

## DEPARTMENT OF THE INTERIOR

## Fish and Wildlife Service

## 50 CFR Part 17

[Docket No. FWS-R2-ES-2018-0029;  
FXES11130900000 189 FF09E42000]

RIN 1018-BD46

**Endangered and Threatened Wildlife and Plants; Reclassifying the American Burying Beetle From Endangered to Threatened on the Federal List of Endangered and Threatened Wildlife With a 4(d) Rule**

**AGENCY:** Fish and Wildlife Service, Interior.

**ACTION:** Proposed rule and 12-month petition finding; request for comments.

**SUMMARY:** Under the authority of the Endangered Species Act of 1973, as amended (Act), we, the U.S. Fish and Wildlife Service (Service), propose to reclassify the American burying beetle (*Nicrophorus americanus*) from endangered to threatened on the Federal List of Endangered and Threatened Wildlife (List). This determination is based on a thorough review of the best available scientific and commercial information, which indicates that the threats to this species have been reduced to the point that it no longer meets the definition of an endangered species under the Act, but is likely to become endangered within the foreseeable future. We are also proposing a rule under section 4(d) of the Act to provide for the conservation of the species. Many routine activities in the species' range will not be regulated if this proposal is finalized because these practices will not affect the overall viability of the American burying beetle. We are soliciting additional data and information that may assist us in making a final decision on this proposed action. This document also serves as the 12-month finding on a petition to remove this species from the List.

**DATES:** We will accept comments received or postmarked on or before July 2, 2019. Please note that if you are using the Federal eRulemaking Portal (see **ADDRESSES**), the deadline for submitting an electronic comment is 11:59 p.m. Eastern Time on this date. We must receive requests for public hearings, in writing, at the address shown in **FOR FURTHER INFORMATION CONTACT** by June 17, 2019.

**ADDRESSES:** *Written comments:* You may submit comments by one of the following methods:

(1) *Electronically:* Go to the Federal eRulemaking Portal: <http://www.regulations.gov>. In the Search box, enter FWS-R2-ES-2018-0029, which is the docket number for this rulemaking. Then, click on the Search button. On the resulting page, in the Search panel on the left side of the screen, under the Document Type heading, click on the Proposed Rules link to locate this document. You may submit a comment by clicking on "Comment Now!"

(2) *By hard copy:* Submit by U.S. mail or hand-delivery to: Public Comments Processing, Attn: FWS-R2-ES-2018-0029, U.S. Fish and Wildlife Service, MS: BPHC, 5275 Leesburg Pike, Falls Church, VA 22041-3803.

We request that you send comments only by the methods described above. We will post all comments on <http://www.regulations.gov>. This generally means that we will post any personal information you provide us (see *Public Comments*, below, for more information).

*Copies of documents:* This proposed rule and supporting documents are available on <http://www.regulations.gov>. In addition, the supporting file for this proposed rule will be available for public inspection, by appointment, during normal business hours, at the Oklahoma Ecological Services Field Office, 9014 East 21st St., Tulsa, OK 74129; telephone 918-382-4500.

**FOR FURTHER INFORMATION CONTACT:** Jonna Polk, Field Supervisor, U.S. Fish and Wildlife Service, Oklahoma Ecological Services Field Office, 9014 East 21st St., Tulsa, OK 74129; telephone 918-382-4500. Persons who use a telecommunications device for the deaf (TDD) may call the Federal Relay Service at 800-877-8339.

**SUPPLEMENTARY INFORMATION:**

**Executive Summary**

*Why we need to publish a rule.*

Under the Act, a species may warrant reclassification from endangered to threatened if it no longer meets the definition of endangered (in danger of extinction). The American burying beetle is listed as endangered, and we are proposing to reclassify the American burying beetle as threatened because we have determined it is not currently in danger of extinction. Reclassifications can only be made by issuing a rulemaking. Furthermore, changes to the prohibitions relevant to this species, such as those we are proposing for this species under a section 4(d) rule, can only be made by issuing a rulemaking.

*The basis for our action.*

Under the Act, we may determine that a species is an endangered or threatened

species based on any one or a combination of five factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. We have determined that the American burying beetle is not currently at risk of extinction and, therefore, does not meet the definition of endangered. However, due to continued threats from increasing temperatures and ongoing land use changes, we find that the American burying beetle is likely to become an endangered species within the foreseeable future throughout all of its range.

*We are proposing to promulgate a section 4(d) rule.*

The Service proposes to prohibit all intentional take of the American burying beetle and specifically tailor the prohibition of incidental take to the three geographic areas that the American burying beetle occupies. In the New England and Northern Plains analysis areas, incidental take under the proposed rule is only prohibited in suitable habitat when the take is the result of soil disturbance. However, we propose an exception for any incidental take associated with ranching and grazing activities. In the Southern Plains analysis areas, incidental take is not prohibited unless it occurs on defined conservation lands. However, we propose an exception for any incidental take that occurs on conservation lands while conducting activities that are in compliance with a Service-approved management plan. Federally implemented, funded, or permitted actions would continue to be subject to the requirements of section 7 of the Act.

**Information Requested**

*Public Comments*

We want any final rule resulting from this proposal to reflect full consideration of all relevant issues and be as effective as possible. Therefore, we invite tribal and governmental agencies, the scientific community, industry, and other interested parties to submit comments or recommendations concerning any aspect of this proposed rule. Comments should be as specific as possible.

To issue a final rule to implement this proposed action, we will take into consideration all comments and any additional information we receive. Such communications may lead to a final rule

that differs from this proposal, *i.e.*, a final rule could leave the species listed as endangered, reclassify the species as threatened, or remove the species from the List. All comments, including commenters' names and addresses, if provided to us, will become part of the supporting record.

We specifically request comments on:

(1) New information on the historical and current status, range, distribution, and population size of the American burying beetle, including the locations of any additional populations.

(2) New information on the known, potential, and future threats to the American burying beetle, particularly any projected quantities and locations of potential threats to the American burying beetle or its habitat. For example, we request any information that would allow us to better project the potential future impacts of wind development, including scientific assessments of how much potential habitat could be lost. Better assessments of future land use and industry development could allow us to develop more accurate assessments of risks and potential exemptions associated with the proposed rule under section 4(d) of the Act (16 U.S.C. 1531 *et seq.*), which we refer to as our proposed "4(d) rule," below.

(3) The temperature range in which the species will or will not persist long term.

(4) Any available data on the effects climate change may have on the ecosystem on which this species depends, particularly information related to a future northward shift of this ecosystem.

(5) New information regarding the life history, ecology, and habitat use of the American burying beetle.

(6) Information on a potential acreage threshold level below which the prohibitions in the proposed 4(d) rule would not be necessary and advisable for the conservation of American burying beetle.

Please note that submissions merely stating support for or opposition to the action under consideration without providing supporting information, although noted, will not be considered in making a determination, as section 4(b)(1)(A) of the Act (16 U.S.C. 1533(b)(1)(A)) directs that determinations as to whether any species is an endangered or threatened species must be made "solely on the basis of the best scientific and commercial data available."

You may submit your comments and materials concerning the proposed rule by one of the methods listed in **ADDRESSES**. Comments must be

submitted to <http://www.regulations.gov> before 11:59 p.m. (Eastern Time) on the date specified in **DATES**. We will not consider hand-delivered comments that we do not receive, or mailed comments that are not postmarked, by the date specified in **DATES**.

We will post your entire comment—including your personal identifying information—on <http://www.regulations.gov>. If you provide personal identifying information in your comment, you may request at the top of your document that we withhold this information from public review. However, we cannot guarantee that we will be able to do so.

Comments and materials we receive, as well as supporting documentation we used in preparing this proposed rule, will be available for public inspection on <http://www.regulations.gov>, or by appointment, during normal business hours at the U.S. Fish and Wildlife Service, Oklahoma Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

#### Public Hearing

Section 4(b)(5)(E) of the Act provides for a public hearing on this proposed rule, if requested. We must receive requests for a public hearing, in writing, at the address shown in **FOR FURTHER INFORMATION CONTACT** by the date shown in **DATES**. We will schedule a public hearing on this proposal, if requested, and the place of the hearing, as well as how to obtain reasonable accommodations, in the **Federal Register** at least 15 days before the hearing.

#### Peer Review

In accordance with our policy, "Notice of Interagency Cooperative Policy for Peer Review in Endangered Species Act Activities," which was published on July 1, 1994 (59 FR 34270), we solicited the expert opinion of appropriate independent specialists regarding scientific data and interpretations contained in the Species Status Assessment Report (SSA Report) (Service 2019; available at <http://www.regulations.gov> under Docket No. FWS-R2-ES-2018-0029) supporting this proposed rule. The purpose of such review is to ensure that our decisions are based on scientifically sound data, assumptions, and analysis. We have incorporated feedback from the peer review in the SSA Report (Service 2019).

#### Background

Section 4(b)(3)(B) of the Act requires that, for any petition to revise the Federal Lists of Endangered and

Threatened Wildlife and Plants that contains substantial scientific or commercial information that reclassifying a species may be warranted, we make a finding within 12 months of the date of receipt of the petition ("12-month finding"). In this finding, we determine whether the petitioned action is: (1) Not warranted, (2) warranted, or (3) warranted, but immediate proposal of a regulation implementing the petitioned action is precluded by other pending proposals to determine whether species are endangered or threatened, and expeditious progress is being made to add or remove qualified species from the Federal Lists of Endangered and Threatened Wildlife and Plants. We must publish these 12-month findings in the **Federal Register**. This document represents:

- Our 12-month not-warranted finding on an August 21, 2015, petition to remove the American burying beetle from the List (that is, to "delist" this species);
- Our proposed determination that the American burying beetle no longer meets the definition of endangered under the Act;
- Our proposed determination that the American burying beetle meets the definition of threatened under the Act;
- Our proposed rule to reclassify the American burying beetle from endangered to threatened on the Federal List of Endangered and Threatened Wildlife; and
- Our proposed 4(d) rule that outlines the proposed prohibitions applicable to the conservation of the American burying beetle.

#### Previous Federal Actions

We published a final rule to list the American burying beetle as an endangered species under the Act on July 13, 1989 (54 FR 29652). We issued a recovery plan on September 27, 1991. We completed a status review ("5-year review") under section 4(c)(2)(A) of the Act for the American burying beetle on June 16, 2008. The 5-year review recommended that this species remain classified as endangered (Service 2008).

On August 21, 2015, we received a petition dated August 18, 2015, from the American Stewards of Liberty, the Independent Petroleum Association of America, the Texas Public Policy Foundation, and Dr. Steven W. Carothers requesting that the American burying beetle be removed from the List. The petition claims that the threats to the species do not support a conclusion that the species is at risk of extinction now or in the foreseeable future. The Service published a 90-day finding on

March 16, 2016 (81 FR 14058), that the petition contained substantial scientific or commercial information indicating that the petitioned action may be warranted. The Independent Petroleum Association of America, American Stewards of Liberty, and Osage Producers Association filed a lawsuit on September 21, 2017, challenging the Service's failure to make a 12-month finding on their petition. The parties have settled this lawsuit, with the Service agreeing to deliver a 12-month finding on the petition no later than April 30, 2019. This document serves as our 12-month finding on the August 18, 2015, petition to remove the American burying beetle from the List.

#### *Species Status Assessment for American Burying Beetle*

We prepared a species status assessment (SSA) for the American burying beetle (Service 2019), which includes a thorough review of the species' taxonomy, natural history, habitats, ecology, populations, and range. The SSA analyzes individual, population, and species requirements, as well as factors affecting the species' survival and its current conditions, to assess the species' current and future viability in terms of resiliency, redundancy, and representation.

We define viability as the ability of a species to persist and to avoid extinction over the long term. Resiliency refers to the population size and demographic characteristics necessary to endure stochastic environmental variation (Shaffer and Stein 2000, pp. 308–310). Resilient populations are better able to recover from losses caused by random variation, such as fluctuations in recruitment (demographic stochasticity), variations in rainfall (environmental stochasticity), or changes in the frequency of wildfires. Redundancy refers to the number and geographic distribution of populations or sites necessary to endure catastrophic events (Shaffer and Stein 2000, pp. 308–310). As defined here, catastrophic events are rare occurrences, usually of finite duration, that cause severe impacts to one or more populations. Examples of catastrophic events include tropical storms, unusually high or prolonged floods, prolonged drought, and unusually intense wildfire. Species that have multiple resilient populations distributed over a larger landscape are more likely to survive catastrophic events, because not all populations would be affected. Representation refers to the genetic diversity, both within and among populations, necessary to conserve long-term adaptive capability (Shaffer and Stein 2000, pp. 307–308).

Species with greater genetic diversity are more able to adapt to environmental changes and to colonize new sites.

The SSA Report (Service 2019) provides the scientific basis that informs our regulatory determination as to whether or not this species should be listed as an endangered or a threatened species under the Act. This decision involves the application of standards within the Act, the Act's implementing regulations, and Service policies (see *Finding and Proposed Determination*, below). The following discussion is a summary of the results and conclusions from the SSA Report (Service 2019). We have solicited and incorporated peer review of the draft SSA Report (Service 2019) from objective and independent scientific experts.

#### *Description*

The American burying beetle (*Nicrophorus americanus*) is a member of the beetle family Silphidae (subfamily Nicrophorinae); these beetles bury vertebrate carcasses for reproductive purposes and exhibit parental care of young. The genus *Nicrophorus* contains about 70 species worldwide, of which 15 occur in North America (Peck and Kaulbars 1987, entire). Globally, burying beetles are restricted to temperate climates, and high elevations in tropical climates (Arnett 1946; Howden & Peck 1972; Cornaby 1974; Anderson & Peck 1985; Young 1978; Peck & Anderson 1985; Trumbo 1990; Ruddiman 2001; Sikes & Venables 2013). The American burying beetle is the largest silphid (carrion beetle) in North America, reaching 1.0 to 1.8 inches (25 to 35 centimeters) in length (Anderson 1982, p. 362; Backlund and Marrone 1997, p. 53). The beetles are black with orange-red markings. The American burying beetle is native to at least 35 States in the United States, covering most of temperate eastern North America, and the southern borders of three eastern Canadian provinces. The species is believed to be extirpated from all but nine States in the United States and is likely extirpated from Canada. Based on the last 15 years of surveys, the American burying beetle is known to occur in portions of Arkansas, Kansas, Oklahoma, Nebraska, South Dakota, and Texas; on Block Island off the coast of Rhode Island; and in reintroduced populations on Nantucket Island off the coast of Massachusetts and in southwest Missouri, where a nonessential experimental population (NEP) was established in 2012 under section 10(j) of the Act (77 FR 16712; March 22, 2012). Reintroduction efforts are also underway in Ohio, but survival of

reintroduced American burying beetles into the next year (successful over-wintering) has not yet been documented. A 2017 report of a potential American burying beetle in Michigan is being investigated. Surveys for American burying beetles in Michigan in 2018 failed to confirm the report, but additional surveys are planned in 2019. While it is possible that additional surveys could result in the location of additional American burying beetles in areas not currently known to support them, it is unlikely that there are viable populations that are not known. Most portions of the historical range have not had a positive survey in over 50 years and over that time period it is likely that the species would have been reported if there was a viable population present.

The American burying beetle is a nocturnal species that lives for only one year. During the daytime, American burying beetles are believed to bury themselves under vegetation litter or into soil (Jurzenski 2012, p. 76). American burying beetles are active from late spring through early fall, occupy a variety of habitats and bury themselves in the soil to hibernate for the duration of the winter. American burying beetles emerge from their winter inactive period when ambient nighttime air temperatures consistently exceed 59 degrees Fahrenheit (°F) (15 degrees Celsius (°C)) (Kozol 1988, p. 11; Kozol 1990c, p. 4; Bedick *et al.* 1999, p. 179; Service 2008, p. 13). Reproduction occurs in the spring to early summer after this emergence. New adult beetles or offspring (called tenerals), usually emerge in summer, over-winter (hibernate) as adults, and comprise the breeding population the following summer (Kozol 1988, p. 2; Amaral *et al.* 2005, pp. 30, 35).

#### *Summary of Species Requirements*

##### *Requirements of Individuals*

Adults and larvae depend on dead animals (carrion), *e.g.*, cotton rats, pheasants, prairie dogs, ground squirrels, etc., for food and moisture. Adults also require adequate soil moisture, appropriate soil temperatures, and appropriate soil particle size to allow them to bury themselves and/or a carcass (see chapter 2 of the SSA Report; Service 2019). Although American burying beetles will use multiple soil types, they have a strong preference for soils with high moisture levels. Burying beetles likely seek moist microhabitats to avoid drying out (Bedick *et al.* 2006; Hoback 2008, pp. 2, 4), but a specific threshold for soil moisture is unknown. Adequate soil moisture levels appear to

be critical for American burying beetles, and they show a strong preference for moist, sandy loam soil with organic matter (Hoback 2008, unpublished). When the nighttime ambient air temperature is consistently below 59 °F (15 °C), American burying beetles bury into the soil and become inactive (Service 1991, p. 11; Scott and Traniello 1989, pp. 34–35; Kozol 1995, p. 11). American burying beetles require adequate soil moisture, temperature, and particle size during this inactive phase as well (Bedick *et al.* 2004, p. 28).

Carrion selection for food can include an array of available carrion species and sizes, as well as feeding through capturing and consuming live insects (Service 1991, p. 11) and eating fly larvae when encountered on a carcass (Trumbo 1994, p. 247).

#### Population and Species Requirements

For reproduction, American burying beetles need appropriately sized carrion, access to mates, and suitable soils. American burying beetles are nocturnal and must find and bury the carcass in one night. Carrion sources that American burying beetles have been documented using for reproduction include carcasses weighing from 1.7 to 10.5 ounces (48 to 297 grams (g)), but the optimum weight of carcasses is 3.5 to 7.0 ounces (80 to 200 g) (Kozol 1988, pp. 12–13, 25, 36–39, figures 1 and 2; Kozol 1990a, pp. 7–8). Once an appropriate carcass has been found for reproduction, American burying beetles may compete amongst themselves or with other species for control of the carcass until usually only a single dominant male and female burying beetle remain (Springett 1967, p. 56; Wilson and Fudge 1984, entire; Scott and Traniello 1989, p. 34). Once the pair wins the battle for the rights to the carcass, the successful couple buries the carrion, copulates, and constructs an underground cavity called a brood chamber around the carcass, although either sex is capable of burying a carcass alone (Kozol *et al.* 1988, p. 170).

Once underground, both parents strip the carcass of fur or feathers, roll the carcass into a ball and treat it with secretions that form a brood chamber

and retard growth of mold and bacteria. The female American burying beetle lays eggs in the soil adjacent to the carcass (Pukowski 1933, p. 555; Milne 1976, p. 84; Scott and Traniello 1990, p. 274) where the eggs incubate for about 6 days before hatching into larvae that require parental care. Higher ambient temperatures increase egg development rates and reduce incubation times (Damos and Savolpoulou-Soultani 2012). Females reproducing on smaller carcasses produce fewer eggs than females reproducing on larger carcasses (Creighton *et al.* 2009, p. 681; Billman *et al.* 2014a, entire; 2014b, entire). Brood sizes of American burying beetles can sometimes exceed 25 larvae, but 12 to 18 is more typical (Kozol 1990b, entire).

Parental care in the genus *Nicrophorus* is unique because both parents participate in the rearing of young (Pukowski 1933, p. 585; Fetherston *et al.* 1990, entire; Trumbo 1990, p. 9). Larvae of large *Nicrophorus* species are extremely dependent on parental regurgitation and will die before they reach second instar (second stage of larval development) if they receive no parental care (Scott 1998a, p. 602). Additionally, American burying beetles will cull their brood through cannibalism to increase size and survival of larvae in response to a less than adequately sized carcass (Billman *et al.*, 2014a, entire; 2014b, entire). The reproductive process from carcass burial to eclosure (emergence from pupae) is about 30 to 65 days (Kozol 1995, pp. 2, 99; 55–65 days; Kozol 1988, p. 16; 48–65 days; Smith and Clifford 2006, p. 11).

Suitable carrion for reproduction is more likely to be available in properly functioning ecosystems that have diverse vegetative communities and associated potential carrion species. Suitable soils contain the appropriate abiotic elements (*e.g.*, soil temperature, soil moisture, particle size, etc.) that are favorable for excavation and formation of brood chambers. These abiotic elements also contribute to proper growth and development of young.

Areas containing the appropriate abiotic elements must be of sufficient size to support the survival of adequate

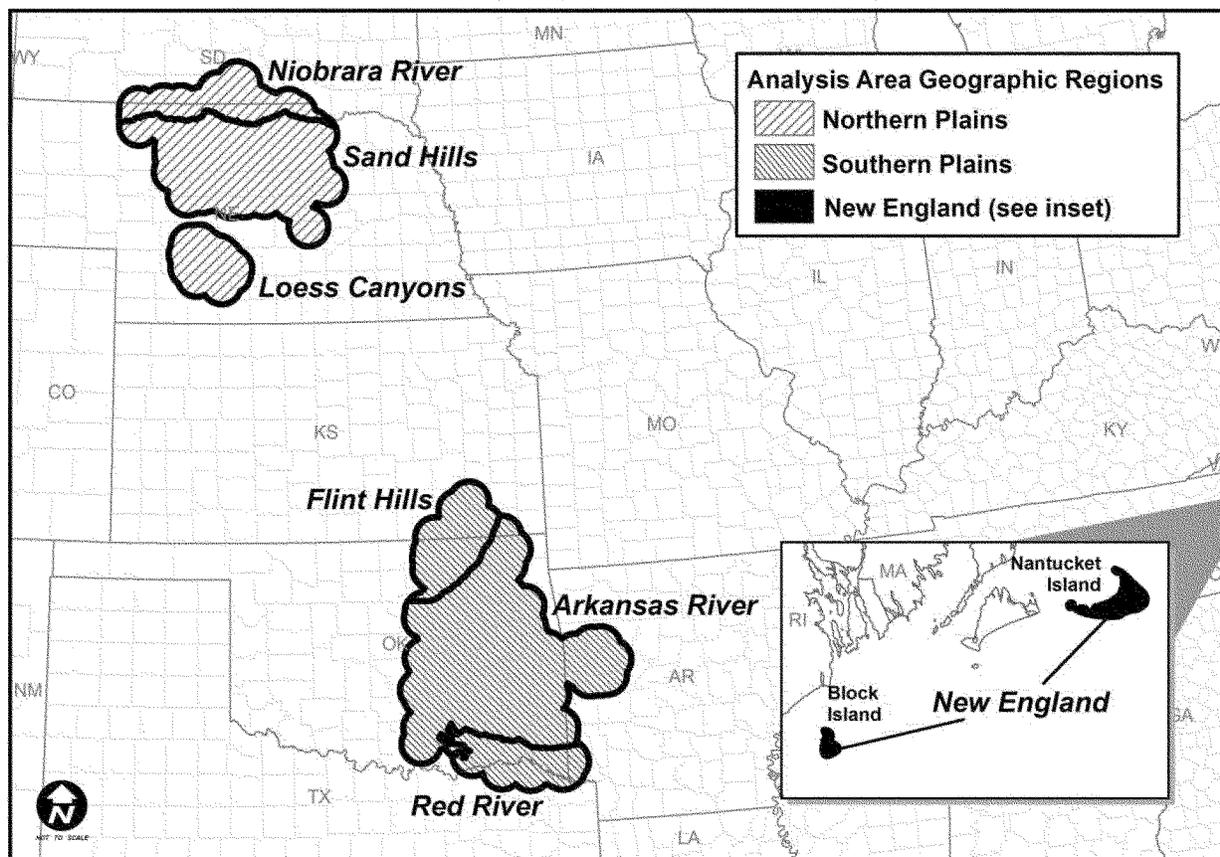
numbers of individual American burying beetles such that the opportunity to find a mate is not reduced and that the presence and abundance of carrion to support breeding and feeding are uninterrupted. The Service does not currently have information on the minimum size of suitable areas (habitat patch size) needed to maintain a healthy population of American burying beetles. The minimum area needed to support a self-sustaining population varies based on habitat quality factors such as climate, soils, vegetation, carrion availability, predators, and competition.

The American burying beetle lives up to 12–16 months and is dependent upon annual reproduction to sustain extant populations. Sufficiently sized areas also contribute to opportunities for populations to at least remain stable over time. Ideally, areas should be of sufficient size to support a positive growth rate and enable populations to expand over time. These suitable areas also must be connected with other suitable, occupied American burying beetle habitats so that gene flow and genetic diversity are maintained, if not enhanced, and individuals have access to areas with appropriate temperatures, moisture levels, and soil types, when needed, across the landscape.

We generally refer to American burying beetle populations as clustered, localized areas, roughly defined by habitat differences or other geographical features, with inter-breeding individuals. However, there are no clear boundaries separating many of the areas known to be occupied by American burying beetles. For the purposes of this analysis we organized the current range of the American burying beetle into analysis areas that follow broad geographic and ecological patterns: Northern Plains analysis areas, Southern Plains analysis areas, and the New England Analysis Area (see Figure 1). This is the scale of “populations” referred to in the analysis of risk factors potentially affecting the species (chapters 4 and 5 in the SSA Report; Service 2019).

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## American Burying Beetle SSA Analysis Areas



**Figure 1.** The Southern Plains analysis areas include the Red River, Arkansas River, and Flint Hills analysis areas in Texas, Oklahoma, Kansas, and Arkansas. The Northern Plains analysis areas include the Loess Canyons, Sand Hills, and Niobrara River analysis areas in Nebraska and South Dakota. The New England Analysis Area includes Block Island off the coast of Rhode Island, and a reintroduced population on Nantucket Island off the coast of Massachusetts.

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### Review of the Recovery Plan

Section 4(f) of the Act directs us to develop and implement recovery plans for the conservation and survival of endangered and threatened species unless we determine that such a plan will not promote the conservation of the species. Recovery plans identify site-specific management actions that will achieve recovery of the species, measurable criteria that set a trigger for review of the species' status, and methods for monitoring recovery progress.

Recovery plans are not regulatory documents; instead they are intended to establish goals for long-term conservation of listed species and define criteria that are designed to indicate when the threats facing a species have been removed or reduced to such an extent that the species may no longer need the protections of the Act, as well

as actions that may be employed to achieve reaching the criteria. There are many paths to accomplishing recovery of a species, and recovery may be achieved without all criteria being fully met or all actions fully implemented. Recovery of a species is a dynamic process requiring adaptive management that may, or may not, fully follow the guidance provided in a recovery plan.

The American burying beetle recovery plan was approved by the Service on September 27, 1991 (Service 1991). Delisting criteria were not established in the recovery plan. However, for reclassification from endangered to threatened, the recovery plan established a criterion of at least three self-sustaining populations of at least 500 individuals in each of four broad geographical areas of the species' historical range: The Northeast, the Southeast, the Midwest, and the Great Lakes States. The threshold of 500 individuals was developed based on

limited empirical data from Block Island (Service 1991, p. 8) and theoretical conservation biology literature (Franklin 1980; Soule 1980; Salwasser *et al.* 1982) that suggested the effective population number of 500 was the minimum threshold size for a biological population to maintain long-term adaptability. We now understand that a population estimate of 500 adults is probably an inadequate metric for a self-sustaining population of this species, because minimum viable population for most species would be considerably larger than 500 individuals, minimum viable populations thresholds vary by species, and additional empirical data and analysis for American burying beetles suggest a larger threshold may be more appropriate for this species (Reed *et al.* 2003; Amaral *et al.* 2005; p. 36; Brook *et al.* 2006; Flather *et al.* 2011; Wolf *et al.* 2015). However, new population targets for the species have not been developed and would be

different for each population due to differences in habitat and stressors acting on populations. Likewise, conservation of populations in the four broad geographical areas used in the recovery plan may not appropriately address future threats given our current understanding of the species' range and risks to populations (see sections 2.5.4 and 5.4 in the SSA Report; Service 2019). For example, the authors of the recovery plan were not aware of future climate-related risks and current projections indicating that southern portions of the historic range would not be suitable for future recovery (see section 5.4 in the SSA Report; Service 2019). Because we have limited information on actual population estimates by which to measure population resiliency, the primary indicators that we rely on for resiliency are area and condition of habitat, geographic distribution of American burying beetles within analysis areas, relative abundance, and size and number of concentrations of positive surveys within an analysis area (see chapters 4 and 5 in the SSA Report; Service 2019). Thus, the recovery plan information is considered to be out of date (Service 2008), and the SSA Report (Service 2019) provides an updated, revised analysis of current and future risks based on our current understanding of the species' needs.

#### Current Status of the Species

Because the American burying beetle completes its life cycle in one year, each year's population levels are largely dependent on the reproductive success of the previous year and reproductive conditions in the current year. Fluctuations are thought to be a function of the abundance of the carrion resources on which the species depends. Therefore, population numbers may be cyclic (due to weather, disease, etc.), with high numbers and abundance in one year, followed by a decline in numbers the succeeding year. Because survey information can fluctuate over time and survey effort is not equal for all analysis areas, the SSA Report (Service 2019) uses a combination of habitat and population factors to evaluate the current status of populations. For each analysis area, a current condition category is assigned based on relative abundance, population distribution, known population trends, availability of suitable habitat, acres of protected areas, and the level of management in protected areas (see section 4.7.1 in the SSA Report; Service 2019). The current condition categories are qualitative estimates of the current status of the species.

#### Southern Plains Analysis Areas

We included three separate analysis areas within the Southern Plains analysis areas: Red River Analysis Area, Arkansas River Analysis Area, and Flint Hills Analysis Area. The Red River Analysis Area includes 3,251,894 total acres in portions of Arkansas, Texas, and southeastern Oklahoma near the Red River. Within this area, there are 2,678,406 acres of suitable habitat, 123,779 acres of managed protected lands, and 23,997 acres of multi-purpose protected lands. Managed lands are defined in the SSA Report (Service 2019) as those areas that have management plans that incorporate active management with the primary purpose of maintaining or improving wildlife habitat and are assumed to protect or improve American burying beetle habitat. Multi-purpose protected lands are defined in the SSA Report (Service 2019) as areas managed for mixed purposes and are assumed to include some management for wildlife that would protect or improve American burying beetle habitat. Within the Red River Analysis Area, only the Hugo Wildlife Management Area in Oklahoma is currently known to support American burying beetles, with five captured in 2016. Between 1993 and 1996, the southeastern portion of the Red River Analysis Area supported localized populations with relatively high catch rates of American burying beetles (Creighton *et al.* 2009, p. 40), but catch rates in these areas have declined since the early 2000s, and this area is no longer considered to be occupied. No positive surveys have been documented in the Arkansas or Texas portions of the Red River Analysis Area since 2008, and only eight positive surveys are known in the analysis area (all in Oklahoma) since 2008. Populations in Texas may be extirpated. The current resiliency of the Red River Analysis Area is considered low due to the limited distribution and very low ratios of positive to negative surveys in recent years.

The Arkansas River Analysis Area includes 17,753,431 total acres in portions of Arkansas, Oklahoma, and Kansas. Within this area, there are 14,470,603 acres of suitable habitat, 1,486,002 acres of managed protected lands, and 933,608 acres of multi-purpose protected lands. Protected areas include multiple Federal, State, and private areas, many of which are known to support American burying beetles. There are some positive surveys in all portions of the Arkansas River Analysis Area and scattered concentrations of positive surveys in all but the northeastern portion of the analysis

area. The current resiliency of the analysis area is considered high due to the large area of suitable habitat, wide distribution of American burying beetles within the analysis area, the presence of several large protected areas, and fair ratios of positive to negative surveys.

The Flint Hills Analysis Area includes 3,706,908 total acres in portions of Oklahoma and Kansas. Within this area, there are 2,758,610 acres of suitable habitat, 133,196 acres of managed protected lands, and 52,114 acres of multi-purpose protected lands. Protected areas include Federal, State, tribal, and private areas, many of which are known to support American burying beetles. Distribution is fair with some recent positive surveys in the southern two-thirds of the analysis area and one concentration of positive surveys. This analysis area has a relatively low ratio of positive to negative surveys with relatively large fluctuations between years. Reports for 2016 indicated more positive surveys and a higher ratio of positive to negative surveys, but some areas have limited survey effort. Portions of this analysis area have a very low ratio of positive surveys, which indicates low density populations. The current resiliency of the analysis area is considered moderate due to the large area of native habitat, relatively wide distribution within the analysis area and proximity to the Arkansas River Analysis Area, the presence of several large protected areas, and ratios of positive to negative surveys that are on average low but can periodically be good in some locations.

#### Northern Plains Analysis Areas

We included three separate analysis areas within the Northern Plains analysis areas: Loess Canyons Analysis Area, Sand Hills Analysis Area, and Niobrara Analysis Area. The Loess Canyons Analysis Area includes 2,758,610 total acres in southcentral portions of Nebraska. Within this area, there are 1,686,948 acres of suitable habitat, 15,342 acres of managed protected lands, and 3,843 acres of multi-purpose protected lands. In addition, there are five conservation easements specifically set up for protection and management of American burying beetles, held by the Nebraska Land Trust, in the Loess Canyons, totaling 3,277 acres. The protected areas within this analysis area are known to support American burying beetles. Distribution is currently fair across the Loess Canyons Analysis Area, with one relatively large contiguous concentration of positive surveys in the center of the analysis area. This analysis area has a fair ratio of positive to

negative surveys. The current resiliency of the analysis area is considered moderate due to the extent of native habitat, relatively wide distribution within the analysis area, and fair ratios of positive to negative surveys. However, expansion of eastern redcedar (*Juniperus virginiana*) due to a lack of fire or mechanical control has reduced the habitat quality in much of this analysis area, and this population is sensitive to droughts. The analysis area is relatively small and isolated from other populations.

The Sand Hills Analysis Area includes 10,819,170 total acres in northcentral portions of Nebraska. Within this area, there are 8,633,685 acres of suitable habitat, 93,983 acres of managed protected lands, and 24,633 acres of multi-purpose protected lands. Most protected areas within this analysis area are known to support American burying beetles, but some large forested areas have relatively few positive surveys. The Valentine National Wildlife Refuge is the only large block of protected lands in this analysis area with relatively good catch rates and distribution of American burying beetles, but smaller protected areas near the Niobrara River also have American burying beetles (Hoback 2018, pers. comm.). Distribution is good, with some positive surveys in all portions of the analysis area and one large contiguous concentration of positive surveys. This analysis area has the highest ratio of positive to negative surveys for the last 15-year timeframe. The current resiliency of the analysis area is considered high due to the large area of native habitat, wide distribution within the analysis area, and good ratios of positive to negative surveys.

The Niobrara River Analysis Area includes 4,108,903 total acres in northcentral portions of Nebraska and southcentral portions of South Dakota. Within this area, there are 2,961,469 acres of suitable habitat, 58,918 acres of managed protected lands, and 33,582 acres of multi-purpose protected lands. It includes a large area of tribal land, but no American burying beetles have been documented there. Some protected areas within this analysis area are known to support American burying beetles. Distribution is currently fair with some positive surveys in most portions of the analysis area and one contiguous concentration of positive surveys. This analysis area has a fair ratio of positive to negative surveys for the last 15-year timeframe. The current resiliency of the analysis area is considered moderate due to the large area of native habitat, relatively wide distribution, and fair ratios of positive to negative surveys.

#### *New England Analysis Area*

The New England Analysis Area includes Block Island and Nantucket Island. Block Island has 2,554 acres of suitable habitat, and Nantucket Island has 23,311 acres of suitable habitat. This is a small area relative to other analysis areas, but the level of protection and active management are significantly greater than the other analysis areas. There are 2,507 acres of protected lands on Block Island and 11,934 acres on Nantucket Island. The total area of protected lands is small compared to some other analysis areas, but it is a relatively large percentage of the suitable habitat. The protected areas within this analysis area are known to support American burying beetles. Distribution is currently fair, with some positive surveys in most portions of the analysis area that is considered suitable habitat. This analysis area has a good ratio of positive to negative surveys on Block Island and fair to poor ratios on Nantucket Island. On Block Island, the American burying beetle population is relatively stable with population estimates ranging from 200 to 1,000. This population has been monitored annually since 1991. Carrion provisioning has been conducted on Block Island since 1993. On Nantucket Island, the reintroduced population does not appear to be self-sustaining and requires human assistance for long-term maintenance (Mckenna-Foster *et al.* 2016, entire). The current resiliency of the analysis area is considered moderate due to relatively good distribution, and fair ratios of positive to negative surveys. However, the populations on both islands are highly dependent on active management.

#### **Summary of Factors Affecting the Species**

Section 4 of the Act and its implementing regulations (50 CFR part 424) set forth the procedures for listing species, reclassifying species, or removing species from listed status. A species may be determined to be an endangered or threatened species due to one or more of the five listing factors described in section 4(a)(1) of the Act: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. A species may be reclassified or delisted on the same basis. The SSA Report (Service 2019) represents a

compilation of the best scientific and commercial data available concerning the status of the species, including the past, present, and future threats, to evaluate viability of the American burying beetle. The effects of conservation actions were also assessed as part of the current condition of the American burying beetle in the SSA Report (Service 2019), and those effects were projected in future scenarios.

The American Burying Beetle Recovery Plan (Service 1991) and the 5-year status review of the species (Service 2008) identify the following factors as threats or potential threats to American burying beetles: Direct habitat loss and alteration, increase in competition for carrion resources, decrease in abundance of prey, loss of genetic diversity in isolated populations, disease/pathogens, dichloro-diphenyl-trichloroethane (commonly known as DDT), habitat fragmentation due to agricultural and grazing practices that lead to changes in vertebrate composition or density, and invasive species. We now know that DDT and some other threats identified at the time that the recovery plan and 5-year status review were completed are either no longer a threat or pose less of a threat to the species. However, none of these factors alone adequately explains why the American burying beetle declined over much of its historic range while species in the same genus are still relatively common rangewide. There are eight sympatric congeners (other *Nicrophorus* species or species of the same genus) which have not experienced similar reductions in their ranges (Sikes and Raithel 2002, p. 104).

Much of the evidence suggesting the reduction of appropriate carrion resources as a primary mechanism of population decline for the American burying beetle is circumstantial. However, this hypothesis fits the temporal and geographical pattern of the disappearance of American burying beetles from 90 percent of its historical range, and may explain why American burying beetles declined while related species that do not rely on the same carrion resources did not similarly decline (Sikes and Raithel 2002, p. 104). The availability of appropriately sized carrion may explain current distributions of the American burying beetle and the presence or absence of American burying beetles in most of the existing analysis areas. For example, the American burying beetle population on Nantucket Island was established with provisioned carcasses, but is projected to be extirpated without continued provisioning of appropriately sized carcasses (Mckenna-Foster *et al.* 2016,

entire). Apparently, the natural availability of appropriately sized carrion is limited on the island and will not support the population without any provisioning. American burying beetles need carcasses of 80 to 200 grams, and areas that can support the species must have potential carrion sources within this size range. The abundance of potential carrion species and competition for the carcasses can affect availability for American burying beetles.

Risk factors are not equal in all portions of the American burying beetle's range, and some risk factors have changed since the recovery plan was written. All current risks for each analysis area are described in chapter 4, and future risks are discussed in chapter 5, of the SSA Report (Service 2019). Risks such as conversion to cropland and wind energy development are greater in portions of the Northern Plains analysis areas, while risks associated with grazing, silviculture, and oil and gas development are more common in the Southern Plains analysis areas. All remaining populations have some risks associated with areas of urban or suburban development, particularly in the New England Analysis Area, but most current American burying beetle populations are in rural areas and have potential risks associated with habitat loss due to agricultural land uses. Risks associated with the effects of changing climate, including increasing temperatures, are now the most significant threat for most analysis areas.

#### *Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range (Factor A)*

Agricultural land uses and urban expansion are predicted to have impacts to American burying beetle habitat and populations over time; however, those impacts are expected to be relatively minor in most of the current known range of the species. Historically and to a lesser extent currently, land conversion to agriculture, intensive domestic livestock grazing, logging, fire suppression, wind energy development, and urban development are common causes of habitat quality reductions, loss, and fragmentation within the current range of the American burying beetle. Habitat loss and alteration affect this species at local and regional levels, and could account for the extirpation of populations once they become isolated from others (Kozol 1995, p. 170; Ratcliffe 1996; Lomolino and Creighton 1996, entire; Amaral *et al.* 1997, pp. 123–124; Bedick *et al.* 1999, p. 179; Creighton *et al.* 2009, p. 40). There are

no known American burying beetle populations surviving in intensively farmed or highly urbanized areas.

Large areas of native grasslands have been converted to nonnative grasses to improve pastures for intensive cattle grazing operations. Even in areas with native vegetation, pastures and hay fields can be more intensely grazed or mowed during drought periods when demand for grass or hay is high, which can keep habitat in an unfavorable or marginal condition for longer time periods. A more complete description of potential land use impacts is provided in chapter 3 of the SSA Report (Service 2019).

Relatively little urban and industrial development is occurring within the current known range of the American burying beetle. There are a few relatively large urban areas near American burying beetle populations in the New England area but most of the current range is rural. Most of the existing American burying beetle range is already under some agricultural use (primarily grazing and hay production).

Two scenarios in the SSA Report (Service 2019) explore potential future land use changes to help characterize the likely potential for impacts to suitable habitat for the American burying beetle. Land use changes were evaluated separately for each analysis area because they are a risk factor for current conditions. Future risk factors like climate changes affect different analysis areas over different time periods; however, climate changes were not considered under the two land use scenarios in the SSA Report (Service 2019). Climate related impacts to habitat and range are addressed under Factor E.

The large areas of known and potential habitat in the Southern Plains buffer the effects of most land use changes. The projected combined permanent loss of suitable habitat from all sources for the Southern Plains analysis areas is 1.2% or 246,293 acres from the existing 19,995,088 acres (Service 2019). The combined impacts of urban expansion and agriculture (primarily conversion to cropland) are expected to affect 5–15% of the suitable habitat in the Northern Plains and redcedar expansion in the Loess Canyon Analysis Area is expected to result in up to an additional 30% habitat loss (Service 2019).

The projections in our SSA Report (Service 2019) indicate that future representation and redundancy are both reduced with potential losses of habitat in New England, Loess Canyons, and the reintroduction site in Missouri. The potential loss of the Loess Canyons population is due to land use changes,

including redcedar expansion, and the New England populations and Missouri reintroduction could be lost if active management and habitat protection are not continued. The combined effects of land use and future climate changes (see Factor E) are likely to impact the resiliency of most populations and the overall viability of the species.

#### *Other Considerations*

This assessment of land use effects includes cautions because these effects were compared to areas of potential suitable habitat, and our assessment of suitable habitat was very broad. Not all potentially suitable habitat is occupied by American burying beetles; therefore, this analysis may underestimate the impacts of land use changes. Additional cautions are related to our limited ability to quantify some potential future effects. For example, uncommon increases in crop prices could increase incentives for conversion of grassland to row crops to levels beyond the assumptions used in the two scenarios.

Recent development and potential expansion of wind energy projects could also add to impacts from other land use changes. The construction of wind turbines, roads, and powerlines has direct permanent habitat impacts and fragments the remaining habitat. The operation of wind turbines also has potential for direct take through American burying beetle collisions with the blades.

Future land use effects related to wind power were not factored into land use scenarios because we did not have estimates of future development or total areas that may be affected by wind projects, and there are no studies available to evaluate the actual effects of wind projects on American burying beetles. Within the Southern Plains analysis areas, the current area of wind projects is relatively small, and there is limited potential for expansion. Less than 10 percent of the Southern Plains analysis areas have annual average wind speeds of 6 meters/second (m/s) or greater at 30 meters height that are recommended for wind development. There is greater potential for wind energy development in the Northern Plains analysis areas. Nearly all of the Northern Plains analysis areas have annual average wind speeds of 6 m/s or greater at 30 meters height. There are 6,471 wind turbines registered in the Northern Plains analysis areas, but we do not know what areas, or what percentage of the suitable habitat in Northern Plains analysis areas, may be affected by wind projects in future years. The Service intends to do further evaluation of potential effects of wind

projects and welcomes any additional information on the subject.

*Overutilization for Commercial, Recreational, Scientific, or Educational Purposes (Factor B)*

Overutilization for any purpose was not identified as a threat to the species at the time of listing in 1989, and it is not considered a threat to the species' continued existence today.

*Disease or Predation (Factor C)*

While disease and predation may represent relevant threats to the American burying beetle, they are not known to result in population-level impacts. Further information regarding disease and predation can be found in the SSA Report (Service 2019).

*Inadequacy of Existing Regulatory Mechanisms (Factor D)*

Under this factor, we examine the stressors identified within the other factors as ameliorated or exacerbated by any existing regulatory mechanisms or conservation efforts. Section 4(b)(1)(A) of the Act requires that the Service take into account "those efforts, if any, being made by any State or foreign nation, or any political subdivision of a State or foreign nation, to protect such species . . ." In relation to Factor D under the Act, we interpret this language to require the Service to consider relevant Federal, State, and Tribal laws, regulations, and other such binding legal mechanisms that may ameliorate or exacerbate any of the threats we describe in threat analyses under the other four factors or otherwise enhance the species' conservation. We give strongest weight to statutes and their implementing regulations and to management direction that stems from those laws and regulations.

Existing regulatory mechanisms vary by location, but generally do not fully address the numerous stressors that the American burying beetle faces. The American burying beetle is State-listed in Kansas, Massachusetts, Nebraska, Ohio, and Oklahoma. The specific protections vary by State, but often include some permitting requirements or coordination with the State wildlife agencies when projects could directly impact the species or its habitat. It is not State-listed in Rhode Island, Arkansas (special concern only), South Dakota, or Texas. Currently, there is no protection under State law for the habitat of the American burying beetle in Arkansas or South Dakota (Backlund *et al.* 2008).

In some parts of the range (Nebraska, South Dakota, and Kansas), the species occurs almost exclusively on private land and regulatory mechanisms do not

address the stressors impacting the species. In other areas, there are several robust populations on public lands or private conservation organization properties, but many protected lands supporting American burying beetles require ongoing management like prescribed fire or other measures to control invasion of woody vegetation to ensure the species' continued presence. Federal and State agencies have adopted and implemented laws, regulations, and best management practices that result in protection of American burying beetles.

In addition, the Department of Defense (DoD), with the assistance of the Service and the states, is responsible under the Sikes Act (16 U.S.C. 670a–670f, as amended) for carrying out programs and implementing management strategies to conserve and protect biological resources on its lands. Integrated Natural Resources Management Plans (INRMPs) are planning documents that allow DoD installations to implement landscape-level planning to provide for the management of natural resources, including fish, wildlife, and plants, without any net loss in the capability of an installation to support its military mission. Incorporation of INRMPs on the DoD installations provide management and conservation benefit to American burying beetles.

In some cases, where American burying beetles occur on lands with conservation easements, deed restrictions, or owned by conservation organizations, existing regulatory mechanisms appear to be adequate. However, existing land protections are not comprehensive for the American burying beetle. Given the varied missions of these landowners, the level of protection varies and may change over time. Additionally, populations in the New England and Northern Plains Analysis areas are expected to experience future threats from land use change and all populations are expected to experience future threats from climate change over varying time periods. Existing regulatory mechanisms do not address those future threats to the American burying beetle.

*Other Natural and Manmade Factors (Factor E)*

The most significant potential threat under this factor is climate change. This is a summary of climate-related risks, and additional information is available in the SSA Report (Service 2019). The SSA Report's chapter 3 summarizes general climate risks, chapter 4 includes current risks, and chapter 5 covers future risks (Service 2019).

Most considerations of climate change in classification decisions hinge upon whether climate change will manifest in changing habitat conditions and how the species is likely to respond to these changes in the future. Therefore, a key consideration for classification decisions where climate change is a potential stressor is how we interpret "foreseeable future" in the definition of a threatened species under the Act.

The Intergovernmental Panel on Climate Change (IPCC) adopted four possible Representative Concentration Pathways (RCP) scenarios (2.6, 4.5, 6, and 8.5) to capture the possible ranges of climate change within the next century (Hartmann *et al.* 2013; Moss *et al.* 2008). In our analysis of potential climate change impacts to the American burying beetle, we used two of those scenarios, RCP 4.5 and 8.5, over different blocks of time through the end of this century (years 2010–2039, 2040–2069, and 2070–2099). For the purpose of this document we define those time periods as: "early century time period" (2010–2039), "mid-century time period" (2040–2069), and "late century time period" (2070–2099). We use more than one emissions scenario to account for uncertainty regarding future atmospheric greenhouse gas concentrations. By using both a relatively high and relatively low emissions scenario in our projections, we attempt to bracket the likely possibilities for climate change in the foreseeable future. RCP 4.5 is at the low end of the intermediate range of conditions projected by the IPCC and represents a situation under which key atmospheric conditions would stabilize at a relatively moderate level shortly after 2100. This scenario envisions emissions mitigation through strong policy action by the international community, including the United States, in the near future to curb emissions and the resulting effects to global climate. RCP 8.5 is the high end of IPCC projections of atmospheric conditions. RCP 8.5 is the expected scenario if strong policy actions to curb emissions are not pursued by the United States and the international community. This scenario is essentially the continuation of current trends in emissions as they may play out over the next century. For ease of reference, we refer to these as "emissions scenarios," although they are not based solely on emissions of greenhouse gases. Our approach of using the two RCPs is consistent with the current widespread scientific practice of considering projections based on RCP 4.5 and RCP 8.5 so as to consider a range of projected

conditions, rather than relying on a single scenario. The U.S. Global Change Research Program used these two RCPs as the core scenarios for the Fourth National Climate Assessment (Hayhoe *et al.* 2017), and they also are used as the basis for projections generated via the U.S. Geological Survey's National Climate Change Viewer.

The life-history characteristics of American burying beetles indicate limited ability to tolerate warmer temperatures. Adult American burying beetles use secretions to slow decomposition of carcasses they bury for reproduction (see *Summary of Species Requirements*, above, for more information on the role of carcasses in reproduction). The carcasses are buried and must support both adults and larvae for at least 2 to 3 weeks, but high temperatures have been shown to reduce the effectiveness of the secretions and accelerate decomposition (Jacques *et al.* 2009, p. 871). While the American burying beetle has life-history requirements similar to other carrion beetles, it is the largest *Nicrophorus* in North America and requires a larger carcass to reach its maximum reproductive potential (*i.e.*, to raise a maximum number of offspring) than the other burying beetles (Service 1991, p. 2; Kozol *et al.* 1988, p. 37; Trumbo 1992, pp. 294–295). American burying beetles also have a longer time period for egg and larval development than other *Nicrophorus* carrion beetles, so the carcass must last longer (at least 12 to 14 days) to provide food and moisture for adults and support development of their larvae to the pupa stage. Temperature-related increases in decomposition and development of fly larvae would limit or prohibit reproductive success for American burying beetles if carcasses are in a suitable condition for shorter periods of time or do not last long enough to support development of their larvae.

The distribution of American burying beetles also indicates a limited ability to tolerate warmer temperatures. *Nicrophorus* abundance and diversity are higher in cooler climates. There are 15 *Nicrophorus* species in the United States and Canada, but only 2 are endemic to Central and South America, and they occur at higher elevations with cooler temperatures. Reasons for burying beetles' lack of success in warmer climates include increased competition with flies and ants, as well as increased rates of carcass decomposition. Carcass decomposition is dominated by dipteran species (true flies) and the diversity of dipteran species using carcasses increases in warmer climates. Based on species

distributions and existing climate conditions, few *Nicrophorus* species appear to be capable of maintaining populations in areas with long-term average summer mean-maximum temperatures at or exceeding a 95 °F threshold (*N. carolinus*, and possibly *N. pustulatus* and *N. marginatus*), and there are no *Nicrophorus* species in areas with average summer mean-maximum temperatures exceeding 100 °F.

Under both RCP 4.5 and 8.5 emissions scenarios, all American burying beetle populations in the Southern Plains Analysis Areas are projected to have summer mean-maximum temperatures exceeding 95 °F within the mid-century time period. Surveys for American burying beetles in locations that have experienced a mean-maximum temperature near or above 95 °F during summer have shown declining capture rates the following year. Existing survey information from Fort Chaffee (Arkansas River Analysis Area) supports the assumption that mean-maximum temperatures above 95 °F would adversely affect American burying beetle populations. Monitoring of American burying beetles has occurred annually from 1992 through 2016. During the study period, catch rates of American burying beetles declined from the previous year every time mean-maximum temperatures exceeded 95 °F, which happened a total of six times throughout the study period. Based on this information, we anticipate continued population declines and potential extirpation if mean-maximum temperatures exceeding 95 °F became the average during summer months and more extreme temperatures occurred more frequently.

Evidence suggests that southern populations of American burying beetles that experience summer mean-maximum temperatures near 95 °F are declining. Since 2008, only seven American burying beetles have been detected within the Oklahoma portion of the southernmost analysis area, and no American burying beetles have been documented in the Texas or Arkansas portions. We have no evidence to suggest that habitat conditions within these areas have significantly changed, which might otherwise explain the observed American burying beetle declines in this area. Populations have declined or are extirpated in large protected areas like Camp Maxey, Texas, with no apparent changes in land use. It appears that temperatures near this area are at, or past, a threshold that would support American burying beetles. This may be further supported by the fact that the species does not

exist south of the Red River area in Texas and Louisiana, where habitat, soil conditions, and carrion availability are likely to be similar. This leads us to conclude that the southern edge of the species' range is driven by this temperature threshold.

Temperature has always limited the American burying beetle's range to some degree. Populations at the northern edge of the range are limited by cool night time temperatures and shorter growing seasons, whereas populations at the southern edge of the range are likely limited by high temperatures. The western edge of the species' range has been limited by reduced precipitation and soil moisture. Although temperature and other effects of climate change are expected to affect American burying beetles in both the northern and the southern parts of the range, we expect that the populations in southern areas will be affected sooner and to a greater extent based on projected temperatures. Under both the RCP 4.5 and 8.5 emissions scenarios, a majority of the Southern Plains analysis areas are expected to be near or exceed summer mean-maximum threshold temperatures (95 °F) by 2039, with potential to extirpate American burying beetles from most or all Southern Plains populations. Within the mid-century time period, all Southern Plains analysis areas are expected to exceed threshold temperatures under both the RCP 4.5 and 8.5 emissions scenarios, likely resulting in extirpation of the American burying beetle from these areas. American burying beetles near the southern and western edge of the range may already be at their limits for temperature- and moisture-related tolerances and have a limited ability to adapt to rapidly changing climate conditions (see comments on limits related to life history in chapter 5 of the SSA Report; Service 2019).

There are no American burying beetle populations, including known historical populations, located in areas that experience a long-term summer mean-maximum air temperature above 95 °F. The Red River Analysis Area represents the southernmost and warmest portion of the American burying beetle's current range, with summer mean-maximum air temperatures of approximately 93 to 94 °F. Historical populations south of the Red River Analysis Area have not been documented in over 70 years. Because American burying beetles have not expanded their range to warmer climates since the early 1900s, we believe that climate conditions associated with the current and historical ranges represent existing

thresholds for maintaining American burying beetle populations.

Increased air temperatures, changes in precipitation, increased evaporative losses, and prolonged droughts may stress or kill individual American burying beetles and reduce reproductive success or reduce the time periods with suitable conditions for reproduction. High air temperatures have been documented to kill or sterilize American burying beetles at captive colonies when air conditioning systems have failed, resulting in colony temperatures at 85 to 90 °F for about 2 weeks (Merz 2016, pers. comm.). Survey protocols require traps to be checked in the morning because American burying beetle mortalities have occurred when they are confined in traps during warm days. More indirect effects of increased temperatures and reduced precipitation or soil moisture may be related to competition. Congeners with higher temperature or lower moisture tolerances, like *N. carolinus*, may be more competitive and reduce or eliminate American burying beetles in southern populations. Species like *N. carolinus* can compete for appropriate carcasses and reproduce under warmer and drier conditions than American burying beetles (Abbott and Abbott 2013, p. 2). At Camp Maxey, *N. carolinus* numbers increased rapidly when American burying beetle and *N. orbicollis* numbers declined (Abbott and Abbott 2013, p. 2).

Increasing temperatures resulting from climate change could reduce the reproductive success of American burying beetles by reducing the portion of the active season with suitable temperatures for reproduction. Recent temperature studies with *N. orbicollis* indicate even small increases in temperature can affect reproduction (Creighton 2016, pers. comm.). This type of research is currently being conducted with American burying beetles as well, but those results are not yet available. *N. orbicollis* has a similar historical range and is the most closely related congener; therefore, we expect the American burying beetle study will yield similar results. For *N. orbicollis*, the percent of successful broods declined at temperatures greater than 20 °C (68 °F) and declined rapidly at any temperatures greater than 25 °C (77 °F). An increase of only 2 to 3 degrees (from 25 to 27–28 °C, or approximately 77 to 80 °F) stopped most beetles from attempting to prepare a carcass for reproduction, and those that did were not successful in producing any larvae or teneral. The warmer temperatures apparently precluded eggs from hatching or larvae from developing

beyond a very early stage. The study also demonstrated effects of temperatures on seasonal timeframes that would support reproduction. While more southern latitudes have a longer active season and would logically have more time to reproduce, the temperature restrictions actually reduce the potential for reproduction in Oklahoma. *N. orbicollis* in the northern portion of their range (Wisconsin) have a longer period of suitable climate conditions for reproduction and could reproduce more often than *N. orbicollis* in the southern portion of their range (Oklahoma) due to these temperature restrictions. Projected climate changes could limit reproduction in the future to an even greater extent.

American burying beetles are a nocturnal species, and nighttime temperatures are likely to influence the behavior and range of this species as well. Nights above 75 °F were only observed in the Southern Plains analysis areas (Red River, Arkansas River, and Flint Hills analysis areas) with the exception of 7 nights over a 35-year period in Colome, South Dakota (1 night in 2001, 3 nights in 2006, and 3 nights in 2011). The effects of the increase in nights above 75 °F and potential impacts to reproductive success may be occurring in the Red River Analysis Area, where declines in positive American burying beetle surveys have been documented since the early 2000s. Temperatures of 75 °F or higher adversely affected reproductive success in *N. orbicollis* (Creighton 2016, pers. comm.) and may have a similar effect on American burying beetles. We do not have data specifically related to reproductive success in the Red River Analysis Area, but the American burying beetle population declines coincide with the increase in nighttime temperatures above 75 °F. From 1993–1996, the Red River Analysis Area supported some areas with good catch rates of American burying beetles in the southeastern portion (Creighton *et al.* 2009, p. 40), but positive/negative ratios and catch rates have declined since the early 2000s. On the Weyerhaeuser Habitat Conservation Plan planning area in McCurtain County, Oklahoma, relative densities of American burying beetles generally declined from an average of 0.076 beetles per trap-night (106 beetles captured) in 1997, to 0.010 beetles per trap-night (16 beetles captured) in 2001. There was a slight increase in 2002 (0.015 beetles per trap-night), and a greater one in 2003 (0.053 beetles per trap-night), but then relative densities dropped again. During 2005–2007, there were no captures of

American burying beetles at regular sites and only one capture in 2005 at a supplemental site (Schnell *et al.* 2008). No positive surveys have been documented in the Arkansas or Texas portions since 2008, and only seven positive surveys are known in the Oklahoma portion since 2006. Populations in Texas may be extirpated.

American burying beetles are only active at night, resulting in a very narrow window of time for suitable carcasses to be available for American burying beetles to find, bury, and prepare for reproduction. Higher temperatures cause carrion to decompose more rapidly, and fly larvae to develop faster and quickly consume small carcasses. At high temperatures, exposed carcasses can be heavily infested with fly larvae within 2 days, and carcasses may only be suitable and available for 1 or 2 nights. Thus, we conclude that increased air temperatures can affect reproductive success by reducing the availability of suitable carrion due to competition with flies and ants.

Risks associated with the effects of changing climate, including increasing temperatures, are a significant threat for some analysis areas in the foreseeable future. The combination of information in the SSA Report (see chapter 5; Service 2019) indicates increasing air and soil temperatures as a result of climate change is a significant risk to future viability of the species. Within the mid-century time period, American burying beetles in all Southern Plains analysis areas would likely be extirpated and would represent a loss of approximately 59 percent of the current range of the species. The summer mean-maximum threshold (95 °F), where we determine American burying beetle numbers will decline and not be able to persist into the future, is predicted to be exceeded in nearly all portions of the Southern Plains analysis areas under either the moderate or high emissions levels of climate change within the mid-century time period. Northern Plains analysis areas are largely unaffected by moderate emissions levels of climate change within the mid-century time period (see chapter 5 of the SSA Report; Service 2019), but under the RCP 8.5 emissions scenario, temperatures approach 93 to 95 °F in about two-thirds of the Loess Canyons Analysis Area and small portions of the other two analysis areas in the Northern Plains within the mid-century time period. Under the RCP 8.5 emissions scenario, Southern Plains American burying beetle populations would be projected to have summer mean-maximum temperatures up to 98 to 100 °F within the mid-century time

period. We conclude that the American burying beetle is at risk of extirpation within the Southern Plains analysis areas under the two projected climate conditions we analyzed (RCP 4.5 and 8.5) within the mid-century time period. The species would likely continue to be represented by Northern Plains and New England populations, but at least three populations and 59 percent of the existing range of the species are projected to be lost within the mid-century time period.

The effects of climate change, such as increasing temperatures, changes in precipitation, increased evaporative losses, and prolonged droughts, are known to stress and sometimes kill individual American burying beetles and, therefore, are likely to reduce reproductive success. Overall, we consider these factors threats to American burying beetle populations, but the impacts are currently limited to the southernmost parts of the range. However, future projections indicate that American burying beetles have a high risk of extirpation throughout the Southern Plains analysis areas and in large portions of the Northern Plains analysis areas due to these effects of climate change.

#### Finding and Proposed Determination

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats to the American burying beetle. The American burying beetle was listed as endangered in 1989, due to the disappearance of the species across the vast majority of its known historical range, habitat changes, and competition for limited carrion resources. At the time of listing, only two highly disjunct populations of a formerly widespread species were known to be extant, one in New England and one in eastern Oklahoma.

We now know there are more populations over a much wider area relative to the time of listing. Since the time of listing, numerous searches and surveys have resulted in the discovery of additional American burying beetle occurrences in Oklahoma, Nebraska, Arkansas, Texas, Kansas, and South Dakota. However, some known populations are small and isolated, and populations in the monitored portions of the southernmost areas have declined in recent years. In some parts of the range (Nebraska, South Dakota, and Kansas), the species occurs almost exclusively on private land, presenting additional future risks for land use conversion leading to loss or fragmentation of previously suitable habitat. Several robust populations

occur on public lands or private conservation organization properties, but many protected lands supporting American burying beetles require ongoing management like prescribed fire or other measures to control invasion of woody vegetation to ensure the species' continued presence. Additionally, most of those protected areas are in southern areas, where increasing temperatures due to climate change are projected to cause extirpation sometime within the mid-century time period. Although we now know the species occurs in more locations than at the time of listing, extant American burying beetle populations vary in level of protected habitat, there is limited information on population trends and biological limiting factors for most populations, and all populations are exposed to a combination of risk factors. Further, although the threats to the species vary in scope and severity, some threats (such as those related to increasing temperatures) are difficult to avoid or minimize. Population viability in the only areas that are not threatened by climate changes, namely the New England Analysis Area, appears to be reliant to some degree upon continuing habitat management and/or provisioning of carrion.

We have determined that the American burying beetle's current viability is higher than was known at the time of listing. Based on the analysis in the SSA Report (Service 2019), and summarized information above, the Service concludes that the American burying beetle does not currently meet the definition of endangered under the Act because it is not presently in danger of extinction. Our analysis indicates that the overall viability of the species is not significantly impacted by the current rate of land use change or the existing level of habitat degradation or fragmentation. The species is currently represented by several populations with moderate to high resiliency that are distributed in several portions of the historical range.

The future status of the species was evaluated under increasing temperatures for three periods of time (years 2010–2039, 2040–2069, and 2070–2099). As described above, we defined those time periods, as such: “early century time period,” “mid-century time period,” and “late century time period,” respectively. According to both RCP 4.5 and 8.5 emissions scenarios, due to expected temperature increases, the species is likely to be extirpated from the Southern Plains analysis areas sometime within the mid-century time period. Furthermore, mean

maximum summer temperatures in the Northern Plains analysis areas approach 93–95 °F under the RCP 8.5 emissions scenario within the mid-century time period. About two-thirds of the Loess Canyons Analysis Area and small portions of the other two analysis areas in the Northern Plains would also be at risk of extirpation under this scenario. The projections of increasing temperatures are considered reliable; however, there is greater uncertainty in future projections of land use change and in the species' response to both increasing temperatures and changes in land use. We believe that the risk of extinction will increase significantly between 2040 and 2069, based primarily on the effects of projected temperature increases. The foreseeable future is uniquely related to population status, trends, and threats for the species in each analysis area, and there are varying degrees of foreseeability with respect to various threats. Due to the improved condition of the species' status since the time of listing and the increasing threats from increasing temperatures and ongoing land use changes, we find that the American burying beetle is not currently in danger of extinction, but is likely to become endangered within the foreseeable future throughout all of its range. Because we have found that the American burying beetle meets the definition of threatened under the Act, we propose to reclassify it from endangered to threatened on the Federal List of Endangered and Threatened Wildlife (List).

#### Significant Portion of the Range Analysis

Under the Act and our implementing regulations, a species may warrant listing if it is endangered or threatened throughout all or a significant portion of its range. Because we have determined that the American burying beetle is likely to become an endangered species within the foreseeable future throughout all of its range (*i.e.*, warrants listing as a threatened species), we find it unnecessary to proceed to an evaluation of potentially significant portions of the range. Where the best available information allows the Services to determine a status for the species rangewide, that determination should be given conclusive weight because a rangewide determination of status more accurately reflects the species' degree of imperilment and better promotes the purposes of the Act. Under this reading, we should first consider whether the species warrants listing “throughout all” of its range and proceed to conduct a “significant portion of its range” analysis if, and only if, a species does

not qualify for listing as either an endangered or a threatened species according to the “throughout all” language. We note that the court in *Desert Survivors v. Department of the Interior*, No. 16–cv–01165–JCS, 2018 WL 4053447 (N.D. Cal. Aug. 24, 2018), did not address this issue, and our conclusion is therefore consistent with the opinion in that case.

Therefore, on the basis of the best available scientific and commercial information, we propose to reclassify the American burying beetle as a threatened species across its entire range in accordance with sections 3(20) and 4(a)(1) of the Act.

#### Conclusion

Using the best available scientific and commercial information, we conclude that, while the American burying beetle is not currently in danger of extinction throughout all or a significant portion of its range, it is likely to become an endangered species within the foreseeable future throughout all of its range. In accordance with 50 CFR 424.11(c), we therefore propose to reclassify the American burying beetle as threatened on the Federal List of Endangered and Threatened Wildlife at 50 CFR 17.11(h).

#### Proposed 4(d) Rule

Under section 4(d) of the Act, the Service has discretion to issue regulations that we find necessary and advisable to provide for the conservation of threatened species. We may also prohibit by regulation, with respect to threatened wildlife, any act prohibited by section 9(a)(1) of the Act for endangered wildlife. When we establish a 4(d) rule, the general prohibitions in 50 CFR 17.31 for threatened species do not apply to the subject species, and the 4(d) rule contains all the prohibitions and exceptions that apply to the subject species. For the American burying beetle, the Service has developed a proposed 4(d) rule to respond to the specific threats and conservation needs of this species.

The proposed 4(d) rule would prohibit all intentional take of the American burying beetle. The proposed 4(d) rule would only prohibit incidental take of the species where the Service has determined such a prohibition is necessary and advisable for the conservation for the species. For example, take from a biologically insignificant threat would not be necessary and advisable to regulate whereas a factor that is a population driver would be necessary and advisable to regulate via a 4(d) rule. Incidental

take is defined as take that is incidental to, and not the purpose of, otherwise lawful activity.

The Service proposes to specifically tailor the prohibition of incidental take in each of the three geographic areas that the American burying beetle occupies. In the New England and Northern Plains analysis areas, incidental take would only be prohibited in suitable habitat when the take is the result of soil disturbance. Suitable habitat is defined, consistent with the SSA Report (Service 2019), as areas where suitable soils contain the appropriate abiotic elements (*e.g.*, soil temperature, soil moisture, particle size, etc.) that are favorable for excavation and formation of brood chambers and where appropriate carrion for reproduction is available. This suitable habitat accounts for breeding, feeding, overwintering, and dispersal needs. Areas that are regularly tilled, maintained through regular mowing, or urban areas with paved surfaces are examples of lands considered unfavorable for use by American burying beetles. Soil disturbance means movement or alteration of soil associated with modifying the existing land use. Soil disturbance includes actions such as grading, filling, soil excavating or topsoil stripping. Soil disturbance also includes non-physical alterations such as chemical treatment, including ground or soil sterilizers, and pesticides that would make the habitat unsuitable. However, typical agricultural levels of applications like liming or fertilizer should not affect American burying beetles, and we do not intend to regulate such practices.

Because incidental take stemming from normal livestock ranching and grazing activities is not expected to have an appreciable negative impact on the species, and retaining land uses associated with ranching or grazing (rather than converting the land to row crops) provides potential habitat for the species, we are proposing to allow any incidental take associated with ranching and grazing. Ranching and grazing means activities involved in grazing livestock (*e.g.*, cattle, bison, horse, sheep, goats or other grazing animals) such as: Gathering of livestock; construction and maintenance of fences associated with livestock grazing; installation and maintenance of corrals, loading chutes, and other livestock working facilities; development and maintenance of livestock watering facilities; placement of supplements such as salt blocks for grazing livestock; and, when associated with livestock grazing, the control of noxious weeds, haying, mowing, and prescribed

burning. Ranching and grazing does not include any form of tillage, conversion of grassland to cropland, or management of cropland. Overall, we find that ranching, grazing, and wildlife management activities, such as prescribed fire or invasive species control, is necessary and advisable to conserve the species.

In the Southern Plains analysis areas, incidental take would only be prohibited on certain conservation lands, as defined below under Proposed Regulation Promulgation. However, within these conservation lands, activities conducted in compliance with Service-approved conservation plans that result in take of the species would not be prohibited. For example, on conservation lands in the Southern Plains analysis areas managed by the Department of Defense, certain activities that result in incidental take would not be prohibited if those activities are in compliance with a Service-approved integrated natural resources management plan.

In addition to intentional take and some forms of incidental take, we also propose to prohibit activities related to possession and other acts with unlawfully taken American burying beetles, import and export of the species, activities related to shipping or delivering the species in interstate or foreign commerce, and the sale or offering to sell of the species. These activities are generally prohibited for endangered wildlife. We have determined that it is appropriate to extend the Act’s protections to these activities as well for the American burying beetle.

This proposed 4(d) rule tailors the Act’s protections to allow activities that only have minor or temporary effects and are unlikely to affect the resiliency of American burying beetle populations or viability of the species. The risks for American burying beetle populations are different for each region of the country, and risks that may be minor for one population could affect the resiliency of others. For example, urban expansion is a minor risk for larger populations in Nebraska and South Dakota, but is a substantial risk for the small Block Island population in Rhode Island. The proposed 4(d) rule includes protection of habitat related to soil disturbance activities on Block Island because suitable habitat is limited (only about 2,000 acres) and protecting habitat is necessary for the conservation of this population.

Although threats vary in type and degree across the American burying beetle’s range, those related to land use activities and climate change continue

to impact the species. Habitat loss or alteration related to land use activities is ongoing in all American burying beetle populations, but the impacts of these habitat losses is minor for most analysis areas with the exception of the Loess Canyons and New England populations. Climate change impacts are ongoing as well, and southern populations are projected to be extirpated within 20 to 30 years, as described above.

We recognize that many types of activities will impact suitable American burying beetle habitat, and application of prohibitions should also take into account the scope, scale, and magnitude of potential risks in American burying beetle habitat. We recognize that large intact areas of habitat are important for American burying beetle conservation. We seek public comment on the proposed 4(d) rule to ensure that proposed measures will effectively conserve the American burying beetle.

*Provisions of the Proposed 4(d) Rule in the New England Analysis Area*

Within the New England Analysis Area, we propose to only prohibit incidental take if it occurs in suitable habitat and is the result of soil disturbance, as defined below under Proposed Regulation Promulgation, which includes converting suitable habitat from an existing land use to a different land use. The species persistence in the New England Analysis Area is dependent upon active management occurring on two small coastal islands. There is a large percentage of land mass in the New England Analysis Area that is protected in some form, and American burying beetles occur on many lands with conservation easements, deed restrictions, or owned by conservation organizations; municipal, State, and Federal agencies; and private land trusts. However, existing land protections are not comprehensive for the American burying beetle. Given the varied missions of these landowners, the level of protection varies and may change over time. Although there may be some minimal level of take incidental to ranching and grazing, the effects of such land uses serve to maintain suitable habitat for the species. Therefore, prohibiting take from ranching and grazing is not necessary and advisable to conserve the species. Urban and suburban expansion and development activities can lead to soil disturbance that may lead to incidental take of the species. Habitat conversion further limits the habitat available to American burying beetles in the New England Analysis Area. The population

in the New England Analysis Area is proportionally more sensitive and vulnerable to impacts than the other analysis areas, because it is limited to two small coastal islands, and the species' persistence on one or both of the islands is likely dependent on management, particularly captive breeding, reintroduction, and the provisioning of carrion. Thus, urban and suburban expansion represent substantial risks to the future viability of the species in this area. Therefore, we have determined that prohibiting incidental take due to activities that cause soil disturbance, including suitable habitat conversion, is necessary and advisable to conserve the species. Limiting the prohibition to suitable habitat is sufficient as any beetles occupying unsuitable habitat would be very few in number and possibly either lost to the population or not of value to the population.

*Provisions of the Proposed 4(d) Rule in the Northern Plains Analysis Areas*

Within the Northern Plains analysis areas, we propose to only prohibit incidental take if it occurs in suitable habitat and is the result of soil disturbance, which includes converting habitat from an existing land use to a different land use, as defined below under Proposed Regulation Promulgation. The combined impacts of urban expansion and agriculture (primarily conversion to cropland) are expected to affect 5–15% of the suitable habitat in the Northern Plains (Service 2019). Thus, we find that urban expansion and agriculture land conversion to cropland (combined with other risks such as cedar expansion as discussed earlier in the proposed rule) represent risks to the future viability of the species in this area. Therefore, we have determined that prohibiting incidental take due to activities that cause soil disturbance, including suitable habitat conversion, is necessary and advisable to conserve the species.

However, incidental take that is the result of normal grazing and livestock activities would not be prohibited. In addition, activities by State or Federal government agencies related to wildlife management that result in incidental take of American burying beetles would not be prohibited. Grasslands in the Northern Plains support relatively high-density populations of American burying beetles that have high resiliency. Ranching, grazing, and wildlife management activities in this area are generally compatible with conservation of this species, as these land uses help maintain native grassland habitats (see chapters 4 and 5

in the SSA Report; Service 2019) important for American burying beetle conservation. Based on the analysis of climate change impacts in the SSA Report (Service 2019), we believe it is possible that the Northern Plains may support the only remaining self-sustaining populations with moderate or high resiliency by mid-century. Therefore, protecting existing habitat in the Northern Plains is important for the future viability of the species. Although there may be some minimal level of take incidental to ranching, grazing, and wildlife management activities, the effects of such land uses serve to maintain suitable habitat for the species and prevent more extensive soil disturbance than would occur with other land use changes such as farming or urban development.

*Provisions of the Proposed 4(d) Rule in the Southern Plains Analysis Areas*

Within the Southern Plains analysis areas on defined conservation lands, see below under Proposed Regulation Promulgation, incidental take is exempted if it occurs in compliance with a Service-approved management plan, such as an integrated natural resources management plan (INRMP), that includes conservation measures for the American burying beetle. Outside of defined conservation lands incidental take is not prohibited because the Southern Plains Analysis Area currently has low risks to the species associated with land development. The combined permanent loss of habitat projected due to urban and agricultural expansion is less than 2 percent (Service 2019).

Currently, conservation lands provide relatively large protected areas of habitat with good populations; these lands would potentially serve as sources of American burying beetles for relocation and reintroduction efforts in areas that are projected to have future climate conditions that would be expected to sustain the species. We propose to define "conservation lands" as lands included within the existing boundaries of Fort Chaffee in Arkansas (approximately 64,000 acres), and McAlester Army Ammunition Plant (approximately 45,000 acres), Camp Gruber/Cherokee Wildlife Management Area (approximately 64,000 acres), and The Nature Conservancy Tall Grass Prairie Preserve (approximately 40,000 acres) in Oklahoma. These areas have defined boundaries and management that is compatible with recovery for the American burying beetle; however, that management is not intentionally being conducted for American burying beetles and monitoring and management would likely cease at some sites without the

incidental take protections in place specific to the species. Active management and monitoring in these conservation lands is considered important to help support recovery by serving as source populations for relocation and reintroduction efforts of American burying beetle populations, for as long as they sustain beetle populations.

Land use changes such as urban development and conversion to agricultural lands that cause habitat loss and fragmentation are a minor risk in Southern Plains analysis areas. These activities are not considered a threat to the species in this area because the combined permanent loss of habitat projected due to urban and agricultural expansion is less than 2 percent of these large analysis areas and is unlikely to affect the viability of the species in these areas (Service 2019). Large areas of suitable habitat, combined with low levels of projected land use change, and relatively large areas of protected habitat indicate that impacts to habitat are not likely to affect the viability of the species in these areas.

*Section 4(d) and Section 7 of the Act*

Federal agencies would continue to be required to consult on all actions that may affect American burying beetles in all analysis areas; however, these consultations could likely be streamlined through a programmatic consultation for actions with incidental take that is not prohibited under the proposed 4(d) rule.

*Permits for Threatened Wildlife*

We may issue permits to carry out otherwise prohibited activities involving threatened wildlife under certain circumstances. Regulations governing permits are codified at 50 CFR 17.32. With regard to threatened wildlife, a permit may be issued for the following purposes: For scientific purposes, for the enhancement of propagation or survival, for economic hardship, for zoological exhibition, for educational purposes, or for special purposes consistent with the purposes of the Act. There are also certain statutory exemptions from the

prohibitions, which are found in sections 9 and 10 of the Act.

Questions regarding whether specific activities would constitute a violation of 50 CFR 17.47(c) should be directed to the Oklahoma Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

**Effects of the Rule**

This proposal, if made final, would revise 50 CFR 17.11(h) to reclassify the American burying beetle as threatened on the Federal List of Endangered and Threatened Wildlife and would revise 50 CFR 17.47 to codify the prohibitions and exceptions that would apply to the American burying beetle under the 4(d) rule. This proposal would not affect the designation of the nonessential experimental population in four counties in Missouri or the prohibitions established for that population. There is no critical habitat designated for this species; therefore, this proposed rule would not affect 50 CFR 17.95.

**Required Determinations**

*Clarity of the Rule*

We are required by Executive Orders 12866 and 12988 and by the Presidential Memorandum of June 1, 1998, to write all rules in plain language. This means that each rule we publish must:

- (1) Be logically organized;
- (2) Use the active voice to address readers directly;
- (3) Use clear language rather than jargon;
- (4) Be divided into short sections and sentences; and
- (5) Use lists and tables wherever possible.

If you feel that we have not met these requirements, send us comments by one of the methods listed in **ADDRESSES**. To better help us revise the rule, your comments should be as specific as possible. For example, you should tell us the numbers of the sections or paragraphs that are unclearly written, which sections or sentences are too long, the sections where you feel lists or tables would be useful, etc.

*National Environmental Policy Act*

We have determined that environmental assessments and

environmental impact statements, as defined under the authority of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*), need not be prepared in connection with regulations pursuant to section 4(a) of the Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

**References Cited**

A complete list of all references cited in this proposed rule is available at <http://www.regulations.gov> at Docket No. FWS-R2-ES-2018-0029, or upon request from the Oklahoma Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

**Authors**

The primary authors of this proposed rule are staff members of the Service's Oklahoma Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

**List of Subjects in 50 CFR Part 17**

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

**Proposed Regulation Promulgation**

Accordingly, we propose to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

**PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS**

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

**Authority:** 16 U.S.C. 1361–1407; 1531–1544; and 4201–4245, unless otherwise noted.

- 2. Amend § 17.11(h) by revising the entry for “Beetle, American burying” under “INSECTS” in the List of Endangered and Threatened Wildlife to read as follows:

**§ 17.11 Endangered and threatened wildlife.**

\* \* \* \* \*  
(h) \* \* \*

Common name	Scientific name	Where listed	Status	Listing citations and applicable rules
*	*	*	*	*
INSECTS				
*	*	*	*	*
Beetle, American burying.	<i>Nicrophorus americanus</i> .	Wherever found, except where listed as an experimental population.	T	54 FR 29652, 7/13/1989; [Federal Register citation of the final rule]; 50 CFR 17.47(c). <sup>4d</sup>

Common name	Scientific name	Where listed	Status	Listing citations and applicable rules
Beetle, American burying.	<i>Nicrophorus americanus</i> .	In southwestern Missouri, the counties of Cedar, St. Clair, Bates, and Vernon.	XN	77 FR 16712, 3/22/2012; 50 CFR 17.85(c). <sup>10</sup>
*	*	*	*	*

■ 3. Amend § 17.47 by adding paragraph (c) to read as follows:

**§ 17.47 Special rules—insects.**

\* \* \* \* \*

(c) American burying beetle (*Nicrophorus americanus*).

(1) *Prohibitions.* The following prohibitions apply to the American burying beetle:

(i) Take of the American burying beetle, except that take that is incidental to otherwise lawful activity (incidental take) is only prohibited when the take occurs on suitable American burying beetle habitat:

(A) In the New England and Northern Plains Analysis Areas where the incidental take results from soil disturbance; or

(B) In the Southern Plains Analysis Areas where the incidental take occurs on defined conservation lands, except where incidental take is in compliance with a Service-approved conservation plan.

(ii) Possession and other acts with unlawfully taken American burying beetles.

(A) It is unlawful to possess, sell, deliver, carry, transport, or ship, by any means whatsoever, any American burying beetle that was taken in violation of paragraph (c)(1)(i) of this section or State law.

(B) Notwithstanding paragraph (c)(1)(ii)(A) of this section, Federal and State law enforcement officers may possess, deliver, carry, transport, or ship any American burying beetle taken in violation of the Act as necessary in performing their official duties.

(iii) Import and export of the American burying beetle.

(iv) Interstate or foreign commerce. It is unlawful to deliver, receive, carry, transport, or ship in interstate or foreign commerce, by any means whatsoever, and in the course of a commercial activity, the American burying beetle.

(v) Sale or offer for sale. It is unlawful to sell or to offer for sale in interstate or

foreign commerce any American burying beetle.

(2) *Exceptions from prohibitions.* (i) Any employee or agent of the Service or of a State conservation agency that is operating a conservation program pursuant to the terms of a cooperative agreement with the Service in accordance with section 6(c) of the Act, who is designated by his agency for such purposes, may, when acting in the course of his official duties, take American burying beetles, provided that, for State conservation agencies, the American burying beetle is covered by an approved cooperative agreement to carry out conservation programs.

(ii) Federal or State government agencies may incidentally take American burying beetles when conducting wildlife management activities in the Northern Plains Analysis Areas.

(iii) Incidental take of American burying beetles resulting from ranching and grazing activities is allowed.

(3) *Definitions.* For the purposes of this paragraph (c), we define the following terms:

(i) *Conservation lands* means lands included within the existing boundaries of Fort Chaffee in Arkansas (approximately 64,000 acres), and McAlester Army Ammunition Plant (approximately 45,000 acres), Camp Gruber/Cherokee Wildlife Management Area (approximately 64,000 acres), and The Nature Conservancy Tall Grass Prairie Preserve (approximately 40,000 acres) in Oklahoma.

(ii) *New England Analysis Area* means Block Island in Rhode Island and Nantucket Island in Massachusetts.

(iii) *Northern Plains Analysis Areas* means portions of Nebraska and South Dakota, as presented in the map at paragraph (c)(4) of this section, to initially include an 18.6-mile buffer around each capture location to determine the outside boundaries of the analysis area. For specific information regarding whether a parcel of land is

inside the Northern Plains Analysis Areas, contact your local Service ecological services field office. Field office contact information may be obtained from the Service regional offices, the addresses of which are listed at 50 CFR 2.2.

(iv) *Ranching and grazing* means activities involved in grazing livestock (e.g., cattle, bison, horse, sheep, goats, or other grazing animals) such as: Gathering of livestock; construction and maintenance of fences associated with livestock grazing; installation and maintenance of corrals, loading chutes, and other livestock working facilities; development and maintenance of livestock watering facilities; placement of supplements such as salt blocks for grazing livestock; and, when associated with livestock grazing, the control of noxious weeds, haying, mowing, and prescribed burning. Ranching and grazing does not include any form of farming, conversion of grassland to cropland, or management of cropland.

(v) *Soil disturbance* means movement or alteration of soil. Soil disturbance includes actions such as grading, filling, soil excavating or topsoil stripping. Soil disturbance also includes non-physical alterations such as chemical treatment.

(vi) *Southern Plains Analysis Areas* means portions of Arkansas, Kansas, Oklahoma, and Texas, as presented in the map at paragraph (c)(4) of this section, to initially include an 18.6-mile buffer around each capture location to determine the outside boundaries of the analysis area. For specific information regarding whether a parcel of land is inside the Southern Plains Analysis Areas, contact your local Service ecological services field office. Field office contact information may be obtained from the Service regional offices, the addresses of which are listed at 50 CFR 2.2.

(4) *Map of American Burying Beetle Analysis Areas.*

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