Owls and golf courses may be mutually beneficial

By MATTHEW D. SMITH and Dr. COURTNEY J. CONWAY

RICHLAND, Wash. — In an effort to reverse population declines of burrowing owls, Washington State University Professor Courtney J. Conway is collaborating with the United States Golf Association (USGA) and five golf courses in southeastern Washington to determine if the courses can provide suitable nesting locations for the owls. If successful, the project could prove to be beneficial to owls and golf courses throughout North America.

Burrowing owls inhabit short-grass, open country such as prairies, deserts and grasslands. Owls typically nest in abandoned burrows of fossorial mammals such as badgers, prairie dogs and ground squirrels. Burrowing owl populations are declining throughout North America and reduction in the number of suitable nest burrows is one factor commonly thought to limit owl populations. Thus, burrowing owls are considered a species of special concern throughout the United States and are endangered in Canada and several Western states. This designation has attracted the attention of wildlife agencies, conservation groups and the USGA.

Attracting nesting burrowing owls has potential benefits for golf courses. Their diet includes small rodents such as voles, mice and pocket gophers, as well as insects such as locusts, beetles and crickets. Hence, burrowing owls may help to control populations of species typically considered pests by golf courses.

Golf courses have the potential to contribute significantly to burrowing owl conservation and recovery efforts because they have the open, short-grass conditions that owls typically prefer. However, golf courses lack one critical component: nesting burrows.

Conway approached the USGA to fund a project to test whether artificial burrows would attract owls to nest on golf courses. The project is funded by a three-year $75,000 grant through the USGA's Wildlife Links program and receives additional support from Washington State University, Washington Department of Fish and Wildlife, U.S. Bureau of Land Management, U.S. Fish and Wildlife Service and the Lower Columbia Basin Audubon Society.

Conway and his field assistants, along with golf course grounds crews and local volunteers, are installing 150 artificial nest burrows on Canyon Lakes, Columbia Point, Horn Rapids, Meadow Springs and Sun Willows golf courses.

Artificial burrows are constructed by attaching 10 feet of irrigation tubing to an upside-down five-gallon bucket, and then burying the structure three feet underground. The last three feet rise quickly to the surface and the small, exposed opening serves as the entrance. The area left exposed is less than one square foot and does not interfere with typical golfer or maintenance activity. If owls really are limited by the availability of suitable nest burrows, these structures may allow the local population to expand. The data gathered from the study will identify situations that nesting owls will and will not accept. Of particular interest is understanding what level of golfer activity the birds will tolerate.

Project Coordinator Matthew D. Smith digs a trench for an artificial owl burrow that is situated just 33 feet from the 16th green at Canyon Lakes Golf Club in Kennewick, Wash. (above). A pair of burrowing owls (inset).

Conway and his team have installed 30 artificial burrows since the project began in February and 150 burrows are planned to be installed by August. Once installed, the new burrows are checked each week to determine whether owls are using the artificial structures. Occupancy is obvious because resident owls leave tell-tale signs which include small regurgitated pellets and a few feathers at the entrance. Conway is simultaneously monitoring the occupancy rates of another 150 artificial burrows in the area (ones not on golf courses) and 150 natural burrows. This data will allow him to compare burrow occupancy and reproductive success of the golf course burrows with both natural and artificial burrows in more natural settings.

Burrowing owls are unique in that they are active and visible throughout the daylight hours. Two of the partner courses already have natural burrows with resident owls present each year.

"Many of our golfers look for the owls when they play, and, in fact, if they don't see them, people will come and ask why they weren't there," said Nick Rodriguez, superintendent at Horn Rapids Golf Course.

The end product of this study will be to publish and distribute a pamphlet to superintendents throughout the breeding range of the burrowing owl. The information will describe how and where to install burrows and the benefits associated with them. Ultimately, the aggregation of golf courses can significantly contribute to the conservation of this species.

Matthew D. Smith, project coordinator for the burrowing owl study, graduated from Earlham College in 1997 with a bachelor's degree in biology.
Dr. Courtney J. Conway is a wildlife ecologist in the Department of Natural Resource Sciences at Washington State University. He has a bachelor's degree in wildlife biology from Colorado State University, a master's in zoology from the University of Wyoming, and a Ph.D. in ecology from the University of Montana. He has published more than 20 manuscripts and book chapters summarizing his research on the effects of environmental and land-use changes on populations of rare animals.

Wasps as grub control

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paralyze them, roll them into a ball and lay an egg on their backs. Then the wasp grub slowly devours the white grub."

In areas that have strong natural wasp populations Potter has found patches where three-quarters of the white grubs were parasitized.

"These wasps can be a pretty significant mortality agent against masked chafer grubs," said Potter. "But right now we know little about them."

Along with a two-year $42,950 grant from the United States Golf Association, Potter and entomology graduate student Michael Rogers are studying how the wasps locate white grubs, how they can be attracted to golf courses and how maintenance practices can be adjusted to encourage healthy wasp populations.

Preliminary studies indicate that at close range the wasps locate white grubs by sensing vibrations in the ground.

"At long range, we speculate that wasps are homing in on plant odors that are produced by damaged turfgrass," said Potter. "Root feeding would create an odor bouquet that is different and the wasps hone in on the damaged plant to find the grubs."

In order to build up natural populations on golf courses, Potter is looking at which wildflowers attract the wasps.

"Wasps use flowering plants as a source for nectar and carbohydrates, so we are going to determine which of these plants the wasps like to visit and perhaps we can augment their populations by including these plants in landscape plans," he said.

Potter has also experimented with a more rudimentary method of attraction — spraying turf with a diluted sugar solution. "We were able to attract dozens of wasps to the site, which we assume would then parasitize the grubs, but we haven't verified that yet," said Potter.

Altering turf management regimes can also help to build and sustain wasp populations. Potter has worked with Mach 2 and Merit insecticides and determined that both are compatible with the preservation of beneficial insects.

"However, we have to work with them and not knock them out," he said. "The wasps are the most active in late August to mid-September and if you don't spray then you won't kill them."

Instead, Potter recommends spraying preventatively early in the season and working around the life cycle of the wasps to encourage healthy grub-fighting populations.

"This study is part of an overall effort to understand why insect outbreaks occur on courses and to learn how to work with the golf course environment to encourage as much natural pest control as we can get," said Potter.

The wasp study will be taking place over the next two summers and Potter expects final results to be available in the winter of 2001.