condor population grew to 120 birds by early 1997, and only a year later it had increased to 147 birds, of which there were 97 in captivity, 28 returned to the wild in California's Los Padres National Forest, and 22 released in Arizona (BI 2000). The released birds are provided with livestock carcasses until they are able to find food on their own. The success of this program has not yet been proven by breeding in the wild, as all released birds are too young. Only time will tell whether these birds survive and reach the goal of 150 birds in separate populations. They are being trained to avoid some of the sources of mortality that killed them in the past, such as power lines, but as long as lead shot is used in deer hunting in their range, this will remain a potential threat to them.

Elsewhere in the world, birds of prey receive little or no protection from persecution. In Italy, shooting of migrating birds of prey has long been a "sport" in which gunners position themselves in concrete bunkers on hillsides and kill hawks, falcons and eagles as they fly by. One woman decided to fight the hunters and worked successfully for an official ban on shooting these birds. In spite of this, illegal shooting takes place in Italy, and every year during the migration season, conservationists from many parts of Europe come to help her enforce the ban. The campaign to stop hunting of these birds was described in a film, *Anna and the Honey-Buzzards* (see Video section). In Australia, persecution of eagles and hawks is rampant. After shooting these birds, especially Wedge-tailed Eagles, they are often nailed to fence posts with their wings spread. Few of the ranchers who kill thousands of these birds seem aware of the important role they play in controlling rabbits.

Snakes

The prejudice against snakes may be traced in some cultures to the Biblical story of Adam and Eve, in which the snake represents the evil temptor. For many, snakes inspire great fear and loathing, and they are often killed upon sight. In the American West, rattlesnake hunts are carried out in many towns as an annual event, with thousands of

snakes captured. After being prodded and manhandled, they are killed, often by being skinned alive. The New Mexican Ridge-nosed Rattlesnake (*Crotalus willardi obscurus*) is a threatened species on the US Endangered Species Act, persecuted and overcollected in its limited range. In Eastern states, especially in the South, snakes are also hunted for sport, burned alive with gasoline poured down their dens, and killed in bizarre religious ceremonies. One town in Georgia has an annual war on rattlesnakes, killing as many as possible. For some species, this has resulted in serious declines. The Eastern Timber Rattlesnake (*Crotalus horridus*), the largest snake native to the United States, inhabits forested areas with rock faces, crevices and caves in the Northeast. It has become threatened in many parts of its range. These snakes, which range in size from 35 to 74 inches in length, are vulnerable to persecution because they congregate in large numbers in rocky dens and overwinter with other types of snakes for warmth. They hide under rocks where hunters and collectors find them. Timber Rattlesnakes are long-lived, known to survive 30 years or more. Females give birth only every other year, do not mature until age 4 or 5, and have only 5 to 17 young (Behler and King 1979). With such slow reproduction, they are vulnerable to declines when hunted.

This species has legal protection from hunting in Pennsylvania and New York and is listed on their state endangered laws, yet hunting still kills hundreds each year. One rattlesnake hunter, profiled by CNN, bragged that he had captured 9,000 Timber Rattlesnakes in his lifetime and planned to continue openly flouting laws protecting the species. He claimed that he enjoyed catching and killing these snakes so much that he would never stop, and some herpetologists accuse this man of single-handedly causing declines. He has been arrested many times and jailed for trading in endangered species, but refuses to stop. These snakes do not pose a threat to people unless they are sought out in their retreats.

Biologists point out that snakes are extremely useful ecologically, feeding on squirrels, mice, rats and other rodents, but since laws in the United States and around the world either fail to protect snakes or are not enforced, snakes often are persecuted and killed senselessly.

Rodent Control

Prior to settlement of North America, prairie dogs of many species inhabited towns of burrows that covered some 98 million acres of shortgrass prairies, from southern Canada to Mexico. One prairie dog town in the Texas Panhandle stretched over 25,000 square miles and held an estimated 400 million animals (Dold 1998). Prior to the 19th century, they are thought to have numbered 5 billion animals (DeBlieu 1993). These towns have since been destroyed, the prairie dogs killed, and the habitat used for agriculture, pastureland and development. A keystone species, prairie dogs create habitat for hundreds of other animals who live in their complex burrow systems. These rodents have been driven to endangered status after centuries of persecution and poison campaigns that were based on the belief by cattle ranchers that prairie dogs ate too much grass, depriving cattle of fodder. The US government sponsored the destruction of prairie dog towns beginning in 1900. The poisoning program was bolstered by inaccurate information from the US Biological Survey, which stated in 1902 that prairie dogs decreased productivity of grasslands by 50 to 75 percent (Dold 1998). Poison bait was distributed in the towns, gasoline was poured into their burrows and set afire, and they were shot by the thousands. A highly toxic poison, 1080, was used from the 1960s on, devastating prairie dog towns and killing vast numbers of animals, from foxes to Golden Eagles, who fed on the poisoned prairie dogs. This reduced prairie dog habitat to about 1.5 million acres, a fraction of their original range.

Modern biological research has unveiled the truth about the effect of these rodents on grasslands. Rich Reading, Director of Conservation Biology at the Denver Zoological Foundation, stated flatly that the Biological Survey's figures claiming that prairie dogs reduced grass by up to 75 percent, were "vastly in error" (Dold 1998). Studies by Dan Uresk, a Forest Service biologist, have concluded that prairie dogs eat only a small percentage of grass--from 4 to 7 percent (Dold 1998). James Detling of Colorado State University in Fort Collins has found that prairie dogs are natural fertilizers, whose incessant grass clipping increases the protein content and digestibility of grass (Long 1998).

Other studies have examined the claims of cattle ranchers against prairie dogs and have demonstrated again and again that these rodents actually improve forage quality for livestock and, by cropping the shortgrass prairie, stimulate it to grow, increasing the amount of grasses around the towns (Wuerthner 1996). The American Bison prospered in herds of 50 million, much of the species range lying within prairie dog towns of the short-grass prairies. Their major predator, the highly endangered Black-footed Ferret (*Mustela nigripes*), has been eliminated in the wild as a result of poisoning and shooting campaigns. At least 130 grassland species are associated with prairie dog towns (Godbey and Biggins 1994), and up to 170 vertebrate species have been seen in these towns.

Another complaint of cattlemen, that cattle fall into prairie dog burrows and break their legs, has also been refuted. Don Sharps, a wildlife consultant, asked an audience of 200 ranchers if any of them knew of a case of a horse or cow that had broken its leg in a prairie dog town, and no one said yes (Dold 1998). Such prejudices are passed down from generation to generation and fuel the persecution programs against these ecologically important rodents.

Slow-acting poisons, such as zinc phosphide, are used by many animal damage control programs. This chemical takes up to 12 hours to kill prairie dogs, who suffer extremely painful deaths (Wuerthner 1996). Another technique is the placement of gas cartridges in prairie dog burrows. These are ignited and burn the prairie dogs alive (Wuerthner 1996). On federal lands, these programs are conducted by the Wildlife Services unit of the Department of Agriculture at public expense. In the 1980s, more than \$6 million was spent to eradicate 460,000 acres of dog towns on the Pine Ridge Indian Reservation in South Dakota (Line 1997). This was the largest remaining prairie dog town in the United States (Dold 1998) and the site of the only population of Black-footed Ferrets known to exist in the 1970s. In 1993, Animal Damage Control (now called Wildlife Services) used, sold or distributed 220,000 fumitoxin tablets, 60,000 gas cartridges, and 21,000 pounds of zinc phosphate baits in the northern plains states to eradicate prairie dogs (Wuerthner 1996).

Studies about prairie dogs have revealed them to be surprisingly intelligent. They communicate in yips and chirps, some of which are warnings to other members of the town. A study by Professor Con Slobodchikoff of Northern Arizona University has revealed that prairie dogs' calls convey specific information, such as what size a predator is, what type of animal, its speed of travel and level of threat (Dold 1998). Slobodchikoff created experiments in which two people walked through a prairie dog town that had experienced hunting; one carried a simulated rifle, while the other did not. The prairie dogs gave different calls for each person, and when the "hunter" returned in a few weeks without his rifle, they still gave the call for a man carrying a rifle (Dold 1998). Such communication goes far beyond what most people consider rodents to be capable of and shows their ability to react to a variety of threats, including the most serious one, human beings. Unfortunately, their warnings could not protect them from poison, shooting, and even bulldozing of their burrows.

Knowledge about the true role that prairie dogs play in grassland ecosystems has yet to reach most ranchers and others who have a hatred for these rodents that seems to reach no bounds. Many compare notes on how many prairie dogs they have killed, usually by high-powered bullets that cause them to disintegrate on contact (Long 1998). One group in eastern Colorado with 30 members calls themselves the Varmint Militia and kills prairie dogs as a sport. They recently spent two full days shooting prairie dogs until activity in the prairie dog town slowed (Long 1998). One militiaman bragged of having shot 20,000 prairie dogs and wants to retire from his exterminating business to shoot them full time (Long 1998). These shooters recount with glee the story of a recent protest. Some animal rights protesters tried to stop one of these hunts and chained themselves together, refusing to move; the Varmint Militia called the Kit Carson County sheriff, who placed them in jail for the weekend (Long 1998).

Although private shooting may be difficult to stop, many biologists and conservationists have recommended that all government poisoning and shooting on public land be halted and that subsidies be offered to ranchers who do not kill prairie dogs on their property (DeBlieu 1993). Unfortunately, no action has been taken in this direction.

Sport hunting of these rodents is encouraged by state game departments, and many towns organize hunts as a form of recreation. These hunts, which often involve the killing of hundreds of prairie dogs in a single afternoon, are taking a

high toll of these declining animals in many areas (Wuerthner 1996). A South Dakota organization, Varmint Hunters Association, brags that its 45,000 members do society a favor by killing prairie dogs. The vice president, Marc Minkin, told a reporter, "I'd like to be able to step out my back door in the morning and take a couple of shots before my morning coffee" (Dold 1998). The organized prairie dog shoots draw "hunters" from around the country; one hunt held in Nucla, Colorado, obliterated an entire town (Dold 1998). This hunt, which involves taking pot shots at prairie dogs emerging from their burrows, which they must do to feed, is totally unsportsmanlike--a virtual slaughter.

Even in national parks, poisoning takes place as a result of pressure from neighboring ranchers. In spite of abundant habitat in Theodore Roosevelt National Park, Badlands National Park, Wind Cave National Park and various national monuments in the Great Plains, only 6,000 acres of prairie dog towns have been protected (Wuerthner 1996). In most cases, park authorities have been threatened with lawsuits unless they poison prairie dogs. In South Dakota, home of Badlands National Park, a prime potential area for reintroduction of the endangered Black-footed Ferret, the state has declared prairie dogs to be noxious pests and mandates their control (Long 1998). At Devils Tower National Monument in Wyoming, the park rangers use rifles and poison to thin the ranks of its prairie dog colony (Long 1998).

Increasingly, development in the form of housing complexes, malls, highways and industrial centers, has gobbled up millions of acres of land in the West, much of it inhabited by prairie dogs. Some developers merely bulldoze the towns, while others pay to have a company use a giant vacuum cleaner that sucks prairie dogs out of the ground amid deafening noise similar to that of a jet airplane taking off. The proud inventor of this machine bragged that it was non-lethal, and the rodents could then be killed humanely or otherwise disposed of to allow development programs to proceed. In fact, most of the prairie dogs taken in this manner are killed or injured in the process (Dold 1998). The trauma involved for the prairie dogs must be extreme. Many of the prairie dogs removed from their burrows have been offered for sale as pets, advertised in eastern newspapers. Although loveable and cute, these animals are not suitable house pets because they are wild rodents who require extensive dirt to burrow in. They cannot adjust to the unnatural environment of a home. Unfortunately, this new invention has been given favorable publicity in the media. The majority of prairie dogs that survive this operation end up as pet food, according to CNN (December 15, 1996).

A more humane program involves the moving of prairie dogs to safer environments. A Colorado organization, Prairie Ecosystem Conservation Alliance, hoses prairie dog burrows with water and a biodegradable dish soap that creates frothy suds below ground. The suds irritate the eyes of the prairie dogs, who come to the surface where members of the Alliance are waiting to scoop them up and place them in carriers. They then truck them to a safe area, preferably one with empty burrows, and release them (Dold 1998). An even better solution is to save the towns, since the latter method will not save all the other animals inhabiting the burrows. The city of Boulder, Colorado, became the first town in the state to officially designate land to protect prairie dogs. In 1987 it set aside a preserve for prairie dogs, which now covers almost 5,000 acres (Dold 1998). Fort Collins, further north, began with a reserve of 268 acres and now has 1,700 acres (Dold 1998).

A Native American Gros Ventre tribesman, Mike Fox, has come full circle, from sponsoring prairie dog shoots on the Fort Belknap Indian Reservation in Montana to understanding their positive effect on grasslands by watching Bison graze near the towns on the "best grass around" (Long 1998). There are 400 American Bison on the reservation, and Fox, who manages the reservation's wildlife program, has sharply curtailed prairie dog shooting and accepted 23 Black-footed Ferrets to be reintroduced into the 500,000 acres of prairie on the reservation (Long 1998). He tells Indian ranchers, who still kill prairie dogs, that these animals were here before, and the ferret is not a new animal, but an old one returning (Long 1998).

All but 2 percent of original prairie dog populations are now gone, having been poisoned out to make way for livestock or agriculture. The majority of remaining towns are still unprotected, and the poisoning continues. Grasslands with prairie dogs support far higher densities of mammals, birds and other wildlife than those without them.

Several prairie dog species have been driven to near extinction. The Utah Prairie Dog (*Cynomys parvidens*), native to

south-central Utah, became endangered from these programs and the loss of habitat to livestock and agriculture. Listed on the US Endangered Species Act, this species has a restricted range in southwest Utah, and after poisoning programs, its population fell from an estimated 95,000 animals in 1920 to only 3,300 in 1972 (Nowak 1999). Through protection accorded by the US Endangered Species Act, Utah Prairie Dogs began to rebound, and by 1984, the species was downgraded from Endangered to Threatened on the US Endangered Species Act. Populations of prairie dogs fluctuate widely, and counts of Utah Prairie Dogs in the early 1990s ranged from 6,400 in the fall to 24,000 after they had pups in the spring (Nowak 1999). The species has recovered somewhat overall, mainly as a result of the Fish and Wildlife Service program of transplanting prairie dogs from private to public lands (Turbak 1993). Initially, many of the released prairie dogs failed to survive, and not until they began releasing males in the spring, who industriously spent the summer excavating burrows to accommodate other prairie dogs released in the fall, did transplants succeed (Turbak 1993). Utah Prairie Dogs hibernate each winter in compartments in the complex maze of their underground tunnels.

Although some Utah Prairie Dogs have been placed on public land, 60 percent of them still live on private land, where special US Endangered Species Act regulations allow farmers and ranchers to shoot or trap an annual quota of prairie dogs; a high of 6,000 were killed one year, and in 1992, 1,543 were killed (Turbak 1993). Education campaigns and tax incentives to protect prairie dog towns would be far preferable to quota systems.

Mexican Prairie Dogs (*Cynomys mexicanus*) of southern Coahuila and northern San Luis Potos, Mexico, have declined as their habitat has been converted to agriculture and grazing land for livestock, and many colonies were exterminated by poisoning. The largest remaining town covers only 4,400 hectares (Nowak 1999). The species is listed as Endangered by the US Endangered Species Act as well as by the 2000 IUCN Red List of Threatened Species.

A third species, the Black-tailed Prairie Dog (*Cynomys ludovicianus*) has declined by 98 to 99 percent (Wuerthner 1996) in a range which once extended from Montana and southern Saskatchewan to northern Mexico (Nowak 1999). The Biodiversity Legal Foundation in Colorado filed a petition in October 1994 to list it as a Category 2 species under the US Endangered Species Act, a category just below Threatened. Although the Fish and Wildlife Service's own biologists supported this listing, the petition was denied after political pressure from ranchers (Wuerthner 1996).

Thus, at least three of North America's five species of prairie dogs are in grave danger of extinction, and the remaining two have declined precipitously. Their ecosystems are threatened as well, as are many of the species that depend on them. Although they are extremely photogenic and likeable, prairie dogs are not ecotourist attractions at present. With protection and more publicity, such as nature films and education programs, they could become so, and this would enhance their conservation.

Conservationists have proposed some huge reserves for prairie dogs that would link remnant populations in parts of the West, where much of the land is now under the control of the Bureau of Land Management of the Department of the Interior. The latter department favors cattle ranchers more than prairie dogs, but with outside pressure and publicity, such a plan might become reality. The Fish and Wildlife Service has had difficulty locating prairie dog towns that are protected from poison programs in which to reintroduce captive-bred Black-footed Ferrets.

For their long-term survival, prairie dogs need extremely large territories. At present, fragmented populations, which are often reduced to a few hundred animals widely separated from the nearest prairie dog town, have lost viability from lack of genetic interchange, and some scientists fear that their natural behavior may be altered by this isolation. These loveable animals need more friends to speak out on their behalf and demand that they be protected from poisoning, "sport" hunting and other persecutions, and that sanctuaries be established.

Economically, they may be worth far more alive than dead. The potential for using prairie dogs as a focal point for ecotourism is great. Tourists would be delighted by their behavior and fascinated to see the rich wildlife that inhabits their towns.

Trophy and Sport Hunting

During the late 19th and early 20th centuries, wealthy European and American big game hunters traveled to Asia, Africa and South America to "bag" large animals that they proudly displayed as stuffed animals and heads mounted on the walls of their homes. Maharajahs of India and British hunters took what Vincenz Ziswiler (1967), in his interesting book, *Extinct and Vanishing Animals*, describes as "a morbid pleasure in killing." Lord Ripon, an Englishman who died in 1923, was credited with killing 500,000 game birds and mammals--about 67 creatures for every shooting day of his life (McClung 1976).

One maharajah turned away from hunting and became a famous conservationist. Brajendra Singh, the last Maharajah of Bharatpur, hosted hundreds of hunts on his estate at the Keolada Ghana marsh 100 miles south of Delhi. A shoot organized by an English lord resulted in the killing of 4,323 ducks by 39 hunters in one day. In 1970, Brajendra Singh converted the duck shoot marsh into India's best known bird sanctuary. Singh died in 1995, having presided over the preservation of this vast marsh and its rare resident birds.

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Trophy and Sport Hunting: Page 1

The most prestigious trophy for maharajahs and colonial hunters was the Tiger (*Panthera tigris*), largest of all cats. One maharajah shot at least 1,000 Tigers in his lifetime, while another complained that his total bag of Tigers was only 1,150 (McClung 1976). The number of Tigers killed by these two maharajahs equaled the entire population of these cats in India by the late 1960s. Tiger hunts were a royal pastime and employed hundreds of native "beaters," who drove the frightened cat toward a hunter who was perched safely atop an elephant.

Tigers require large territories. Even in the best habitats, their natural density is low. They probably once numbered 50,000 in India alone, however, when forests covered much of the country. Tigers were hunted to extinction on the Indonesian islands of Java and Bali, where each was a separate subspecies, and they have been hunted to endangered status on Sumatra. In the western portion of their range, the Anatolian or Caspian Tiger (*Panthera tigris virgata*) once ranged from Turkey eastward through the Caspian Sea region of Central Asia. Hunting eliminated these Tigers in Central Asia centuries ago, and only a few isolated populations remained in Turkey by 1900. The last individuals in Turkey were shot in 1972. This subspecies was driven to extinction by trophy hunting and persecution by livestock owners. By the 1960s, Indian Tigers were endangered, yet trophy hunting and killing by livestock herders for the fur trade continued. Indian President Indira Ghandi established a conservation program called Project Tiger in the 1970s, which set aside many reserves and accorded strong legal protection. When the species was beginning to increase in numbers, a trade in their body parts for Traditional Chinese Medicine reversed this recovery.

Today, fewer than 5,000 Tigers remain in the wild. At the present rate of killing--one Tiger per day--the species will become extinct in the wild within 30 years or less. Hunting of these magnificent cats intensified in the 1980s and has accelerated everywhere. They are killed by poison, traps and guns wherever they survive. Villagers and professional

hunters sell Tiger pelts, bones and other body parts in a network of smugglers that reaches from rural India, Bangladesh and Indochina to China, Japan and Taiwan. Tiger pelts are openly sold as trophies in many Asian countries, including Pakistan, Cambodia and Vietnam. They are displayed on shop walls, often with head attached. Some Tiger cubs are even part of this trade, killed and stuffed to be sold as tiny curios.

This magnificent cat will not survive long without legions of rangers guarding the remaining animals. Anti-poaching funding is inadequate in almost all its range. Indian parks and sanctuaries, many of them set aside for the Tiger, are understaffed, and dedicated wildlife wardens are underpaid and poorly equipped to combat poachers (Currey 1996). Some Indian park wardens have been bribed by poachers and watch as they skin dead Tigers (Breedon and Wright 1996). Elsewhere in the Tiger's range in Thailand, Cambodia and Burma, for example, few parks and protected areas have been set aside, and wildlife conservation has low priority.

The market for the pelts and stuffed trophies of these last Tigers among wealthy status-seekers in Asia and elsewhere has increased in recent years. One Taiwanese businessman profiled in a *National Geographic* article (Zich 1993) proudly displayed three stuffed Tigers which he had placed in his bedroom; one of the Tigers was standing on a Lion pelt with the head attached. He protested, "I worked so hard to make money. Now I spend it" (Zich 1993).

In spite of what appear to be overwhelming odds, new projects are attempting to turn the tide. Anti-poaching work in Siberia has helped arrest the steep decline of this critically endangered race of the Tiger in a joint United States-Russian program (Galster 1996). An international fund begun by Exxon Corporation, whose logo is a Tiger, has sponsored anti-poaching work and research throughout its range as well as education programs to persuade Asians not to purchase Tiger products. The US Congress appropriated several million dollars for anti-poaching campaigns, and organizations, such as the Wildlife Conservation Society based in New York City, have worked in Cambodia, Indonesia and other countries to survey and aid in conservation of the species. Scientists have cooperated in studies of the Tiger and aided governments in conservation programs, as described in the recent book, *Riding the Tiger. Tiger Conservation in Human-dominated Landscapes* (Seidensticker *et al.* 1999).

The Asiatic Cheetah (*Acinonyx jubatus venaticus*) once occurred throughout the Middle East as far as India. In the 16th century, the Indian emperor Akbar the Great kept more than 1,000 Cheetahs for hunting. Only one litter was produced by his Cheetahs, and the species died out in India and all of its Asian range except Iran, where fewer than 200 animals remain (Hunter 1998). It is classified as Critical, the most endangered category by the *2000 IUCN Red List of Threatened Species*. The Northwest African Cheetah (*Acinonyx jubatus hecki*) is listed as Endangered by the IUCN. In reality, it is nearly extinct, with possible survival only in Algeria, Morocco and Niger, having disappeared from Egypt, Libya and Western Sahara. In the Saharan region, nomadic tribes, such as the Tuareg and Toubou, hunt Cheetah in desert areas of Mali, Niger and Chad, using saluki dogs (Hunter 1998). On occasion, Cheetah prey on young camels in the area, their natural prey having been eliminated. The tribes have such a hatred for Cheetah that they pursue them if they see their tracks, with or without proof of predation (Hunter 1998). Being followed for days in the extreme heat, the Cheetahs sometimes die from heat and stress even before the men and dogs reach them (Hunter 1998).

Trophy and Sport Hunting: Page 2

In the stark deserts of the Saudi Arabian Peninsula and the Mideast, wildlife is not abundant. Animals struggle just to survive in the harsh environment. A wild desert equine became a casualty of unrestricted hunting after World War I. The Syrian Wild Ass (*Equus hemionus hemippus*) was hunted to extinction for sport and meat. These wild asses had been hunted out of most of their original range by the 19th century, but in 1850, they were still seen commonly in large herds in the region once known as Mesopotamia, between the Tigris and Euphrates Rivers. Perfectly adapted to the searing desert heat and sparse vegetation, they ran from natural predators at great speed, and their sand-brown

coloration camouflaged them. After thousands of years of adaptation and survival, these delicately hued wild asses found themselves shot at by 20th century soldiers and other hunters. World War I troops and later, civilians in all-terrain vehicles, chased them at high speeds, killing entire herds of these equines for "sport." With no natural cover and unable to outrun jeeps, entire herds were slaughtered. The last known Syrian Wild Ass was shot in 1927 as it came down for water at the Al Ghams oasis in northern Arabia (Day 1981). The surviving populations of this species, the Asian Wild Ass (*Equus hemionus*), are listed as Endangered by the US Endangered Species Act.

After World War II, Arab sheikhs began hunting Arabian Oryx (*Oryx leucoryx*), Arabian Gazelles (*Gazella arabica*) and Arabian Ostrich (*Struthio camelus syriacus*) in all-terrain vehicles and trucks, mowing them down with repeating rifles, shotguns and even machine guns. These macabre and senseless hunts even involved the use of planes and helicopters for spotting. Sometimes animals were pursued until they dropped dead from exhaustion. In 1955, some 482 cars took part in a hunt during the course of a "royal goodwill tour" in northern Saudi Arabia, and every living animal seen was gunned down (McClung 1976). The Arabian Ostrich formerly ranged from Syria to the Arabian Peninsula, and it became a casualty of these forays. The last wild Ostrich was killed and eaten by Arabs near the Trans-Arab oil pipeline north of Bahrain between 1940 and 1945 (Greenway 1967).

The Arabian Oryx nearly followed the Ostrich into extinction when the last three individuals left in the wild were killed off in 1972 in southern Oman (IUCN 1978). This statuesque white antelope, with long, curved horns that arch over its back, once inhabited a wide range in the Middle East, from Syria and Israel to the Arabian Peninsula (Nowak 1999). It was saved from extinction by actions of the Fauna Preservation Society, headquartered in England, and the IUCN, which had undertaken an expedition in 1962 to capture some of the last wild Arabian Oryx for captive breeding. In eastern Aden, four oryx had been taken into captivity, and this herd was augmented from private game farms and zoos by another eight animals, which were transported to the Phoenix Zoo in Arizona. They adjusted easily to the desert climate of the American Southwest and soon bred in captivity. This herd has grown, and several zoos now breed them. Some of these stately animals have been reintroduced successfully into preserves in Oman and other parts of their original range. They have been studied by field biologists who have found that they reverted to wild behavior, with females in separate herds, and males solitary or in bachelor herds defending territories (Nowak 1999). Eighteen breeding herds occupied 14,121 square kilometers in Oman in two 1988 studies (Nowak 1999). In 1990, more Arabian Oryx were reintroduced into Saudi Arabia. There are now about 500 of these oryx in the wild and an additional 300 in captivity on the Arabian peninsula; 2,000 are held in zoos (Nowak 1999). For many Arab conservationists, the return of the Arabian Oryx has been an important event because this species has been very important to the cultures of the Arabian Peninsula for thousands of years. The reintroduced oryx have been guarded zealously to prevent another tragic disappearance.

Gazelles of dryland and open country were at one time abundant throughout North Africa and the Middle East, able to survive in the hottest and driest of deserts. People have long hunted them for food, and there is little cover where they can hide. In ancient times, stone corrals were constructed into which gazelles were driven for slaughter, and until the early 20th century, these were still in use (Nowak 1999). Some Arab hunters still use captive and trained falcons to harass gazelles in order to frighten and confuse them so they can then be chased down by dogs (Nowak 1999). Two of these small and dainty ungulates have been hunted to extinction, and others have become very rare throughout the region. The Antelope Specialist Group of the IUCN lists the Saudi Gazelle (*Gazella saudiya*) as extinct in the wild and the Queen of Sheba's Gazelle (*Gazella bilkis*) of Saudi Arabia as extinct, with no captive populations. Until the 1990s, the latter species had been classified as Endangered. But the 2000 IUCN Red List of Threatened Species reports that this delicate animal, which was considered very common in 1951, has not been seen in decades. A survey in 1992 in its range in mountains near Ta'izz failed to find any of these gazelles.

The 2000 IUCN Red List of Threatened Species categorizes many other gazelles of the region as Threatened and Endangered. The Arabian Gazelle (*Gazella gazella*), native to the Arabian Peninsula, Israel and Palestine, is classified as Conservation Dependent, a category indicating that without strict protection it would decline to Threatened status. Five subspecies of this gazelle are listed in various categories, the most endangered being the Palestine Mountain Gazelle (*Gazella gazella gazella*) (Conservation Dependent) and the Acacia Gazelle (*Gazella gazella acaciae*)

(Critical) of Israel, and the Muscat Gazelle (*Gazella gazella muscatensis*) (Critical) of Oman. Another threatened gazelle is the Arabian Sand Gazelle (*Gazella subgutturosa marica*) (Vulnerable). These little Mideastern gazelles have been heavily persecuted and hunted. Added to the hunting, which is not well controlled, the Arabian Peninsula and much of Israel and Palestine have been heavily overgrazed by livestock, and the scarce oases are used for agriculture and livestock, leaving little natural vegetation for wildlife.

Reintroduced gazelles in Israel's Golan Heights increased to about 4,000 in the late 1980s, and government officials decided to allow the hunting of 2,000 of them by Arabs, who shot to wound rather than kill so that the animals could be killed ritually through throat slitting. This hunt, filmed by Afikim Productions and Survival Anglia in 1990, was a gruesome sight of crippled and dazed gazelles, stumbling about after the shooting.

The most avidly pursued animal by Arab sheikhs is undoubtedly the Houbara Bustard (*Chlamydotis undulata*). The meat of this large, long-legged bird of scrubby desert and sandy grasslands is considered an aphrodisiac by Arabs, although in fact it is a mild diuretic (Weaver 1992). It has been hunted relentlessly on the Arabian Peninsula, causing many populations to disappear. Arab sheikhs have hunted these birds for centuries using a trained falcon that catches the bird as it flies to escape. The great oil wealth accumulated by sheikhs of Saudi Arabia, Qatar, Bahrain, Kuwait and the United Arab Emirates has allowed them to indulge in this "sport" in a manner befitting the bejeweled and pampered rulers of ancient kingdoms. With these bustards so rare on the Arabian Peninsula, they now hunt them in Pakistan. Traditionally, the sheikhs used camels as transport, but today they drive in fleets of 60 or 70 customized all-terrain vehicles, careening through the desert at speeds up to 80 miles per hour, flattening the landscape, vegetation and small animals under their wheels (Weaver 1992). Armed with high-powered guns to shoot any animal that comes into view, the sheikh occupies an elevated seat that swivels 180 degrees to enable him to spot the Houbara Bustards and their tracks in the sand (Weaver 1992). The ecological damage done by the armies of vehicles that flatten vegetation, scar the landscape, and slaughter every animal they see is so severe that it may result in the local extinctions of many rare and delicate species of the Pakistani desert (Hoyo *et al.* 1996).

Many Houbara Bustards winter in Pakistan, converging from breeding areas in Kazakhstan and other countries in the region. Their breeding range extends to North Africa east across Asia to China. In Pakistan and 23 other countries, including India, Iran and Russia, the Houbara Bustard is totally protected from hunting (Weaver 1992). Yet by means of lavish gifts and payments to high government officials and landowners, wealthy Arabs have received special dispensation to pursue and kill thousands of these birds, which are considered endangered and declining in many parts of their range, especially in North Africa, Bahrain, Jordan, Iran, Iraq and India (Hoyo *et al.* 1996, BI 2000).

These extraordinary birds present a spectacular show with their elaborate courtship, strutting and displaying beautiful white puffs of head and body feathers.* Some hunting, mainly illegal, also occurs in their breeding grounds, which greatly disrupts their courtship, nesting and care of chicks.

*"Red Desert," a film in the series *Realms of the Russian Bear* described in the Video section, shows these birds displaying and hunting lizards.

The hunts have been carried on for decades in Pakistan, and Houbara Bustards have declined steadily as a result. As early as 1983, scientists and conservationists at a symposium on bustards convened by the International Council for Bird Preservation (now BirdLife International) unanimously called for a five-year ban on hunting (Weaver 1992). Although Pakistan's President at that time supported the symposium, he ignored the appeal and, the following year, allowed 25 parties from the Saudi Arabian Peninsula to hunt; they killed more than 5,000 Houbara Bustards (AWI 1985). Since that time, hunts have continued in spite of changes in administration in Pakistan, and although Arab hunters realize that these birds are heading toward extinction, they have not decreased their kills or practiced conservation. Moreover, they are now hunting in new areas, close to breeding grounds (BI 2000).

One sheikh, the cousin of the ruler of Dubai, found no Houbaras in the tract where he had arranged to hunt. He then moved his camp into Kirthar National Park, where he illegally killed more than 200 Houbaras in 10 days, along with

protected gazelles and ibex (Weaver 1992). As recently as the 1960s, Houbara Bustards were so numerous in Pakistan that they could be counted "like butterflies in a field," but by the 1990s, they became scarce in many areas, and their populations have experienced sharp downward trends (Weaver 1992). No restrictions are placed on the take of Houbaras by the visiting sheikhs.

Some Pakistani conservationists have fought the illegal arrangements made between the Arabs and government officials, and the Society for Conservation and Protection of the Environment (SCOPE), took the issue to the Sind High Court, which ruled in their favor (Weaver 1992). However, because Pakistani government officials rarely follow such provincial court decisions, the hunt did not end. When asked why the government has done so little to protect its wildlife, a well-known Pakistani environmentalist, Wahajuddin Ahmed Kermani, the retired Inspector General of Forests, replied, "Because we lack the moral fibre and the moral courage" (Weaver 1992).

Protests from conservationists in Europe and elsewhere have had no real effect either. Paul Goriup, the bustard expert at BirdLife International in Cambridge, United Kingdom, believes that populations of Houbara Bustards in Sind and Punjab provinces of Pakistan have become "terribly diminished," and hunting of breeding populations has a disastrous effect (Weaver 1992). Goriup contends that the species must be protected by the United Nations' Bonn Convention on Migratory Species to bring the issue to an international level (Weaver 1992). The Houbara Bustard is listed on Appendix I of CITES, which bans all commercial trade between member nations. Yet each year, 500 or more eggs, chicks and adult Houbaras are smuggled from Pakistan, a CITES member, by sheikhs who use them to train their falcons and for captive-breeding programs of dubious effectiveness. Abrar Mirza, the wildlife conservator for the Province of Sind, confiscates many such shipments, but most provincial wildlife officials merely look the other way, especially after receiving diamond-studded, gold Rolex watches and other such gifts from the Arabs (Weaver 1992). The confiscation of so many Appendix I birds in the United States would result in severe penalties, including possible jail sentences, but the effectiveness of CITES depends on the legislation each member country enacts to enforce it and the zeal with which these laws are enforced.

Sheikhs from the United Arab Emirates (UAE) were not so well-received in Turkmenistan in 1995 when they applied to the Ministry of Foreign Affairs to hunt Houbara Bustards. This Ministry forwarded the request to the Ministry of Nature Use which, quite unexpectedly, turned it down because the birds would be breeding (Zatoka 1995). Certain that they would be able to overcome this opposition, the sheikhs arrived in Turkmenistan ready to hunt without official approval, bringing their falcons (Zakota 1995). To their amazement, they were issued an official complaint by the Director of the Department for Animal Conservation and fined \$40,000 (Zakota 1995). The sheikhs then turned to Turkmenistan's President Niyaziv, confident that they would be able to overturn the decisions of the wildlife department; instead, he backed up the decision of the Ministry of Nature Use, stating that it had jurisdiction in this issue (Zakota 1995). This was an extremely important precedent and a fine example of a country according its wildlife the respect and protection it deserves. Turkmenistan has a record of combating poaching and conducting environmental research and conservation programs (Zakota 1995).

One sheikh has renounced hunting and fostered environmental programs. Sheikh Zayed of the United Arab Emirates, while hunting gazelles with a rifle, realized that this amounted to "an outright attack on animals" and a cause for their possible extinction (Morgan 1998). He then began a program of setting tracts of land aside for wildlife and setting up breeding herds of endangered oryx, gazelles and other desert ungulates on an island off the coast (Morgan 1998). Other UAE sheikhs have obtained special favors when hunting on the African continent. The government of Tanzania granted exclusive hunting rights in one of the country's most important wildlife areas to a high-ranking official from UAE (Alexander 1993). The agreement was reached in secret with the Deputy Minister of Defense of that country, and he apparently has been allowed to hunt endangered species, such as Cheetah, with automatic weapons (Alexander 1993). The influence of wealthy Arabs in bending wildlife laws has reached to many corners of the world. One of their prime targets is North America for its beautiful Gyrfalcons (*Falco rusticolus*), listed on CITES Appendix I, one of the most coveted of all birds of prey for falconry. Their attempts at bribery, often successful, to obtain these protected birds from Canada resulted in the listing of this species on CITES to prevent any further commercialization of these birds, which was causing declines in their wild populations.

Trophy and Sport Hunting: Page 3

The vast Sahara has been the scene of similar hunts. Scimitar-horned Oryx (*Oryx dammah*) originally had a wide range in arid grasslands from Morocco and Senegal east to Egypt and the Sudan. In historic times, herds of 100 animals were commonly seen, and during wet season migrations, they traveled in groups of 1,000 animals or more. Their white and brown coloration allowed them to blend into the desert, and they were admired for their extremely long, back-curving horns. Their populations and range gradually shrank with hunting, overgrazing and agricultural encroachment on natural grasslands; the species disappeared from Egypt and Senegal in the 1850s. In the 1970s there were still an estimated 6,000 of these spectacular animals in the southern Sahara (Nowak 1999). The Haddad tribe of northern Chad centered their way of life around hunting these oryx, driving them into nets and killing them for their meat (Simon 1995).

Although traditional hunting made inroads into Scimitar-horned Oryx populations, the use of four-wheel-drive vehicles and modern firearms by prospectors and military personnel within the past 30 years drove the species to near extinction (Simon 1995). Groups of wealthy Middle Eastern hunters arrived with all-terrain vehicles and automatic rifles, eliminating these animals from most of their range. Chad's Ouadi Rime-Ouadi Achim Faunal Reserve became one of their only refuges by the 1970s, but the outbreak of war between that government's forces and Libyan-backed rebels in 1978 brought about an unregulated slaughter of the last population of Scimitar-horned Oryx within the reserve, reducing them to only a few hundred animals (Simon 1995). In an attempt to reintroduce these majestic antelope to their original range, 41 were captured in western Chad in 1966 and placed in captivity (Simon 1995). Some 500 of these oryx are part of the American Zoo Association's Species Survival Plan, and another 700 are in other zoos; an unknown number are in ranches, especially in Texas (Nowak 1999). A small number of Scimitar-horned Oryx were released into a national park in Tunisia in 1991 (Simon 1995), and others may be released in Niger (Nowak 1999). The IUCN listed this species as Critical in 1996, Extinct in Algeria, Egypt, Libya, Mauritania, Senegal, and Western Sahara, and Probably Extinct in Burkina Faso, Chad, Mali, Niger, and Sudan. The 2000 IUCN Red List of Threatened Species listed the Scimitar-horned Oryx as Extinct in the wild.

The Addax (*Addax nasomaculatus*), a desert antelope which once ranged from Western Sahara and Mauritania to Egypt and Sudan, is now nearly extinct in the wild as a result of heavy hunting combined with loss of its grassland and shrubland habitat to agriculture and competition with livestock. Perfectly adapted to life in the desert, Addax are able to spend their lives without drinking water, deriving moisture from plants on which they feed (Nowak 1999). Instead of the long, arched horns of the Scimitar-horned Oryx, the Addax has horns that grow outward, then bend inward and upward. A stocky antelope that is not able to run quickly enough to flee men on horses, it has been easy prey for hunters and feral dogs. In recent years, remnant populations literally have been run to death by tourists in four-wheel-drive vehicles who pursue them until the animals fall dead in the sand (Nowak 1999). A herd in northeastern Niger was reduced to 50 to 200 animals when, according to some reports, they were wiped out by hunting. Fewer than 200 remained in north-central Chad, and another 50 along the border of Mali and eastern Mauritania in 1994 (Nowak 1999). The 1996 IUCN Red List of Threatened Animals listed the Addax as Endangered, Extinct in Algeria, Egypt, Libya, and probably Sudan. The 2000 IUCN Red List of Threatened Species upgraded its status to Critical. A small reintroduced population survives in Tunisia, but the wild population is at risk of disappearing altogether. More than 400 animals are in captivity, including a herd in a large dryland safari park in Texas called Fossil Rim.

Other Saharan animals have been ruthlessly pursued. Pelzeln's Gazelle (*Gazella dorcas pelzelni*) have been pushed to Vulnerable status by hunting. They are listed on the US Endangered Species Act. The Slender-horned Gazelle (*Gazella leptoceros*), native to North Africa, is now endangered throughout its range, according to the 2000 IUCN Red List of Threatened Species. The hunting of these desert animals by men in all-terrain vehicles, some armed with

machine guns, reached such heights in the 1970s that they nearly became extinct, and their status has not improved in the intervening years. The endangered Dama Gazelle (*Gazella dama*), also a heavily hunted species, is extinct in Algeria, Libya, Mauritania, Morocco and Western Sahara; it has been reintroduced into Senegal, and populations are now confined to Chad, Mali, Niger and Sudan (Baillie and Groombridge 1996). Cuvier's Gazelle (*Gazella cuvieri*), another North African species, is also extinct in the Western Sahara and survives in endangered populations in Algeria, Morocco and Tunisia, according to the IUCN. In some cases, antelope and gazelles have been pursued by hunters in helicopters who shoot at them with rockets, a method also used to kill African Elephants in Chad, where the last Greater Kudu (*Tragelaphus strepsiceros*) were destroyed in 1976 (Anon. 1977).

Trophy and Sport Hunting: Page 4

Poachers have caused the extinction in Somalia of the endangered Hunter's Hartebeest or Hirola (*Damaliscus hunteri*), which now survives only in a restricted portion of scrubby desert of south-eastern Kenya. Looking somewhat like an Impala, this delicate, dryland antelope can live for weeks on very little water. This species is considered an evolutionary relic, having lived on earth for 15 million years, and is a progenitor of other hartebeests and the Topi; fossil evidence indicates that the Hirola's range once extended to South Africa (McKinley 1996). Kenyan populations totaled 14,000 in 1976, living along the Tana River and in the arid Garissa region to the east (McKinley 1996). In the 1980s, poachers killed off the region's African Elephants, who had kept the land clear of thorn bushes for grazers, such as the Hirola (McKinley 1996). A rinderpest epidemic brought in by cattle herders wiped out half the region's antelope between 1983 and 1985.

In the early 1990s, Somali refugees and troops fleeing from civil war in Somalia crossed into Kenya and began slaughtering the Hirola (McKinley 1996). By 1993, only 2,000 Hirola survived, and with unregulated hunting, a 1995 census found a total of 306 animals scattered in small groups over 45,000 square miles (McKinley 1996). Rangers from the Kenya Wildlife Service decided to capture and move as many as possible of the remaining animals to Tsavo National Park, where they could be guarded against illegal hunting. One hundred animals were moved to the park in 1995, and a year later, about 57 survived. In 1996, more were chased by helicopter into nets, sedated, blindfolded, and then taken by truck to a small plane which airlifted them to Tsavo. The habitat in Tsavo is lush and greener than their native desert shrub, and the Hirola may not thrive there. Only time will tell. The *2000 IUCN Red List of Threatened Species* lists the species as Critical.

Trophy and Sport Hunting: Page 5

In South Africa, the Quagga (*Equus quagga*), a zebra-like equine, became extinct from hunting. Some zoologists consider these animals to have been a race of Burchell's Zebra (*Equus burchelli*), but others classify them as a full species. They had black, vertical stripes on the head and neck, while their back and haunches were uniform grayish or faintly striped. Native to the Cape Colony grassy plains, their limited and open habitat made them vulnerable to the Boer settlers, who killed them by the thousands (Day 1981). Many were tamed and used to guard domestic livestock at night because they gave loud alarm calls upon seeing predators (Day 1981). Some were even shipped to London and used as harness animals. The Boers used their skins for sacks and other practical purposes. By the 1850s, it had nearly disappeared from the Orange River area from relentless hunting (Nowak 1999). The last wild Quagga was killed in 1878, and in 1883, the last captive Quagga died in the Amsterdam Zoo (Day 1981). Photographs (Nowak 1999) and specimen skins exist with DNA that has been compared with living zebras. There has been talk of restoring a Quagga-like animal through selective breeding with Plains Zebras.

Many other South African species were reduced to endangered status or eliminated from the country altogether by

Boer hunting and their policy of clearing the land for livestock and agriculture. Although many parks have been set aside, wildlife as a whole has been crowded out of its natural environments in South Africa. Elephants became restricted to an area in the northeast that later became Kruger National Park, and only recently have they been reintroduced into a few parks elsewhere. Zebras have become extremely rare, with several races critically endangered (see Grasslands, Shrublands and Deserts chapter).

The high-altitude Simien Mountains National Park (6,234 to 14,535 feet) has many endangered endemics. A Survival Anglia film, *Edge of the Abyss*, records many of these species, including the Walia Ibex (*Capra walie*), a mountain goat found only in Ethiopia. It has a population of about 300 in the park and stays above 10,000 feet, browsing in the giant heath. These goats were common until the 1930s when hunting decimated their numbers. They also have lost habitat to agriculture and livestock. By the 1960s, there were only 200 Walia Ibex in the park, and although they have recovered somewhat, they still are poached for their magnificent, massive curved horns, hides and meat. Poachers enter the park and place nooses on the narrow mountain trails they must use to travel from one part of the park to another.

Trophy and Sport Hunting: Page 6

Local villagers in Kankani, India, have turned the tables on hunters of the threatened Blackbuck. This town, located in the Rajasthan desert of western India, has a history of preserving nature, refusing to allow an 18th century maharajah to cut their trees by encircling them and vowing to be killed rather than let the maharajah's men cut the trees (Bearak 1998). When hunters in all-terrain vehicles awoke the villagers with gunshots in October 1998, the villagers chased them off and got the license plate number of the driver (Bearak 1998). Some bucks of these striking black-and-white antelope had already been killed. "These animals are considered sacred to us, and we consider their lives more important than even our own," said a village elder of the Bishnoi people (Bearak 1998). The license turned out to belong to a famous movie actor, Salman Khan, star of many high-action, violent films (Bearak 1998). The story was told in many newspapers, and public opinion turned against Khan, who came to symbolize the callous rich who take pleasure in poaching endangered species like the Bengal Tiger and Sarus Crane (Bearak 1998). The week before, he had hunted Chinkara (*Gazella bennetti*), a Conservation Dependent species, according to the IUCN. On October 12, 1998, the actor was arrested, but he was unlikely to go to jail, as a result of his fame and wealth. The village elder said: "Between us and the animals there is complete trust. Our teachings tell us that we must serve as protectors and nurturers of all living things" (Bearak 1998).

Trophy Hunting Clubs

The US-based Boone and Crockett Club keeps records of trophy animals for North American mammals, and Safari Club International (SCI) maintains international records and promotes trophy hunting of animals worldwide. US state wildlife departments tend to favor sport hunting, and many earn large license fees from the trophy hunting of Bighorn Sheep, Elk, Grizzly Bear, Gray Wolf and other mammals. Trophy hunters in North America vie with one another to receive the "Outstanding Hunting Achievement" trophies awarded each year, primarily for having killed one each of 29 big game animals, some of which are on the US Endangered Species Act list (Williams 1991). Trophy hunting organizations have "master measurers" who check the size of horn, antlers and other measurements of animals killed for record books. SCI gives awards to those who kill at least 13 of the world's 22 species of "available" wild sheep (Williams 1991).

Rifles that fire at distant targets with telescopic lenses, elaborate blinds, heat sensors, and other technological gadgetry have weighted the contest so much in favor of the hunter that animals have become mere targets, with virtually no

hope of escape. Hunters using these high-powered rifles revel in recounting their experiences in hunting publications, whose writing fees help pay for their trips. One hunter's 1997 account recorded his delight in seeing the look of total shock of an Alaskan Dall Sheep (*Ovis dalli*) as it died from a shot he fired without it even having been aware of his presence. The hunter had selected the largest male with the most massive horns, which curved into a complete circle. Such hunting can so terrify animals that they run off cliff edges or flee into places from which they cannot escape.

Bernard Grzimek's *Animal Life Encyclopedia* recounts a hunt in the Canadian Rockies of Mountain Goats (*Oreamnos americanus*), in which five animals were pursued by hunters. They fled in terror, becoming entrapped on the ledge of an overhanging cliff, unable to move in any direction (Grzimek 1968). The hunters returned to their camp where they could see the goats as they stood on the ledge. The next day, the goats were still standing on the spot, but during the following days, they gradually became weakened and fell, one after another, usually at night, to their deaths. The last of the animals fell after 10 days (Grzimek 1968).

One US trophy hunter, Donald G. Cox, has hunted in 68 countries, taken 208 different species, including 125 from Africa, and has killed 23 of the world's spiral-horned antelope (Williams 1991). Trophy hunters try to kill as large a number of species as possible and as many trophy-sized animals as they can shoot. Many trophy hunting organizations claim to have made major contributions to conservation, but documentation is often lacking. SCI has published brochures in which it claims that it purchased habitat for endangered species. As it turned out, on investigation these claims were unsubstantiated (Williams 1991). Endangered animals are often the prime targets of trophy hunters. Safari Club International makes regular applications to the Fish and Wildlife Service to import trophies of endangered species. A 1978 application was particularly stunning because it requested permits to import 1,120 animals of a wide range of species, including Orangutans, various species of monkeys and crocodiles, and 39 species of endangered deer, gazelles, wild sheep, antelope, rhinoceroses, and 12 species of endangered wild cats. After a public outcry, the Safari Club withdrew its application, but in 1982, it was successful in its long battle to allow importation of Leopard trophies.

Trophy hunting clubs have made financial contributions to officials in foreign countries to receive permission to hunt endangered species and have convinced wildlife officials in countries such as Pakistan, Zimbabwe and Botswana that trophy hunting fees pay for conservation and should form the basis of wildlife management programs. The profits from trophy hunting pale beside those of ecotourism, however (see Trophy Hunting vs. Ecotourism Revenues section below).

Illegalities

Trophy hunting organizations have lobbied the US Department of the Interior for decades to weaken law enforcement "overzealousness" and have, on occasion, been successful. The Law Enforcement Division of the US Fish and Wildlife Service has tended to be strict in prosecuting trophy hunters for violations. In one case that inflamed Safari Club International members, it subpoenaed pages of the SCI's *Record Book*, which listed many endangered species, to determine the details of the killing of various protected animals. To shield its members from prosecution, SCI returned information to their members on trophy animals killed at a time when they could not have been imported legally, and deleted this information in the SCI database to avoid further investigations (Williams 1991).

In another case, however, SCI influence won favors from the Department of the Interior. A highly placed official with the Fish and Wildlife Service, Richard Mitchell of the Office of Scientific Authority, allegedly accepted money from SCI in exchange for facilitating permits to get endangered species trophies into the United States (Williams 1991). Correspondence between Mitchell and SCI members included advice on registering as an institution with CITES on behalf of the trophy museum that the organization maintains in Arizona. Mitchell suggested that he would arrange to register several institutions in China and Pakistan in order to trade endangered species "specimens" with them

(Williams 1991). Another official, Assistant Secretary of the Interior G. Ray Arnett, who later co-founded a lobbying organization for trophy hunters, helped a fellow hunter caught importing an endangered species in the early 1980s by ordering agents to return the trophies to the smuggler, Thornton Snider (Williams 1991). Rick Parsons, who founded the Permit Office within the Fish and Wildlife Service, which gave permits to trophy hunters and others wishing to import endangered species, later became the Washington Counsel to Safari Club International, using his government experience to facilitate the permit process for trophy hunters and also lobbying at CITES Conferences on behalf of trophy hunters.

Ted Williams, in a 1991 article in *Audubon* magazine, tells of an appraiser for the Safari Club, R. Bruce Duncan, who arranged for many members of the club to mislabel the trophy animals they killed in foreign countries in order to import them into the United States without prosecution under the US Endangered Species Act (Williams 1991). One Club member imported a Jaguar (*Panthera onca*) pelt from Venezuela, labeled as a "goat hide" under Duncan's advice, and valued at \$60; Duncan had appraised it at \$11,000 (Williams 1991). Another SCI trophy hunter, Andrew Samuels, was the winner of the 1990 "Weatherby Award" given by a firearms company to the hunter who kills the greatest number of average, as well as record-sized, game animals throughout the entire world and whose character and sportsmanship are "beyond reproach" (Williams 1991). An undercover Fish and Wildlife Service Law Enforcement investigation revealed that Samuels had confided having illegally killed a Bighorn Sheep and numerous endangered foreign animals and smuggled them into the United States by falsifying shipping documents (Williams 1991). These included Jaguars, endangered wild Markhor goats (*Capra falconeri*), rare African antelope, Jentink Duikers (*Cephalophus jentinki*), Ocelot (*Leopardus pardalis*), and a wild Asian sheep, the Punjab Urial (*Ovis orientalis punjabiensis*) (Williams 1991). Samuels paid \$100,000 in fines, spent 30 days in jail, and performed 800 hours of community service; he also forfeited his world hunting rights for three years (Williams 1991).

In another case, John Funderburg, the curator of the North Carolina Museum of Natural Sciences in Raleigh, acquired more than 1,800 animals as "specimens," many of them endangered, that had been killed by trophy-hunting acquaintances (Williams 1991). They were donated to the museum as tax-exempt, but had little scientific value because they lacked information about the location or date where they were killed, and many were merely heads mounted for hanging on walls. Scientific specimens consist of the skins of entire animals, or their skeletons. A number of the donated trophy animals mysteriously disappeared from the collection, apparently returned to the donors (Williams 1991). In exchange for financial "donations" to the museum, the trophy hunters received the title of "associate curator," with certificates that allowed them to misrepresent themselves to foreign wildlife officials in order to obtain permits to kill protected animals (Williams 1991). Funderburg urged the hunters to send him the trophy animals via private taxidermists to avoid the attention of authorities, but a five-year undercover investigation by Fish and Wildlife Service Law Enforcement revealed all the details of this scam (Williams 1991).

The highly respected Smithsonian Institution has not been invulnerable to such unprincipled arrangements. A wealthy real estate developer, Kenneth Behring, pledged \$20 million to the Institution's National Museum of Natural History in 1999, the largest donation in the 151-year history of the museum (Golden 1999). Behring, a trophy hunter and past president of Safari Club International, donated the remains of four endangered Central Asian wild sheep, including the Kara-Tau Argali (*Ovis ammon nigrimontana*) of Kazakhstan, listed as Critical by the 2000 *IUCN Red List of Threatened Species*, to the museum. This animal cannot be imported legally because it is listed on the US Endangered Species Act, but on behalf of Behring, the Smithsonian petitioned the Department of the Interior to waive the ban in order to have the trophy shipped into their collection (Golden 1999). This action set an unfortunate precedent for this august institution. Behring is also under investigation for illegally killing three bull elephants in Mozambique, in spite of a \$20,000 "donation" he made to a local hospital in the province (Golden 1999). The head of Mozambique's wildlife department, Arlito Cuco, said that the hunt was illegal, "Because according to the law in Mozambique, you cannot hunt for sport" (Golden 1999).

Hunting magazines often glorify the pursuit of endangered species. An article in *Sports Afield* encouraged the hunting in Mexico of Jaguar, Ocelot, and "crested Guan," or Horned Guan (*Oreophasis derbianus*), a highly endangered pheasant-like bird (Anon. 1981). It noted parenthetically, "However, United States laws prohibit bringing in skins"

(Anon. 1981).

Effects of Trophy Hunting on Animals

Among the most coveted of the "Grand Slam," or the most prestigious trophy animals, is the Brown Bear. The Kodiak Bear (*Ursus arctos middendorffi*) of Alaska represents a major trophy for hunters who come from all around the world to kill large males. This bear exceeds other subspecies in size, weight and skull size. These bears have been isolated since the end of the last Ice Age, and the abundant food supply of salmon runs, berry bushes and other edible plants in their habitat has produced this giant bear (Chadwick 1990). Trophy hunters pay \$20,000 or more to private hunting guides for the privilege of shooting these bears. A recent study has revealed a potentially disastrous effect on the species of this trophy hunting. According to *The Kingdom. Wildlife in North America*, by the respected author and National Geographic Society correspondent Douglas Chadwick, "Continued harvesting of the biggest animals by trophy hunters has caused a decline in the average size of Kodiak Bears over the years" (Chadwick 1990). Thus, this record-size animal is gradually becoming smaller and smaller as a result of trophy hunting.

The pressure of hunters on some populations of Alaskan bears is so intense that it has altered the behavior of males, preventing their normal feeding on salmon runs. On Admiralty Island in southeastern Alaska, part of the Tongass National Forest, tourists watch female Brown Bears fishing with their cubs, but rarely see males because they have become so wary of people after years of being hunted; even females without cubs can be hunted on Admiralty Island (Crittenden 1997). The rich salmon rivers on this island are among the world's most productive, and since clearcutting of timber has been banned, salmon thrive in the clear water. Salmon is an important portion of the diet of male bears, yielding a great deal of protein and helping to fatten them for the winter. By frightening the male bears from the salmon rivers, which they have fished for thousands of years, humans may be affecting the health, survivability and size of these bears. Each year more than 40 Brown Bears are killed on Admiralty, and hunters are lobbying to reopen hunting in areas such as Pack Creek that are now closed to protect the fishing spots (Hanson 1998). This island deserves to be declared a National Park, which would protect these bears from hunting.

Another effect of hunting male bears has recently been documented by Swedish and Norwegian biologists, who found that in areas where resident adult male Brown Bears had been killed to thin the population, bear cubs suffered very high mortality for several years until dominant males reoccupied the territory (O'Neil 1997). Male bears, who have traditionally been considered threats to cubs, may be a danger only to cubs they have not fathered. Thus, the killing of bears by sport and trophy hunters may also result in the deaths of hundreds of bear cubs.

Russian Brown Bears have been hunted heavily in recent years. When a prominent government official, Prime Minister Viktor S. Chernomyrdin, announced early in 1997 that he wanted to trophy hunt a Brown Bear, local guides bulldozed a path to the den of a sleeping female bear (Filipov 1997). Tractors plowed a campsite for a large tent with mobile kitchen and cafeteria, and the Prime Minister flew in by helicopter (Filipov 1997). Chernomyrdin, accompanied by 12 hunters, rode a skimobile to the site, roused the bear and killed her two cubs and the mother. This incident received much adverse publicity in Russia. When the Prime Minister was criticized for his lack of sportsmanship, he replied: "What's wrong with that? Hunting of bears is not banned; it's a normal thing . . . I'd like to watch those who are writing about this meet those bears eye to eye to see their reaction" (Filipov 1997).

In Greece and Turkey, where Brown Bears are avidly hunted in spite of their dwindling numbers, cubs orphaned when their mothers are killed are often sold to zoos or to gypsies who treat them abusively. This trade is illegal in both countries, and the World Society for the Protection of Animals (WSPA) has saved many of these gypsy bears, who are dragged through the streets with nose rings and made to perform tricks. WSPA has placed several hundred of these abused bears in large wooded compounds, unfettered for the first time in their lives. Some had to be euthanized because of severe infections that had caused them extreme pain and serious physical disabilities that they had endured

for many years without veterinary treatment. The majority suffered the effects of malnutrition.

The animals trophy hunters seek--the finest specimens--are the very ones that should be left in the wild to maintain the species. Killing the largest specimens of a species, subspecies or population is likely to diminish it in size and survivability. This would seem elementary, but trophy hunters, state game departments, many in the Fish and Wildlife Service, the World Wildlife Fund and other organizations in favor of trophy hunting do not discuss or acknowledge this fact. Claims are made on behalf of trophy hunters that only old and non-breeding adults are killed, but this contention has been proven wrong in case after case. Brown and Grizzly Bears continue to breed until an advanced age. Other trophy animals have also been shown to be at their prime when shot.

Lions are a prime target of trophy hunters, who select the largest male specimens, especially those with enormous manes. Two filmmakers, Derek and Beverly Joubert, in producing their dramatic series, *Lions of Darkness* for the National Geographic Society, followed three exceptionally large males for a long period. These magnificent Lions spent most of their lives in a national park in Botswana, but made the fatal mistake of leaving the park and entering a wildlife management area where trophy hunting was allowed. All were shot within a short time at the prime of their lives by trophy hunters.

Trophy hunting took a tragic and highly controversial turn when the government of Tanzania sold trophy hunting rights for African Elephants at more than \$4,000 per animal in the early 1990s. The *2000 IUCN Red List of Threatened Species* classifies this species as Endangered. The government claimed that the largest animals, which for trophy hunters were the most desirable, were not active breeding males, but past the breeding age and, therefore, "excess." Tanzania issued 50 permits a year for trophy-hunted elephants (Brody 1994). At least four very tame bull elephants that had been studied for decades in Amboseli National Park in southern Kenya by biologist Cynthia Moss, author of two classic books, *Echo of the Elephants* and *Elephant Memories*, wandered into Tanzania in 1994, where they were shot at point-blank range by trophy hunters (Moss 1995). The hunters had received CITES permits from the Tanzanian government to export the tusks as hunting trophies (Moss 1995). Northern Hunting Enterprises, which organized the Tanzanian elephant hunt, is run by Rick Trappe, a German Tanzanian; the hunters were two Germans and an American (Brody 1994). One of the bulls killed, called "R.B.G.," was 47 years old at the time of his death, based on aging of the jaw--not old in elephant years--and so habituated to vehicles that he could be easily approached to within a few feet (Moss 1995). Cynthia Moss said she was "devastated" by the loss of the animals, who had come to trust researchers, tourists and rangers. She stated: "The message they got from us was, 'It's OK, we're not going to hurt you, you can trust us.' Then one day they walk two kilometers into Tanzania, where they'd been going for most of their lives, and they're blown away . . . I feel as if was lying to them" (Brody 1994). A spokesperson for the African Wildlife Foundation said: "The ethics of shooting these virtually tame animals is appalling. You can't call this a hunt of any kind" (Brody 1994). Had R.B.G. not been shot, he would have lived another 18 years, according to Moss (Brody 1994).

These were among a relatively small number of large, old bull elephants left in East Africa, protected through the ivory slaughters of the 1980s by the presence of field researchers and tourists. The assertion that they were non-breeding males was refuted by Moss, who had documented that they were active breeders and, in fact, among the top breeding bulls in the Amboseli population (Brody 1994). This disputes the view that they were not contributing to the gene pool and were "excess," worthy only of being used as targets. After protests and adverse publicity on television programs that reached the United States and elsewhere, Tanzania announced a ban on trophy hunting of elephants near the Tanzania/Kenya border on December 13, 1994, and initiated an investigation into the granting of permits to shoot the Amboseli bull elephants.

In spite of the supposed ban, two other big bulls of the Amboseli, Sleepy and Beach Ball, both in their 50s, were killed in Tanzania by trophy hunters in 1996. Both had fathered calves that were born after their deaths. The largest bull in Cynthia Moss's study area is the gigantic Dionysus who, at 55 years old, weighs some 6,000 kilograms, with 100-pound tusks. He probably owes his life to Cynthia Moss and other researchers who have deterred poachers, but should he wander into Tanzania, he may be killed. The females in the family, headed by Echo, an old matriarch, prefer

Dionysus above all the males, and he has fathered many calves. In a BBC film about her work in Africa, *Echo of the Elephants. The Next Generation* (PBS--WNET 1996), Moss pledged that she would spend the rest of her life watching over these elephants.

Another effect of trophy hunting of elephants and many other animals is an imbalance that is created between the sexes. The largest elephant bulls of both the African and Asian species have been killed off, leaving far too few males for the number of adult females. In some parts of Africa where the ivory massacres were the most intense during the 1970s and 1980s, virtually no adult males remained prior to the 1989 CITES ban on ivory. In Asia, adult male Asian Elephants (*Elephas maximus*), also listed as an Endangered species by IUCN, have become extremely rare because they were killed by ivory poachers. Females do not have tusks, and most have been spared by ivory hunters. In parts of Asia, males without tusks, a recessive trait, have come to dominate some populations, since they are not valuable for their ivory. This is altering the traits of the species.

After the largest bull African Elephants were killed off, trophy and ivory hunters turned to the older females, who have large tusks. They are essential in maintaining and leading family groups, providing experience, protection and guidance (Moss 1995). These older females, or matriarchs, have accumulated survival lore over many decades, acquired from previous matriarchs and their long life experiences. They also know the location of scarce water holes in the dry season, where to find minerals in clay they need for their nutrition, what plants are poisonous and other bits of survival lore that can mean the difference between life and death of herd members. Yet these matriarchs also were killed in the 1980s, leaving young, traumatized teen-aged females, who wandered in disarray, without the knowledge or authority of the older females. Females as young as 10 years old found themselves matriarchs of bands of orphan calves, many just weaned. Without direction, they often blundered, placing the calves at risk.

Scientists studying elephants over the past 30 years have documented hundreds of cases of trauma and apparent mourning when family members were killed. The elephants that suffer the most are the young who see their mothers and relatives butchered in front of them. Researchers in the 1990s have noted that many of these young elephants fail to develop normally and are extremely shy, unable to find food and cope with predators as effectively as adults. Some young males, who were calves when they watched as their families were slaughtered by poachers or in culls in South Africa, were released in national parks where they later became unruly and destructive to property and to other animals. Only when older elephants were released to lead and discipline them did they calm down and assume the peaceful personality that characterizes the species.

Zimbabwe, Botswana and Namibia submitted proposals in 1997 to the CITES Conference that the African Elephant's population in their countries be down listed from CITES Appendix I to Appendix II to allow export of trophy-killed elephants. Zimbabwe requested commercial trade in trophies, and Namibia, non-commercial trade. This proposal was amended to read "for non-commercial purposes" and adopted by the CITES members at the 1997 Conference. This is a step in the wrong direction, as hunters will arrive in these countries from around the world to kill the largest, prime elephants as trophies. Shooting elephants in open country where they have no cover is hardly sport, yet the hunting companies tout their massacre as a feat of bravery. Killing them as they come to drink at the few water holes that remain in the dry season in southern Africa is also unsportsmanlike. Matupula Hunters of Texas calls such hunting "exciting and rewarding." Their brochure states, "With the country dry and surface water limited, the elephant bulls can be tracked going to and from water, or in amongst the woodlands and forest where they feed and lay up" (Scully 1997).

Trophy Hunting vs. Ecotourism Revenues

The irony of the slaughter of elephants and other large mammals for trophies is that the funds accrued from trophy hunting or ivory are miniscule in comparison to the value of these animals as ecotourist drawing cards. In Kenya, a

1989 analysis on the viewing value of elephants found that between \$25 and \$30 million per year was earned in tourist dollars from people attracted to the elephants alone (Brody 1994). A new project provides a local Maasai tribe with about \$23,000 a year from tour operators who camp there primarily to show visitors the big bull elephants that are now so rare in East Africa (Brody 1994). During the long life of an African Elephant, it may produce tourist revenue worth \$1 million, distributed to a wide range of recipients, from airlines to travel companies, and to local economies (Currey and Moore 1994). By contrast, a trophy-hunted elephant brings a one-time fee of \$4,000 to \$20,000. Estimates for African Lions are similar. A fully maned male Lion, according to Lee Durrell (1986) in *State of the Ark*, is worth \$500,000 as a tourist attraction, whereas a Lion shot for sport or trophy is worth between \$3,500 and \$8,500, and its skin about \$1,000.

Ecotourism has shown an astronomic rise within the past decade, with magazines, books and films aimed at the ecotourist and soaring revenues accruing to countries that protect their natural heritage. Most tourists prefer to come to a country where the animals are tame and where senseless killing is not carried out. Countries that allow hunting of the largest specimens of their wildlife, whether elephants or Leopards, are likely to suffer loss of tourist revenue because they have fewer larger animals and the hunted species often become either shy, hiding from tourists, or belligerent, charging them. A recent article in *Africa. Environment and Wildlife*, a magazine affiliated with World Wildlife Fund South Africa, gave advice to tourists coming to Okavango. Daryl and Sharna Balfour (1998) recommended that tourists avoid coming during hunting season, which runs from early April to mid-September, because game is "scarce in this areas, skittish and almost impossible to approach." They further noted that the sound of gunfire and the sight of carcass-laden vehicles can be disconcerting (Balfour and Balfour 1998). Wildlife can remain shy throughout the year, especially sensitive, gun-shy animals like elephants, and even beyond the suffering caused to the animals, this trophy hunting potentially deprives the country of far greater revenues that tourists could contribute. Several tourists have been killed recently by charging African Elephants in areas where the animals had been trophy hunted.

Tourists coming to South Africa have increased in number in recent years, producing revenues totaling \$6 billion in 1995; a large percentage of this total derives from tourists coming to see scenery and wildlife. By contrast only \$2 million in trophy hunting fees for rhinos, and a few million dollars more for other animals, were earned in that year, according to the Natal Parks Board (Hughes and Brooks 1996).

Botswana earns \$100 million per year from tourism and only a tiny fraction from trophy hunting, yet the government actively promotes the latter activity and has failed to give national park status to its crowning jewel, the Okavango Delta. Portions of this superb wildlife area have been designated as game reserves which allow hunting, but most remains unprotected (Balfour and Balfour 1998). By contrast, Kenya has designated vast areas as national parks and has encouraged ecotourism for decades, with the result that the government earned \$500 million in 1996, up from \$452 million in 1995. A new organization, Okavango Peoples' Wildlife Trust, in Botswana, is pressing for a complete ban on trophy hunting in the immense Okavango Delta wetland (Jackman 1997). As a result of livestock fencing in the area, African Buffalo are declining 18 percent a year, and Lion, zebra, Sable Antelope and waterbucks are also becoming scarce (Jackman 1997). This organization has proposed that all hunting, except for subsistence or problem animals, be banned and that the Delta be promoted as an ecotourism center, with low-impact camps for luxury visitors (Jackman 1997). New fencing has blocked about one-fourth of the Okavango to wildlife, who migrate to this oasis from surrounding desert areas as a vital refuge for many months during the year. These fences also have blocked wildlife migrations between Namibia and Angola, a disastrous event for many thousands of animals (Jackman 1997). This region has enormous potential for ecotourism that would far outweigh the revenues from cattle ranching or trophy hunting.

In general, funds from trophy hunting end up in government coffers and in the pockets of a few tour operators; the people of a country receive little of the revenues. By contrast, ecotourism funds are spread throughout the local economies, with hotels, taxis, buses, restaurants, souvenir shops and others benefiting from the greater number of tourists than hunters. In fact, the number of trophy hunters is miniscule in comparison to the number of ecotourists. In most countries, hunters amount to a few hundred or thousand, versus hundreds of thousands--or even millions--of

tourists. In some countries, a portion of trophy fees and the meat from slaughtered animals are shared with local villagers, but if they were given the same share of tourist money, it could be very profitable. This trend of sharing tourist revenues or park fees with local people is making an enormous difference in the lives of people around the world.

Meat Hunting

Three Asian wild cattle are endangered from hunting, and one of these is on the verge of extinction. The Kouprey (*Bos sauveli*), discovered in 1937, is classified as Critical by the 2000 IUCN Red List of Threatened Species. Native to open lowland forests of Southeast Asia in Cambodia, Laos, Thailand and Vietnam, it is the size of a steer. Adult males weigh up to 1,980 pounds and stand 6 feet tall at the shoulder (Nowak 1999). Originally, the Kouprey's habitat consisted of low, rolling hills interrupted by patches of forest; it grazed in herds of up to 20 animals, covering some 15 kilometers a day in the open areas and entering the forest for shelter from the sun and refuge from predators (Nowak 1999).

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Meat Hunting: Page 1

Today, much of the Kouprey's habitat has become a battleground for bands of guerrillas who have planted land mines throughout the region and hunt and snare wildlife for food. After the Vietnam War and the Khmer Rouge occupation of Cambodia, Kouprey were only seen rarely (Stewart-Cox 1995). A 1986 survey found fragmented, small populations remaining in most of its range (Nowak 1999). A few Kouprey were seen in the 1980s trying to migrate through the steep escarpment separating Cambodia and northeast Thailand, but they apparently died in booby-traps set for people (McNeely and Sochaczewski 1988). The skull and horns of a female Kouprey were offered for sale in a shop in Poipet, Cambodia, in 1994 for \$400, according to biologists surveying illegal trade in the country (Martin and Phipps 1996). The Kouprey has little chance of surviving without protection from hunting unless a large sanctuary is set aside for it. No strong conservation measures have been taken to date. No Koupreys are in zoos. It is possible that this species is already extinct.

The Banteng (*Bos javanicus*) is similar in size to the Kouprey, with upturned horns and an extremely stocky build. Brown to bluish-black, Bantengs have white legs and a white rump patch. Their range is larger than that of the Kouprey, extending from India to Myanmar (Burma), Thailand and Indochina, south through the Malay Peninsula to Java and Borneo. These animals are being crowded out of their forest and shrubland habitat by settlements and logging, and they are extremely vulnerable to hunting. They have become wary and shy, and large herds are now rare. Banteng have been domesticated in Indonesia and bred with domestic cattle, producing fertile offspring (Nowak 1999). Wild, genetically pure Bantengs are extinct in Bangladesh, Brunei, and probably India as well, according to the 1996 IUCN Red List of Threatened Animals. The 2000 version of this list also classifies the species as Endangered.

The Gaur (*Bos gaurus*), largest of the three Asian wild cattle, is the most numerous, yet it is listed as Vulnerable by the 2000 IUCN Red List of Threatened Species. Ranging from Nepal and India to the Malay Peninsula, these massive animals weigh up to 1,000 kilograms (2,200 pounds) (Nowak 1999). They have become extremely rare to absent in all

but protected national parks, and their populations have been estimated as extremely low, only about 1,000 animals (Nowak 1999). These animals are killed whenever possible for their meat throughout their range.

The Annamite Mountains extend along the border between Laos and Vietnam, rising to more than 6,000 feet in some areas, where stands of wet evergreen broadleaf forest harbor some of the strangest and rarest mammals on earth. Not until the 1990s were these remote forests explored by scientists, who examined skins and horns of rare animals killed by Hmong tribespeople. First to come to light in 1992 was the extraordinary Sao la or Vu Quang Ox (*Pseudoryx nghetinhensis*), a beautiful, gray, goat-like antelope. Its genus, *Pseudoryx*, meaning false oryx, indicates its superficial resemblance to oryx because of its long, straight, backward pointing horns. Weighing up to 200 pounds and 35 inches tall, this relatively large animal somehow had escaped the attention of scientists. (See photo in Nowak 1999.) Soon after discovery of several pairs of its horns, rewards were offered for live specimens. Two young calves were captured in Vietnam and placed in the Hanoi Zoo; within weeks, both were dead (Rabinowitz and Schaller 1994). Others were captured by villagers hoping to receive rewards, and some of the animals died (Nowak 1999).

The Hmong people know the Sao la well and hunt them whenever they can. They believe these antelope number at most a few hundred animals (Rabinowitz 1997). Many have been killed since their discovery, and hunters indicate that it has disappeared from some areas (Nowak 1999). Only a few hundred Sao las are thought to exist in Vietnam and Laos, where heavy hunting presents a major threat to them in spite of official protection by the Vietnamese and Laotian governments (Nowak 1999). Wildlife Conservation Society biologist Alan Rabinowitz (1997) estimates that they are restricted to an 800-square-mile portion of the rugged mountain forests along the border. In 1994, soon after this animal was given its scientific name, it was listed on Appendix I of CITES to prevent international commercial trade. The 2000 IUCN Red List of Threatened Species lists it as Endangered. Vietnam set aside the Vu Quang Nature Reserve for these very rare animals and prohibited snaring in the reserve (Rabinowitz and Schaller 1994).

Other rare and newly discovered or rediscovered animals of the Annamite Mountains include two species of muntjac, or barking deer, one of which is the largest of all muntjac species; a long-snouted, yellowish wild hog rediscovered from a skull fragment; a striped rabbit, based on fur pelts found in a local village, which may be the same species or related to the endangered Sumatra Short-eared Rabbit (*Nesolagus netscheri*); and a very endangered palm civet (Rabinowitz 1997). The muntjacs and palm civet were discovered as captive animals, but nothing is known of the others, and searches for the wild hog have been unsuccessful (Rabinowitz 1997). Had these intriguing and unusual animals been discovered in a wilderness area in North America, they would be the subjects of field surveys and strict protection, as well as extensive media coverage. In Asia, where diversity is far greater and conservation a luxury few can afford, even such fascinating species may fade into extinction for lack of funding for conservation programs.

Throughout the region, much of the larger wildlife, from deer to large predators, has been hunted out, and guerrilla warfare has left the land marked with bomb craters and land mines. Alan Rabinowitz (1997), who has lived in Southeast Asia and witnessed overhunting in many countries, says, "The killing of wildlife in Laos was unlike anything I had seen elsewhere." Even within the Nakai Nam Theun Reserve, "walls of death" were constructed of thatch, bamboo and small trees, with openings rigged with snares; animals walking along the wall would be caught when trying to pass through an opening, snared by a leg or the neck, to "die a slow death" (Rabinowitz 1997).

Meat Hunting: Page 2

A wildlife slaughter of enormous proportions is taking place in Central and West African countries. Rural people who once killed animals only for personal consumption now hunt professionally, and markets in villages and cities now sell thousands of monkeys, antelope, wild cats, pangolins and even endangered apes (Pearce 1995, McRae 1997). Hunters use wire snares and leghold traps, high-powered rifles and dogs to track down animals. The tropical rainforests of west-central Africa, which once teemed with wildlife and echoed with their calls, are now falling silent.

For miles surrounding villages, wildlife has largely disappeared as local peoples throughout this vast region are killing every animal to sell its meat and body parts. Professional hunters have taken so much wildlife that little is left for local tribes. Logging corporations based in Europe have launched this commercialization of bushmeat by opening up previously impenetrable wilderness areas with logging roads and offering to buy animals that local people kill. Both the forests and the wildlife are being devastated.

Logging companies have taken advantage of these impoverished countries' national debts, buying rights to clearcut the majority of the remaining primary tropical rainforest in West and central-west Africa at bargain prices. The last primary forests in Cameroon, the Congo, the Democratic Republic of Congo and the Central African Republic are being cut and bulldozed, and their wildlife exterminated. Five-hundred-year-old trees with massive trunks 20 feet around, standing more than 100 feet tall, fall daily. The old-growth forests that provide homes for a myriad of wildlife will soon be gone at the present rate of cutting. In some areas, the logging is selective for certain species of trees, but this reduces forest diversity, and hundreds of trees are destroyed in the process of obtaining a few. When great trees fall, they bring down others, and logging roads and entry roads into forest tracts take thousands more trees.

In a shocking and moving report, *Slaughter of the Apes. How the Tropical Timber Industry is Devouring Africa's Great Apes* (Pearce 1995), the World Society for the Protection of Animals documents the tragic and gruesome slaughter of hundreds of Gorillas, Chimpanzees and other wild animals in Central African countries in this trade. The commercialization of wildlife and environmental devastation that have resulted are activities totally antithetical to the legislation and conservation ethics of the European countries--France, Germany, Italy, the Netherlands, Belgium and Denmark--that are sponsoring the logging (Pearce 1995). Several documentary films shown on the National Geographic Explorer program and CNN have shown the markets with thousands of small antelope, Chimpanzees, Gorillas, monkeys and other mammals lying dead on tables, offered for sale. *Africa Extreme* and *Ndoki Adventure* are National Geographic films shown in March 2001 that document the discovery of poachers' camps with dead forest antelope, Leopard skins and other wildlife. One incident of snaring was filmed. A hunter filmed in the remote Ndoki Forest of the former Zaire found a Forest Pig struggling in a wire snare. The hunter began hitting the pig in the head to cause death, while the animal screamed and kicked. Only after hitting the animal about six times did death finally occur. Local hunters interviewed by the photographers said they regularly killed Bongos (*Boocercus euryceros*), rare and extremely beautiful rainforest antelope that are closely related to giraffes. These films traced the 1,500-mile voyage by Wildlife Conservation Society biologist Michael Fay through the last rainforests of the Democratic Republic of Congo and Gabon to publicize the fact that these magnificent wildernesses are being logged and their wildlife killed, and urgent action is needed to stop these activities.

Hundreds of Lowland Gorillas are being killed for the meat trade and sold for \$40 per animal. Loggers place orders for Gorilla meat, which encourages the snaring and shooting of virtually every Gorilla that local people are able to procure for this grisly trade. WSPA found that in one district of the Cameroon, 800 Gorillas a year were being killed (Pearce 1995). Swiss photographer Karl Ammann has spent years fighting this trade (McRae 1997), and in the late 1990s, conservationists from around the world began efforts to save these beleaguered apes from slaughter.

In the forests of southeastern Cameroon, Ammann and Michael McRae, a journalist, found an infant Gorilla being kept in a dark mud-hut; the tiny animal was cowering in the corner, grinding its teeth and straining against its tether. The owner explained that the Gorilla's parents had been shot two weeks earlier by a village hunter, the male having been wounded as he charged to defend the family, but escaping. The mother Gorilla died clutching her baby; she was then gutted and carried out of the bush, cooked and eaten (McRae 1997). Malnourished baby Gorillas are kept to be sold to passing trucks, but usually die within days. Ammann, after years of witnessing these tragedies, concluded, "Chimpanzees have the will to live if they're separated from their family, but Gorillas fall into a depressive state, and just give up on life" (McRae 1997). One baby Gorilla photographed by WSPA had been stuffed into a suitcase, where the Gorilla died of starvation after days of suffering (Pearce 1995). Another baby Gorilla was filmed lying dead in a battered cardboard box. CNN reporter Gary Streiker filmed an orphan baby Gorilla, tied on a string leash, being kicked and taunted. Huge cargo boats chug along the Congo River and other waterways of the Central African rainforest that serve as highways, carrying hundreds of orphan Chimpanzees and Gorillas to markets, stuffed in boxes

and bound with rope. *Down the Dark River*, a 1996 film by CNN, captured the squalid and cruel conditions that baby Chimpanzees endured on these boats. When sold as pets, baby Chimpanzees are often placed in outdoor dirt yards, lonely, solitary little gnome-like figures with sad eyes, hugging themselves or clinging to dirty cotton cloths. When they grow older and become strong and difficult to manage, they are usually killed and eaten (McRae 1997).

The total Lowland Gorilla population is not known with any certainty, and "guesstimates" of 100,000 put forth in 1985 are probably greatly exaggerated. Their true numbers are probably half that, and in steep decline (McRae 1997). Several bushmeat hunters were interviewed in *The Bush Meat Trade*, a film shown on the National Geographic Explorer television series in 1995. When asked why they shoot these magnificent and protected animals, the hunters defended themselves by saying: "What's wrong with killing a Gorilla? They're fierce." One of the hunters told McRae that he was sure Gorillas were plentiful: "In Cameroon there are a million Gorillas. Three weeks ago, I saw sixty in one day. I shot three and then stopped . . . Why should I feel bad for a Gorilla? He is just a stupid animal" (McRae 1997). The West African country of Gabon also has markets where huge amounts of bushmeat are offered for sale, including Chimpanzee heads and Gorilla parts (Walters 1996).

Monkeys are killed on sight by the hundreds by hunters for sale in meat markets. Traders on the boat trip filmed in *Down the Dark River* were transporting some 30 or more dead monkeys, strung together with cord wrapped around their necks. These colorful and delicate rainforest primates are rapidly disappearing throughout their range. Monkeys from the forests surrounding the Congo River are bought by traders from hunters along the boat routes, or by logging truck drivers, and sold for \$1 each in cities such as Kinshasa to be smoked for human consumption. Some traders traveling on riverboats specialize in bushmeat and barter with local people for monkeys, apes, turtles and other animals, some kept alive for the journey to preserve freshness of the meat, and others dead, stacked in piles.

WSPA has launched a campaign called EscAPE to encourage African governments to enforce existing hunting laws and police the trade in ape meat and body parts. WSPA personnel have rescued baby Chimpanzees and Gorillas from being sold as pets or abandoned, placing them in zoos or sanctuaries. A conference organized by WSPA invited loggers, conservationists, government representatives and organization representatives to discuss the bushmeat market and possible ways of ending it. The loggers boycotted the meeting, but others attended and, after two days, drafted a long list of resolutions, including enforcing existing laws, instilling conservation ethics, and restricting the logging trade (McRae 1997). In December 1995, Ammann and WSPA presented information on the trade to a committee of the European Parliament, distributing their report (Pearce 1995), and at a subsequent meeting of Afro-Caribbean-Pacific nations and the European Union, 140 delegates passed a resolution urging action (McRae 1997).

The bushmeat trade has become the foremost threat to wildlife in Central and West Africa's forests, an even greater threat than logging (McRae 1997). Urgent action to substitute other sources of income is needed. Ecotourism has been suggested, as well as employing hunters to conduct wildlife counts and become rangers. To date, no coherent program has been set into place, and hunters claim that they will continue to kill large numbers of animals until they find an adequate substitute.

Bonobos (*Pan paniscus*), or Pygmy Chimpanzees, number only about 13,000 in a restricted area of the former Zaire's dwindling rainforests. As the most endangered of the apes, exploitation could cause their extinction. WSPA documented illegal trade in these primates (Pearce 1995).

A study of the bushmeat trade in western Cameroon found serious declines in several other species of primates, caused by the meat trade. The rare Preuss's Guenon (*Cercopithecus preussi*) and the highly endangered Drill (*Mandrillus leucophaeus*), a large monkey listed on the US Endangered Species Act and Appendix I of CITES, are also being hunted for market sale. In one hunt alone, 30 Drills were killed (King 1994). Troops in the area have declined in number. One monkey, the Russet-eared Guenon (*Cercopithecus erythrotis camerunensis*) has been hunted to extinction there, and all primates from the Mount Manenguba region have declined dramatically (King 1994). In Sierra Leone, 300 tons of monkey meat are exported to Liberia each month, decimating wild populations of Red

Colobus (*Procolobus badius*) and Diana Monkeys (*Cercopithecus diana*). All these primates are listed by the 2000 IUCN Red List of Threatened Species as Endangered. Scientists predict extinction in the region for the Red Colobus in 10 years, and the Black and White Colobus (*Colobus guereza*) in 20 years. Gabonese markets also offer various species of monkeys for sale. In one market, three small monkey heads were lined up on a gutter curb. Two of the faces were expressionless, and the third was open-mouthed, its eyes staring under furrowed brows, "as if frozen in a final, terrified gaze" (Walters 1996).

The Gabonese bushmeat trade, while not linked to commercial logging, has nevertheless grown in size and, in 1993, accounted for almost 11 percent of the country's gross domestic product (Walters 1996). A 1993 study found that, in a single city, more than 5,000 animals of 43 species of mammals, reptiles and birds were sold per year. Guenons; the magnificent and colorful Mandrill (*Mandrillus sphinx*), a Vulnerable species; Black Colobus; Chimpanzees; Gorillas; four species of duiker antelope; pangolins; Brush-tailed Porcupines; mongooses; genets; civets; and African Golden Cats are among the mammals killed for sale in Gabonese markets (Walters 1996). Birds being sold in these markets include crowned eagles, vultures, hornbills, guineafowl and plaitain eaters (a type of turaco). Pythons, Gabon Vipers, Nile Monitors, hinge-back tortoises and even threatened West African Dwarf Crocodiles (*Osteolaemus tetraspis*) were being marketed. Even animals protected under Gabonese law as endangered species are offered openly for sale. In addition to Gorillas and Chimpanzees, the Giant Pangolin (*Manis gigantea*), a race of the Potto (*Perodicticus potto*), and Demidoff's Dwarf Galago (*Galagoides demidoff*), nocturnal primates, all threatened species, could be obtained clandestinely (Walters 1996). In some areas of Gabon, high-ranking government--as well as local--officials supply hunters in villages with rifles and ammunition. Hunters then decimate wildlife and exchange the dead animals with traders for beer or soap. The traders then sell them for large amounts in city markets (Walters 1996). Hunting takes place throughout the forests, which still cover much of the country, and even in protected reserves where hunting is not allowed (Walters 1996).

An environmental organization, ECOFAC, has set up an ecotourism project to attract visitors to one of Gabon's wildlife havens, the Lope Reserve. Paths have been made through the forests, and 24 elevated observation posts have been built by members of the Scottish Primate Research Group, who have spent years habituating mangabeys and Chimpanzees to human contact (Walters 1996). The goal is to provide local communities with an alternate form of income from tourism and, perhaps, to spread the concept throughout the country and elsewhere in tropical forests where viewing wildlife is not as easy as in open savannah habitats.

The wild animal trade of Central and West Africa is obliterating populations of small forest antelope, such as various species of duiker. Twelve species of central and west African duiker are listed in the 2000 IUCN Red List of Threatened Species. The meat trade and unregulated hunting, accompanied by destruction of forests, are the major threats. These animals are killed by capture in snares, where they may struggle for days. Two small, delicate antelope, both on CITES Appendix II, the Blue Duiker (*Cephalophus monticola*) and Bay Duiker (*Cephalophus dorsalis*), are trapped in wire snares or taken in pit traps in the Cameroon (King 1994). Dismembered duikers were seen in a market in Libreville, the capital of Gabon, in 1995 (Walters 1996).

Illegal snaring for antelope meat in national parks has been a major threat to Mountain Gorillas (*Gorilla (gorilla) beringei*), who number only about 650 animals. Many have lost their hands to snares, but some have now learned to recognize these traps and spring them. In 1995, however, a baby Mountain Gorilla strayed from the group and became snared, crying and struggling in terror for almost 24 hours while family members watched helplessly until Virunga National Park guards cut him free. Others have died in these snares.

Congo's national park, Odzala National Park, an area of 1,000 square miles, until recently had the region's only unexploited populations of African Elephants, African Buffalo and other mammals. Because of a lack of guards, poachers are now invading the park. The European Economic Community has agreed to fund the hiring and training of guards, with help from the Congolese army. This country is nearly bankrupt, like neighboring countries, making wildlife protection extremely difficult. Private hunting safaris enter the Congo rainforest and, for a fee, a foreign hunter can kill rare species of antelope and other wildlife.

Those who eat African monkeys and apes may be risking death. Several people who ate a dead Chimpanzee they found in the forest in Gabon died of the dreaded ebola virus, and the disease threat is not well-known to those who eat the meat of primates. Sooty Mangabeys harbor a virus related to HIV-2, an AIDS-like virus, and McRae (1997) saw a hunter carrying dead mangabeys, dripping blood into scratches on his leg.

In the Amazon, primates are avidly hunted for meat. Russell Mittermeier, head of the IUCN Primate Specialist Group, states that thousands of primates are killed by hunters, causing local extinctions of woolly monkeys (*Lagothrix* spp.) and spider monkeys (*Ateles* spp.) in Peru and Brazil. Forest tribes in Suriname kill very large numbers of primates for food, selling the meat in many local markets. The Wildlife Conservation Society (WCS) has been working with several native tribes in South America, evaluating the effect of their hunting on wildlife. They have found that in many cases, natives were overhunting many animals, causing local extinctions, even when only killing for subsistence. Peccaries of various species have been extremely vulnerable.

Meat Hunting: Page 3

Fruit bats of Asia and Pacific islands are killed in large numbers for food, sold by the tens of thousands to markets in Southeast Asia. Two species of the western Pacific, the Little Mariana Fruit Bat (*Pteropus tokudae*) of Guam and the Mariana Fruit Bat (*Pteropus mariannus mariannus*) of Guam, Rota, Tinian, Saipan and Agiguan have both been exploited so heavily that they are nearly extinct. Both bats are listed on the US Endangered Species Act as Endangered, yet the trade continues. On Sulawesi Island in Indonesia, thousands of bats are caught by young boys using kites to entangle them as they fly overhead. These bats are vital as pollinators of many species of commercially important fruit.

Bushmeat hunters in Indonesia and Malaysia are wiping out the populations of many animals. On the island of Borneo, a study conducted by the Wildlife Conservation Society found that hunting, legal and illegal, was the single greatest threat to wildlife (Bennett 1994). In Sarawak and Sabah, two northern states on Borneo, Elizabeth Bennett and her assistants conducted a three-year study of native hunting. These rural people, who previously had hunted only for subsistence, now hunt to sell the meat to town markets (Bennett 1994). Areas that had been inaccessible were opened up by logging roads, and hunters now swarm in the forests, killing any animal they see (Bennett 1994). Except in the most remote areas, all local people now possess shotguns. Squirrels, which have a great diversity of species on Borneo, nearly disappeared in some areas, along with leaf monkeys (Bennett 1994). Bearded Pigs, macaques, deer and porcupines are hunted, speared and trapped by some tribes (Bennett 1994). The only taboo involves the killing of Orangutans, who are protected by legend. Hunting pressures were so great that Bennett predicted extinctions for many animals, and the effects on the forest ecology were equally dire, as seed dispersers are killed off (Bennett 1994). WCS is working with local peoples to educate them about the effects of their hunting, with the cooperation of the Forest Department of Sarawak and the Wildlife Department of Sabah (Bennett 1994).

On the neighboring island of Sulawesi, formerly known as Celebes, WCS conducted a similar study in the Tangkoko-DuaSudara Nature Reserve. The study found that in the past 15 years, populations of the endemic Bear Cuscuses (*Ailurops ursinus*), bear-like marsupials who hang by their prehensile tails from branches, had declined by 95 percent from hunting (Kinnaird and O'Brien 1996). Crested Black Macaques or Celebes Apes (*Macaca nigra*), tailless, all-black monkeys found only on Sulawesi and listed as Endangered by the 2000 IUCN Red List of Threatened Species, have declined by 90 percent, due in large part to meat hunting (Kinnaird and O'Brien 1996). An extraordinary turkey-like bird that incubates its eggs in large, leaf mounds, the endemic Maleo (*Macrocephalon maleo*), a Vulnerable species (BI 2000), has declined 75 percent from hunting (Kinnaird and O'Brien 1996). Other endemic species affected by this hunting are the Mountain Anoa (*Bubalus quarlesi*), a CITES Appendix I threatened dwarf buffalo found only on Sulawesi that is on the verge of local extinction, and the threatened, gargoye-headed

Babirusa (*Babirusa babirusa*), a tusked wild pig, whose total wild population is about 5,000 (Kinnaird and O'Brien 1996). Highly organized networks hunt and trade the meat from these threatened species. Some dealers acquire animals on order for traders in North Sulawesi by driving up to 375 miles to buy Babirusa and other meat from forest hunters (Kinnaird and O'Brien 1996).

When native peoples cease hunting for subsistence only and begin hunting for markets, wildlife can be decimated quickly. Even subsistence hunting has been shown to be detrimental in some areas, but when wild animal meat becomes an economic commodity, overhunting usually results. Market hunting in the United States caused the extinction of the Passenger Pigeon (*Ectopistes migratorius*) and Labrador Duck (*Camptorhynchus labradorium*). The Eskimo Curlew (*Numenius borealis*), heavily hunted for meat in the 19th century, is probably extinct as well. The American Bison, Elk, White-tailed Deer and many waterfowl species also nearly disappeared. Following the 19th century slaughters that decimated these animals, laws banning the sale of wild meat from mammals and birds were enacted and remain in force today. In other parts of the world, only extinctions may bring about strong legislation banning market hunting of wildlife.

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