References Cited

A complete list of all references we cited in the proposed rule and in this document is available on the Internet at *http://www.regulations.gov* or by contacting the Carlsbad Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this notice are staff members of the Carlsbad Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**).

Authority

The authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Dated: July 7, 2010

Eileen Sobeck,

Acting Assistant Secretary for Fish and Wildlife and Parks.

[FR Doc. 2010–17708 Filed 7–19– 10; 8:45 am]

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DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R1–ES–2010–0023]
[MO 92210–0–0008–B2]

Endangered and Threatened Wildlife and Plants; 90-Day Finding on a Petition To List the Giant Palouse Earthworm (*Driloleirus americanus*) as Threatened or Endangered

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of petition finding and initiation of status review.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), announce a 90–day finding on a petition to list the giant Palouse earthworm (*Driloleirus americanus*) as threatened or endangered under the Endangered Species Act of 1973, as amended, (Act) and to designate critical habitat. Based on our review, we find that the petition presents substantial scientific or commercial information indicating that listing the giant Palouse earthworm as threatened or endangered may be warranted. Therefore, with the publication of this notice, we are initiating a review of the status of the species to determine if listing the giant Palouse earthworm is warranted. To ensure that this status review is comprehensive, we are requesting scientific and commercial data and other information regarding this species. Based on the status review, we will issue a 12–month finding on the petition, which will address whether the petitioned action is warranted, as provided in section 4(b)(3)(B) of the Act.

DATES: To allow us adequate time to conduct this review, we request that we receive information on or before September 20, 2010. Please note that if you are using the *Federal eRulemaking Portal* (see **ADDRESSES** section, below), the deadline for submitting an electronic comment is Eastern Time on this date.

ADDRESSES: You may submit information by one of the following methods:

- Federal eRulemaking Portal: *http://www.regulations.gov. In the box that* reads "Enter Keyword or ID," enter the docket number for this notice, which is **docket number FWS–R1–ES–2010–0023**. Check the box that reads "Open for Comment/Submission," and then click the Search button. You should then see an icon that reads "Submit a Comment." Please ensure that you have found the correct rulemaking before submitting your comment.
- U.S. mail or hand-delivery: Public Comments Processing, Attn: **FWS–R1–ES–2010–0023**; Division of Policy and Directives Management; U.S. Fish and Wildlife Service; 4401 N. Fairfax Drive, Suite 222; Arlington, VA 22203.

We will post all information received on *http://www.regulations.gov. This* generally means that we will post any personal information you provide us (see the **Information Solicited** section below for more details).

After the date specified in **DATES**, you must submit information directly to the Field Office (see **FOR FURTHER INFORMATION CONTACT** section below). Please note that we might not be able to address or incorporate information that we receive after the above requested date.

FOR FURTHER INFORMATION CONTACT: Ken Berg, Manager, Washington Fish and Wildlife Office, 510 Desmond Dr. SE, Suite 102, Lacey, WA 98503; by telephone (360–753–9440); or by facsimile (360–753–9405). If you use a telecommunications device for the deaf (TDD) please call the Federal Information Relay Service (FIRS) at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Request for Information

When we make a finding that a petition presents substantial information indicating that listing a species may be warranted, we are required to promptly review the status of the species (status review). For the status review to be complete and based on the best available scientific and commercial information, we request information on the giant Palouse earthworm (GPE) from governmental agencies, Native American Tribes, the scientific community, industry, and any other interested parties. We seek information on:

(1) The species' biology, range, and population trends, including:

(a) Habitat requirements for feeding, breeding, and sheltering;

(b) Genetics and taxonomy;

(c) Historical and current range including distribution patterns;

(d) Historical and current population levels, and current and projected trends; and

(e) Past and ongoing conservation measures for the species and/or its habitat.

(2) The factors that are the basis for making a listing determination for a species under section 4(a) of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 *et seq.*), which are:

(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.

(3) Information on grassland or other natural habitats within the range of the species including distribution of known or potential habitats; information on ongoing or future activities in potential GPE habitat; information on life history of the GPE and evidence supporting its endogeic (earthworms that live in mineral soil and consume organic matter within the soil or at the soil-litter interface) or anecic (earthworms that inhabit deep vertical burrows and emerge at night to consume relatively fresh plant detritus on the surface) life-history mode; and information on other native or nonnative earthworm distributions in the range of the species.

If, after the status review, we determine that listing the GPE is warranted, we will propose critical habitat (see definition in section 3(5)(A) of the Act), under section 4 of the Act, to the maximum extent prudent and determinable at the time we propose to list the species. Therefore, within the geographical range currently occupied by the GPE, we request data and information on:

(1)What may constitute "physical or biological features essential to the conservation of the species,"

(2)where these features are currently found, and

(3)whether any of these features may require special management considerations or protection.

In addition, we request data and information on "specific areas outside the geographical area occupied by the species" that are "essential to the conservation of the species." Please provide specific comments and information as to what, if any, critical habitat you think we should propose for designation if the species is proposed for listing, and why such habitat meets the requirements of section 4 of the Act.

Please include sufficient information with your submission (such as scientific journal articles or other publications) to allow us to verify any scientific or commercial information you include.

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. Section 4(b)(1)(A) of the Act 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 information concerning this status review by one of the methods listed in the **ADDRESSES** section. If you submit information via *http://www.regulations.gov, your entire submission—including any personal identifying* information—will be posted on the website. If you submit a hardcopy that includes personal identifying information, you may request at the top of your document that we withhold this personal identifying information from public review. However, we cannot guarantee that we will be able to do so. We will post all hardcopy submissions on *http://www.regulations.gov.*

Information and supporting documentation that we received and used in preparing this finding, will be available for you to review at *http://www.regulations.gov,* or you may make an appointment during normal business hours at the U.S. Fish and Wildlife Service, Washington Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**).

Background

Section 4(b)(3)(A) of the Act requires that we make a finding on whether a petition to list, delist, or reclassify a species presents substantial scientific or commercial information indicating that the petitioned action may be warranted. We are to base this finding on information provided in the petition, supporting information submitted with the petition, and information otherwise available in our files. To the maximum extent practicable, we are to make this finding within 90 days of our receipt of the petition and publish our notice of the finding promptly in the **Federal Register**.

Our standard for substantial scientific or commercial information within the Code of Federal Regulations (CFR) with regard to a 90–day petition finding is "that amount of information that would lead a reasonable person to believe that the measure proposed in the petition may be warranted" (50 CFR 424.14(b)). If we find that substantial scientific or commercial information was presented, we are required to promptly conduct a status review, which is subsequently summarized in our 12–month finding.

Previous Federal Action(s)

On August 30, 2006, we received a petition from three private citizens and three other parties (the Palouse Prairie Foundation, the Palouse Audubon Society, and Friends of the Clearwater) to list the GPE (*Driloleirus americanus*). On October 9, 2007, we published a 90–day finding stating that the August 30, 2006, petition did not provide substantial scientific or commercial information to indicate that listing the GPE may be warranted (72 FR 57273). On January 24, 2008, the petitioners filed a lawsuit in the U.S. District Court, Eastern District of Washington against the U.S. Department of the Interior and the Service challenging the "not substantial" decision (*Palouse Prairie Foundation et al.* v. *Dirk Kempthorne, et al., No. 2:08–cv–0032–FVS*). On February 12, 2009, the District Court denied the Appellants' motion for summary judgment and granted summary judgment in favor of the Service, upholding the October 9, 2007, determination. The U.S. Court of Appeals for the Ninth Circuit affirmed the District Court ruling on June 14, 2010.

History of Current Petition

On July 1, 2009, we received a petition dated June 30, 2009, from Friends of the Clearwater, Center for Biological Diversity, Palouse Audubon, Palouse Prairie Foundation, and Palouse Group of the Sierra Club (petitioners) requesting that the GPE be listed as threatened or endangered and that critical habitat be designated under the Act. The petitioners also requested that we list the GPE as a threatened or endangered species either in the entirety of its range, or in the Palouse bioregion as a significant portion of its range. The petition clearly identified itself as such and included the requisite identification information for the petitioners, as required by 50 CFR 424.14(a).

The July 1, 2009, petition was accompanied by a letter from Samuel W. James, an earthworm taxonomist, and additional information about GPE and threats to the species that was not available to the Service during our evaluation of the August 30, 2006, petition. In an August 5, 2009, letter to the petitioners, we responded that we had reviewed the information presented in the petition and determined that issuing an emergency regulation temporarily listing the species under section 4(b)(7) of the Act was not warranted. We also stated that we would not be able to further address the petition at that time, but that we would complete the action when funding became available in fiscal year 2010. This finding addresses the petition.

Species Information

The GPE was first described by Smith in 1897, based on a collection near Pullman, Washington. At the time of this collection, Smith stated: "this species is very abundant in that region of the country and their burrows are sometimes seen extending to a depth of over 15 feet" (Smith 1897, pp. 202–203). Although only a few specimens have been collected, early descriptions indicate that the GPE can be as long as 3 feet (0.9 meters). Some consider the GPE to be an endemic species (a species native to a particular region), that uses grassland sites with good soil and native vegetation of the Palouse bioregion (James 1995, p. 1; Niwa *et al.* 2001, p. 34). The Palouse bioregion is an area of rolling hills and deep soil in southeastern Washington and adjacent northwestern Idaho.

The petition acknowledges (Petition, pp. 1, 3) four positively identified collections of this species in the past 110 years (Sánchez-de León and Johnson-Maynard 2008, p. 2), compared to the species being described as "very abundant" in Smith (1897, p. 202). Three of the collection locations were in the Palouse River basin (one between Moscow and Pullman, one at Moscow Mountain, Idaho (Petition cover letter, p. 2), and one at a prairie remnant, Smoot Hill Biological Preserve (Sánchez-de León and Johnson-Maynard 2008, p. 6)). The fourth location was in the hills west of Ellensburg, Washington (Fender and McKey-Fender 1990, p. 358), outside of the Palouse bioregion. We were unable to clearly match the dates of collection with the exact

locations based on information in the petition and references. However, several GPE were collected in 1978 near Pullman and Moscow (Petition, p. 5; Johnson-Maynard 2009b, p. 2), a collection was made in 1988 by Johnson and Johnson at a forest clearing near Moscow (Sánchez de León and Johnson-Maynard 2008, p. 2; Johnson-Maynard 2009b, p. 3), and a specimen was collected in 2005 by a University of Idaho graduate student near Pullman (Johnson-Maynard 2009b, p. 3; Mullins 2006, p. 1). The Ellensburg, Washington specimen was collected before 1990 (Petition, p. 5; Fender and McKey-Fender 1990, p. 358). Follow-up surveys in previous collection locations were unsuccessful in locating the GPE. Several of these collection locations had major ground-disturbing activities. One site was converted into a parking lot and another was "very disturbed with graveling" (Petition, p. 5). James (2000, p. 5) states that only a small portion of suitable earthworm habitat in the Columbia Basin area has been surveyed. Since 2005, two *Driloleirus* genus earthworms have been documented, one south of Moscow, Idaho, and one near Leavenworth, Washington (University of Idaho 2008, p. 1; Johnson-Maynard 2009b, p. 3), but the specimen could not be verified to species level due to damage during collection.

The GPE is described as an anecic earthworm (James 2000, p. 5) based on its functional role in the soil ecosystem. Anecic earthworms are the largest and longest lived of the three earthworm types (James 2000, p. 2; 1995, p. 6), and transport fresh plant material from the soil surface to subterranean levels. We reviewed the 2006 petition within the context of this information. However, after additional scrutiny, James (2009, p. 3) determined that, based on its pale pigmentation, the species is endogeic rather than anecic. Endogeic earthworms live entirely in the soil and rely on subsurface organic matter, rather than transporting plant material below ground. Life-history forms aside, we accept the characterization of the GPE as a species (Smith 1897, p. 203; Fender and McKey-Fender 1990, p. 372; Fender 1995, pp. 53–54). While the naming conventions of the GPE has changed over time, (*Megascolides americanus* in 1897 (Smith 1897, p. 203); changed to *Driloleirus americanus* by 1990 (Fender and McKey-Fender 1990, p. 372), there is no information provided in the petition or in our files that would indicate scientific disagreement about its status as a species.

Evaluation of Information for this Finding

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations at 50 CFR 424 set forth the procedures for adding a species to, or removing a species from, the Federal Lists of Endangered and Threatened Wildlife and Plants. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1) 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.

In considering what factors might constitute threats, we must look beyond the exposure of the species to a factor to evaluate whether the species may respond to the factor in a way that causes actual impacts to the species. If there is exposure to a factor and the species responds negatively, the factor may be a threat and, during the subsequent status review, we attempt to determine how significant a threat it is. The threat is significant, if it drives, or contributes to, the risk of extinction of the species such that the species may warrant listing as threatened or endangered as those terms are defined in the Act. However, the identification of factors that could impact a species negatively may not be sufficient to compel a finding that the information in the petition and our files is substantial. The information must include evidence sufficient to suggest that these factors may be operative threats that act on the species to the point that the species may meet the definition of threatened or endangered under the Act.

In making this 90–day finding, we evaluated whether information regarding threats to the GPE, as presented in the petition and other information available in our files, is substantial, thereby indicating that the petitioned action may be warranted. Our evaluation of this information is presented below.

A. The Present or Threatened Destruction, Modification, or Curtailment of the Species' Habitat or Range

Petition Information on Habitat Loss and Fragmentation in the Palouse Bioregion

The petitioners claim that the GPE is threatened by habitat conversion, loss, and fragmentation from agriculture and urban sprawl in the Palouse region (Petition, pp. 1, 7). The petitioners cite Sánchez-de León and Johnson-Maynard (2008, p. 1) who state that combined effects of land-use change, habitat fragmentation, and competitive interactions have decimated native earthworms. James (2009, p. 1) states that earthworms are sensitive to habitat disturbance, and that to find indigenous earthworms one must work in undisturbed or mildly disturbed vegetation. Undisturbed vegetation is rare in the Palouse bioregion, since the native grassland habitat has been reduced to less than 1 percent of the pre-agricultural extent (Petition, p. 8; James 2009, p. 1; Noss *et al.* 1995, p. 74). The petition lists a dozen locations in the Palouse area that contain prairie remnants (Petition, p. 5). In a survey of four prairie remnants and adjacent conservation reserve program (CRP) fields (areas set aside from farming and mainly planted with nonnative grasses), Sánchez-de León and Johnson-Maynard (2008, pp. 1, 4; Petition, p. 4) found one GPE in one prairie remnant. Sánchez-de León and Johnson-Maynard (2008, p. 6; Petition, p. 5) observed that many remaining prairie remnants are not suitable for tillage (preparing land for the raising of crops by plowing) as they are often steep, rocky, or contain shallow soil and, therefore, may also be less suitable for earthworms (Sánchez-de León and Johnson-Maynard 2008, p. 6; Petition, p. 5).

Evaluation

Information in the petition and in the Service's files indicates native habitats are rare and fragmented in the Palouse bioregion. The estimated amount of habitat conversion varies, but several studies have determined that the conversion of native habitats is very high: 99.9 percent of Palouse prairie habitats to agriculture (Noss 1995, p. 74); 94 percent of the grasslands and 97 percent of the wetlands in the Palouse bioregion have been converted to crop, hay, or pasture (Black *et al.* 1998, pp. 9–10); 21 percent of previously forested lands have been converted to agriculture or urban uses; and less than 1 percent of the original bunchgrass prairie habitat remains (Gilmore 2004, p. 3; Donovan *et*

al. 2009, p. 1). Although the Palouse prairie grasslands habitat has been extensively impacted by agriculture and development, very limited information exists on the specific habitat needs of the GPE. If the species is endemic to good soil ("good" soil was not defined in references) and native vegetation of the Palouse bioregion, as stated by some scientists (James 1995, p. 1; Niwa *et al.* 2001, p. 34), the best available information may indicate that remaining prairie remnants are not the best habitat for the GPE (Sánchez-de León and Johnson-Maynard 2008, p. 6).

Although its habitat may be limiting, there also may be sampling challenges that could bias available information on GPE. Sánchez-de León and Johnson-Maynard (2008, p. 7) explained that hand sampling methods may underestimate abundance of deep-burrowing species; while James (2009, p. 3) states that, if present, an endogeic earthworm such as the GPE should be moderately easy to find.

Petition Information on Habitat Loss and Fragmentation in the Ellensburg Area

The GPE occurs both in the Palouse bioregion and in central Washington near Ellensburg. The petitioners claim that, similar to the Palouse bioregion, the areas around Ellensburg have also been extensively modified by agriculture (Adolfson Associates 2005, p. 2; Petition, p. 8).

Evaluation

There is little information in the petition or the Service's files on the habitat associated with the GPE collected near Ellensburg. Fender and McKey-Fender (1990) described the location as "in the hills west of Ellensburg," and they noted that the range of GPE extends into "treeless areas" (pp. 358, 366). The Adolfson Associates report (2005, p. 1) was limited to the city and the urban growth area around Ellensburg. The location of the Ellensburg collection site is uncertain, and the petitioners did not provide additional information on potential GPE habitat other than the Adolfson Associates report. James (2000, p. 8; 1995, p. 2) confirms that GPE collection data provides little detailed information about habitat types, and he included the Ellensburg collection site, among others, as being generally located in what is now agricultural land, grassland, and shrubland.

Petition Information on Habitat Impacts from Agriculture and Urban Development

The petitioners claim that earthworms or their grassland habitats are influenced by soil disturbance, tillage, traffic, food sources, chemical and pesticide residues, and soil microclimate (Jennings *et al.* 1990, p. 75; Edwards & Bohlen 1996b, pp. 283–289; Edwards *et al.* 1995, pp. 200–201; USDA–NRCS 2001, p. 2; Petition, p. 10). The petitioners also claim that it is appropriate to use other earthworms as proxies for effects to the GPE as long as they are similar biologically and ecologically (Sappington *et al.* 2001, p. 2869; Caro *et al.* 2005, p. 1821; Petition, p. 10).

An Australian study showed 3 years of tillage reduced earthworm burrow density by nearly 90 percent (Chan 2004, p. 89; Petition, p. 10), and that tillage changes water infiltration into soil through burrows. In the Palouse bioregion, tillage removes the original topsoil, which may reduce earthworm burrow densities, soil aeration, soil infiltration rates, and the amount of organic matter available to the GPE for forage (Veseth 1986b, p. 2; Petition, pp. 10–11). All original topsoil has been removed from 10 percent of Palouse cropland, and another 60 percent of cropland has lost 25 to 75 percent of the topsoil (Veseth 1986b, p. 2).

Moisture, temperature, and food availability influence earthworm populations in general, and earthworms need the organic matter found in the topsoil that agriculture removes (James 2000, pp. 1–2; Petition, p. 11). Bare soil also increases effects of flooding, drought, or other weather conditions due to the lack of vegetation that buffers soil from extreme moisture, dryness, and temperature fluctuations. These fluctuations can temporarily or permanently make soils unusable by earthworms (James 2000, pp. 1–2; Petition, p. 11).

Soil compaction from livestock grazing or farm machinery can affect earthworms by making burrowing and feeding more difficult (James 2000, p. 9), by decreasing soil pore size and thereby decreasing nutrient retention and changing the soil food web (Niwa *et al.* 2001, p. 7), or by favoring nonnative earthworms that prefer course soils rather than the fine soils preferred by the GPE (Fender and McKey-Fender 1990, p. 364; Petition, p. 11). In addition to soil compaction, livestock grazing changes the quality and accessibility of detrital material, decreasing organic matter available to earthworms through conversion of herbage to partly digested clumps of organic matter (James 2000, p. 9; Petition, p. 14).

The petitioners also claim that chemicals and some soil chemistry effects, notably a reduction in soil pH, negatively impact earthworms (Petition, p. 11). Soil pH is a factor that often greatly affects earthworm populations, both in numbers of individuals and numbers of species; in general there are fewer species in the more acidic soils below pH 5 than in more alkaline soils (Edwards and Lofty 1977, p. 234). Nitrogenous fertilizers reduce pH levels (Ma *et al.* 1990, p. 76).

Pesticide applications can be extremely toxic to earthworms, and have indirect effects on vegetation (Edwards and Bohlen 1996a, pp. 282–288). Like other farmers, growers in the Palouse region apply many herbicides (Hall *et al.* 1999, p. 12 Table 3.08; Kellog *et al.* 2000, p. 2), including Triazine (Atrazine) herbicides that may have negative effects on earthworm numbers (Edwards and Bohlen 1996a, p. 285), and which may include indirect effects due to their influence on weeds as a source of supply of organic matter on which worms feed in the soil. Traces of Triazine herbicides were found in surface-water samples from the Palouse River basin (Wagner *et al.* 1995, p. 15, Table 4). The petition also states no-till farming uses herbicides rather than tilling for weed-control, resulting in higher herbicide use in no-till fields than is used in tilled fields (Veseth 1986a, p. 1; Petition, p. 12).

The petitioners claim that urban sprawl and rural development negatively impact habitats in the Palouse and Ellensburg areas. The Ellensburg, Washington; Pullman Washington; and Moscow, Idaho populations increased by approximately 76, 88, and 73 percent since 1980, respectively (Petition, p. 12; *www.census.gov, figure 4).* The petition states that urban development compacts soils, removes topsoil, and favors nonnative invasive earthworms (Petition, pp. 12–13). New road construction affects remaining prairie remnants (Petition, p. 13), including a potential rerouting of U.S. 95 through a large prairie remnant in the Palouse bioregion.

Evaluation

Information in the petition and the Service's files indicates that tillage may affect earthworms, and the use of surrogate species (such as other earthworms) may be useful for evaluating potential effects to the GPE, provided such studies are conducted with appropriate scientific controls and precautions. Caro *et al.* (2005, p. 1821)

states that "for substitute species to be appropriate, they should share the same key ecological or behavioral traits that make the target sensitive to environmental disturbance and the relationship between populations vital rates and level of disturbance should match that of the target; these conditions are unlikely to pertain in most circumstances and the use of substitute species to predict endangered populations' responses to disturbance is questionable."

Chan's study (2004, p. 90) compared effects to an anecic Megascolecidae (the same family as the GPE) by assessing burrows in pastures, no-till agriculture, one-pass tilled agriculture; and two-pass conventional tilled agriculture (Chan 2004, p. 94). The effect of tillage on earthworm abundance was usually negative because tilling causes physical damage and burial of residues; alternatively it can increase abundance of some earthworm species due to incorporation of residues into the soil (Chan 2004, p. 90). Tillage decreases burrow density, and related water conduction into the soil (Chan 2004, p. 94). Some preservation of earthworm burrows can be achieved by adopting conservation tillage techniques (no-till) (Chan 2004, p. 96).

Since the earthworm species used in Chan's studies was anecic, whereas the GPE may be endogeic, the effects of tilling within the plow zone may not be applicable to the GPE. Edwards and Bohlen (1996b, p. 215) also stated that earthworm populations were larger in soil that was not cultivated and had crops drilled directly. No-till agriculture occurs on about five percent of Palouse acreage considered in a survey by Hall (1999, p. 15). More tillage destroys burrows, while less tillage leaves residues and improves environments for earthworms (USDA-NRCS 2001, p. 3).

Tillage and cultivation impacts to the GPE may vary depending on whether it is has an endogeic or anecic life-history form. James (2009, p. 3) believes the GPE is endogeic, and lives entirely in the soil, feeding on organic matter in varying stages of decomposition. According to James, a large endogeic species is probably more susceptible to habitat changes than an anecic species, and that agricultural conversion stabilizes soil organic matter at a low level, with only the lowest quality and most resistant organic matter remaining. Because of these low levels of organic material, the GPE could starve, even if it could survive mechanical disturbances and chemicals associated with agricultural conversion (James 2009, p. 4).

Degradation of the land base from topsoil losses, changes in soil structure and chemistry, and reduced soil organic matter has resulted from tillage methods, crop rotations, and fertilization practices used historically in the Palouse region (Jennings *et al.* 1990, p. 75). There was no detailed information provided on agriculture activities in the Ellensburg area outside of the urban growth area. Furthermore, no information was provided by the petitioner, and no information is available in our files on the extent of livestock ranching impacts in the Palouse or Ellensburg areas.

The petitioners cite soil chemistry effects, notably a reduction in soil pH, as having deleterious effects on earthworms, and state that generally, earthworms do not thrive in soils with a pH below 5 (Petition, p. 11); however, our review of information on pH effects to earthworms showed both supportive and contradictory information relevant to the petitioners' claims. Fender (1995, p. 56) stated that Argilophiline worms (a tribe of earthworms that includes the GPE) appear to have higher tolerance than Lumbricidae (night crawler earthworms) for low pH (acid) soils, high clay, and resinous low-nitrogen plant litter. A tribe is a taxonomic ranking between the family and genus rankings in Linnaean taxonomy. Sánchez-de León and Johnson-Maynard (2008, pp. 5, 7) found more nonnative earthworms in lower pH soils (pH 5.9 to 6.2) in Conservation Reserve Program (CRP) sites, than in prairie remnants with higher pH soils (pH 6.3 to 6.6). As a result, the researchers question whether it is possible that lower pH correlates with some other non-measured soil parameter, such as previous fertilizer applications and resultant increased organic matter (Sánchez-de León and Johnson-Maynard 2008, p. 7).

Ma *et al.* (1990, p. 75) found different results: the lower the pH (the more acidic), the smaller the endogeic earthworm populations. The lower pH resulted in larger accumulations of organic matter or thatch, indicating decreased rates of decomposition and microbial mineralization (Ma *et al.* 1990, p. 79). A Natural Resource Conservation Service (USDA-NRCS) report states inorganic fertilizers can have a positive impact on earthworms due to increased biomass (USDA-NRCS 2001, p. 5), but that earthworms do not thrive in soils with a pH below 5 (USDA-NRCS 2001, p. 2; Edwards and Lofty 1977, p. 234). In summary, studies regarding earthworms and soil pH indicate that earthworm response may vary with species, location, or other attributes and it is unclear how the GPE may react to different soil acidity, which makes it difficult to determine if reduced pH is negatively impacting the species.

Information in the petition and available in the Service's files on the GPE and pesticides (used here as a general term, including herbicides, fungicides, and insecticides) found that some chemical applications may impact earthworms, and potentially the GPE. Edwards and Bohlen (1996, p. 283) state that the toxicities of different chemicals and pesticides on earthworms vary greatly, and summarize the toxicities of many pesticides. Edwards and Bohlen (1996, p. 285; USDA-NRCS 2001, p. 6) state that some herbicides, including Triazine herbicides, are moderately toxic to earthworms. Carbamates are toxic to earthworms (USDA-NRCS 2001, p. 6). Wagner *et al.* (1996, pp. 21–22) listed multiple pesticides used in a subset of the Palouse bioregion, and found several, including Triazine (Atrazine), in water samples (pp. 15–16). No information was provided in the petition on the use of, or surveys of, pesticides in the Ellensburg area.

We acknowledge several differences between information presented by the petitioner and other information available in our files with regard to claims made in the 2006 and 2009 GPE petitions. The 2006 petition stated that the GPE was endemic to the Palouse bioregion (Petition, p. 2); the 2009 petition expanded the petitioned area, stating that the species is native to the Columbia River basin of eastern Washington and northern Idaho (Petition, p. 1). We evaluated the petitioner's 2006 claim that the species may be affected by agricultural practices that use chemicals and result in soil compaction, but were unable to verify that these activities presented a threat (72 FR 57273).

The 2009 petition includes a letter of support from Samuel W. James, Biodiversity Institute, University of Kansas (James 2009, pp. 1-4). Mr. James states that he is the only earthworm taxonomist operating in the United States, and has extensive experience in biodiversity inventory of earthworms. In one of the references provided in support of the 2006 petition, James (1995, p. 12), stated that he can "confidently state that nothing is known of the impact of any management practice on any Columbia River Basin native earthworm species."

For purposes of the 2009 petition, James now believes the GPE is endogeic and not anecic as he previously thought, and states that, "I have no doubt that *Driloeirus americanus* is in danger of

extinction" (James 2009, p. 1). James also states that "this re-evaluation is significant to the petition to list *D. americanus*, because a large endogeic species is probably more susceptible to habitat changes than an anecic" (James 2009, p. 3). This finding fully considers the new information presented by the petitioner. Our review for purposes of a 90–day finding is limited to a determination of whether the information in the petition meets the "substantial information" threshold. We do not conduct additional research at this point, nor do we subject the petition to rigorous critical review.

In summary, our review and the 2009 petition indicate there has been extensive agricultural conversion in the Palouse bioregion, and the petition states that similar conversion has taken place in the central Washington area. Other threats identified by the petitioner include habitat fragmentation, urban development, pesticides, and soil compaction. The petitioner presents a reasonable argument that the GPE may be exposed to the above threats in the entirety of its range or in what may constitute a significant portion of its range (Petition, p. 3). Although the species' responses to these threats are still undeterminable at this time due to the lack of specific information on the species' biology and habitat needs, James (2009, p. 3) provides a logical explanation as to why a species like the GPE may be susceptible to these threats. The limited and fragmented remnant deep-soil habitats in the Palouse bioregion, and the potential impacts to any GPE from ongoing agriculture activities, including tilling, may negatively impact the species. However, the magnitude of these threats could differ, depending on whether the species exhibits an anecic or endogeic life history. The species may be affected by pesticides, although based on the best available information, we are unable to verify or quantify these threats at this time.

In James (2000, p. 10), the author identifies certain research and monitoring priorities, including experimentally testing hypotheses of the mechanisms through which habitat disturbance, exotic species invasions, and other human-caused factors may affect native (earthworm) species, beginning with those species potentially threatened such as the GPE. In his 2009 letter, James states that in his opinion, the GPE is in danger of extinction (James 2009, p. 1); we have no other expert opinion or conflicting information in our files in this regard.

We acknowledge there are gaps in the data presented by the petitioner, and that we have very little specific information on the GPE in our files. Nonetheless, in conclusion, we find that the information provided in the petition, as well as other information in our files, presents substantial scientific or commercial information indicating that the petitioned action may be warranted due to the present or threatened destruction, modification, or curtailment of the species' habitat or range.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

The petition did not identify overutilization for commercial, recreational, scientific, or educational purposes as a potential threat to the GPE. In our October 9, 2007, 90–day finding (72 FR 57273) we acknowledged that three GPE individuals were inadvertently killed during research activities. Researchers have yet to find an efficient survey method that reliably finds the GPE without damaging it (Johnson-Maynard 2009b, p. 7). While we continue to acknowledge mortality of several GPE individuals due to scientific collection, we do not have population size information indicating that the loss of three individuals or the sampling risk in the future may be a threat to the continued existence of the species. Therefore, we do not have substantial information indicating that overutilization for commercial, recreational, scientific, or educational purposes may present a threat to the continued existence of the GPE.

C. Disease or Predation

The petition did not identify any threats to the GPE related to disease or predation; however, we found some relevant information available in our files. Hendrix and Bohlen (2002, p. 802) state that imported nonnative earthworms may be vectors for plant or animal pathogens or viruses, but do not correlate this potential threat to the GPE. Although James (1995, p. 11) states that predation on earthworms can be accentuated by tilling the soil and exposing earthworms to bird predators, the correlation to the GPE is inconclusive given uncertainties regarding its anecic or endogeic life-history form. Because of these uncertainties, we are unable to determine if the amount of predation would rise to the level of a threat to the species at this time. Other impacts from agricultural tilling are discussed in more detail under Factor A. In summary, we conclude neither the petition nor information in our files presents substantial scientific or commercial information to document that disease or predation presents a threat to the continued existence of the GPE.

D. The Inadequacy of Existing Regulatory Mechanisms

Information Provided in the Petition

The petition claims that there are no Federal, State, or local regulations that specifically protect the GPE or its habitat. The Washington Department of Fish and Wildlife identifies the GPE as a species of concern (WDFW 2009, p. 1), although this status does not provide any regulatory protection for the species. The petition indicates that the Palouse Subbasin Management Plan, developed as part of the Northwest Power and Conservation Council review process for the subbasins in the Columbia River Basin, contains three objectives (7, 8, and 15) that are relevant to the GPE and its habitat. Objective 7 is designed to protect native grassland habitat within the Palouse subbasin; however, this objective is voluntary in nature and does not provide specific protection for the GPE. Objective 8 is designed to restore lost or degraded grassland habitat within the Palouse subbasin by identifying feasible opportunities for restoration. This objective does not define ''feasible opportunities,'' and appears to rely on a voluntary approach, which provides no regulatory protection for GPE habitat. Objective 15 is designed to increase wildlife habitat value on agricultural land for focal species; however, it is also voluntary in nature and does not provide specific protection for the GPE or its habitat.

The petition states that the Forest Service, Bureau of Land Management, Fish and Wildlife Service, Environmental Protection Agency, and NOAA Fisheries signed a memorandum of understanding (MOU) agreeing to implement the Interior Columbia Basin Strategy. The MOU commits the agencies to use information developed during the Interior Columbia Basin Ecosystem Management Project in future planning processes; however, neither the MOU nor the accompanying strategy specifically mention the GPE or create any regulatory mechanisms to provide protections for its habitat (petition p. 15).

According to the petition, the regulation of earthworms imported into the United States is based on the Federal Plant Pest Act (7 U.S.C. 150aa–150jj, May 23, 1957, as amended 1968, 1981, 1983, 1988 and 1994), under which the Animal and Plant Health Inspection Service controls imports containing soil that might carry

pathogens. The petition cited Hendrix and Bohlen (2002, p. 809), who state, "In the absence of pathogens, it appears that any earthworm species may be imported, that is, there is no specific consideration of earthworms as invasive organisms." The petition claims that regulation has not been effective in reducing the importation of nonnative earthworm species to the United States from other parts of the world, which poses a direct threat to the existence of the GPE and other native earthworm species (see Factor E for more information on impacts from nonnative earthworms).

Evaluation

Information in the petition and available in Service files indicates that there are limited regulatory mechanisms that may be protective of the GPE or its habitat. As we found in Factor A, the petition provided sufficient information indicating the species may be threatened by destruction, modification, or curtailment of its habitat or range from agricultural conversion, habitat fragmentation, urban development, pesticides, and soil compaction. Below, in Factor E, we discuss how the petitioner provided sufficient information indicating nonnative earthworm species impacts or competition may also present a threat to the GPE. Since we determine that the petition provided sufficient information indicating that both habitat loss and introduction of nonnative earthworms may be a threat to the GPE, the inadequacy of regulatory mechanisms to control these factors may also be a threat. Although the magnitude of this threat is presently indeterminable based on uncertainties regarding the species' biology, habitat needs, and its anecic or endogeic life history, we find that the information provided in the petition, as well as other information in our files, presents substantial scientific or commercial information indicating that the petitioned action may be warranted due to the inadequacy of existing regulatory mechanisms.

E. Other Natural or Manmade Factors Affecting the Species' Continued Existence

Information Provided in the Petition

The petitioners claim that the GPE is threatened by invasive nonnative earthworms (Petition, p. 1). In a 3–year study of earthworms in the Palouse region of eastern Washington and Idaho, Sánchez-de León and Johnson-Maynard (2008, p. 8) found a dominance of invasive exotic earthworms in both native and nonnative grasslands. Exotic (nonnative) earthworms can invade new habitats, change the ecological soil functions, and displace native species (Hendrix and Bohlen 2002, p. 805; Petition, p. 16). Earthworm populations are dominated by nonnative earthworms in agricultural sites and native prairie remnants in the Palouse region (Fauci and Bezdicek 2002, p. 257; Sánchez-de León and Johnson-Maynard 2008, pp. 7–8; Petition p. 16). Habitat conversion favors invasion of nonnative earthworm species that are better adapted to a disturbed or degraded environment (Petition, p. 16; James 1995, p. 5). Some exotic earthworm species may be highly competitive with a deeper-dwelling species like the GPE. James (2000, p. 2) states that invasive earthworm species present a potential threat to the GPE. He describes the loss of a deep-dwelling Illinois earthworm species as an example, and states that the GPE is probably endogeic (deep-dwelling) as well (James 2009, p. 3).

We acknowledge that there are substantial weaknesses in extrapolating data from an Illinois species to the GPE, since we have no information that would indicate the responses of the Illinois species and the GPE to invasive earthworms would be similar. However, since we have no conflicting information in our files on this potential threat to the GPE, we are deferring to the expert's opinion for purposes of this 90–day finding.

The petitioners also describe the existence of introduced annual grasses and noxious weeds in the Palouse region, including: Kentucky bluegrass, crops, cheatgrass, and yellow-star thistle (Gilmore 2004, pp. 1–87), and assume these plants do not provide the same quality and quantity of earthworm forage as native vegetation (Petition, p. 17). The petitioners also claim that climate change resulting in changing weather patterns will impact the GPE (Petition, p. 17), since the amount of annual precipitation is a parameter that influences GPE habitat (Fender & McKey-Fender 1990, p. 366).

Evaluation

Information in the petition and available in our files indicates that other natural or manmade factors, including potential nonnative earthworm species impacts or competition may present a threat to the GPE. In a recent study in the Palouse region of southeastern Washington and northern Idaho, Sánchez-de León and Johnson-Maynard compared four paired sites of prairie remnants and CRP lands (2008, pp. 2, 8). The main purpose of the study was to characterize and compare native and exotic earthworm populations in two important grassland ecosystems of the Palouse region, native prairie remnants and CRP set asides.

One invasive earthworm species (*Aporrectodea trapezoides*) made up 90 percent of the total earthworm density in the paired comparison study (Sánchez-de León and Johnson-Maynard 2008, p. 4). The researchers also observed that *A. trapezoides* may compete with GPE for food in upper layers of soil (Sánchez-de León and Johnson-Maynard 2008, p. 6). One GPE was found at one of the four prairie remnant study sites used for the study. The researchers state that the rarity of native earthworms in their prairie site surveys lends support for the theory that native earthworms are being replaced by nonnative earthworms, even in visibly intact remnants of fragmented habitats (Sánchez-de León and Johnson-Maynard 2008, p. 6).

The researchers also present several scenarios regarding the GPE and nonnative earthworms: The GPE may be able to coexist with some species; some nonnative species may be replacing the GPE; or the GPE may remain only in lower quality prairie remnants (shallow rocky soils) (Sánchez-de León and Johnson-Maynard 2008, p. 6). The researchers propose that a combination of extensive habitat fragmentation in the Palouse region, low habitat quality of remaining prairie remnants, and possible competitive interactions with exotic earthworms, decimated GPE populations at their study sites (Sánchez-de León and Johnson-Maynard 2008, p. 6).

The Service agrees with the petitioner that native plant communities in the Palouse are susceptible to invasion by nonnative plants (Gilmore 2004, pp. 1-26; James 2000, p. 8), that domination of deep-soil sites by Kentucky bluegrass is common, and that in shallow soils cheatgrass and yellow-star thistle weeds compete with native grasslands. However, we have no information from the petitioner or our files that documents a threat to the GPE from these nonnative plants.

Although the petition expresses a concern about future climate change and its effects on the GPE, it does not present information or data in this regard. The Service evaluated information available in our files related to this potential threat. Lawler and Mathias (2007, pp. 19–20) investigated possible climate change impacts to vascular plants, stating that plants may mature earlier creating potential mismatches between pollinators and plants, parasites and hosts, and herbivores and food sources; increased summer temperatures and decreased

summer precipitation may lead to changes in distribution of some plant species; sagebrush steppe and grasslands may contract while dry forests and woodlands expand; and plant distribution changes will depend in part on plant water-use efficiencies. Based on the best available information, it is difficult to predict how or if future changes in growth or distribution of vegetation will affect local conditions for weeds, native vegetation, or both. It is also unclear how or if this will have an adverse or beneficial impact on the GPE or its habitat.

We acknowledge that the magnitude of the above threats is uncertain because we lack specific information on the species' biology and habitat needs. In addition, the species' exposure and response would likely differ, depending on whether it exhibits an anecic or endogeic life history. However, we find that the information provided in the petition, as well as other information in our files, presents substantial scientific or commercial information indicating that the petitioned action may be warranted due to other natural or man-made factors, in particular due to the presence of nonnative invasive earthworms.

Finding

On the basis of our determination under section 4(b)(3)(A) of the Act, we find that the petition presents substantial scientific or commercial information indicating that listing the GPE throughout its entire range may be warranted. This finding is based on information provided under factors A, D and E.

Because we have found that the petition presents substantial information indicating that listing the GPE may be warranted, we are initiating a status review to determine whether listing the GPE under the Act is warranted. The petition asserts that the GPE is also threatened or endangered throughout a significant portion of its range. Accordingly, a significant portion of the range analysis will be conducted during the status review if we determine that listing the species in its entire range is not warranted.

The "substantial information" standard for a 90–day finding differs from the Act's "best scientific and commercial data" standard that applies to a status review to determine whether a petitioned action is warranted. A 90–day finding does not constitute a status review under the Act. In a 12–month finding, we will determine whether a petitioned action is warranted after we have completed a thorough status review of the species, which is conducted following a substantial 90–day finding. Because the Act's standards for 90–day and 12–month findings are different, as described above, a substantial 90–day finding does not mean that the 12–month finding will result in a warranted finding.

References Cited

A complete list of references cited is available on the Internet at *http://www.regulations.gov and upon request from the Washington Fish and Wildlife* Office (see **FOR FURTHER INFORMATION CONTACT**).

Author

The primary authors of this notice are the staff members of the Eastern Washington Field Office.

Authority: The authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Dated: July 2, 2010

Wendi Weber

Acting Director, U.S. Fish and Wildlife Service

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