



Natural Heritage & Endangered Species Program

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Massachusetts Division of Fisheries & Wildlife

American Burying Beetle *Nicrophorus americanus*

State Status: **Endangered**
Federal Status: **Endangered**

DESCRIPTION: The male and female American Burying Beetles are indistinguishable externally. They are members of the family Silphidae, the carrion beetles, also called sexton and burying beetles. It is the largest member of the genus in North America, measuring 25-36 mm (1.0-1.4 inches). The beetle has a large orange-red pronotal disk, an orange antennal club, red frons, and two pairs of scalloped red spots on the elytra (wing covers), on a black background.

SIMILAR SPECIES IN MASSACHUSETTS: *N. orbicollis*, *N. marginatus*. It is also closely related to the European species *N. germanicus*.

HABITAT: Habitat requirements are poorly understood. In the western portions of its range, American Burying Beetles prefer open oak-hickory savanna forested areas with well-developed, deep sandy soils with little shrub cover. They will also breed successfully in grasslands.

RANGE: The American Burying Beetle was once widespread in North America, but declined severely in the 20th century. In Massachusetts, specimens exist for the three counties in the Connecticut River valley, as well as Essex, Barnstable, Dukes, and Nantucket counties. Surveys for its presence throughout its known Massachusetts range have been unsuccessful. It is known to occur in Arkansas, Kansas, Nebraska, Rhode Island (Block Island), Oklahoma, and Texas, and it has been reintroduced in Massachusetts and Ohio.

LIFE CYCLE / BEHAVIOR: The American Burying Beetle lives for about 12 months and both males and females actively tend their offspring. Its wing covers (elytra) have a plectrum at the bottom of each wing. The plectrum rubs against ridges on the beetles' abdomen to stridulate, calling larvae to food and in times of stress. Adults are nocturnal.



Photograph by Chris Raithel, RI DCR.

N. americanus can move and bury a carcass a hundred times its size. After stripping the carcass, the beetles shape it into a ball and preserve it with secretions. The antennae of male and female beetles have highly sensitive chemical receptors to detect odors of decomposition and are quickly attracted to vertebrate carcasses such as mice or pheasants. Even a dead snake can be subdivided and buried by more than one pair of beetles, although it is more difficult to bury. When a carcass is located, beetles walk around and under it to assess it, and search for suitable burial spots. Individuals of both sexes are capable of burying a carcass alone. They bury by gradually excavating soil out from under the dead animal. During burial, either member of the pair may creep into a concealed place and depart or sleep for half an hour and then resume digging.

If two or more males or females simultaneously arrive at the carcass, they fight until only one male and one female remain. The victorious male and female become mates. They move the body, sometimes a foot or more, to the burial spot. Once the carcass is buried about 4 inches below the surface, the beetles construct a brood

A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan

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chamber. Then they strip the carcass of fur or feathers and shape the carcass, skin intact, into a ball and preserve it with anal and oral secretions.

Within two days, the female lays 30 or more eggs in the soil near the carcass and three or four days later, the eggs hatch into larvae, which crawl to the top of the ball to a hollow prepared by the parents. Both parents regurgitate food to the begging larvae. The larvae grow tenfold each day and are soon able to feed themselves. Both parents circle the carcass, clipping it with their mandibles to keep it clear of fungi and dragging their abdomens to spread secretions that inhibit bacteria. About two weeks after burial, larvae complete development and pupate in soil nearby. Females are reproductively capable immediately upon leaving a brood.

Parents will cannibalize their young while they are very small, reducing the larvae to a number that can be successfully reared on the available food. Brood size varies between 8 and 23. When the young are three or four days old, one parent, usually the male, leaves. By the time the young are 8 or 9 days old, they have eaten one-third or more of the carcass. The remainder is left to decompose. In general, the heavier the carcass, the heavier the total brood will be.

Population Status and Threats

One reintroduction attempt on Penikese Island failed. A second attempt on Nantucket is currently being evaluated to determine whether it was successful. No other populations are known in Massachusetts. No one knows why this beetle disappeared from the majority of its former range although habitat loss has been ruled out. Hypotheses include a change in available, appropriate carrion, such as the extinction of passenger pigeon and the decline in quail, pheasant and other birds, or the severe fragmentation of large tracts of land capable of supporting substantial populations of preferred carrion types. Another suggestion is that competition from other carrion-eating animals was responsible. The pattern of extirpation suggests a pathogen such as a virus or bacteria may be responsible. The exclusion of fire from some recently occupied habitats has resulted in the rapid spread of dense red cedar shrubs rendering the habitat unusable to the beetle. Perhaps the accumulation of several factors is the answer.

Known populations have been monitored for several years and most display wide fluctuations in numbers of individuals from year to year. One site has been recently invaded by fire ants and the population is showing a marked decline.

References

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