

# What's Eating OUR Game?

By Brad Fitzpatrick



## **Predators are often blamed for declines in wild game populations, but which predatory species take the heaviest toll is up for debate. Here's what the latest ecological data tells us.**

**G**ame populations across the country are generally the healthiest they have been in generations. However, for species such as elk that have experienced significant declines, some people argue that a single predator is driving the decline. Even when game populations are robust — as is the case with white-tailed deer, wild turkey, and waterfowl — there are perceptions that a single predator has a disproportionate impact on the population.

Predation rates vary from one area to the next based on habitat, human populations, and climate. It's a complex ecological puzzle that scientists are slowly piecing together. Let's separate myth from fact and look at what the current data tells us about predation of four popular game species.





## MYTH

Coyotes are the whitetail's primary predator.

## FACT

Black bears and bobcats kill more deer in some landscapes.



# WHITE-TAILED DEER

White-tailed deer are America's most widespread and popular big game animal. Whitetail numbers have rebounded strongly since the turn of the 20th century, when the U.S. population was estimated at less than a half-million deer. Today, whitetail numbers nationwide hover at around 30 million animals.

In many areas of the country, whitetails are intensely managed. Part of this management has involved the removal of key predatory species – specifically, the coyote. While there's certainly evidence that suggests coyotes prey on deer, are they the whitetail's primary natural predator?

In a 2010-2011 study of cause-specific mortality rates for white-tailed deer, researchers from the Wisconsin Division of Natural Resources and the University of Wisconsin determined that of the more than 300 deceased whitetails studied, the cause of mortality varied by location. In the northern region of Wisconsin – primarily forest area with low human population densities – 26 percent of deer mortalities were the result of non-human predation. Mature deer were killed by wolves (4 yearlings), bobcats (1 doe, 2 yearlings), black bears (1 doe), coyotes (1 yearling, 1 doe), and unknown predators (2 bucks). Fawns were lost to predation by black bears (5 fawns), bobcats (2), coyotes (1), unknown canids (2), and unidentified species (4).

In the more agricultural area of eastern Wisconsin, predation rates were much lower. There was not a single event of predation on radio-collared adult deer. More than 60 percent of the mature deer were taken by hunters and another 24 percent were killed as a result of vehicle collisions. Disease and starvation also factored into adult deer deaths. Fawn predation occurred here but at lower rates than in the northern forest: 4 were killed by coyotes, 1 by a black bear, and 1 by an unidentified predator.

A 2004 study in Pennsylvania showed disparity between primary predators in agricultural and forested areas as well. In that study, predation accounted for almost 70 percent of fawn deaths in forested areas and only 17 percent of fawn deaths in agricultural areas. Coyotes were the most prevalent predators on fawns in the forested areas tested, accounting for more than 60 percent of fawn deaths. Black bears killed 12.5 percent of radio-collared fawns in forest habitat, and bobcats were responsible for 7.3 percent of predation. By contrast, bears were responsible for 36.6 percent of predation events on fawns in the agricultural areas while coyotes accounted for 31.7 percent. (Bobcats did not kill any fawns in agricultural areas in the Pennsylvania study.)

Although coyotes are responsible for a high percentage of fawn deaths in some areas, they are not the only predators responsible for fawn losses. In northern areas, where they face greater competition from wolves, coyotes prey on deer less frequently. Some predators also target specific age classes of deer: Black bears primarily prey on young fawns while wolves tend to focus on yearlings. Bobcats seem to be more varied in their selection, killing both adult and young deer. While coyotes are common predators of fawns, they seem less likely to take on adult deer.



## WILD TURKEY

Like all ground-nesting birds, wild turkeys are particularly vulnerable to predation before chicks hatch. Even after birth, turkey poults are common prey for many mammalian and avian predators.

Cause-specific mortality — knowing exactly which predatory species is responsible for the death of a monitored game species — can be difficult to track. There's little question that some predators have a higher rate of predation than others, though.

A 2010-2015 telemetry study of wild turkey hens in Pennsylvania found that 32 percent of mortalities were due to mammalian predation, 11 percent to avian predation, and 7 percent to unknown predation, reports Mary Jo Casalena, a wild turkey biologist for the Pennsylvania Game Commission. Identified predators ranged from hawks to bears.

The species that accounted for the most deaths was bobcats, having killed three hens during the nesting/rearing period and seven hens throughout the five-year study. Three other species accounted for three hen kills each during the course of the study: foxes, owls, and hawks. Additionally, three hens were killed by unknown avian predators, so the number for hawks and owls may actually be higher. Coyotes, often considered one of the primary predators of turkeys, killed two hens, and a bear was

responsible for killing one hen during the nesting/brood rearing season.

This research did not specifically examine nest robbing, but other research indicates that a handful of species are primarily responsible for nest loss. In an article that appeared in the *Wilson Journal of Ornithology* in December 2008, researchers on the Edwards Plateau in Texas studied nesting predation of Rio Grande turkeys and found

that one species — the raccoon — was responsible for more nest robberies than the next three predatory species combined. Raccoons actively seek out and eat turkey eggs in the spring, and they are formidable enough to drive hens off the nest as they devour the clutch. Ravens accounted for three nest robberies in that study, and gray foxes were responsible for two nest raids. Feral hogs, bobcats, and armadillos accounted for one nest predation each. Surprisingly, striped skunks — often considered a major nest-raiding species — did not steal any turkey clutches. This doesn't mean, of course, that skunks don't rob nests, but it was clear in this study that raccoons are a major factor in clutch survival rates of Rio Grande turkeys.

## MYTH

Wild canids are responsible for most turkey kills.

## FACT

Small, nest-robbing mammals as well as bobcats and avian predators have a greater impact on turkey populations.





## ELK

The reintroduction of wolves to many areas of the American West has sparked controversy with elk hunters, landowners, and biologists. While wolves undoubtedly account for a number of kills, are they the primary predators of elk?

“This is an age-old question and very complex,” says Douglas Smith, senior wildlife biologist at the Yellowstone Center for Resources in Wyoming. According to Smith, the complexity of varying ecosystems from one area to the next makes it more difficult to label a “primary” elk predator.

The northern Yellowstone elk herd is one of seven migratory elk herds that forage in the park’s high-elevation meadows in summer, according to *Yellowstone Science* (January 2016). What makes the northern Yellowstone herd unique is that these animals winter in the low, grassy valleys and shrub steppes within the park.

In January 1994, park staff estimated there were more than 19,000 elk in Yellowstone – a new record. But by December of that same year, there was an estimated loss of more than 2,200 animals. The reasons for the decline were not clear. Three months after that December 1994 count, wolves were reintroduced into the park.

In the 2013 count, the herd numbers were estimated at 3,915 – only 743 more than the lowest previous count in 1968. As you might imagine, this initiated a widespread outcry from the public since they believed that wolves were the culprit. The answer to the Yellowstone herd decline has been debated for decades by scientists, and no firm answer to the cause of the reduction has been identified. There is agreement that the reintroduction of wolves has resulted in a decline, but what is not certain is whether or not wolves are solely to blame. Research has shown that wolves have a fairly low hunting success rate – about 20 percent – and they are opportunists that do not specialize in



one prey species but rather feed on a variety of animals and seek out “easy marks.” On average, wolves killed calves and older elk — over 10 years of age — but these age dynamics are thought to be influenced by outside factors. A harsh winter, for instance, may make elk of all age ranges vulnerable and skew data.

Wolves are just one of the large predators in the Yellowstone ecosystem, and they are certainly not the only animals that affect elk populations. In fact, a 2008 research study published in *Yellowstone Science* showed that black and grizzly bears are responsible for as many as 60 percent of the newborn elk mortality in the late spring and summer and wolves accounted for just 15 percent of newborn calf kills.

Bears tend to kill only newborn calves. Cougars and wolves, on the other hand, prey on 6- to 12-month calves as well as adults, Smith says. “Wolves tend to be selective on vulnerability, whereas cougars tend to select on size, not age or condition. Cougars have highly variable kill rates but can have higher per capita kill rates than wolves. Some of this may depend on if it is a female with kittens versus a lone individual.”

Smith says that the number of predators present may also affect elk populations. Increases in grizzly bear numbers have resulted in more newborn elk kills, and black bears, wolves, coyotes, and cougars are all present in many areas of the park. This reintroduction of large predators has certainly led to elk declines, though research indicates that it’s difficult to identify one single cause for the decline.

## MYTH

**Reintroduction of wolves is the primary factor in elk declines.**

## FACT

**Bears — including increasing populations of grizzlies — are a primary predator of newborn elk.**



## WATERFOWL

**MYTH**  
Eradicating coyotes  
will increase waterfowl  
populations.

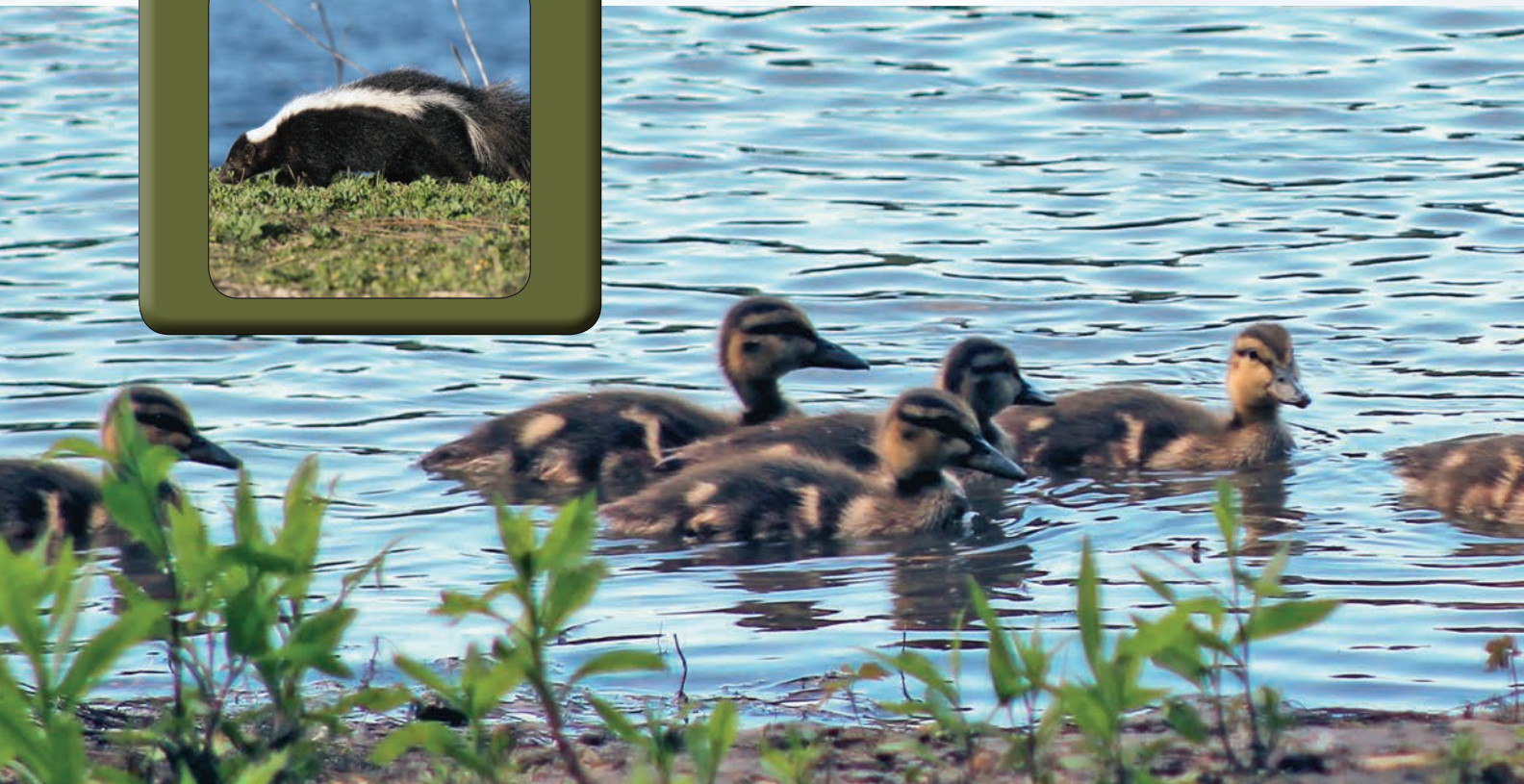
**FACT**  
Red foxes and  
nest-robbing mammals  
more destructive – and  
coyotes are needed to  
keep them in check!



Rebounding waterfowl populations are one of the great success stories in American conservation. However, like all nesting birds, ducks and geese are susceptible to nest predation. Research compiled by the U.S. Fish and Wildlife Service on duckling predators in the Prairie Pothole Region showed that numerous species – from Franklin’s ground squirrels to coyotes – rely on ducks as a food source. One of the primary culprits is the red fox, which targets eggs, ducklings, and adult ducks (primarily hens).

Red foxes are known to “cache” food, so they may steal an entire clutch to consume later. But foxes don’t stop at eggs – they eat ducklings and are one of the top predators of nesting hens. In two separate studies in the Prairie Pothole Region, scientists from the U.S. Geological Society led by waterfowl production expert Alan Sargeant found that foxes killed between 13.5 and 18.1 percent of the female mallards in the test area and between 4.5 and 5.1 percent of the drakes. Research cited in *Interpreting Evidence of Depredation of Duck Nests*, which Sargeant co-authored for the U.S. Department of the Interior, found that the average family of foxes in Iowa killed approximately 21 ducks per year. The research did not touch on geese, which, being larger, are better able to defend their clutches, but there’s little doubt that foxes account for a number of goose nest robberies.

Coyotes are also regular predators of ducks, eating both eggs and adults. In a study conducted at Valentine National Wildlife Refuge in Nebraska, coyotes were responsible for 36 percent of duck nest



depredations. However, research conducted by Sargeant shows that coyotes are less likely to feed on ducks as regularly as foxes, and even though coyotes also cache food, they are less likely than foxes to steal an entire clutch of eggs. Whereas foxes have relatively small home ranges and higher densities, coyotes tend to have larger home ranges, resulting in fewer coyotes per square mile to rob nests and eat juvenile and adult birds.

Raccoons are omnivores and opportunists and will regularly take duck eggs when available. Sargeant and his colleagues found the remains of waterfowl eggs in 29 to 34 percent of summer raccoon droppings. Other research indicates that raccoons in the Prairie Pothole region feed primarily on duck eggs (55 percent) compared with other bird eggs because many ducks are ground nesters and nest around water, where raccoons are commonly found. Skunks are another important waterfowl predator. Sargeant's research shows that in areas where waterfowl breed, eggs comprise half the average skunk's diet during the summer months, and shell thickness indicates that the majority of these eggs are from waterfowl species. Raccoons and skunks will feed on dead ducks, but neither species is considered a major contributor to adult duck mortality. Likewise, species of ducks that nest along the edge of lakes and ponds are more likely to be targeted than birds that nest on islands. However, some predators — primarily raccoons and mink — are adept at swimming across open water to feed on duck nests.

## Reducing Predation of Game Species

The Izaak Walton League's longstanding conservation policies recognize "the intrinsic value of predatory species and their important ecological roles" and state that there is "no justification for widespread destruction of animals classified as predators."

While for more than a century, predator control has been used as a management tool to increase game populations, it has often had unintended negative consequences. For example, well-meaning bounty programs for raptors — intended to boost small-game populations — threatened substantial populations of owls, falcons, hawks, and eagles.

Further, eliminating predators often does not achieve the desired goal. Harvesting coyotes to protect ducks and geese, for example, can actually result in a decrease in waterfowl populations because the numbers of nest-robbing predators such as raccoons and foxes increase when coyotes are eliminated. In addition, predator control efforts must be continuous to be effective. Killing a handful of coyotes, raccoons, or foxes may help prey species in the short term, but predators will either repopulate at higher birth rates or migrate into those areas and resume feeding on game species. In some cases — as with hawks and owls, which are now federally protected — removal is simply not an option.

What choices, then, does this leave landowners? The best long-term solution is habitat improvement. If ample protective cover is available, fawns, elk calves, and game bird nests are less likely to suffer predation. When game species have higher reproductive success, the effects of predation are minimized and, over the long term, populations of game species will increase.

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