

## Wildlife Scores on Golf Courses

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## Wildlife Scores on Golf Courses

Conserving America's rapidly disappearing natural world sometimes takes wildlife biologists strange places, but University of Arizona researcher Matt Goode never thought it would lead him to a golf course. Once an 18-handicap golfer, Goode is one of a growing number of scientists studying wildlife on golf courses. They want to know why animals use golf courses, how they do it, and how golf courses can be designed and managed to conserve wildlife.

"There was a time when I would never have considered golf courses as anything but a disaster," Goode says. Now he has changed his mind. "From a wildlife perspective, golf courses hold promise. If done right, they represent a more compatible land use for wildlife than a [shopping center]. There is not enough pristine nature left to preserve all wild animals. The more species we can save, the better our chances to preserve biodiversity. That's why golf courses are important."

A typical 18-hole golf course encompasses 150 acres, says Clark Throssell, director of research for the Golf Course Superintendents Association of America. More than half consists of rough, water hazards, or other natural areas at the course's edges. Those areas represent potential wildlife habitat, says Peter Stangel, the National Fish and Wildlife Foundation's science director.

Goode has studied tiger rattlesnakes at Stone Canyon Golf Course in Tucson since 2002. He finds more tiger rattlesnakes at Stone Canyon than on adjacent land. Goode says he can catch up to three or four snakes a day at the golf course but may have to search several days to find one elsewhere. Not only are there more snakes on golf courses, but they grow

faster, are larger, reach sexual maturity sooner, and reproduce more often.

The reason, Goode says, is this: Golf courses are watered. The water, especially in the Sonoran Desert around Tucson, promotes plant growth. More plants mean more seeds, which attract more rodents—the natural prey of tiger rattlesnakes. At Stone Canyon, rodents make up more than 90 percent of the snakes' diet; elsewhere, rodents account for only about 40 to 60 percent. Goode speculates that a diet higher in rodents provides more energy per weight consumed than other prey, such as lizards.

Similarly, Arizona State University assistant professor Dale DeNardo has found more Gila monsters at Stone Canyon than at other, more natural sites. DeNardo says that although juveniles typically constitute about 10 percent of Gila monster populations, preliminary findings at Stone Canyon suggest they number nearly half. Furthermore, females breed annually at the golf course but usually only every two or three years elsewhere.

Meanwhile, David Scott, a research professional at the University of Georgia's Savannah River Ecology Laboratory in Aiken, South Carolina, studies amphibians that breed in Carolina bays. These temporary ponds fill up with water from fall rains, then dry out by summer. They have disappeared from much of the southeastern United States as more land is developed for human use. Scott found that golf courses with seasonal ponds have more frog, toad, and salamander species (18) than those with permanent ones (11), although both trailed natural Carolina bays (24).

Birds, too, are attracted to golf courses. One is the red-headed woodpecker, a

species whose numbers are declining as oak savannas disappear in the East. Amanda Rodewald, an associate professor of wildlife ecology at Ohio State University in Columbus, found one-fourth of Ohio golf courses reported having woodpeckers. Rodewald encourages golf course managers to keep dead trees and branches, which red-headed woodpeckers use for nesting.

Going a step further, Courtney Conway has found that golf courses can attract burrowing owls if artificial burrows are constructed in areas adjacent to places where the small birds are naturally found. Burrowing owls prefer broad, open grasslands with lots of rodents. "The owls are really cool," says Conway, an associate professor of natural resources at the University of Arizona. "Golfers and course managers take great pride in their burrowing owls. People want to play on courses that have the owls."

Goode and other scientists urge golf course designers and managers to leave natural areas around their courses' edges and between fairways with roughs that serve as connecting corridors, and to build seasonal ponds that have sloped bottoms and unmowed vegetation surrounding them. As James Howard, dean of natural resources and sciences at Humboldt State University in Arcata, California, says: "With some changes, golf courses could become small wildlife reserves."

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