

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN-1018-AB23

Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the American Burying Beetle**AGENCY:** Fish and Wildlife Service, Interior.**ACTION:** Final rule.

SUMMARY: The U.S. Fish and Wildlife Service determines the American burying beetle (*Nicrophorus americanus*) to be an endangered species under the authority of the Endangered Species Act of 1973 (Act), as amended. Once widely distributed throughout eastern North America, this species has disappeared from most of its former range. Two known populations currently exist, one in eastern Oklahoma and the other on an island off the coast of New England. Despite extensive efforts to locate additional populations, only two specimens have been found elsewhere in more than ten years. The cause of the species' decline is unknown. Critical habitat is not being determined. This action implements Federal protection provided by the Act for the American burying beetle.

DATE: The effective date of this rule is August 14, 1989.

ADDRESS: The complete file for this rule is available for inspection, by appointment, during normal business hours at the U.S. Fish and Wildlife Service, One Gateway Center, Suite 700, Newton Corner, Massachusetts, 02158.

FOR FURTHER INFORMATION CONTACT: Anne Hecht at the above address or by telephone (617/965-5100 or FTS 829-9316).

SUPPLEMENTARY INFORMATION**Background**

Nicrophorus americanus, described by Olivier in 1790 (Perkins 1980), is a member of the family Silphidae, the carrion beetles. Generally known as the American burying beetle, this species has also been referred to as the giant carrion beetle (Wells et al. 1983). The American burying beetle is the largest member of its genus in North America, measuring 25-36 mm (1.0-1.4 inches) in length. Distinguishable by its large size, the American burying beetle is also identifiable by a large orange-red pronotal disk. This, the orange antennal club, red frons, and two pairs of scalloped red spots on the elytra (wing

covers) contrast sharply with a black background (Wells et al. 1983).

Investigations to date indicate that the biology of the American burying beetle is similar to that of other species of the genus, except that the carrion selected for breeding purposes tends to be larger (Kozol et al. 1987). Schweitzer and Master (1987) based the following description of the American burying beetle's life history on Kozol's paper and their own observations:

Beetles of both sexes are attracted to appropriate carrion at night, generally soon after dark. Apparently males and females fight among themselves until one pair (usually the largest male and female) remains on the carcass. These individuals then bury it, often before dawn of the first morning. The carrion may then be moved laterally for some distance (often over a meter) underground. Eventually, a chamber is constructed. Eggs are laid on the carrion and at least one, usually both, parents remain with the eggs and subsequent larvae. Larvae cannot survive without parental care. They emerge as adults in about 48-56 days and the parents and young then disperse. Occasionally, individuals may succeed in rearing two broods of young. As far as is known, the young, which emerge in July and August, do not reproduce until the following June or July. Adults overwinter, probably singly in the soil. Adults feed on carrion and apparently also capture and consume live insects.

Apparently, any kind of vertebrate carrion between about 50 and 200 grams is acceptable * * *. Brood sizes varied between 8 and 23 teneral adults eclosed.

Once widely distributed throughout eastern North America, this species has disappeared from most of its historic range. Historical records include 32 states, the District of Columbia, and 3 Canadian provinces encompassing the area from Nova Scotia and Quebec, south to Florida and west to Minnesota, South Dakota, Nebraska, Oklahoma, and Texas (Wells et al. 1983, Schweitzer and Master 1987). Two extant populations are known, one on a New England island and the other in eastern Oklahoma.

The New England island population was estimated at 520 beetles (850 beetles at the high end of the 95% confidence interval) in 1988 (Kozol et al. 1987). All but one capture occurred on a portion of the island where much of the land is owned by a State agency or by private conservation organizations.

The existence of the eastern Oklahoma population was recently brought to the attention of the U.S. Fish and Wildlife Service (Service). This population is known from collections at blacklight of one specimen in 1979, one specimen of unknown date sometime between 1979 and 1987, seven specimens in 1987, and one specimen in 1988. Several circumstances, including

the sporadic pattern of these collections at a blacklight that has reportedly been operated for more than 5000 hours since 1976 and the fact that at least five other species of *Nicrophorus* are regularly collected at this site, suggest that the size and stability of this population may be a matter of concern (pers. comm. Pat Mehlhop, Oklahoma Natural Heritage Inventory, 1988).

In the early 1980's, an incident involving collection of a single American burying beetle occurred about 40 miles north of the site of the Oklahoma population described above. Nightly blacklighting conducted during one week each summer over an eight year period yielded only the one specimen at this locale (pers. comm. D. Davis, Smithsonian Institution, 1988). It is unclear whether there is a relationship between this specimen and the other Oklahoma collections.

A single specimen was captured and released at a second site in New England in 1985. Extensive efforts using both carrion baits and blacklights resulted in the capture of over 7000 *Nicrophorus* species at this location in 1986, but failed to retrap this species (Schweitzer and Master 1987).

Anderson (1982) speculated that the natural habitat of the species is mature climax forest, but the fact that there is no forest on the island where the beetle is found today casts serious doubt on this thesis. Habitat occupied by the known population includes maritime shrub thickets, coastal moraine grassland, and pastureland. There is agreement that availability of significant humus and top soil suitable for burying of carrion is an essential habitat requirement of the American burying beetle (Schweitzer and Master 1987).

Davis (1980) detailed the decline in the number of American burying beetle specimens in collections and solicited information on the locations of existing populations. Anderson (1982) found a pattern of increasing localization in capture records. The *IUCN Red Data Book* (Wells et al. 1983) described this species as having experienced "one of the most disastrous declines of an insect's range ever to be recorded," and stated that the Service should be encouraged to list it as an endangered species. In 1980, the Service included *Nicrophorus americanus* in a status review of insects in major public collections (Perkins 1980). The American burying beetle was recognized as a Category 2 candidate for listing in the Service's May 22, 1984 (49 FR 21670) invertebrate review notice. Category 2 taxa are those for which existing information indicates the possible

appropriateness of proposing listing under the Endangered Species Act (Act), but for which sufficient biological information is not presently available to support a proposed rule.

In 1987, the Eastern Regional Office of The Nature Conservancy compiled the results of a range-wide status survey for the American burying beetle. Since 1960, this once ubiquitous species has been collected only in Ontario, Kentucky, Arkansas, Michigan, Oklahoma, Nebraska (pers. comm. Brett Ratcliffe, Nebraska State Museum, 1988) and in two New England states. Moreover, failure of extensive efforts in 1986 to recapture American burying beetles at the sites of most recent captures in Arkansas and Michigan suggests a continuing constriction of the species' range. Significant efforts in 1986 and 1987 to locate American burying beetles on another New England island, where a 1985 capture was reported, were unsuccessful. Other recent unsuccessful capture efforts were conducted in northwestern Pennsylvania, New Jersey, New York (Long Island), Tennessee, western North Carolina, Torreya State Park in Florida, and on mainland areas in New England. The abundance of the species in collections (including student collections) with capture dates prior to 1950 and the ease of capture at blacklight and pitfall traps experienced at the site of the known extant island population confirm that these unsuccessful efforts to locate American burying beetles are indicative of their decline throughout most of their former range.

Summary of Comments and Recommendations

In the October 11, 1988 proposed rule, all interested parties were requested to submit factual reports or information that might contribute to the development of a final rule. Copies of the proposed rule were mailed to appropriate State resource agencies, county governments, Federal agencies, scientific organizations, and other interested parties, with a request for comments. Notices inviting public comment were published in newspapers of general circulation in all areas where American burying beetles have been captured during the last ten years and in several other areas with less recent capture records. Ten written comments were received; all supported the proposed rule. No new information was received.

Summary of Factors Affecting the Species

Section 4(a)(1) of the Endangered Species Act (16 U.S.C. 1531 *et seq.*) and regulations (50 CFR Part 424)

promulgated to implement the listing provisions of the Act set forth the procedures for adding species to the Federal Lists. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1). These factors and their application to the American burying beetle (*Nicrophorus americanus*) are as follows:

A. The Present or Threatened Destruction, Modification or Curtailment of its Habitat or Range

As described above, the American burying beetle has almost entirely vanished from its former range. It is possible that future search efforts may result in discovery of another extant population. However, the extent of the species' decline suggests that any newly discovered populations are also vulnerable to whatever factors have caused their disappearance elsewhere.

Anderson (1982) believed that, as with a similarly large European *Nicrophorus* species, the decline of the American burying beetle was due to the destruction of "primary" or virgin forest, which he speculated was the essential habitat of the species. This hypothesis is refuted by the fact that many records document collections of the species in various locations more than a century after destruction of the primary forest. Furthermore, the site of the known New England population supports no forests. It is possible that loss of some obscure habitat component has contributed to the beetle's disappearance, but habitat generally similar to that of the known population is not rare (Schweitzer and Master 1987).

B. Over-Utilization for Commercial, Recreational, Scientific, or Educational Purposes

Collection has not been a factor in the present decline of this once ubiquitous species (Schweitzer and Master 1987). However, ease of trapping could make remaining populations vulnerable to over-collection if their locations were to become well known.

C. Disease or Predation

Predation has probably not been a factor in this species' decline, but introduction of a non-native, species-specific pathogen could explain the fact that this species has disappeared while several other species of the same genus (for example, *N. orbicollis* and *N. tomentosus*) with similar habits continue to thrive (pers. comm. Andrea Kozol, Boston University, 1988). Such a hypothesis is also consistent with the location of the two remaining

populations: one on an island and the other on the edge of the species' historic range. No studies addressing this theory have been undertaken to date.

D. The Inadequacy of Existing Regulatory Mechanisms

This species has no legal protection in any State where it is known or suspected to exist. Localized regulations requiring that electronic bug-zappers in the vicinity of the known population be equipped with grids small enough to exclude American burying beetles would remove the potential for take described under E, below. Lack of understanding of the causes of the species' decline precludes recommendation of other regulations for protection of the species at this time. It is possible that future studies of the species will show a need for such regulations.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

A low reproductive rate (compared with other insects) limits the ability of this species to rebound from any period of elevated mortality.

Use of electronic bug-zappers in the vicinity of American burying beetles could result in take of this species. Other *Nicrophorus* species have been killed by zappers and American burying beetles are attracted to identical light sources (pers. comm. Michelle P. Scott, Boston University, 1987). Since *Nicrophorus* males are involved in brood-rearing, this sex (which is selectively killed by zappers in most insect groups) is not functionally surplus.

Some speculation has focused on the possible role of the pesticide DDT in the decline of the American burying beetle. Some support for this hypothesis is furnished by reports that the site of the known island population, unlike most other New England islands and many mainland areas, was never extensively sprayed for mosquito or gypsy moth suppression. However, most other recent records of the species are from farming areas where DDT would likely have been used prior to its banning. Further, if DDT contamination of the beetle's food supply had occurred, it is hard to explain why other carrion-feeding members of the genus were not similarly affected (Schweitzer and Master 1987).

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by this species in determining to make this rule final. Based on this evaluation, the

preferred action is to list the American burying beetle as endangered. Endangered status is warranted by the decline in the species' range from more than a third of the continental United States and parts of southeastern Canada to only two verified populations. Failure of 1986 efforts to relocate the species in Arkansas and Michigan suggests that whatever caused the decline of the species was still at work at least as recently as the mid 1970's. While it is not improbable that other remnant populations will be discovered in the future, it is likely that those populations remain vulnerable to the factors that have caused the general decline of the species. Further, there is no known way to reverse any decline that might occur in the known populations.

Critical Habitat

Section 4(a)(3) of the Act, as amended, requires that to the maximum extent prudent and determinable, the Secretary designate any habitat of a species which is considered to be critical habitat at the time the species is determined to be endangered or threatened. The Service finds that designation of critical habitat is not prudent for this species at this time. This determination is based on the premise that such a designation would not be beneficial to the species (50 CFR 424.12). As discussed under "Factor B" above, ease of trapping could make the American burying beetle vulnerable to collectors who might be attracted to the locale of the known populations by the publication of maps and other specific location information. No benefit from critical habitat designation has been identified that outweighs the threat of collection.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Endangered Species Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing encourages and results in conservation actions by Federal, State, and local governments and private agencies, groups and individuals. The Act provides for possible land acquisition and cooperation with the States and requires that recovery actions be carried out for all listed species. Such actions are initiated by the Service following listing. The protection required of Federal agencies and prohibitions against taking and harm are discussed, in part, below.

The Act requires development and implementation of recovery plans for listed species. Because the causes of the

decline of the American burying beetle are unknown, it is probable that initial recovery activities will focus on research to determine those causes. Later actions may include efforts to reestablish the species in suitable locations in its former range.

Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is listed as endangered or threatened and with respect to its critical habitat, if any is designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR Part 402. Section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of such a species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service. The Service has not identified any ongoing or proposed projects with Federal involvement that could affect this species.

The Act and implementing regulations found at 50 CFR 17.21 set forth a series of general trade prohibitions and exceptions that apply to all endangered wildlife. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to take, import or export, ship in interstate commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce any listed species. It also is illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to agents of the Service and State conservation agencies.

Permits may be issued to carry out otherwise prohibited activities involving endangered or threatened wildlife species under certain circumstances. Regulations governing permits are at 50 CFR 17.22 and 17.23. Such permits are available for scientific purposes, to enhance the propagation or survival of the species, and/or for incidental take in connection with otherwise lawful activities.

Requests for copies of the regulations on take of endangered and threatened species and inquiries regarding them may be addressed to the Office of Management Authority, U.S. Fish and Wildlife Service, P.O. Box 27329, Washington, DC, 20036 (202/343-4955).

National Environmental Policy Act

The Fish and Wildlife Service has determined that an Environmental

Assessment, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. A notice outlining the Service's reasons for this determination was published in the *Federal Register* on October 25, 1983 (48 FR 49244).

References Cited

- Anderson, R.S. 1982. On the decreasing abundance of *Nicrophorus americanus* Olivier (Coleoptera:Silphidae) in eastern North America. *Coleopt. Bull.* 36(2):362-365.
- Davis, L.R. 1980. Notes on beetle distributions with a discussion of *Nicrophorus americanus* Olivier and its abundance in collections. (Coleoptera:Scarabeidae, Lampyridae and Silphidae). *Coleopt. Bull.* 34(2):245-251.
- Kozol, A.J., M.P. Scott, and J.F.A. Traniello. 1987. Distribution and natural history of the American burying beetle (*Nicrophorus americanus*). Unpublished report for the Eastern Heritage Task Force of The Nature Conservancy.
- Perkins, P.D.P. 1980. North American insect status review. Contract 14-16-0009-79-052 final report to USDI Office of Endangered Species.
- Schweitzer, D.F., and L.L. Master. 1987. *Nicrophorus americanus* (American burying beetle): results of a global status survey. Report for Region 5 of the U.S. Fish and Wildlife Service.
- Wells, S.M., R.M. Pyle, and N.M. Collins. 1983. The IUCN red data book. IUCN, Gland, Switzerland, pp 379-381.

Author

The primary author of this rule is Anne Hecht of the Service's Regional Office in Newton Corner, Massachusetts (see ADDRESSES section).

List of Subjects in 50 CFR Part 17

Endangered and threatened wildlife, Fish, Marine mammals, Plants (agriculture).

Regulation Promulgation

Accordingly, Part 17, Subchapter B of Chapter I, Title 50 of the Code of Federal Regulations, is amended as set forth below:

PART 17--[AMENDED]

1. The authority citation for Part 17 continues to read as follows:

Authority: Pub. L. 93-205, 87 Stat. 884; Pub. L. 94-359, 90 Stat. 911; Pub. L. 95-632, 92 Stat. 3751; Pub. L. 96-159, 93 Stat. 1225; Pub. L. 97-304, 96 Stat. 1411; Pub. L. 100-478, 102 Stat. 2306; Pub. L. 100-653, 102 Stat. 3825 (16 U.S.C. 1531 et seq.); Pub. L. 99-625, 100 Stat. 3500, unless otherwise noted.

2. Amend § 17.11(h) by adding the following, in alphabetical order under

is, to the list of Endangered and Threatened Wildlife:

§ 17.11 Endangered and threatened wildlife.

(h) * * *

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Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
INSECTS							
Beetle, American burying (=Giant carion beetle).	<i>Nicrophorus americanus</i> .	U.S.A. (eastern States south to FL, west to SD and TX), eastern Canada.	NA	E	351	NA	NA

Dated: June 12, 1989.

Susan Recce Lamson,
Assistant Secretary for Fish and Wildlife and Parks.

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