

HUMAN-WILDLIFE CONFLICTS—THE NATURAL RESOURCE ISSUE OF THE 21ST CENTURY

BRUCE LEOPOLD

DEPARTMENT OF WILDLIFE,
FISHERIES AND AQUACULTURE,
MISSISSIPPI STATE UNIVERSITY

MICHAEL R. CONOVER

EDITOR, HUMAN-WILDLIFE INTERACTIONS
PROFESSOR, WILDLAND RESOURCES
DEPARTMENT, UTAH STATE UNIVERSITY

Wildlife provide great benefits to individuals and to society. Consider the white-tail deer (*Odocoileus virginianus*). Over 10 million people in the United States hunt big game, and deer is the most popular big game species. Deer hunting in the U.S. is an important economic benefit, with an estimated \$33.7 billion in expenditures annually. Many deer hunters find the opportunity to be out-of-doors and hunting deer to be one of the greatest pleasures in their life. Other people (76 million in the U.S.) enjoy watching wildlife and many people (23 million) visit public parks to view or photograph wild animals. Deer are among the most awe-inspiring mammals in North America due to their grace, size, and role they have played in our history. Another role of deer, an ecological one, is to provide a food source for populations of wolves and cougars.

On the negative side, wildlife can harm a person or society. That harm might be economical when someone suffers a financial loss due to wildlife, including damage to physical property, such as when a vehicle needs to be repaired or replaced after striking a deer or a loss of future income when wildlife damage reduces profitability of farms, ranches, timber production, or other professions. Conflicts arise when people are injured or killed by wildlife, or their health is threatened by a disease pathogen that thrives in a wildlife species and then is transmitted to humans. Harm can occur to other wildlife species or their habitat, other natural resources, or to landscapes or ecosystems. For all native wildlife species, the benefits they provide society far outweigh the problems they cause (i.e., human-wildlife conflicts). It is for this reason that we have a positive opinion of wildlife and worry when we hear that a wildlife population is declining. But while this is true for society, it is not true for every individual because the problems caused by wildlife do not fall evenly upon every individual; many

farmers whose crops are destroyed by deer consider them a pest, and a family whose child is killed by a cougar often does not look kindly on the species. This creates conflicts among members of society about how wildlife populations should be managed.

Human-wildlife conflicts have been increasing in frequency and intensity over the last several decades for several reasons. Human populations have been increasing, of course, but so have many wildlife populations. During the 1800s, wildlife populations were at historic lows due to unregulated hunting and efforts to eradicate predator populations. When hunting was regulated and laws passed to protect predators and migratory birds, wildlife populations began to rebound. With more people and more wildlife, conflicts between the two were bound to proliferate, but increasing populations was not the only factor in the increase in human-wildlife conflicts. Many wildlife species moved into metropolitan areas seeking areas where food was abundant; hence, we now have deer, rabbits, raccoons, opossum, Canada geese, red foxes, coyotes, and black bears living in our neighborhoods. While wildlife have moved into our habitat, we have been spending time in theirs. Wildlife recreation has increased several fold, and people hike and camp in remote wilderness areas. This commingling of humans and wildlife has also heightened human-wildlife conflicts. However, much of the increase in human-wildlife conflicts has resulted from behavioral changes in wildlife and humans. Many wildlife have lost their fear of humans due to habituation; rather than fleeing when they see a person, many animals will either ignore the person or approach. People's

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perceptions of wildlife have also changed over time. Predators, once viewed as evil, vicious, and terrifying, are now seen as magnificent creatures that have important ecological roles. Hence, humans have lost their fear of animals and many get themselves in dangerous situations because of their ignorance. In Yellowstone National Park, dozens of tourists are injured or killed when they get too close to bison while taking a selfie.

Conflicts with white-tail deer and feral hogs illustrate current human-wildlife conflicts and the reasons why these conflicts have become so serious in recent years.

Wild hogs were introduced to North America by Hernando de Soto to establish a reliable food source. Additionally, swine were domesticated and raised on farms for food. However, viewed as an important game species, wild hog populations were valued and their range expanded by transporting hogs and releasing them. Today, wildlife biologists are gravely concerned about the wild hog. Wild hogs pose one of the greatest threats to humans, wildlife, and their habitats. To date, wild hogs have been identified as transmitters of 30 diseases and 37 parasites, with at least 11 of these being directly transmitted to humans. Additionally, water supplies may be impacted. One study showed that in the watershed with hogs, *E. coli* was found in water sources, whereas in the watershed without hogs, no *E. coli*. Wild hogs are prolific breeders, producing two litters per year, with litter sizes of 10-14. Wildlife biologists are concerned because hogs are invading North America. In 1982, 17 states reported having hogs; by 1998, 26 states; and in 2012, 40 states. An individual hog eats between 3-5 percent of its body weight daily, and those foods are the same foods

needed by native wildlife. Thus, hogs are competing with our native wildlife. Studies show that by consuming large amounts of hard mast (e.g., acorns, hickory nuts), wild hogs are changing the composition of our forests, many to the detriment of native wildlife. Lastly, wild hogs impact greatly our agricultural resources, causing almost \$1 billion annually in crop damage and loss. Thus, the wild hog in North America has the potential to affect many resources, including human health and safety, disease transmission to native wildlife, water resources, agricultural operations, and competition with native wildlife.

Whitetail deer populations were believed to number between 9 and 20 million prior to European settlement of North America. With the arrival of European colonists in the New World during the 1600s, deer populations began to drop due to overharvest, and by 1900, fewer than 500,000 remained. Today, there are 30 million whitetail deer in North America—more than has existed at any time in the past. This vast recovery represents one of the great achievements of wildlife management.

But this plethora of deer also leads to a plethora of problems. In the U.S., there are over 1 million deer-vehicle collisions a year, resulting in 15,000 human injuries and 50 human fatalities. Deer damage to timber exceeds \$1.6 billion annually, agricultural losses total \$600 million, and losses to household gardens and yards average \$500 million each year. Deer also serve as a reservoir for several human diseases that are transmitted from wildlife to humans via ticks including Lyme disease, anaplasmosis, ehrlichiosis, and deer tick virus.

It is estimated that there are approximately 50,000 foreign species in the

U.S. that cause \$120 billion in damages annually. There is a unified effort to address this profound issue. A federal agency called the Animal and Plant Health Inspection Service (APHIS), through its Wildlife Services (WS) program, is part of the U.S. Department of Agriculture, and it is at the center of addressing these issues. The mission of WS is “...to provide Federal leadership and expertise to resolve wildlife conflicts to allow people and wildlife to coexist.” WS has a daunting task as invasive species appear at a rate faster than funding to address eliminating these species. WS biologists are not just dealing with invasive species, but also overabundant species including starlings, blackbirds and cormorants. WS biologists also are working to make our airports safer by minimizing bird-plane collisions. Rabies is being held in check by a very effective WS program. At its research center located in Fort Collins, Colorado, WS biologists are testing new techniques to control species. Fortunately, every state agency has a program to address invasive and overabundant wildlife, as well as wildlife creating damage to personal property (e.g., deer eating gardens, etc.).

There are many challenges when addressing human-wildlife conflicts. We cannot discuss them all. One major challenge is the process of animal removal: killing the animal or animals causing the conflict. What do you do with a black bear that has become accustomed to humans at a campground and has become aggressive? Relocate it to a more remote area or euthanize it? Wildlife biologists across the nation are being limited in what tools they may use to address invasive and overabundant species by the actions of animal rights

groups. Solutions promoted by the latter include non-lethal strategies such as mass sterilization and establishing protected colonies (e.g., feral cats). However, research is showing that these are not viable options. Another challenge is to provide adequate funding to state and federal agencies. As we stated, there are 50,000 exotic species in the U.S., and WS, with approximately 600 biologists in the field, is not staffed to adequately address all issues.

Human-wildlife conflicts will only increase as new species are accidentally introduced into the U.S., humankind expands into natural environments adjacent to urban areas, and existing species expand their numbers. Education at all levels will be critical. Providing effective educational programs to legislators, municipal leaders and the general citizenry is critical if resolution of human-wildlife conflicts is to be successful. All citizens must understand that regardless of their inherent beauty or their value as game animals, exotic, invasive, and overabundant native species pose serious ecological, health, sociological, and economic threats to our native wildlife and ecosystems, and to humankind. Educational programs also must include modules to sensitize the citizenry to the need for lethal and non-lethal methods of removing individual animals.

Resolving human-wildlife conflicts has become a major agenda item for federal, state, and private conservation organizations. Trends indicate that it will only grow as a major issue regarding sustaining our natural wildlife species and their habitats. Given that such conflicts inevitably impact every citizen in some way, it is imperative that people become actively involved. ■