



The Banished Beetle Project

- **My goal is to involve citizen scientists in the pursuit of saving the endangered American burying beetle – I need your help!**
- In this packet you will find background information on the American burying beetle and classroom experiments.
- I introduce pitfall trapping for the amateur entomologist, as well as an advanced activity to trap burying beetles.
- I encourage your students to get outside, get their hands dirty and marvel at the many insects they will find.



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The American Burying Beetle (ABB)

The American burying beetle, *Nicrophorus americanus*, belongs to the order Coleoptera, and is in the family Silphidae, which groups together all the carrion and burying beetles. ABB are easy to recognize, as they are large, about 25-35 mm in length and have distinctive markings. They are shiny black with two orange-red spots on each elytron, a star shaped orange-red marking on the pronotum, as well as an orange facial marking and orange-tipped clubbed antennae. Males and females can be told apart by the facial marking; males have a square and females have a triangle. Adults are fully nocturnal and are most active from May through September, and breed during June and July. They are habitat generalists and have a broad vegetational landscape tolerance and have been found in grasslands, scrublands and forest edges. They require an area with an abundance of bird and mammal carrion, and proper soil to bury the carrion.

They are unique among non-social insects because they display parental care. The male ABB will locate a carcass, and then attract a female with his pheromones. Together they will bury the carcass, clean it of its feathers or

fur and excrete oral and anal secretions to delay decomposition. Along with all other beetles, burying beetles are holometabolous with a life cycle consisting of egg, larvae, pupae and adult. Eggs are laid in a tunnel near the carrion, and can range from 3 to 30. At least one adult, but usually both, will provide care for the young until at least the third instar. Even though the larvae have the ability to eat with chewing mouthparts just like the adults, the adults will feed them predigested carrion. They also provide care by protecting their young from predators. Larvae grow rapidly, and in about 10-14 days crawl off and pupate in the nearby soil and emerge as adults in 5-6 weeks.

The American burying beetle has been listed as endangered by the United States Fish and Wildlife Service since July 13, 1981. It is one of only about 30 insects protected under the Endangered Species Act of 1973. Formerly, ABB were found throughout temperate eastern North America, as well as Minnesota, South Dakota, Nebraska, Oklahoma and Texas. There has been a 90% decrease in their original range, and are currently present in Rhode Island, South

Dakota, Kansas, Arkansas, Nebraska and eastern Oklahoma. There are many hypotheses for their decline including habitat alteration, competition with vertebrates, lack of appropriately sized carrion, use of pesticides, light pollution and more. The extinction of two appropriately sized carrion, the passenger pigeon and the greater prairie chicken, may also explain a decline in ABB populations. Under section 4 of the Endangered Species Act, it is required that the Fish and Wildlife Service develop recovery plans. The recovery plan for ABB was completed in 1991 and includes monitoring existing wild populations, maintaining captive populations, conducting surveys for additional populations and conducting additional reintroductions. Progress has been made through these efforts, and ABB have even been found in 13 counties of eastern Oklahoma.

This banished beetle plays a vital role in the environment as a recycler and undertaker. They significantly reduce fly populations, saving humans from the filth, diseases and agricultural dilemmas that flies cause. Research is also being done to investigate the oral and anal secretions the beetles produce as a possible antibiotic for humans. The first step to saving this species is knowledge, which is where you come in. Help

Insect Conservation

A look at the American Burying Beetle

Introduction: Most people understand that wildlife conservation is important, that our own survival may depend on other species that we share the planet with. Some people are even fascinated with wildlife and don't want to see their favorite animals go extinct. But what about insects? Insects make up about four fifths of animal biodiversity of earth, and play a large part in enabling other types of wildlife to survive.

Endangered Species Act

The U.S. Fish and Wildlife Service created the Endangered Species Act after realizing that many native plants and animals are at risk of going extinct. The Endangered Species Act serves to protect and recover imperiled species. When an organism is placed under ESA, it is defined as threatened or endangered. If it is threatened, that means it is likely to become endangered in the foreseeable future. If it is endangered, it means the species is in danger of extinction throughout all or most of its range.

There are currently 2,054 species listed under the Endangered Species Act. The ESA protects its listed species by prohibiting the "take" of these animals, deeming it unlawful to collect or harm one.

Objectives: Upon completion of this module you shall:

- Learn about the U.S. Fish & Wildlife Service's Endangered Species Act
- Be able to use a pitfall trap
- Be able to identify the American burying beetle

Species on the conservation list

The current list of species listed as threatened or endangered totals 1,519 with 874 plants and 645 animals:



SOURCE: United States Fish and Wildlife Service

AP

"The biodiversity crisis is undeniably an insect biodiversity crisis. Yet insect conservation remains the awkward "kid sister" to vertebrate conservation." (Dunn 2005)