

## SCIENCE FOCUS

### Vultures, Wild Dogs, and Rabies: Some Unexpected Scientific Connections

In 2004, the World Conservation Union placed three species of vultures found in India and South Asia on the critically endangered list. During the early 1990s, there were more than 40 million of these carcass-eating vultures. But within a few years their populations had fallen by more than 97%.

This is an interesting scientific mystery, but should anyone care if various vulture species disappear? The answer is yes.

Scientists were puzzled, but they eventually discovered that the vultures were being poisoned by *diclofenac*. This anti-inflammatory drug was given to cows to help increase their milk production by reducing inflammation in their bodies. But it caused

kidney failure in vultures that fed on the carcasses of such cows.

As the vultures died off, huge numbers of cow carcasses, normally a source of food for the vultures, were now consumed by wild dogs and rats whose populations the vultures had helped to control by reducing their food supply. As wild dog populations exploded due to a greatly increased food supply, the number of dogs with rabies also increased. This increased the risks to people bitten by rabid dogs. In 1997 alone, more than 30,000 people in India died of rabies—more than half the world's total number of rabies deaths that year.

Thus, protecting vulture species from extinction can result in the protection of mil-

lions of people from a life-threatening disease. Discovering often-unexpected ecological connections in nature is not only fascinating but also vital to our own lives and health.

Some critics of efforts to protect species and ecosystems from harmful human activities frame the issue as one of choosing between protecting people and protecting wildlife. Most conservation biologists reject this as a misleading conclusion, arguing that it is important to protect both wildlife and people because their fates and well-being are interconnected.

#### Critical Thinking

What would happen to your life and lifestyle if most of the world's vultures disappeared?

## CASE STUDY

### Burmese Pythons Are Eating Their Way through the Florida Everglades

Burmese pythons, along with African pythons and several species of boa constrictors, have been accidentally introduced in Everglades National Park in the U.S. state of Florida. About a million of these snakes, imported from

Africa and Asia, have been sold as pets. After learning that these reptiles do not make good pets, some owners have dumped them into the wetlands of the Everglades.

The Burmese python (Figure 9-11) can live 20–25 years, growing as long as 5 meters (16 feet). It can weigh as much 77 kilograms (170 pounds) and be as big around as a telephone pole. Pythons are hard to find and kill and they reproduce rapidly. They have huge appetites and feed at night, eating a variety of birds and mammals and occasionally other reptiles, including the American alligator. They seize their prey with their sharp teeth, wrap themselves around the prey, and squeeze them to death before feeding on them. They have also been known to eat pet cats and dogs, small farm animals, and geese.

According to a 2012 National Academy of Sciences peer-reviewed study, since 1993, the rapidly growing population of the Burmese pythons in the Everglades has greatly depleted populations of marsh and eastern cottontail rabbits, red and gray foxes, raccoons, Virginia opossums, and white-tailed deer. The pythons also eat a variety of bird species (some of them endangered) and American alligators—a keystone species and top predator in the Everglades ecosystem (see Chapter 4, Case Study, pp. 95–96).

Researchers say that the Burmese python population in Florida's wetlands cannot be controlled. Some fear that the species could spread to other swampy wetlands in the southern half of the United States by finding natural routes to, or by being released to other wetlands by pet owners. In 2012, the U.S. Department of the Interior made it illegal to import Burmese pythons, North

and South African pythons, and yellow anacondas, as well as to move them across state lines. In 2013, more than 1,300 people took part in a 1-month contest to find and remove Burmese pythons in Florida's wetlands.

Wildlife officials estimate that there are many thousands of pythons and constrictors living in the Everglades, and their numbers are increasing rapidly. Research indicates that predation by these snakes is altering the complex food web and ecosystem services of the Everglades. This is an excellent example of what can happen if an invasive top predator ends up in an ecosystem where it has no natural enemies.