

First-ever release of endangered burying beetles in Missouri

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Beetle last seen in state in 1970s; Zoo has monitored for beetle since 2002. The Saint Louis Zoo's Center for American Burying Beetle Conservation; the U.S. Fish & Wildlife Service; the Missouri Department of Conservation; and The Nature Conservancy are reintroducing up to 600 Zoo-bred American burying beetles – for the first time ever in Missouri -- beginning in June in locations across the 4,040-acre Wah' Kon-Tah Prairie in Southwest Missouri. The American burying beetle was the nation's first insect species ever to be designated as endangered.

The reintroduction site in St. Clair and Cedar counties is jointly owned and managed by the Missouri Department of Conservation and The Nature Conservancy.

For the June reintroduction in Missouri, a special designation was sought from U.S. Fish and Wildlife, which has authority over the nearly 7,000 captive [beetles](#) the Zoo has bred since 2005. The waiting period for that designation ended April 23; today the designation is officially approved. It helps provide assurance to nearby private landowners that the presence of this protected species will not affect farming and other activities.

"This designation took some time because we had to weigh the costs and benefits of reintroducing this species as a non-essential experimental population. Getting this designation as a 'nonessential experimental' population does not mean that this is not an important species to conserve, but it does mean that we can offer some flexibility so that

reintroduction does not interfere with the activities of nearby landowners," said Scott Hamilton, U.S. [Fish](#) and Wildlife Biologist based in Columbia, Mo. "The 'nonessential' determination allowed us to reintroduce the beetle."

Going Underground

Beetles slated for release will be paired and marked by notching the elytra—the hard, modified forewings that encase the thin hind wings used in flight. Ultimately, the notch will distinguish captive-bred and wild beetles. The beetle release process involves digging holes, or plugs, at specially selected sites, placing the carcass of a quail and a pair of notched beetles in each cavity and replacing the plugs. This process simulates a natural underground setting for the beetles' life cycle. The plug sites will then be monitored for signs of breeding activity by checking for larvae, and later, new adult beetles.

What Happened to the Beetles?

"The beetle was last seen in Missouri in the mid-1970s, and for the last decade, the Zoo has been monitoring for existing American burying beetles—with none found," said Saint Louis Zoo Zoological Manager for Invertebrates Bob Merz. Merz is also director of the American burying beetle center that is part of the Zoo's 12-center WildCare Institute dedicated to saving animals across the globe and at home.

Surveying for the endangered beetles has been the focus of the Zoo's American burying beetle conservation efforts for the past several years.

"Our contribution to reintroduction efforts by returning the beetle to parts of its former range is the beginning of the recovery of this beautiful beetle," says Merz.

The beetles' historic range included 35 states and three Canadian provinces, but at the time of its listing as endangered in 1989, only one beetle population was known—one in Rhode Island. Later, populations were found in Arkansas, Oklahoma, Nebraska, Texas, South Dakota and Kansas—but not in Missouri.

The first reintroduction for this species was in Penikese Island, Mass., in 1990; a reintroduction followed in Nantucket Island in 1994.

Since 1998, there have been ongoing efforts to reintroduce a population in Ohio.

The reasons for the beetle's decline are still unknown. Scientists have speculated that the loss may be due to pesticides, habitat loss and destruction, even light pollution.

"Competition for carrion by scavengers is also thought to be an important factor in their decline," Hamilton added.

The Great Undertakers

American burying beetles are the largest of the carrion beetles: up to one-and-a-half inches long. Largely nocturnal, the beetles are shiny black with bright orange-red bands on their wing-covers. They also have a bright orange-red patch just behind the head and a patch between the eyes.

The American burying beetle is named for its practice of burying its food -- carrion. When they bury the carcass of a quail or other small mammal, they can tunnel a foot deep, stripping fur or feathers from the body with pincers and expectorating an antibacterial secretion that slows decomposition by embalming the body. Because carrion can be scarce, these beetles sometimes cross large areas; by necessity, they are strong

fliers capable of covering several miles overnight. The beetle uses special chemical receptors in its antennae to detect dead meat from almost two miles away. Once it finds the carrion, the beetle often has to fight other burying beetles for its right to eat it.

Pairs bury the carrion cooperatively. The female beetle lays her eggs near the preserved carcass. Within four days, the eggs hatch into larvae. Both parents feed their offspring by eating some of the dead flesh and regurgitating it into the larvae's mouths. This goes on for about six to 12 days, until the larvae begin their next stage of development, pupation.

After 45 to 60 days, the new generation of beetles emerges from the carcass cavity. This process is repeated during the beetles' one-year life span.

"In recycling decomposing components back into the environment, this beetle is a necessary part of our ecosystem," says Ed Spevak, Saint Louis Zoo curator of Invertebrates.

"Clearly, its rapid decline is cause for alarm. Insects, like this, are often the proverbial 'canary in the coal mine,' providing warning to us of something harmful because of their sensitivity to environmental changes. With adequate research on what has caused this animal to become lost, we hope this species will thrive in Missouri once again."

Provided by Saint Louis Zoo

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