DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R8–ES–2013–0072]

[4500030113]

RIN 1018–AY10

Endangered and Threatened Wildlife and Plants; Threatened Status for the Bi-State Distinct Population Segment of Greater Sage-Grouse With Special Rule

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), propose to list the Bi-State distinct population segment (DPS) of greater sage-grouse (*Centrocercus urophasianus*) as threatened under the Endangered Species Act of 1973, as amended (Act). We also propose a special rule under section 4(d) of the Act to provide for the conservation of the Bi-State DPS of greater sage-grouse. If finalized, the effect of this regulation would be to add the Bi-State DPS of greater sage-grouse to the List of

Endangered and Threatened Wildlife, extend the Act's protections to this DPS, and establish a 4(d) special rule for the conservation of this DPS. Elsewhere in today's **Federal Register**, we propose to designate critical habitat under the Act for the Bi-State DPS of greater sage-grouse.

DATES: *Comment Submission:* We will accept comments received or postmarked on or before [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]. Comments submitted electronically using the Federal eRulemaking Portal (see **ADDRESSES** section, below) must be received by 11:59 p.m. Eastern Time on the closing date. We must receive requests for public hearings, in writing, at the address shown in **FOR FURTHER INFORMATION CONTACT** by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

Public Meetings: Two public meetings will be held on this proposed rule: (1) November 5, 2013, from 4:00 p.m. to 6:00 p.m. (Pacific Time); and (2) November 6, 2013, from 1:00 p.m. to 3:00 p.m. (Pacific Time). People needing reasonable accommodations in order to attend and participate in the public hearing should contact Jeannie Stafford, Nevada Fish and Wildlife Office, as soon as possible (see **FOR FURTHER INFORMATION CONTACT**).

ADDRESSES: *Comment Submission:* 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–R8–ES–2013–0072, which is the docket number for this rulemaking. Then, 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–R8–ES–2013–0072; Division of Policy and Directives Management; U.S. Fish and Wildlife Service; 4401 N. Fairfax Drive, MS 2042–PDM; Arlington, VA 22203.

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 the **Information Requested** section below for more information).

Public Meetings: The November 5, 2013, public meeting will be held at the Tri-County Fairgrounds, Home Economics Room, Sierra Street and Fair Drive, Bishop, CA 93514. The November 6, 2013, public meeting will be held at the Smith Valley Community Center, 2783 State Route 208, Wellington, NV 89444.

FOR FURTHER INFORMATION CONTACT: For general information on the proposed listing and information about the proposed listing specific to Nevada (Carson City, Douglas, Esmeralda, Lyon, and Mineral Counties), contact Edward D. Koch, State Supervisor, Nevada Fish and Wildlife Office, U.S. Fish and Wildlife Service, 1340 Financial Boulevard, Suite 234, Reno, NV 89502; telephone 775–861–6300; facsimile

775–861–6301. For specific information related to California (Alpine, Inyo , and Mono Counties), contact Diane Noda, Field Supervisor, or Carl Benz, Assistant Field Supervisor, Ventura Fish and Wildlife Office, U.S. Fish and Wildlife Service, 2493 Portola Road, Suite B, Ventura, CA 93003; telephone 805–644–1766; facsimile 805–644–3958. Persons who use a telecommunications device for the deaf (TDD) may call the Federal Information Relay Service (FIRS) at 800–877–8339.

SUPPLEMENTARY INFORMATION

Executive Summary

Why we need to publish a rule. Under the Act, if a species is determined to be an endangered or threatened species throughout all or a significant portion of its range, we are required to promptly publish a proposal in the **Federal Register** and make a determination on our proposal within 1 year. Listing a species as an endangered or threatened species can only be completed by issuing a rule.

This rule proposes the listing of the Bi-State distinct population segment (DPS) of greater sage-grouse as a threatened species. The Bi-State DPS is a candidate species for which we have on file sufficient information on biological vulnerability and threats to support preparation of a listing proposal, but for which development of a listing regulation had been precluded by other higher priority listing activities. This rule reassesses all available information regarding the status of and threats to the Bi-State DPS. This rule also proposed a special rule under section 4(d) of the Act to provide for

the conservation of the Bi-State DPS. Elsewhere in today's **Federal Register**, we propose to designate critical habitat for the Bi-State DPS under the Act.

The basis for our action. Under the Act, we can determine that a species is an endangered or threatened species based on any 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 threats that pose the most significant impacts to the Bi-State DPS currently and in the future are nonnative and native, invasive species (Factors A and E); wildfires and altered fire regime (Factors A and E); infrastructure (Factors A and E); grazing (Factors A, C, and E); and small population size and population structure (Factor E). Other threats that are impacting the Bi-State DPS to a lesser degree are urbanization and habitat conversion (Factor A); mining (Factors A and E); renewable energy development and associated infrastructure (Factors A and E); disease and predation (Factor B); climate change, including drought (Factors A and E); and recreation (Factors A and E). The existing regulatory mechanisms are inadequate to protect the Bi-State DPS from these threats (Factor D). The threats listed above are also acting cumulatively to further contribute to the challenges faced by several Bi-State DPS populations now and into the future.

We are proposing a special rule. We are proposing to exempt from the Act's take prohibitions (at section 9) activities conducted pursuant to a comprehensive conservation

program that was developed by or in coordination with a State agency. Specifically, the proposed 4(d) special rule provides that any take of the Bi-State DPS incidental to agricultural activities is not a prohibited action under the Act if the activities are: (1) Included within either of two comprehensive conservation programs: the Natural Resources Conservation Service (NRCS) for private agricultural lands in connection with NRCS's Sage Grouse Initiative (SGI), or the Bi-State Local Area Working Group Action Plan; or (2) managed not by a formal SGI participant but are consistent with the SGI. If an activity resulting in take of the Bi-State DPS is prohibited under this 4(d) special rule, then the general prohibitions at 50 CFR 17.31 for threatened wildlife would apply, and we would require a permit pursuant to section 10 of the Act for such an activity, as specified in our regulations. Nothing in this proposed 4(d) special rule would affect the consultation requirements under section 7 of the Act. The intent of this special rule would be to increase support for the conservation of the Bi-State DPS and provide an incentive for continued management activities that benefit the Bi-State DPS and its habitat.

We will seek peer review. We are seeking comments from knowledgeable individuals with scientific expertise to review our analysis of the best available science and application of that science and to provide any additional scientific information to improve this proposed rule. Because we will consider all comments and information we receive during the comment period, our final determination may differ from this proposal.

Information Requested

Public Comments

We intend that any final action resulting from this proposed rule will be based on the best scientific and commercial data available and be as accurate and as effective as possible. Additionally, we intend to make a final determination on the 4(d) special rule concurrent with the final listing rule, if the result of our final listing determination concludes that threatened species status is appropriate. Therefore, we request comments or information from other concerned governmental agencies, Native American tribes, the scientific community, industry, or any other interested parties concerning this proposed listing rule and 4(d) special rule. We particularly seek comments concerning:

(1) The Bi-State DPS's biology, distribution, population size and trend, 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 DPS, its habitat, or both.

(2) The factors that are the basis for making a listing determination for a species under section 4(a) of the 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) Biological, commercial trade, or other relevant data concerning any threats (or lack thereof) to this DPS and existing regulations that may be addressing those threats.

(4) Additional information concerning the historical and current status, range, distribution, and population size of this species, including the locations of any additional leks or populations of this DPS.

(5) Any information on the biological or ecological requirements of the DPS, and ongoing conservation measures for the DPS and its habitat.

(6) Application of the Bi-State Action Plan of March 15, 2012, to our determination of status under section 4(a)(1) of the Act, particularly comments or information to help us assess the certainty that the plan will be effective in conserving the Bi-State DPS of greater sage-grouse and will be implemented.

(7) Information concerning whether it would be appropriate to include in the 4(d) special rule a provision for take of the Bi-State DPS of greater sage-grouse in accordance with applicable State law for educational or scientific purposes, the enhancement of propagation or survival of the DPS, zoological exhibition, and other conservation purposes consistent with the Act.

(8) Whether the Service should include in the scope of the proposed 4(d) special rule the incidental take of sage-grouse within the Bi-State DPS if the take results from other agricultural activities not subject to the SGI or the Bi-state Action Plan, if those activities are compatible with the conservation of the DPS.

(9) Whether the Service should expand the scope of this 4(d) special rule to allow incidental take of sage-grouse within the Bi-State DPS if the take results from implementation of the SGI or Bi-State Action Plan by a person or entity other than a State agency or their agent(s).

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.

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 directs that determinations as to whether any species is a threatened or endangered species must be made "solely on the basis of the best scientific and commercial data available."

You may submit your comments and materials concerning this proposed rule by one of the methods listed in the **ADDRESSES** section. We request that you send comments **only** by the methods described 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 your submission is made via a hardcopy that includes personal identifying information, 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. We will post all hardcopy submissions on *http://www.regulations.gov*. Please include sufficient information with your comments to allow us to verify any scientific or commercial information you include.

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, Nevada Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**).

Public Hearing

Section 4(b)(5) of the Act provides for one or more public hearings on this proposal, if requested. Requests must be received within 45 days after the date of publication of this proposed rule in the **Federal Register**. Such requests must be sent to the address shown in the **FOR FURTHER INFORMATION CONTACT** section. We will schedule public hearings on this proposal, if any are requested, and announce the dates, times, and places of those hearings, as well as how to obtain reasonable accommodations, in the **Federal Register** and local newspapers at least 15 days before the hearing.

Peer Review

In accordance with our joint policy on peer review published in the **Federal Register** on July 1, 1994 (59 FR 34270), we have sought the expert opinions of at least three appropriate and independent specialists regarding this proposed rule. The purpose of peer review is to ensure that our listing determination section 4(d) special rule are based on scientifically sound data, assumptions, and analyses. The peer reviewers have expertise in the Bi-State DPS' (and the greater sage-grouse in general) life-history requirements, ecology, and habitat needs. We invite comment from the peer reviewers during this public comment period.

Previous Federal Actions

On January 2, 2002, we received a petition from the Institute for Wildlife Protection requesting that the sage-grouse occurring in the Mono Basin area of California and Nevada be emergency listed as an endangered DPS of *Centrocercus urophasianus phaios*, which the petitioner considered to be the western subspecies of the greater sage-grouse. This request concerned the sage-grouse in portions of Alpine and Inyo Counties and most of Mono County in California, and portions of Carson City, Douglas, Esmeralda, Lyon, and Mineral Counties in Nevada. On December 26, 2002, we published a 90-day finding that the petition did not present substantial scientific or commercial information indicating that the petitioned action may be warranted (67 FR 78811). Our 2002 finding concluded: (1) That the petition did not present substantial information indicating that the population of greater sage-grouse in this area was recognizable as a DPS under our DPS policy (61 FR 4722; February 7, 1996), and thus was not a listable entity (67 FR 78811; December 26, 2002); and (2) that the petition did not present substantial information regarding threats to indicate that listing the petitioned population may be warranted (67 FR 78811).

On November 15, 2005, we received a petition submitted by the Stanford Law School Environmental Law Clinic on behalf of the Sagebrush Sea Campaign, Western Watersheds Project, Center for Biological Diversity, and Christians Caring for Creation to list the Mono Basin area population of greater sage-grouse (referred to as the Bi-State DPS in this document) as an endangered or threatened DPS of the greater sage-grouse (*C. urophasianus*) under the Act. On March 28, 2006, we responded that emergency listing

was not warranted and, due to court orders and settlement agreements for other listing actions, we would not be able to address the petition at that time.

On November 18, 2005, the Institute for Wildlife Protection and Dr. Steven G. Herman filed suit against the Service in U.S. District Court for the Western District of Washington (*Institute for Wildlife Protection et al.* v. *Norton et al.*, No. C05-1939 RSM), challenging the Service's 90-day finding (67 FR 78811; December 26, 2002) that the Institute for Wildlife Protection's January 2002 petition did not present substantial information indicating that the petitioned action may be warranted. On April 11, 2006, we reached a stipulated settlement agreement with both plaintiffs under which we agreed to evaluate the November 2005 petition and concurrently reevaluate the January 2002 petition. The settlement agreement required the Service to submit to the **Federal Register** a 90-day finding by December 8, 2006, and if we found the petition to be substantial, to complete the 12-month finding by December 10, 2007. On December 19, 2006, we published a 90-day finding that these petitions did not present substantial scientific or commercial information indicating that the petitioned actions may be warranted (71 FR 76058).

On August 23, 2007, the November 2005 petitioners filed a complaint challenging the Service's 2006 finding. After review of the complaint, the Service determined that we would revisit our 2006 finding. The Service entered into a settlement agreement with the petitioners on February 25, 2008, in which the Service agreed to a voluntary remand of the 2006 petition finding, and agreed to submit for publication in the **Federal Register**

a new 90-day finding by April 25, 2008. The agreement further stipulated that if upon reevaluation the Service made a finding that the petitions presented substantial information, the Service would undertake a status review of the Mono Basin area population of the greater sage-grouse and submit for publication in the **Federal Register** a 12-month finding by April 24, 2009.

On April 29, 2008, we published in the **Federal Register** (73 FR 23173) a 90-day petition finding that the petitions presented substantial scientific or commercial information indicating that listing the Mono Basin area population may be warranted and that initiated a status review. A joint stipulation by the Service and the plaintiffs agreed to extend the due date for the 12-month finding. On May 27, 2009, the U.S. District Court, Northern District of California, issued an order accepting a joint stipulation between the Service and the plaintiffs, where the parties agreed that the Service may submit to the **Federal Register** a single document containing the 12-month findings for the Mono Basin area population and the greater sage-grouse no later than by February 26, 2010. The due date for submission of the document to the **Federal Register** was extended to March 5, 2010, and the document was subsequently published on March 23, 2010 (75 FR 13910). In this document, we concluded, among other things, that the Mono Basin area population is a listable entity under Service policy as a DPS and that the DPS warranted recognition under the Act but that immediate action was precluded by higher listing priorities. This warranted-but-precluded finding placed the species on our candidate list.

Both the 2002 and 2005 petitions, as well as our 2002 and 2006 findings, use the term "Mono Basin area" and "Mono Basin population" to refer to greater sage-grouse that occur within the geographic area of eastern California and western Nevada that includes Mono Lake. For conservation planning purposes, this same geographic area is referred to as the Bi-State area by the States of California and Nevada (Bi State Local Planning Group 2004, pp. 4–5). For consistency with ongoing planning efforts, we adopted the "Bi-State" nomenclature in our 2010 finding and consequently refer to this DPS as the "Bi-State DPS" within this document.

On May 10, 2011, we filed a multiyear work plan as part of a proposed settlement agreement with Wild Earth Guardians and others in a consolidated case in the U.S. District Court for the District of Columbia. On September 9, 2011, the Court accepted our agreement with the plaintiffs in *Endangered Species Act Section 4 Deadline Litig.*, Misc. Action No. 10–377 (EGS), MDL Docket No. 2165 (D. DC) (known as the "MDL case") on a schedule to publish proposed rules or not-warranted findings for the 251 species designated as candidates as of 2010 no later than September 30, 2016. The publication of this proposed rule complies with our current work plan.

Elsewhere in today's **Federal Register**, we propose to designate critical habitat for the Bi-State DPS under the Act.

Background

In our 12-month finding on petitions to list three entities of sage-grouse (75 FR 13910; March 23, 2010), we found that the Bi-State population of sage-grouse meets our criteria as a DPS of the sage-grouse under Service policy (61 FR 4722; February 7, 1996), and we reaffirm that this finding is still valid. This determination was based principally on genetic information (Benedict *et al.* 2003, p. 308; Oyler–McCance *et al.* 2005, p. 1,307), where the DPS was found to be both markedly separated and significant to the remainder of the sage-grouse taxon. The Bi-State DPS defines the far southwest limit of the species' range along the border of eastern California and western Nevada (Stiver *et al*. 2006, pp. 1–11; 71 FR 76058).

Although the Bi-State DPS is a genetically unique and markedly separated population from the rest of the greater sage-grouse's range, the DPS has similar life-history and habitat requirements. In this proposed rule, we use information specific to the Bi-State DPS where available but still apply scientific management principles for greater sage-grouse that are relevant to the Bi-State DPS's management needs and strategies, which is a practice followed by the wildlife and land management agencies that have responsibility for management of both the DPS and its habitat.

A detailed discussion of the Bi-State DPS's description, taxonomy, habitat (sagebrush ecosystem), seasonal habitat selection, life-history characteristics, home range, life expectancy and survival rates, historical and current range distribution, population estimates and lek (sage-grouse breeding complex) counts, population trends, and land ownership information is available in the 2013 Species Report (Service 2013a,

entire). A team of Service biologists prepared this status review for the Bi-State DPS. The team included biologists from the Service's Nevada Fish and Wildlife Office, Ventura Fish and Wildlife Office, Pacific Southwest Regional Office, Mountain-Prairie Regional Office, and national Headquarters Office. The Species Report represents a compilation of the best scientific and commercial data available concerning the status of the Bi-State DPS, including the past, present, and future threats to this DPS. The Species Report and other materials relating to this proposal (e.g., references cited, maps, management documents) can be found at *http://www.regulations.gov* under Docket No. FWS–R8–ES–2013–0072, the Pacific Southwest Regional Office website (*http://www.fws.gov/cno/*), and two Fish and Wildlife Office websites (*http://www.fws.gov/nevada/* and *http://www.fws.gov/ventura/*).

Species Information

As stated above, the Bi-State DPS of greater sage-grouse is genetically unique and markedly separated from the rest of the species' range. The species as a whole is long-lived, reliant on sagebrush, highly traditional in areas of seasonal habitat use, and particularly susceptible to habitat fragmentation and alterations in its environment (see the "Seasonal Habitat Selection and Life History Characteristics" section of the Species Report (Service 2013a, pp. 10–14)). Sage-grouse annually exploit numerous habitat types in the sagebrush ecosystem across broad landscapes to successfully complete their life cycle, thus spanning ecological and political boundaries. Populations are slow-growing due to low reproductive rates (Schroeder *et al.* 1999 pp. 11, 14; Connelly *et al.*

2000a, pp. 969–970), and they exhibit natural, cyclical variability in abundance (see "Current Range/Distribution and Population Estimates/Annual Lek Counts" section of the Species Report (Service 2013a, pp. 17–29)).

For the purposes of this proposed rule, we discuss the Bi-State DPS populations, threats to those populations, and associated management needs or conservation actions as they relate to population management units (PMUs). Six PMUs were established in 2001 as management tools for defining and monitoring sage-grouse distribution in the Bi-State area (Sage-Grouse Conservation Planning Team 2001, p. 31). The PMU boundaries are based on aggregations of leks, known seasonal habitats, and telemetry data, which represent generalized subpopulations or local breeding complexes. The six PMUs include: Pine Nut, Desert Creek-Fales, Bodie, Mount Grant, South Mono, and White Mountains PMUs. These six PMUs represent a total of four to eight demographically independent populations with a combined total of approximately 43 active leks (see Table 1 below; Service 2013a, pp. 17–20). Leks are considered either active (i.e., two or more strutting males during at least 2 years in a 5-year period), inactive (i.e., surveyed three or more times during one breeding season with no birds detected and no sign (e.g., droppings) observed), historical (i.e., no strutting activity for 20 years and have been checked according to State protocol at least intermittently), or unknown (i.e., sign was observed, and one or no strutting males observed, or a lek that had activity the prior year but was surveyed under unsuitable conditions during the current year and reported one or no strutting males).

Table 1— Bi-State DPS Population Management Units (PMUs), PMU size, estimated range in population size, number of active leks, and reported range in total males counted on all leks within each PMU.

PMU	Total Size hectares (acres)*	Estimated Population Size Range (2002–2012)**	Current Number of Active Leks**	Lek Count (number of males) Range (2002–2012)**
Pine Nut	232,440 (574,373)	50–331	1	6–22
Desert Creek–Fales	229,858 (567,992)	317–1,268	8	30–190
Mount Grant	282,907 (699,079)	85–1,412	8	12–>140
Bodie	141,490 (349,630)	522–2,400	13	124–510
South Mono	234,508 (579,483)	859–2,005	11	204–426
White Mountains	709,768 (1,753,875)	Data not available	2+	Data not available
Total (all PMUs combined)	1,830,972 (4,524,432)	1,833–7,416	43	376–1,288

* Bi-State Local Planning Group (2004, pp. 11, 32, 63, 102, 127, 153)
** CDFW (2012, unpublished data); NDOW (2012a, unpublished data).

Each sage-grouse population in the Bi-State area is relatively small and below theoretical minimum criteria for long-term persistence, as is the entire DPS on average, which is estimated at 1,833 to 7,416 individuals (formerly California Department of Fish and Game (CDFG), now known as California Department of Fish and Wildlife (CDFW)) 2012, unpublished data; Nevada Department of Wildlife (NDOW) 2012a, unpublished data). The two largest populations exist in the Bodie (Bodie Hills population) and South Mono (Long Valley population) PMUs. The remaining PMUs contain much smaller populations. Sage-grouse abundance declines and sagebrush habitat reductions within

the Bi-State area are both estimated to exceed 50 percent, with losses historically greater on the periphery of the DPS (Service 2013a, p. 135). Overall, the remaining habitat is reduced in quality (see various Impact Analysis discussions in the Species Report including, but not limited to, the "Infrastructure," Nonnative and Native Plants," and "Wildfires and Altered Fire Regime" sections (Service 2013a, pp. 33–113)) and, thereby, sage-grouse carrying capacity is also reduced. Thus, reductions in sage-grouse abundance proportionally exceed habitat loss (in other words, because sage-grouse habitat quality and quantity is reduced by greater than 50 percent as compared to historical information, the expected sage-grouse population numbers (or abundance) are reduced by more than 50 percent). The residual limited connectivity of populations and habitats within and among the PMUs also continues to slowly erode (Service 2013a, pp. 17–29, 34, 51–52, 55, 65, 73–74, 105–108, 135).

Declining Bi-State DPS population trends continue for the Pine Nut, Desert Creek-Fales, and Mount Grant PMUs, with an unknown trend for the White Mountains PMU (Service 2013a, pp. 21–29). These trends are of critical concern at the DPS level because fluctuations in these small, less secure populations are likely to result in extirpations and loss of population redundancy within the DPS. Historical extirpations outside the existing boundaries of the six PMUs present a similar pattern of lost peripheral populations (see "Historical Range/Distribution" section of the Species Report) (Service 2013a, pp. 16–17)). Two range-wide assessments investigating patterns of sage-grouse population persistence confirm that PMUs on the northern and southern extents of the Bi-State DPS (i.e., Pine Nut, Desert Creek-Fales, and White Mountains

PMUs) are similar to extirpated sites elsewhere within the range of greater sage-grouse, while the central PMUs (i.e., South Mono, Bodie, and Mount Grant PMUs) are similar to extant sites (Aldridge *et al*. 2008, entire; Wisdom *et al*. 2011, entire). In other words, these assessments suggest that the sage-grouse populations within the Pine Nut, Desert Creek-Fales, and White Mountains PMUs have an increased risk of extirpation in the near future as compared to the other PMUs that currently harbor larger populations.

The Bodie and South Mono PMUs form the central core of the Bi-State DPS. The Bodie Hills and Long Valley populations are the largest sage-grouse populations within the Bi-State area and encompass approximately 70 percent of existing Bi-State DPS individuals (Service 2013a, pp. 24–27). These populations are relatively stable at present (estimates range from approximately 522 to 2,400 individuals in the Bodie PMU and 859 to 2,005 individuals in the South Mono PMU), and the scope and severity of known impacts are comparatively less than in other PMUs. Although populations currently are relatively stable with overall fewer impacts as compared to the other four PMUs, the Bodie and South Mono PMUs have experienced prior habitat losses, population declines, and internal habitat fragmentation. Significant connectivity between the populations within these two PMUs is currently lacking (Service 2013a, p. 26, 135), and both PMUs (as well as the other four PMUs) are increasingly vulnerable to the effects of cheatgrass invasion (Service 2013a, pp. 65–67, 69) and wildfire impacts (Service 2013a, pp. 69–76).

Together, the Bodie and South Mono PMUs represent less than 20 percent of the historical range for the Bi-State DPS (historically, the DPS occurred throughout most of

Mono, eastern Alpine, and northern Inyo Counties, California (Hall *et al.* 2008, p. 97), and portions of Carson City, Douglas, Esmeralda, Lyon, and Mineral Counties, Nevada (Gullion and Christensen 1957, pp. 131–132; Espinosa 2006)). While both the Bodie and South Mono PMUs (which harbor the two largest populations) are projected by sage-grouse experts to have moderate to high probabilities of persistence into the future (Aldridge *et al*. 2008, entire; Wisdom *et al*. 2011, entire), the Bodie PMU has fluctuated with positive and negative population growth over the past 40 years with no discernible long-term trend (Service 2013a, pp. 24–26). In addition, the Bodie PMU is expected to fall below 500 breeding adults within the next 30 years (Garton *et al.* 2011, p. 310). The long-term population trend for the South Mono PMU has been stable (Service 2013a, p. 26–27), but sage-grouse experts predict an 80 percent chance of the population declining to fewer than 500 breeding adults in 30 years (Garton *et al*. 2011, p. 310).

In summary, the Service anticipates a greater risk of sage-grouse population loss for four of the six PMUs in the Bi-State DPS (i.e., Pine Nut, Desert Creek-Fales, Mount Grant, and White Mountains PMUs) as compared to the PMUs that harbor the central core or largest populations (i.e., Bodie and South Mono PMUs). Additionally, the core population in the Bodie PMU is likely to have reduced viability within 30 years, and the two populations in the South Mono PMU (including one of two core populations—Long Valley) will likely persist but exhibit reduced population viability in the next 30 years.

Following are brief accounts of each PMU. Primary threats are introduced in these summaries and described in more detail in the **Summary of Factors Affecting the**

Species section below, and fully evaluated and described in the "Impact Analysis" section of the Species Report (Service 2013a, pp. 33–127).

(1) The Pine Nut PMU has the smallest number of sage-grouse of all Bi-State DPS PMUs (i.e., 1 population ranging in size from 50 to 331 individuals based on data collected between 2002 and 2012 (Table 1, above). This population represents approximately 5 percent of the DPS. The population in the Pine Nut PMU has some level of connectivity with the Desert Creek-Fales PMU and potentially also with the Bodie and Mount Grant PMUs. Urbanization, grazing management, wildfire, invasive species, infrastructure, and mineral development are affecting this population, and the scope and severity of most of these impacts are likely to increase into the future based on the proximity of the PMU to expanding urban areas, agricultural operations, road networks, and power lines; altered fire regimes; new mineral entry proposals; and increasing recreational off-highway vehicle (OHV) use on public lands. Because of the current small population size and the ongoing and potential future magnitude of habitat impacts, the sage-grouse population in the Pine Nut PMU (i.e., the northern-most population within the range of the Bi-State DPS) is at a greater risk of extirpation than other PMUs within the Bi-State area.

(2) The Desert Creek-Fales PMU straddles the Nevada-California border and contains two populations, one in each State. The two populations have ranged in size from 317 to 1,268 individuals between 2002 and 2012 (Table 1, above). The populations in the Desert Creek-Fales PMU have some level of connectivity with the Pine Nut PMU

and potentially also with the Bodie and Mount Grant PMUs. The most significant impacts in this PMU are wildfire, invasive species (specifically conifer encroachment), infrastructure, and urbanization. Private land acquisitions in California and conifer removal in Nevada and California have mitigated some of the impacts locally within this PMU. However, urbanization and woodland succession remain a concern based on the lack of permanent protection for important brood-rearing (summer) habitat that occurs primarily on irrigated private pasture lands and continued pinyon-juniper encroachment that is contracting distribution of the populations and connectivity between populations. While some of these impacts are more easily alleviated than others (e.g., conifer encroachment), the existing condition is likely to worsen in the future (Bi-State TAC 2012, pp. 24–25). The PMU has seen episodic sage-grouse population declines in the past, and current conditions indicate declines may continue. Long-term persistence of the sage-grouse populations in the Desert Creek-Fales PMU is unlikely without successful implementation of additional conservation measures.

(3) The Mount Grant PMU contains one population, with population estimates between 2002 and 2012 ranging from 85 to 1,412 individuals (Table 1, above). The population in the Mount Grant PMU has some level of connectivity with the Bodie PMU and potentially also with the Desert Creek-Fales and Pine Nut PMUs. Habitat impact sources in this PMU include woodland encroachment, renewable energy and mineral development, infrastructure, and the potential for wildfire. Woodland encroachment, mineral development, and infrastructure currently fragment habitat in this PMU and, in the future, these as well as wildfire (if it occurs) may reduce or eliminate connectivity to

the sage-grouse population in the adjacent Bodie PMU. Long-term persistence of the sage-grouse population in the Mount Grant PMU is less likely than in the other PMUs that currently harbor larger populations of sage-grouse in the Bi-State area without successful implementation of additional conservation measures.

(4) The Bodie PMU contains one population (Bodie Hills), which is one of the two core (largest) populations for the Bi-State DPS. Population estimates for this PMU over the past decade range from 552 to 2,400 individuals (Table 1, above). This PMU typically has the highest number of active leks (i.e., 13) of all the PMUs. The population in the Bodie PMU has some level of connectivity with the Mount Grant PMU and potentially also with the Desert Creek-Fales and Pine Nut PMUs. Woodland succession is estimated to have caused a 40 percent reduction in sagebrush habitat throughout the Bodie PMU, and encroachment into sagebrush habitat is expected to continue both from woodland edge expansion and infilling. The potential of future wildfire (largely unrealized) and subsequent widespread habitat loss by conversion to annual grasses is of greatest concern based on the increased understory presence of cheatgrass, specifically Wyoming big sagebrush (*Artemisia tridentata* spp. *wyomingensis*) communities within the Bodie PMU (e.g., Bodie Hills). In addition, the potential for additional loss (largely restricted to date) of sage-grouse habitat to exurban development (i.e., development of a small, usually prosperous community situated beyond the suburbs of a city) on unprotected private lands in the Bodie PMU is also a concern because these lands provide summer and winter use areas and connectivity among the Bodie, Mount Grant, and Desert Creek-Fales PMUs. Current impacts posed by infrastructure, grazing, and mineral

extraction are of minimal severity in the Bodie PMU, but additional future impacts are anticipated.

(5) The South Mono PMU contains two populations (Long Valley and Parker Meadows). The Long Valley population is one of the two largest (core) populations for the Bi-State DPS. Population estimates for this PMU over the past decade range from 859 to 2,005 individuals (Table 1). The South Mono PMU has typically had the highest estimated population size of all the PMUs. This PMU is considered to be largely isolated from the other PMUs. Currently, the most significant impacts in the South Mono PMU are infrastructure and recreation, with the potential for increased wildfire. An important indirect impact of infrastructure to the sage-grouse population in Long Valley is predation, likely associated with the local landfill. Predation (primarily from ravens) appears to reduce sage-grouse nest success in Long Valley, although the population appears stable. The Parker Meadows population currently has one active lek and is quite small; from 2002 to 2010, male sage-grouse counts have ranged between 3 and 17. This population has the lowest reported genetic diversity in the Bi-State area, and it is experiencing high nest failure rates due to nonviable eggs (Gardner 2009, entire), potentially indicative of genetic challenges.

(6) The White Mountains PMU contains one population. No recent population estimate for this southern-most PMU is available, and, overall, information on population status and impacts is limited. The area is remote and difficult to access, and most data are from periodic observations rather than comprehensive surveys. The population in the

White Mountains PMU is considered to be largely isolated from the other PMUs. Current impacts such as exurban development (e.g., Chiatovich Creek area (Bi-State Lek Surveillance Program 2012, p. 38)), grazing, recreation, and invasive species may be influencing portions of the population and are likely to increase in the future, but current impacts are considered minimal due to the remote locations of most known sage-grouse use areas. Potential future impacts from infrastructure (power lines, roads) and mineral developments could lead to the loss of the remote, contiguous nature of the habitat. Because the population in the White Mountains PMU is small and on the periphery of the range of the Bi-State DPS, it is vulnerable to extirpation if future impacts increase.

Summary of Factors Affecting the Species

Under the Act, we can determine that a species is an endangered or threatened species based on any 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.

A threats analysis for the Bi-State DPS is included in the Species Report (Service 2013a, entire) associated with this proposed rule (and available at *http://www.regulations.gov* under Docket No. FWS–R8–ES–2013–0072*,* *http://www.fws.gov/cno/*, *http://www.fws.gov/nevada/*, and *http://www.fws.gov/ventura/*).

All potential threats of which we are aware that are acting upon the Bi-State DPS currently or in the future (and consistent with the five listing factors identified above) were evaluated and addressed in the Species Report, and are summarized in the following paragraphs.

Many of the impacts to sage-grouse populations and sagebrush habitats in the Bi-State DPS are present throughout the range, and, while they currently affect the DPS to varying degrees, these impacts are likely to continue into the future. The populations and habitat in the northern extent of the Bi-State area, including the Pine Nut, Desert Creek-Fales, and Mount Grant PMUs, are now and will continue to be most at risk from the various threats acting upon the Bi-State DPS and its habitat. We anticipate loss of some populations and contraction of the ranges of others in these three PMUs (see *Species Information* section above and "Bi-State DPS Population Trends" section of the Species Report), which will leave them susceptible to extirpation from stochastic events such as wildfire, drought, and disease. We expect that only two isolated populations in the Bodie and South Mono PMUs (i.e., the Bodie Hills and Long Valley populations, respectively) may remain in 30 years (Aldridge *et al*. 2008, entire; Garton *et al*. 2011, p. 310; Wisdom *et al*. 2011, entire).

The impacts that are of high current or future scope and severity within the DPS (i.e., the most significant threats overall across the range of the Bi-State DPS) include those that are resulting in the present or threatened destruction, modification, or curtailment of its habitat or range, and other natural or manmade threats affecting the

DPS's continued existence. These significant threats include infrastructure (i.e., fences, power lines, and roads) (Factors A and E); grazing and rangeland management (Factors A, C, and E); nonnative and native, invasive plants (e.g., pinyon-juniper encroachment, cheatgrass) (Factors A and E); wildfires and altered fire regime (Factors A and E); and the small size of the DPS (both the number of individual populations and their size), which increases the risk of extinction (Factor E). In addition, the small number, size, and isolation of the populations may magnify the effects of other less significant impacts that are currently acting upon the Bi-State DPS, including urbanization and habitat conversion, mining, renewable energy development, climate (including drought), overutilization, recreation, disease, and predation) (Factors A, B, C, and E). Many of these impacts, including those that are currently considered minor (as compared to significant), are also cumulatively acting upon the Bi-State DPS and, therefore, increase the risk of extinction. Following a thorough analysis of the best available information, we determined that hunting, scientific and educational uses, pesticides and herbicides, and contaminants have negligible impacts to the Bi-State DPS at this time.

The Bi-State DPS is experiencing multiple, identifiable interacting impacts (i.e., synergistic effects) to sage-grouse populations and sagebrush habitats that are ongoing (and expected to continue into the future) in many areas throughout the DPS's range; some of these threats are imminent in certain portions of the DPS's range. Individually, each of these impacts is unlikely to affect persistence across the entire Bi-State DPS, but each may act independently to affect persistence of individual populations. The scope, severity, and timing of these impacts vary at the individual PMU level. In particular,

rangewide impacts resulting in fragmentation and the destruction, modification, or curtailment of the DPS's habitat or range are occurring through infrastructure; grazing and rangeland management; nonnative and native invasive species (e.g., cheatgrass, pinyon-juniper encroachment); and wildfire and an altered fire regime.

While additional less significant impacts are not occurring everywhere across the DPS at this time (such as, but not limited to, urbanization, mining, renewable energy development, or West Nile virus (WNv) infections), where impacts are occurring, the risk they pose to the DPS could be exacerbated and magnified in the future due to the small number, size, and isolation of populations within the DPS. We are unaware of information that can be used to predict future locations where some impacts could manifest on the landscape (such as effects of climate change, or locations of wildfires that in turn could continue the spread of nonnative species such as cheatgrass within the Bi-State area). To the extent to which these impacts occur within habitat used by the Bi-State DPS, due to the low number of populations and their mostly small sizes, the effects to the DPS throughout its range could be magnified. Due to the scope of the impacts occurring throughout the range of the DPS, current and anticipated future habitat degradation, fragmentation and loss, and isolation of already small populations, the potential severity of impacts to the entire Bi-State DPS is considered high.

Following are summary evaluations of 16 potential threats to the Bi-State DPS, including: Nonnative and native, invasive species (Factor A and E); wildfires and altered fire regime (Factors A and E); infrastructure, including roads, power lines, fences,

communication towers, and landfills (Factors A and E); grazing and rangeland management (Factors A, C, and E); small population size and population structure (Factor E); urbanization and habitat conversion (Factor A); mining (Factors A and E); renewable energy development and associated infrastructure (Factors A and E); disease or predation (Factor C); climate change, including drought (Factors A and E); recreation (Factors A and E); overutilization (including commercial and recreational hunting) (Factor B); scientific and educational uses (Factor B); pesticides and herbicides (Factor E); and contaminants (Factor E). The inadequacy of existing regulatory mechanisms was also evaluated (Factor D). Please see the Species Report (Service 2013a, pp. 33–127) for a full evaluation, including but not limited to, an evaluation of the scope, severity, and timing of each potential threat (including many literature citations).

Nonnative and Native, Invasive Plants

Nonnative, invasive plants negatively impact sagebrush ecosystems by altering plant community structure and composition, productivity, nutrient cycling, and hydrology (Vitousek 1990, p. 7) (Factor A), and may cause declines in native plant populations through competitive exclusion and niche displacement, among other mechanisms (Mooney and Cleland 2001, p. 5446) (Factor E). They can create long-term changes in ecosystem processes (Factor A), such as fire cycles (see *Wildfires and Altered Fire Regime* section below, and in the Species Report (Service 2013a, pp. 69–76)) and other disturbance regimes that persist even after an invasive plant is removed (Zouhar *et al*. 2008, p. 33). A variety of nonnative annuals and perennials are invasive to sagebrush

ecosystems (Connelly *et al.* 2004, pp. 7-107 to 7-108; Zouhar *et al.* 2008, p. 144). Cheatgrass is considered most invasive in Wyoming sagebrush communities (which is a subspecies of sagebrush that occurs in the Bi-State area), while medusahead rye (*Taeniatherum caput-medusae* (L.) Nevski) fills a similar niche in more mesic communities with heavier clay soils (Connelly *et al.* 2004, p. 5-9).

Some native tree species are also invading sagebrush habitat and impacting the suitability of the habitat for the various life processes of the Bi-State DPS. Pinyon-juniper woodlands are a native vegetation community dominated by *Pinus edulis* (pinyon pine) and various *Juniperus* (juniper) species that can encroach upon, infill, and eventually replace sagebrush habitat (Factors A and E). Some portions of the Bi-State DPS's range are also being adversely affected by *Pinus jeffreyi* (Jeffrey pine) encroachment. Woodland encroachment is causing significant, measurable habitat loss throughout the range of the Bi-State DPS. While techniques to address this habitat impact are available and being implemented, the scale of such efforts is currently inadequate. Woodlands have expanded by an estimated 20,234 to 60,703 hectares (ha) (50,000 to 150,000 acres (ac)) over the past decade in the Bi-State area, but woodland treatments have only been implemented on 6,475 ha (16,000 ac) (Service 2013b, unpublished data). Overall, forest or woodland encroachment into occupied sage-grouse habitat reduces, and likely eventually eliminates, sage-grouse use.

Both nonnative and native, invasive plants are impacting the sage-grouse and its habitat in the Bi-State area. In general, nonnative plants are not abundant in the Bi-State

area, with the exception of cheatgrass, which occurs in all PMUs throughout the range of the DPS (although it is currently most extensive in the Pine Nut PMU). Cheatgrass will likely continue to expand across the entire Bi-State area in the future and increase the adverse impact that currently exists to sagebrush habitats and the greater sage-grouse through outcompeting beneficial understory plant species and altering the fire ecology of the area. Alteration of the fire ecology of the Bi-State area is of greatest concern. Land managers have had little success preventing cheatgrass invasion in the West, and elevational barriers to occurrence are becoming less restrictive (Miller *et al*. 2011, p. 161; Brown and Rowe *in litt.*, entire). The best available data suggest that future conditions, mostly influenced by precipitation and winter temperatures, will be more hospitable for cheatgrass (Bradley 2009, p. 201). Cheatgrass is a serious challenge to the sagebrush shrub community and its spread will be detrimental to sage-grouse in the Bi-State area. In addition, the encroachment of native woodlands (particularly pinyon-juniper) into sagebrush habitats is occurring throughout the Bi-State area, and continued isolation and reduction of suitable habitats will further adversely influence both short- and long-term persistence of sage-grouse. We predict that future woodland encroachment will continue across the entire Bi-State area, but recognize this is a potentially manageable threat through treatment and management actions. To date, woodland encroachment has outpaced management efforts.

Overall, nonnative and native, invasive species occur throughout the entire Bi-State DPS's range and have a significant impact on the DPS both currently and in the future. This is based on the extensive amount of pinyon-juniper encroachment and

cheatgrass invasion that is occurring throughout the range of the Bi-State DPS, and the interacting impact these invasions have on habitat quality (e.g., reduces foraging habitat, increases likelihood of wildfire) and habitat fragmentation. See the "Nonnative and Native Invasive Species" section of the Species Report for further discussion (Service 2013a, pp. 65–69).

Wildfires and Altered Fire Regime

Wildfire is the principle disturbance mechanism affecting sagebrush communities, although the nature of historical fire patterns, particularly in Wyoming big sagebrush vegetation communities, is not well understood and historically infrequent (Miller and Eddleman 2000, p. 16; Zouhar *et al*. 2008, p. 154; Baker 2011, pp. 189, 196). The historical sagebrush systems likely consisted of extensive sagebrush habitat dotted by small areas of grassland that were maintained by numerous small fires with long interludes between fires, which accounted for little burned area, and that were punctuated by large fire events (Baker 2011, p. 197). In general, fire extensively reduces sagebrush within burned areas, and the most widespread species of sagebrush can take decades to re-establish and much longer to return to pre-burn conditions (Braun 1998, p. 147; Cooper *et al*. 2007, p. 13; Lesica *et al.* 2007, p. 264; Baker, 2011, pp. 194–195).

When intervals between wildfire events become unnaturally long in sagebrush communities, woodlands have the ability to expand (allowing seedlings to establish and trees to mature (Miller *et al*. 2011, p. 167)) when they are adjacent to or are present (in

small quantities) within sagebrush habitat. Conifer woodlands have expanded into sagebrush ecosystems throughout the sage-grouse's range over the last century (Miller *et al.* 2011, p. 162). Alternatively, a shortened fire frequency interval within sagebrush habitat can result in the invasion of nonnative, invasive, annual grasses, such as cheatgrass and medusahead rye; once these nonnatives are established, wildfire frequency within sagebrush ecosystems can increase (Zouhar *et al*. 2008, p. 41; Miller *et al*. 2011, p. 167; Balch *et al*. 2013, p. 178).

While multiple factors can influence sagebrush persistence, wildfire can cause large-scale habitat losses that lead to fragmentation and isolation of sage-grouse populations (Factors A and E). In addition to loss of habitat and its influence on sage-grouse population persistence, fragmentation and isolation of populations presents a higher probability of extirpation in disjunct areas (Knick and Hanser 2011, p. 395; Wisdom *et al.* 2011, p. 469). As areas become isolated through disturbances such as wildfire, populations are exposed to additional threats (or threats already present but to a minor or negligible degree) and the Bi-State DPS's persistence may be hampered by the limited ability of individuals to disperse into areas that are otherwise not self-sustaining. Thus, while direct loss of habitat due to wildfire is a significant factor associated with population persistence for sage-grouse (Beck *et al*. 2012, p. 452), the indirect effect from loss of connectivity among populations may greatly expand the influence of this threat beyond the physical fire perimeter.

Wildfire is considered a relatively high risk across all the PMUs in the Bi-State area due to its ability to affect large landscapes in a short period of time (Bi-State Technical Advisory Committee (TAC) 2012, pp. 19, 26, 32, 37, 41, 49). Furthermore, the future risk of wildfire is exacerbated by the presence of people, invasive species, and climate change. While dozens of wildfires have occurred in the Pine Nut, Desert Creek-Fales, Bodie, and South Mono PMUs (fewer in the Mount Grant and White Mountains PMUs) over the past 20 years, to date there have been relatively few large-scale events. In general, although current data do not indicate an increase of wildfires in the Bi-State DPS, based on continuing habitat conditions, we predict an increase in wildfires over time. Furthermore, cheatgrass is increasing within the Bi-State area, particularly in the Pine Nut PMU where several recent fires have occurred, which appears to mirror the damaging fire and invasive species cycle that affects sagebrush habitat across much of the southern Great Basin.

Changes in fire ecology over time have resulted in an altered fire regime in the Bi-State area, presenting future wildfire risk in all PMUs (Bi-State TAC 2012, pp. 19, 26, 32, 37, 41, 49). A reduction in fire occurrence has facilitated the expansion of woodlands into montane sagebrush communities in all PMUs (see *Nonnative and Native, Invasive Plants*, above). Meanwhile, a pattern of overabundance in wildfire occurrence in sagebrush communities is apparent in the Pine Nut PMU. Each of these alterations to wildfire regimes has contributed to fragmentation of habitat and the isolation of the sage-grouse populations (Bi-State Local Planning Group 2004, pp. 95–96, 133).

The loss of habitat due to wildfire across the West is anticipated to increase due to the intensifying, synergistic interactions among fire, people, invasive species, and climate change (Miller *et al*. 2011, p. 184). The recent past- and present-day fire regimes across the sage-grouse's range (i.e., beyond the range of the Bi-State DPS) have changed with a demonstrated increase of wildfires in the more arid Wyoming big sagebrush communities and a decrease of wildfire across many mountain sagebrush (*Artemisia tridentata* ssp. *vaseyana*) communities (Miller *et al*. 2011, pp. 167–169). Both altered fire regime scenarios have caused losses to sage-grouse habitat through facilitating nonnative, invasive weed encroachment at lower elevations and conifer expansion at high-elevation interfaces (Miller *et al*. 2011, pp. 167–169).

In the face of climate change, both scenarios are anticipated to worsen (Baker 2011, p. 200; Miller *et al*. 2011, p. 179), including in the Bi-State area. Predicted changes in temperature, precipitation, and carbon dioxide (see "Climate Change" section of the Species Report (Service 2013a, pp. 76–83)) are all anticipated to influence vegetation dynamics and alter fire patterns resulting in the increasing loss and conversion of sagebrush habitats (Neilson *et al*. 2005, p. 157). Many climate scientists suggest that in addition to the predicted change in climate toward a warmer and generally dryer Great Basin, variability of interannual and interdecadal wet-dry cycles will likely increase and act in concert with fire, disease, and invasive species to further stress the sagebrush ecosystem (Neilson *et al*. 2005, p. 152). See the *Synergistic Effects* section below and the "Overall Summary of Species Status and Impacts" section of the Species Report (Service 2013a, pp. 135–147) for further discussion of synergistic effects. The anticipated

increase in suitable conditions for wildland fire will likely further be influenced by people and infrastructure. Human-caused fires have increased and are correlated with road presence across the sage-grouse's range, and a similar pattern may exist in the Bi-State area (Miller *et al*. 2011, p. 171).

Fire is one of the primary factors linked to population declines of sage-grouse across the West because of long-term loss of sagebrush and frequent conversion to monocultures of nonnative, invasive grasses (Connelly and Braun 1997, p. 7; Johnson *et al*. 2011, p. 424; Knick and Hanser 2011, p. 395). Within the Bi-State area, the Bureau of Land Management (BLM) and U.S. Forest Service (USFS) currently manage the area to limit the loss of sagebrush habitat given adequate resources (BLM 2012, entire; USFS 2012, entire). Based on the best available information, historical wildfire events have not removed a significant amount of sagebrush habitat across the Bi-State area, and conversion of sagebrush habitat to a nonnative invasive vegetation community has been restricted (except for the Pine Nut PMU). It does appear that a lack of historical fire has facilitated the establishment of woodland vegetation communities and loss of sagebrush habitat. Both the "too-little" and "too-much" fire scenarios present challenges for the Bi-State DPS. The former influences the current degree of connectivity among sage-grouse populations in the Bi-State area and the extent of available sagebrush habitat, likely affecting sage-grouse population size and persistence as a result of habitat modification (such as through conifer encroachment). The latter, under current conditions, now has the potential to quickly alter a large portion of remaining sagebrush habitat.

Restoration of altered sagebrush communities following fire is difficult, requires many years, and may be ineffective in the presence of nonnative, invasive grass species. Additionally, sage-grouse are slow to recolonize burned areas even if structural features of the shrub community have recovered (Knick *et al*. 2011, p. 233).

While it is not currently possible to predict the extent or location of future fire events in the Bi-State area, and historical wildfire events have not removed a significant amount of sagebrush habitat across Bi-State area to date, we anticipate fire frequency to increase in the future due to the increasing presence of cheatgrass and people, and the projected effects of climate change. Given the fragmented nature and small size of the populations within the Bi-State DPS, increasing wildfires in sagebrush habitats would likely have a significant adverse effect on the overall viability of the DPS.

Overall, this threat of wildfire and the existing altered fire regime occurs throughout the Bi-State DPS's range, and has a significant impact on the DPS both currently and in the future. This is based on a continued fire frequency that exacerbates pinyon-juniper encroachment into sagebrush habitat in some locations, but also an increased fire frequency in other locations that promotes the spread of cheatgrass and other invasive species that in turn can hamper recovery of sagebrush habitat. See the "Wildfires and Altered Fire Regime" section of the Species Report for further discussion (Service 2013a, pp. 69–76).

Infrastructure

Infrastructure is described in the Species Report (Service 2013a, pp. 38–52) to include features that assist or are required for the pursuit of human-initiated development or an associated action. Five infrastructure features are impacting the Bi-State DPS: three linear features (roads, power lines, and fences) and two site-specific features (landfills and communication towers). While there may be other features that could be characterized as infrastructure (such as railroads or pipelines), these are not present in the Bi-State area, and we are unaware of any information suggesting they would impact the Bi-State DPS in the future.

In the Bi-State area, linear infrastructure impacts each PMU both directly and indirectly to varying degrees. Existing roads, power lines, and fences degrade and fragment sage-grouse habitat (such as Braun 1998, pp. 145, 146) (Factor A), and contribute to direct mortality through collisions (such as Patterson 1952, p. 81) (Factor E). In addition, roads, power lines, and fences deter the sage-grouse's use of otherwise suitable habitats adjacent to current active areas, and increase predators and invasive plants (such as Forman and Alexander 1998, pp. 207–231 and Connelly *et al.* 2000a, p. 974).

The impact to the Bi-State DPS caused by indirect effects extends beyond the immediate timeframe associated with the infrastructure installation (i.e., the existence of an extended road system, power lines, and fencing already likely limit our ability to recover the Bi-State DPS in various areas). We do not have consistent and comparable

information on miles of existing roads, power lines, or fences, or densities of these features within PMUs or for the Bi-State area as a whole. However, given current and future development (based on known energy resources), the Mount Grant, Desert Creek-Fales, Pine Nut, and South Mono PMUs are likely to be the most directly influenced by new power lines and associated infrastructure. Wisdom *et al*. (2011, p. 463) reported that across the entire range of the greater sage-grouse, the mean distance to highways and transmission lines for extirpated populations was approximately 5 kilometers (km) (3.1 miles (mi)) or less. In the Bi-State area, between 35 and 45 percent of annually occupied leks are within 5 km (3.1 mi) of highways, and between 40 and 50 percent are within this distance to existing transmission lines (Service 2013b, unpublished data). Therefore, the apparent similarity between existing Bi-State conditions and extirpated populations elsewhere suggests that persistence of substantial numbers of leks within the Bi-State DPS will likely be negatively influenced by these anthropogenic features.

The geographic extent, density, type, and frequency of linear infrastructure disturbance in the Bi-State area have changed over time. While substantial new development of some of these features (e.g., highways) is unlikely, other infrastructure features are likely to increase (secondary roads, power lines, fencing, and communication towers). Furthermore, improvements to existing roads are possible, and traffic volume will likely increase, which may be a bigger impact than road development itself. For example, with the proliferation of OHV usage within the range of the Bi-State DPS, the potential impact to the sage-grouse and its habitat caused by continued use of secondary or unimproved roads may become of greater importance as traffic volume increases rates

of disturbance and the spread of nonnative invasive species in areas that traditionally have been traveled relatively sporadically.

Other types of non-road infrastructure (e.g., cellular towers and landfills) also appear to be adversely impacting the Bi-State DPS. At least eight cellular tower locations are currently known to exist in occupied habitat (all PMUs) in the Bi-State area. Wisdom *et al*. (2011, p. 463) determined that presence of cellular towers likely contribute to population extirpation, and additional tower installations will likely occur in the near future as development continues. The landfill facility in Long Valley (within the South Mono PMU) is likely influencing sage-grouse population demography in the area, as nest success is comparatively low and subsidized avian nest predator numbers are high (Kolada *et al*. 2009, p. 1,344). While this large population of sage-grouse (i.e., one of two core populations in the Bi-State area) currently appears stable, recovery following any potential future perturbations affecting other vital rates (i.e., brood survival and adult survival) will be limited by nesting success.

Overall, infrastructure occurs in various forms throughout the Bi-State DPS's range and has adversely impacted the DPS. These impacts are expected to continue or increase in the future and result in habitat fragmentation; limitations for sage-grouse recovery actions due to an extensive road network, power lines, and fencing; and a variety of direct and indirect impacts, such as loss of individuals from collisions or structures that promote increased potential for predation. Collectively, these threats may result in perturbations that influence both demographic vital rates of sage-grouse (e.g.,

reproductive success and adult sage-grouse survival) and habitat suitablity in the Bi-State area. See the "Infrastructure" section of the Species Report for further discussion (Service 2013a, pp. 38–52).

Grazing and Rangeland Management

Livestock grazing continues to be the most widespread land use across the sagebrush biome (Knick *et al.* 2003, p. 616; Connelly *et al.* 2004, p. 7-29; Knick *et al.* 2011, p. 219), including within the Bi-State area. However, links between grazing practices and population levels of sage-grouse are not well-studied (Braun 1987, p. 137; Connelly and Braun 1997, p. 231). Domestic livestock management has the potential to result in sage-grouse habitat degradation (Factor A). Grazing can adversely impact nesting and brood-rearing habitat by decreasing vegetation used for concealment from predators (Factors A and C). Grazing also compacts soils; decreases herbaceous abundance; increases soil erosion; and increases the probability of invasion of nonnative, invasive plant species (Factor A). Livestock management and associated infrastructure (such as water developments and fencing) can degrade important nesting and brood rearing habitat, reduce nesting success, and facilitate the spread of WNv (Factors A, C, and E). However, despite numerous documented negative impacts, some research suggests that under specific conditions, grazing domestic livestock can benefit sage-grouse (Klebenow 1982, p. 121). Other research conducted in Nevada found that cattle grazing can be used to stimulate forbs important as sage-grouse food (Neel 1980, entire; Klebenow 1982, entire; Evans 1986, entire).

Similar to domestic livestock, grazing and management of feral horses have the potential to negatively affect sage-grouse habitats by decreasing grass cover, fragmenting shrub canopies, altering soil characteristics, decreasing plant diversity, and increasing the abundance of invasive cheatgrass (Factor A). Native ungulates (mule deer (*Odocoileus hemionus*) and pronghorn antelope (*Antilocapra americana*)) co-exist with sage-grouse in the Bi-State area, but we are not aware of significant impacts from these species on sage-grouse populations or sage-grouse habitat. However, the impacts from different ungulate taxa may have an additive negative influence on sage-grouse habitats (Beever and Aldridge 2011, p. 286). Cattle, horses, mule deer, and pronghorn antelope each use the sagebrush ecosystem somewhat differently, and the combination of multiple ungulate species may produce a different result than a single species.

There are localized areas of habitat degradation in the Bi-State area attributable to past grazing practices that indirectly and, combined with other impacts, cumulatively affect sage-grouse habitat. In general, upland sagebrush communities in the Pine Nut and Mount Grant PMUs deviate from desired conditions for sage-grouse due to lack of understory plant species, while across the remainder of the PMUs localized areas of meadow degradation are apparent, and these conditions may influence sage-grouse populations through altering nesting and brood-rearing success. Currently, there is little direct evidence linking grazing effects and sage-grouse population responses. Analyses for grazing impacts at the landscape scales important to sage-grouse are confounded by the fact that almost all sage-grouse habitat has at one time been grazed, and thus, no

ungrazed control areas exist for comparisons (Knick *et al*. 2011, p. 232). Across the Bi-State area, we anticipate rangeland management will continue into the future, and some aspects (such as feral horses) will remain difficult to manage. Remaining impacts caused by historical practices will linger as vegetation communities and disturbance regimes recover. Change will likely occur slowly, and alterations to climate and drought cycles will present additional stress on vegetation resources as well as the nature and extent of recovery to sage-grouse and its habitat.

Overall, impacts from past grazing and rangeland management occur within localized areas throughout the Bi-State DPS's range (i.e., all PMUs, although it is more pronounced in some PMUs than others). These impacts have resulted in ongoing habitat degradation that significantly affect sage-grouse habitat indirectly and cumulatively in the Bi-State area, resulting in an overall reduction in aspects of habitat quality (e.g., fragmentation, lack of understory plants, increased presence of nonnative plant species), especially in the Pine Nut and Mount Grant PMUs. See the "Grazing and Rangeland Management" section of the Species Report for further discussion (Service 2013a, pp. 58–64).

Small Population Size and Population Structure

Sage-grouse have low reproductive rates and high annual survival (Schroeder *et al.* 1999, pp. 11, 14; Connelly *et al.* 2000a, pp. 969–970), resulting in a long recovery period due to slower potential or intrinsic population growth rates than is typical of other

game birds. Also, as a consequence of their site fidelity to seasonal habitats (Lyon and Anderson 2003, p. 489), measurable population effects may lag behind negative habitat impacts (Wiens and Rotenberry 1985, p. 666). Sage-grouse populations have been described as exhibiting multi-annual fluctuations, meaning that some mechanism or combination of mechanisms is causing populations to fluctuate through time. In general, while various natural history characteristics would not limit sage-grouse populations across large geographic scales under historical conditions of extensive habitat, they may contribute to local population declines or extirpations when populations are small or when weather patterns, habitats, or mortality rates are altered (Factor E).

The Bi-State DPS is comprised of approximately 43 active leks representing 4 to 8 relatively discrete populations (see *Species Information*, above, and the "Current Range/Distribution and Population Estimates/Annual Lek Counts" section of the Species Report (Service 2013a, pp. 17–29)). Fitness and population size within the Bi-State DPS are strongly correlated and smaller populations are more subject to environmental and demographic stochasticity (Keller and Waller 2002, pp. 239–240; Reed 2005, p. 566). When coupled with mortality stressors related to human activity (e.g., infrastructure, recreation) and significant fluctuations in annual population size, long-term persistence of small populations (in general) is unlikely (Traill *et al*., 2010, entire). The Pine Nut PMU has the smallest number of sage-grouse of all Bi-State area PMUs (usually fewer than 100 individuals, and ranging from 50 to 331 individuals as observed from data collected between 2002 and 2012 (Table 1, above), representing approximately 5 percent of the DPS). However, each population in the Bi-State DPS is relatively small and below

theoretical minimum threshold (as interpreted by sage-grouse experts and not statistically proven (Aldridge and Brigham 2003, p. 30; Garton *et al*. 2011, pp. 310, 374) for long-term persistence, as is the entire DPS on average (estimated 1,833 to 7,416 individuals).

Overall, small population size and population structure occur throughout the Bi-State DPS's range and have a significant impact on the DPS both currently and likely in the future. This is based on our understanding of the overall DPS population size and the apparent isolation among populations contained within the DPS, as inferred from demographic and genetic investigations (e.g., Casazza *et al*. 2009, entire; Oyler–McCance and Casazza 2011, p. 10; Tebenkamp 2012, p. 66). This, combined with the collective literature (Franklin and Frankham 1998, entire; Lynch and Lande 1998, entire; Reed 2005, entire; Traill *et al*., 2010, entire) available that demonstrates both long-term population persistence and evolutionary potential, is challenged in small populations. Some literature (i.e., Franklin and Frankham 1998, entire; Traill *et al*. 2010, entire) suggest that greater than 5,000 individuals are required for a population to have an acceptable degree of resilience in the face of environmental fluctuations and catastrophic events, and for the continuation of evolutionary process. According to the best available information presented in our analysis for the Bi-State area (Service 2013a, Table 1, pp. 20–31), the largest estimated populations (based on data from 2002 through 2012) are within the Bodie PMU (522 to 2,400 individuals) and South Mono PMU (859 to 2,005 individuals). See additional discussion the "Small Population Size and Population Structure" section of the Species Report for further discussion (Service 2013a, pp. 105–110).

Urbanization and Habitat Conversion

Historical and recent conversion of sagebrush habitat on private lands for agriculture, housing, and associated infrastructure (Factor A) within the Bi-State area has negatively affected sage-grouse distribution and population extent in the Bi-State DPS, thus limiting current and future conservation opportunities in the Bi-State area. These alterations to habitat have been most pronounced in the Pine Nut and Desert Creek-Fales PMUs and to a lesser extent the Bodie, Mount Grant, South Mono, and White Mountains PMUs. Although only 14 percent of suitable sage-grouse habitat occurs on private lands in the Bi-State area, and only a subset of that could potentially be developed, conservation actions on adjacent public lands could be compromised due to the high percentage (up to approximately 75 percent (Service 2013b, unpublished data)) of late brood-rearing habitat that occurs on the private lands. Sage-grouse display strong site fidelity to traditional seasonal habitats and loss of specific sites (such as mesic meadow or spring habitats that typically occur on potentially developable private lands in the Bi-State area) can have pronounced population impacts (Connelly *et al*. 2000a, p. 970; Atamian *et al*. 2010, p. 1533). The influence of land development and habitat conversion on the population dynamics of sage-grouse is greater than a simple measure of spatial extent because of the indirect effects from the associated increases in human activity, as well as the disproportionate importance of some seasonal habitat areas, such as mesic areas for brood-rearing.

Although not currently considered a significant threat, urbanization and habitat conversion is not universal across the Bi-State area, but localized areas of impacts have been realized throughout the DPS's range, and additional future impacts are anticipated. At this time, we are concerned because of the high percentage of late brood-rearing habitat that could be impacted on these private lands. See the "Urbanization and Habitat Conversion" section of the Species Report for further discussion (Service 2013a, pp. 33–38).

Mining

Surface and subsurface mining for mineral resources (gold, silver, aggregate, and others) results in direct loss of habitat if occurring in sagebrush habitats (Factor A). The direct impact from surface mining is usually greater than it is from subsurface mining, and habitat loss from both types of mining can be exacerbated by the storage of overburden (soil removed to reach subsurface resource) in otherwise undisturbed habitat. Sage-grouse and nests with eggs could be directly affected by crushing or vehicle collision (Factor E). Sage-grouse also could be impacted indirectly from an increase in human presence, land use practices, ground shock, noise, dust, reduced air quality, degradation of water quality and quantity, and changes in vegetation and topography (Moore and Mills 1977, entire; Brown and Clayton 2004, p. 2) (Factor E).

Currently, operational surface and subsurface mining activities are not impacting the two largest (core) populations within the Bi-State DPS (although areas in multiple

PMUs are open to mineral development, and mining operations are currently active in the Mount Grant, Bodie, South Mono, and Pine Nut PMUs, including some occupied habitat areas). In addition, existing inactive mine sites and potential future developments could impact important lek complexes and connectivity areas between, at minimum, the Bodie and Mount Grant PMUs. If additional mineral developments occur in sagebrush habitats within any PMU, this could negatively influence the distribution of sage-grouse and the connectivity among breeding complexes. There is potential for additional mineral developments to occur in the Bi-State area in the future based on known existing mineral resources and recent permit request inquiries with local land managers. While all six PMUs have the potential for mineral development, based on current land designations and past activity, the Pine Nut and Mount Grant PMUs are most likely to see new and additional activity.

Overall, mining currently occurs in limited locations within four PMUs, including small-scale activities such as gold and silver exploration (Pine Nut, Bodie, and South Mono PMUs), and two open pit mines (Mount Grant PMU). These existing activities may be impacting one large lek in the Bodie PMU; four leks in the Mount Grant PMU, including the Aurora lek complex, which is the largest remaining lek in this PMU; and an undetermined number (although likely few) leks in the South Mono PMU. Additionally, new proposals being considered for mining activity in the Pine Nut PMU could, if approved, impact the single active lek remaining in the north end of the Pine Nut PMU. In general, potential exists for operations to expand both currently and into the future. By itself, mining is not considered a significant impact at this time, but is a concern based on

existing impacts to sage-grouse and its habitat outside of the two largest (core) populations, the potential for mining activities to impact important lek complexes and connectivity areas between (at minimum) the Bodie and Mount Grant PMUs in the future, and the likely synergistic effects occurring when this threat is combined with other threats acting on the Bi-State DPS currently and in the future. See the "Mining" section of the Species Report for further discussion (Service 2013a, pp. 52–54).

Renewable Energy Development

Renewable energy facilities (including geothermal facilities, wind power facilities, and solar arrays) require structures such as power lines and roads for construction and operation, and avoidance of such features by sage-grouse (Factor E) and other prairie grouse is documented (Holloran 2005, p. 1; Pruett *et al.* 2009, p. 6; see discussions regarding roads and power lines in the "Infrastructure" section of the Species Report (Service 2013a, pp. 40–47)). Renewable energy development and expansion could result in direct loss of habitat and indirect impacts affecting population viability (e.g., fragmentation and isolation) (Factor A).

Minimal direct habitat loss has occurred in the Bi-State DPS due to renewable energy development, specifically from the only operational geothermal facility in the Bi-State area, which is within the South Mono PMU. However, the likelihood of additional renewable energy facility development, especially geothermal, in the Bi-State area is high based on current Federal leases. Inquiries by energy developers (geothermal, wind) have

increased in the past several years (Dublino 2011, pers. comm.). There is strong political and public support for energy diversification in Nevada and California, and the energy industry considers the available resources in the Bi-State area to warrant investment (Renewable Energy Transmission Access Advisory Committee 2007, p. 8). Based on our current assessment of development probability, the Mount Grant PMU and to a lesser degree the Desert Creek-Fales PMU are most likely to be negatively affected by renewable energy development. However, interest by developers of renewable energy changes rapidly, making it difficult to predict potential outcomes.

Overall, renewable energy development has impacted one location in the South Mono PMU to date, and could potentially result in impacts throughout the Bi-State DPS's range in the future based on current leases. The best available data indicate that several locations in the Bi-State area (Pine Nut and South Mono PMUs) have suitable wind resources based on recent leasing and inquiries by facility developers (although no active leases currently occur), and it appears the Mount Grant PMU and to a lesser degree the Desert Creek–Fales PMU are likely to be most negatively affected. We are uncertain of the probability of seeing future inquires or development of wind energy in the Bi-State area. By itself, renewable energy development is not considered a significant impact at this time, but is a concern based on a combination of current activity, existing leases, the strong political and private support for energy diversification, the probability of new or expanding development in most likely a minimum of two PMUs, and the likely synergistic effects occurring when this threat is combined with other threats acting on the

Bi-State DPS currently and in the future. See the "Renewable Energy Development" section of the Species Report for further discussion (Service 2013a, pp. 54–58).

Disease

Sage-grouse are hosts for a variety of parasites and diseases (Factor C) including macroparasitic arthropods, helminths (worms), and microparasites (protozoa, bacteria, viruses, and fungi) (Thorne *et al.* 1982, p. 338; Connelly *et al.* 2004, pp. 10-4 to 10-7; Christiansen and Tate 2011, p. 114), which can have varying effects on populations. Connelly *et al.* (2004, p. 10-6) note that, while parasitic relationships may be important to the long-term ecology of sage-grouse, they have not been shown to be significant to the immediate population status across the range of the DPS. However, Connelly *et al.* (2004, p. 10-3) and Christiansen and Tate (2011, p. 126) suggest that diseases and parasites may limit isolated sage-grouse populations as they interact with other demographic parameters such as reproductive success and immigration, and thus, the effects of emerging diseases require additional study.

Viruses (such as coronavirus and WNv) are serious diseases that are known to cause death in grouse species, potentially influencing population dynamics (Petersen 2004, p. 46) (Factor C). Efficacy and transmission of WNv in sagebrush habitats is primarily regulated by environmental factors including temperature, precipitation, and anthropogenic water sources, such as stock ponds and coal-bed methane ponds that support mosquito vectors (Reisen *et al.* 2006, p. 309; Walker and Naugle 2011, pp. 131–

132). WNv can be a threat to some sage-grouse populations, and its occurrence and impacts are likely underestimated due to lack of monitoring. The impact of this disease in the Bi-State DPS is likely currently limited by ambient temperatures that do not allow consistent vector and virus maturation. Predicted temperature increases associated with climate change may result in this threat becoming more consistently prevalent. We have no indication that other diseases or parasites are impacting the Bi-State DPS.

Overall, multiple diseases have the potential to occur in the Bi-State area, although WNv appears to be the only identified disease that warrants concern for sage-grouse in the Bi-State area. By itself it is not considered a significant impact at this time because it is currently limited by ambient temperatures that do not allow consistent vector and virus maturation. However, WNv remains a potential threat and concern for the future based on predicted temperature increases associated with climate change that could result in this threat becoming more consistently prevalent. See the disease discussion under the "Disease and Predation" section of the Species Report for further discussion (Service 2013a, pp. 93–99).

Predation

Predation of sage-grouse as a food item is the most commonly identified cause of direct mortality during all life stages (Schroeder *et al.* 1999, p. 9; Connelly *et al.* 2000b, p. 228; Casazza *et al*. 2009, p. 45; Connelly *et al.* 2011, p. 65) (Factor C). However, sage-grouse have co-evolved with a variety of predators, and their cryptic plumage and

behavioral adaptations have allowed them to persist (Schroeder *et al.* 1999, p. 10; Coates 2008, p. 69; Coates and Delehanty 2008, p. 635; Hagen 2011, p. 96). Predation of sage-grouse can occur at all life cycle stages. Within the Bi-State DPS, predation facilitated by habitat fragmentation (fences, power lines, and roads) and other human activities may be altering natural population dynamics in specific areas of the Bi-State DPS. Data suggest certain populations are exhibiting deviations in vital rates below those anticipated (Koloda *et al*. 2009, p. 1344; Sedinger *et al.* 2011. p. 324). For example, in Long Valley (South Mono PMU) nest predators associated with a county landfill may be lowering nesting success. In addition, low adult survival estimates for the Desert Creek-Fales PMU suggest predators may be influencing population growth there. However, we generally consider habitat alteration as the root cause of these results; teasing apart the interaction between predation rate and habitat condition is difficult.

Overall, predation is currently known to occur throughout the Bi-State DPS's range. It is facilitated by habitat fragmentation (fences, power lines, and roads) and other human activities that may be altering natural population dynamics in specific areas throughout the Bi-State DPS's range. By itself it is not considered a significant impact at this time, but is a concern currently and in the future based on data suggesting certain populations are exhibiting deviations in vital rates below those anticipated, including potential impacts to the Long Valley population, which is one of the two largest (core) populations for the Bi-State DPS. See the predation discussion under the "Disease and Predation" section of the Species Report for further discussion (Service 2013a, pp. 99–105).

Climate

Climate change projections in the Great Basin suggest a hotter and stable-to-declining level of precipitation and a shift in precipitation events to the summer months; fire frequency is expected to accelerate, fires may become larger and more severe, and fire seasons will be longer (Brown *et al.* 2004, pp. 382–383; Neilson *et al*. 2005, p. 150; Chambers and Pellant 2008, p. 31; Global Climate Change Impacts in the United States 2009, p. 83). With these projections, drought (which is a natural part of the sagebrush ecosystem) is likely to be exacerbated. Drought reduces vegetation cover (Milton *et al.* 1994, p. 75; Connelly *et al.* 2004, p. 7-18), potentially resulting in increased soil erosion and subsequent reduced soil depths, decreased water infiltration, and reduced water storage capacity (Factor A). Drought can also exacerbate other natural events such as defoliation of sagebrush by insects (Factor A). These habitat component losses can result in declining sage-grouse populations due to increased nest predation and early brood mortality (Factor E) associated with decreased nest cover and food availability (Braun 1998, p. 149; Moynahan *et al.* 2007, p. 1781).

Climate change will potentially act synergistically with other impacts to the Bi-State DPS, further diminishing habitat (Factor A) and increasing isolation of populations (Factor E), making them more susceptible to demographic and genetic challenges or disease. Predicting the impact of global climate change on sage-grouse populations is challenging due to the relatively small spatial extent of the Bi-State area. It is likely that

vegetation communities will not remain static and the amount of sagebrush shrub habitat will decrease. Further, increased variation in drought cycles due to climate change will likely place additional stress on the populations. While sage-grouse evolved with drought, drought has been correlated with population declines and has shown to be a limiting factor to population growth in areas where habitats have been compromised.

In the Bi-State area, drought is a natural part of the sagebrush ecosystem, and we are unaware of any information to suggest that drought has influenced population dynamics of sage-grouse under historical conditions. There are known occasions, however, where reduced brood-rearing habitat conditions due to drought have resulted in little to no recruitment within certain PMUs (Bodie and Pine Nut PMUs (Gardner 2009)). Given the relatively small and restricted extent of this population, if these conditions were to persist longer than the typical adult life span, drought could have significant ramifications on population persistence. Further, drought impacts on the sage-grouse may be exacerbated when combined with other habitat impacts that reduce cover and food (Braun 1998, p. 148).

Based on the best available scientific and commercial information, the threat of climate change is not known to currently impact the Bi-State DPS to such a degree that the viability of the DPS is at stake. However, while it is reasonable to assume the Bi-State area will experience vegetation changes into the future (as presented above), we do not know with precision the nature of these changes or ultimately the effect this will have on the Bi-State DPS. A recent analysis conducted by NatureServe, which incorporates

much of the information presented above, suggests a substantial contraction of both sagebrush and sage-grouse range in the Bi-State area by 2060 (Comer *et al*. 2012, pp. 142, 145). Specifically (for example), this analysis suggests the current extent of suitable shrub habitat will decrease because a less suitable climate condition for sagebrush may improve suitability for woodland and drier vegetation communities, which are not favorable to the Bi-State DPS.

In addition, it is reasonable to assume that changes in atmospheric carbon dioxide levels, temperature, precipitation, and timing of snowmelt will act synergistically with other threats (such as wildfire and invasive, nonnative species) to produce yet unknown but likely negative effects to sage-grouse populations in the Bi-State area. As a result of these predictions, it is reasonable to assume that the impacts of climate change (acting both alone and in concert with impacts such as disease and nonnative, invasive species) could be pervasive throughout the range of the Bi-State DPS, potentially degrading habitat to such a degree that all populations would be negatively affected. Therefore, given the scope and potential severity of climate change when interacting with other threats in the future, the overall impact of climate change to the Bi-State DPS at this time is considered moderate.

Overall, this threat occurs (i.e., drought) and potentially occurs (i.e., climate change) throughout the Bi-State DPS's range. By itself it is not considered a significant impact at this time, but is a concern based on its scope and potential severity when

interacting with other threats. See the "Climate" section of the Species Report for further discussion (Service 2013a, pp. 76–83).

Recreation

Non-consumptive recreational activities (such as fishing, hiking, horseback riding, and camping as well as more recently popularized activities, such as OHV use and mountain biking) occur throughout the range of the greater sage-grouse, including throughout the Bi-State DPS area. These activities can degrade wildlife resources, water, and land by distributing refuse, disturbing and displacing wildlife, increasing animal mortality, and simplifying plant communities (Boyle and Samson 1985, pp. 110–112) (Factor E). For example, disruption of sage-grouse during vulnerable periods at leks, or during nesting or early brood rearing, could affect reproduction and survival (Baydack and Hein 1987, pp. 537–538). In addition, indirect effects to sage-grouse from recreational activities include impacts to vegetation and soils, and the facilitation of the spread of invasive species (Factor A). Impacts caused by recreational activities may be affecting sage-grouse populations in the Bi-State area, and there are known localized habitat impacts.

Overall, recreation occurs throughout the Bi-State DPS's range, although we do not have data on the severity of these impacts. By itself recreation is not considered a significant impact at this time, but some forms of recreation could become a concern based on anticipated increases of recreation use within the Bi-State area in the future.

Populations of sage-grouse in the South Mono PMU are exposed to the greatest degree of pedestrian recreational activity, although they appear relatively stable at present. See the "Recreation" section of the Species Report for further discussion (Service 2013a, pp. 87–90).

Overutilization Impacts

Potential overutilization impacts include recreational hunting (Factor B). Sage-grouse have not been commercially harvested in the Bi-State area since the 1930s, and they are not expected to be commercially harvested in the future. Limited recreational hunting, based on the concept of compensatory mortality, was allowed across most of the DPS's range with the increase of sage-grouse populations by the 1950s (Patterson 1952, p. 242; Autenrieth 1981, p. 11). In recent years, hunting as a form of compensatory mortality for upland game birds (which includes sage-grouse) has been questioned (Connelly *et al.* 2005, pp. 660, 663; Reese and Connelly 2011, p. 111).

Recreational hunting is currently limited in the Bi-State DPS and within generally accepted harvest guidelines. In the Nevada portion of the Bi-State area, NDOW regulates hunting of sage-grouse. Most hunting of sage-grouse in the Nevada portion of the Bi-State area is closed. NDOW closed the shotgun and archery seasons for sage-grouse in 1997, and the falconry season in 2003 (NDOW 2012b, *in litt.*, p. 4). Hunting of sage-grouse may occur on tribal allotments located in the Pine Nut PMU where the Washoe Tribe of Nevada and California has authority. There are anecdotal reports of harvest by

tribal members, but currently the Washoe Tribe Hunting and Fishing Commission does not issue harvest permits for greater sage-grouse (Warpea 2009). In the California portion of the Bi-State area, CDFW regulates hunting of sage-grouse. Hunting historically occurred and continues to occur in the Long Valley (South Mono PMU) and Bodie Hills (Bodie PMU) areas (known as the South Mono and North Mono Hunt Units, respectively). As a result of work by Gibson (1998, entire) and documented population declines in the Bi-State DPS, CDFW has significantly reduced the number of permits issued (Service 2004, pp. 74–75; Gardner 2008).

It is unlikely that the scope and severity of hunting impacts would act in an additive manner to natural mortality. In the Bi-State area, hunting is limited to such a degree that it is not apparently restrictive to overall population growth currently nor expected to become so in the future (CDFW 2012). Furthermore, we are unaware of any information to indicate that poaching or non-consumptive uses significantly impact Bi-State sage-grouse populations.

Overall, sport hunting is currently limited and within generally accepted harvest guidelines. It is unlikely that hunting will ever reach levels again that would act in an additive manner to mortality. In the Bi-State area, hunting is limited to such a degree that it is not apparently restrictive to overall population growth. Furthermore, we are unaware of any information indicating that overutilization is significantly impacting sage-grouse populations in the Bi-State area. Given the current level and location of harvest, and expected continued management into the future, the impact this factor has on population

persistence appears negligible. See the "Overutilization Impacts" section of the Species Report for further discussion (Service 2013a, pp. 83–87).

Scientific and Educational Uses

Mortality and behavioral impacts to sage-grouse may occur as a result of scientific research activities (Factor B). Sage-grouse in the Bi-State area have been subject to several scientific research efforts over the past decade involving capture, handling, and subsequent banding or radio-marking. Much remains unknown about the impacts of research on sage-grouse population dynamics. However, the available information indicates that very few individuals are disturbed or die as a result of handling and marking. Therefore, the potential impacts associated with scientific and educational uses are considered negligible to the Bi-State DPS at this time and are expected to remain so into the future. See the "Scientific and Educational Uses" section of the Species Report for further discussion (Service 2013a, pp. 90–92).

Pesticides and Herbicides

Although few studies have examined the effects of pesticides to sage-grouse, direct mortality of sage-grouse as a result of pesticide applications (such as insecticides and pesticides applied via cropland spraying) has been documented (Blus *et al*. 1989, p. 1142; Blus and Connelly 1998, p. 23) (Factor E). In addition, herbicide applications can kill sagebrush and forbs important as food sources for sage-grouse (Carr 1968, as cited in

Call and Maser 1985, p. 14) (Factor E). Although pesticides and herbicides can result in direct and indirect mortality of individual sage-grouse, we are unaware of information that would indicate that the current usage or residue from past applications in the Bi-State area is having negative impacts on populations, nor do we anticipate that the levels of use will increase in the future. Therefore, the potential impacts associated with pesticide and herbicide use are considered negligible to the Bi-State DPS at this time, and are expected to remain so into the future. See the "Pesticides and Herbicides" section of the Species Report for further discussion (Service 2013a, pp. 110–112).

Contaminants

Sage-grouse exposure to various types of environmental contaminants (concentrated salts, petroleum products, or other industrial chemicals) may occur as a result of agricultural and rangeland management practices, mining, energy development and pipeline operations, and transportation of hazardous materials along highways and railroads. In the Bi-State area, exposure to contaminants associated with mining is the most likely to occur (see *Mining*, above). Exposure to contaminated water in wastewater pits or evaporation ponds could cause mortalities or an increased incidence of sage-grouse disease (morbidity) (Factor E). Within the Bi-State DPS, sage-grouse exposure to potential contaminants is currently limited and most likely associated with a few existing mining operations in the Pine Nut and Mount Grant PMUs. Future impacts from contaminants (if present) would most likely occur in these same PMUs due to their potential for future mineral development; however, at this time we are unaware of

information to indicate that contaminants are a problem currently or in the future. Therefore, the potential impacts associated with contaminants are considered negligible to the Bi-State DPS at this time, and are expected to remain so into the future. See the "Contaminants" section of the Species Report for further discussion (Service 2013a, p. 113).

Existing Regulatory Mechanisms

Bi-State sage-grouse conservation has been addressed in some local, State, and Federal plans, laws, regulations, and policies. An examination of regulatory mechanisms (Factor D) for both the Bi-State DPS and sagebrush habitats reveals that some mechanisms exist that either provide or have the potential to provide a conservation benefit to the Bi-State DPS, such as (but not limited to): Various County or City regulations outlined in General Plans; Nevada State Executive Order, dated September 26, 2008; Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 *et seq*.), which requires development of resource management plans for BLM lands; National Forest Management Act (16 U.S.C. 1600 *et seq*.), which requires land and resource management plans for U.S. Forest Service lands; and the Sikes Act Improvement Act of 1997 (16 U.S.C. 670a *et seq*.), which requires integrated natural resources management plans for military installations (see "Existing Regulatory Mechanisms" section of the Species Report (Service 2013a, pp. 113–127)). However, supporting documents for some of these are many years old and have not been updated, calling into question their consistency with our current understanding of the DPS's life-history requirements,

reaction to disturbances, and the DPS's conservation needs. In addition, the conservation actions that have been implemented to date according to the existing regulatory mechanisms vary across the Bi-State area, although managing agencies are beginning to work more collaboratively across jurisdictional boundaries. The degree to which these existing regulatory mechanisms conserve the DPS is largely dependent on current and future implementation, which can vary depending on factors such as the availability of staff and funding.

The Bi-State area is largely comprised of federally managed lands. Existing land use plans, as they pertain to sage-grouse, are typically general in nature and afford relatively broad latitude to land managers. This latitude influences whether measures available to affect conservation of greater sage-grouse are incorporated during decision making, and implementation is prone to change based on managerial discretion. While we recognize the benefits of management flexibility, we also recognize that such flexibility with regard to implementation of land use plans can result in land use decisions that negatively affect the Bi-State DPS. Therefore, we consider most existing Federal mechanisms offer limited certainty as to managerial direction pertaining to sage-grouse conservation, particularly as the Federal mechanisms relate to addressing the threats that are significantly impacting the Bi-State DPS (i.e., nonnative and native, invasive plants; wildfire and altered wildfire regime; infrastructure; and rangeland management), and other impacts (such as, but not limited to, renewable energy development). Regulations in some counties identify the need for natural resource conservation and attempt to minimize impacts of development through zoning restrictions, but to our knowledge these

regulations neither preclude development nor do they provide for monitoring of the loss of sage-grouse habitats. Similarly, State laws and regulations are general in nature and provide flexibility in implementation, and do not provide specific direction to State wildlife agencies, although they can occasionally afford regulatory authority over habitat preservation (e.g., creation of habitat easements and land acquisitions).

Synergistic Impacts

Many of the impacts described here and in the accompanying Species Report may cumulatively or synergistically affect the Bi-State DPS beyond the scope of each individual stressor. For example, the future loss of additional significant sagebrush habitat due to wildfire in the Bi-State DPS is anticipated because of the intensifying synergistic interactions among fire, people and infrastructure, invasive species, and climate change. Predation may also increase as a result of the increase in human disturbance and development. These are just two scenarios of the numerous threats that are likely acting cumulatively to further contribute to the challenges faced by many Bi-State DPS populations now and into the future.

In summary, we have determined that the threats causing the most significant impacts on the Bi-State DPS currently and in the future are urbanization and habitat conversion (Factor A); infrastructure (Factors A and E); mining (Factors A and E); renewable energy development and associated infrastructure (Factors A and E); grazing (Factors A, C, and E); nonnative and native, invasive species (e.g., cheatgrass, pinyon-juniper encroachment) (Factors A and E); wildfires and altered fire regime (Factors A

and E); and small population size and population structure (Factor E). Other threats impacting the DPS across its range currently and in the future, but to a lesser degree than those listed above, include climate change, including drought (Factors A and E); recreation (Factors A and E); and disease and predation (Factor B). Existing regulatory mechanisms are inadequate to protect the Bi-State DPS against these threats (Factor D). Numerous threats are likely acting cumulatively to further contribute to the challenges faced by several Bi-State DPS populations now and into the future.

Determination

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats to the Bi-State DPS. We considered the five factors identified in section 4(a)(1) of the Act in determining whether the Bi-State DPS meets the Act's definition of an endangered species (section 3(6)) or threatened species (section 3(20)).

Multiple threats impacting the Bi-State DPS and its habitat are interacting synergistically and resulting in increasingly fragmented habitat for this long-lived habitat specialist. Woodland encroachment is causing significant, measurable habitat loss throughout the range of the Bi-State DPS. While techniques to address this habitat impact are available and being implemented, the scale of such efforts is currently inadequate. Woodlands have expanded by an estimated 20,234 to 60,703 ha (50,000 to 150,000 ac) over the past decade in the Bi-State area, but woodland treatments have only

been implemented on 6,475 ha (16,000 ac) (Service 2013b, unpublished data). Meanwhile, the existing and potential near-term impacts of cheatgrass and wildfire are steadily increasing and will likely escalate further with climate change, providing conditions that will likely result in rapid loss of significant quantities of suitable habitat. Similarly, impacts from infrastructure, urbanization, and recreation on already fragmented habitat and small populations within the Bi-State area are expected to gradually increase.

Taken cumulatively, the ongoing and future habitat-based impacts in all PMUs will likely act to fragment and further isolate populations within the Bi-State DPS. Current or future impacts caused by wildfire, urbanization, grazing, infrastructure, recreation, woodland succession, and climate change will likely persist and interact in the near-term and most significantly influence the Pine Nut, Desert Creek-Fales, and Mount Grant PMUs. The Bodie and South Mono PMUs are larger and more stable, and generally have fewer habitat pressures. The level of impacts within the White Mountains PMU remains largely unknown; the population is likely relatively small, and it is on the southern periphery of the DPS. While the South Mono, White Mountains, and Pine Nut PMUs appear to be largely isolated entities, the Bodie PMU interacts with the Mount Grant PMU and to a lesser degree the Desert Creek-Fales PMU, and the potential erosion of habitat suitability in these latter PMUs may influence the population dynamics and persistence of the breeding population in the Bodie PMU.

When existing and future impacts such as predation, disease, recreation, and climate change (vegetation changes, drought) are considered in conjunction with other habitat stressors, it appears that preservation of sage-grouse populations in the northern half of the Bi-State area will be difficult. Given the Bi-State DPS's relatively low rate of growth and strong site fidelity, recovery and repopulation of extirpated areas will be slow and infrequent, making future recovery of extirpated populations within the Bi-State area challenging. Translocation of sage-grouse is difficult, and given the limited number of source individuals within the range of the Bi-State DPS, translocation efforts, if needed, will be logistically complicated. Within the next several decades, it is possible that sage-grouse in the Bi-State area will persist in two of the potentially eight populations in the Bi-State area, specifically two populations located in the South Mono PMU (Long Valley) and the Bodie PMU (Bodie Hills). These two populations could also become increasingly further isolated from one another as a result of the potential for loss of habitat connectivity due to exurban development on private lands in the Bodie PMU, as well as future habitat fragmentation from potential pinyon-juniper encroachment, wildfire, and cheatgrass impacts. If further isolated, it is likely that both these populations would be at greater risk to stochastic events.

In summary, we believe the Bi-State DPS is likely to become endangered within the foreseeable future throughout all or a portion of its range based on the following:

(1) A reduction of historical range, and a reduction in habitat of greater than 50 percent with a concurrent reduction from historical abundance of greater than 50 percent. The current trend in habitat loss is slow and expected to continue at this slow pace,

further reducing range and habitat. The current trend in abundance is unknown, but it is expected to gradually decrease for at least five of the six PMUs. This is of critical concern to the Bi-State DPS because fluctuations in the four small, less secure PMUs are likely to result in extirpations and loss of population redundancy within the DPS.

(2) All six PMUs include poor connectivity within and among PMUs; the current trend in connectivity is slowly deteriorating, and this is of critical concern to the Bi-State DPS because it increases the risk of loss of individual PMUs via stochastic events.

(3) Remaining habitat is increasingly fragmented in all six PMUs; the current trend in habitat fragmentation is a slow increase.

(4) Trends for most leks are unknown, especially on periphery of the Bi-State DPS's range. This is of critical concern to the DPS because there is an existing pattern of historical extirpations of peripheral populations for the sage-grouse in the Bi-State area. Well known leks in the core of the DPS's range that have remained protected over time and have long-term monitoring data suggest stable population trends.

(5) The size of the Bi-State population is generally below theoretical minimums for long-term persistence reported in literature; populations are especially small and increasingly isolated outside the two largest (core) populations in the South Mono and Bodie PMUs. Recent extensive and intensive surveys for the Bi-State population range-wide did not significantly increase the known number of leks or individuals.

(6) Sage grouse are long-lived habitat specialists particularly susceptible to habitat fragmentation caused by multiple, interacting threats, and there are multiple threats to habitat interacting synergistically throughout the Bi-State population.

(7) Pinyon-juniper tree encroachment has caused significant habitat reduction; the current trend in pinyon-juniper encroachment is increasing, but mitigated partially by ongoing woodland removal projects.

(8) Urbanization is documented to have caused significant habitat reduction; the current trend in urbanization is increasing but slowly.

(9) Infrastructure development (e.g., roads, power lines, fences, communication towers) is documented to have caused significant habitat reductions (although some impacts are being mitigated by ongoing removal of potential avian predator roost sites and modification or removal of fencing); the current trend in this threat is increasing but slowly.

(10) The fire-invasive species cycle destroys native plant communities and sage grouse habitat; the current trend in sagebrush habitat loss from fire and invasive species is increasing.

(11) Small population size and meta-population isolation increases risk to sage-grouse; the current trend in the Bi-State area for small, isolated populations is gradually increasing. This is of critical concern to the Bi-State DPS because fluctuations in the four small, less secure PMUs are likely to result in extirpations and loss of population redundancy within the DPS.

(12) Predation can locally impact sage-grouse in specific circumstances, such as that occurring in the South Mono PMU near a landfill, which is likely impacting one of the two largest, core populations for the Bi-State DPS; however, the current trend in predation is stable.

(13) There is uncertainty over long-term threats from climate change and its effects on other factors like invasive species; it is probable that the threat of climate change will increase in the foreseeable future.

The Act defines an endangered species as any species that is "in danger of extinction throughout all or a significant portion of its range" and a threatened species as any species "that is likely to become endangered throughout all or a significant portion of its range within the foreseeable future." We consider foreseeable future in this proposed rule to be 30 years based on the probability of population persistence analyzed and described by Garton *et al.* (2011, entire), which conducted a trend analysis for the populations that occur in the Bodie, Desert Creek-Fales, and South Mono PMUs. Garton *et al.* (2011, entire) conclude that the probability of declining below a quasi-extinction threshold (as defined by some scientific experts to be fewer than 50 males per population) was 15 percent over the next 30 years for the populations in Bodie and Desert Creek-Fales PMUs, and 0 percent for the populations in the South Mono PMU. In other words, populations in the Bodie, Desert Creek-Fales, and South Mono PMUs have a probability of persistence between 85 and 100 percent over the next 30 years. Data quality was inadequate or unavailable for the populations within the Pine Nut, Mount Grant, and White Mountains PMUs for Garton's (2011, entire) analysis for population persistence. Because populations for these PMUs harbor fewer individuals and thus smaller populations than those analyzed by Garton *et al.* (2011, entire), we expect the populations in these areas within the next 30 years to have an undetermined lower probability of

persistence. Data quality was inadequate or unavailable on a longer time frame for all units.

Based on the analysis presented in the Species Report (Service 2013a, entire), and our discussion and rationale provided above, we find that the Bi-State DPS is not presently in danger of extinction throughout all of its range, but that it is likely to become endangered throughout all of its range in the foreseeable future. First, we find that the Bi-State DPS is not presently in danger of extinction based on the following:

(1) The Bi-State DPS populations will likely persist in multiple areas within the range of the DPS into the foreseeable future (as defined above). Predictions indicate the Bodie, Desert Creek-Fales, and South Mono PMU populations have an 85 (Bodie and Desert Creek-Fales PMUs) to 100 (South Mono PMU) percent chance of persistence over the next 30 years. The Pine Nut, Mount Grant, and White Mountains populations have an undetermined lesser percent chance of persistence.

(2) The best available data for the Bi-State DPS indicate stable or increasing trends for the two largest populations that represent the central core of the DPS.

(3) Because the Bi-State DPS is characterized by multiple populations, some of which are likely to remain in place within the foreseeable future, these populations provide sufficient redundancy (multiple populations distributed across the landscape), resiliency (capacity for a species to recover from periodic disturbance), and representation (range of variation found in a species) such that the Bi-State DPS is not at immediate risk of extinction (i.e., within the foreseeable future). Although data are unavailable for accurately predicting persistence of populations within three of the six

PMUs within the foreseeable future, our evaluation of the best available information leads us to believe that only one population (i.e., the smallest population within the Pine Nut PMU) might not persist into the foreseeable future.

Second, we find that the Bi-State DPS is likely to become endangered throughout all of its range in the foreseeable future based on the following:

(1) Multiple threats are significantly impacting all of the Bi-State DPS populations (i.e., infrastructure; grazing and rangeland management; nonnative and native, invasive plants; wildfire and altered fire regime; and small population size).

(2) Additive and synergistic effects due to the threats listed above as well as other multiple threats (i.e., urbanization and habitat conversion, mining, renewable energy development, climate (including drought), recreation, disease, and predation) are likely to continue and increase in the future. Of significant concern are the compounding impacts to the Bi-State DPS's habitat that are interacting and resulting in increasingly fragmented habitat, especially from pinyon-juniper encroachment throughout the DPS's range.

(3) Current or future impacts identified above will likely persist and interact in the near-term, most significantly affecting the populations and habitat in the Pine Nut, Desert Creek-Fales, and Mount Grant PMUs (while the level of impacts within the White Mountains PMU remains largely unknown). Thus, the potential exists for one or more of the populations in these PMUs to be lost or impacted to such a degree that recovery would be significantly challenged. The two largest (core) populations (i.e., the South Mono PMU (Long Valley) and the Bodie PMU (Bodie Hills)) could also become isolated from one another as a result of the potential for loss of habitat connectivity due to

exurban development on private lands in the Bodie PMU, as well as future habitat fragmentation from potential pinyon-juniper encroachment, wildfire, and cheatgrass impacts. Once further isolated, it is likely that both core PMUs would be at greater risk to stochastic events.

Therefore, on the basis of the best available scientific and commercial information, we propose listing the Bi-State DPS of greater sage-grouse as threatened in accordance with sections 3(20) and 4(a)(1) of the Act.

The Bi-State DPS proposed for listing in this rule is highly restricted in its range and the threats occur throughout its range. Therefore, we assessed the status of the Bi-State DPS throughout its entire range. The threats to the survival of the DPS occur throughout its range and are not restricted to any particular significant portion of that range (see **Significant Portion of the Range**, below). Accordingly, our assessment and proposed determination applies to the Bi-State DPS throughout its entire range.

Significant Portion of the Range

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. In determining whether a species is endangered or threatened in a significant portion of its range, we first identify any portions of the range of the species that warrant further consideration. The range of a species can theoretically be divided into portions an infinite number of ways. However, there is no purpose to analyzing portions of the range

that are not reasonably likely to be both (1) significant and (2) endangered or threatened. To identify only those portions that warrant further consideration, we determine whether there is substantial information indicating that: (1) The portions may be significant, and (2) the species may be in danger of extinction there or likely to become so within the foreseeable future. In practice, a key part of this analysis is whether the threats are geographically concentrated in some way. If the threats to the species are essentially uniform throughout its range, no portion is likely to warrant further consideration. Moreover, if any concentration of threats applies only to portions of the species' range that are not significant, such portions will not warrant further consideration.

If we identify portions that warrant further consideration, we then determine whether the species is endangered or threatened in these portions of its range. Depending on the biology of the species, its range, and the threats it faces, the Service may address either the significance question or the status question first. Thus, if the Service considers significance first and determines that a portion of the range is not significant, the Service need not determine whether the species is endangered or threatened there. Likewise, if the Service considers status first and determines that the species is not endangered or threatened in a portion of its range, the Service need not determine if that portion is significant. However, if the Service determines that both a portion of the range of a species is significant and the species is endangered or threatened there, the Service will specify that portion of the range as endangered or threatened under section 4(c)(1) of the Act.

We evaluated the current range of the Bi-State DPS to determine if there is any apparent geographic concentration of threats. The Bi-State DPS is highly restricted in its range and the threats occur to varying degrees and in various combinations throughout its range. We considered the potential threats due to nonnative and native, invasive plants; wildfire and an altered fire regime; infrastructure (including roads, power lines, fences, communication towers, and landfills); grazing and rangeland management; small population size; urbanization and habitat conversion; mining; renewable energy development; disease; predation; climate change (including drought); recreation; overutilization; scientific and educational uses; pesticides and herbicides; contaminants; and potential inadequacy of existing regulatory mechanisms. However, we found no concentration of threats but rather that various combinations of multiple threats are present throughout the range of the Bi-State DPS.

Given the sage-grouse populations in the Pine Nut, Mount Grant, and White Mountains PMUs are now and will continue to be most at risk from the various threats acting upon the birds and their habitat (see the foreseeable future discussion above in the **Determination** section), we identify this portion of the range for further consideration. The Pine Nut, Mount Grant, and (to the extent known) White Mountains PMUs comprise the least amount of birds and leks within the range of the Bi-State DPS, with the Pine Nut PMU harboring the least number of birds and leks overall.

We analyzed whether threats in these three PMUs (i.e., Pine Nut, Mount Grant, and White Mountains PMUs) rise to the level such that the sage-grouse is currently in

danger of extinction, or "endangered," in these three PMUs combined. We determined that none of the threats within these three PMUs either independently or collectively, is believed to be of the level that the threats have reduced, destroyed, or fragmented sagebrush habitat such that the DPS is currently in danger of extinction. We note that data do indicate that impacts from nonnative and native, invasive species, and thus the threat of wildfire, in the Pine Nut PMU are more extensive than in the Mount Grant and White Mountains PMUs. While these threats continue in the Pine Nut PMU and may increase, monitoring continues to document sage-grouse in some historically occupied areas within the PMU. Also, the Pine Nut PMU currently holds the least number of birds and leks of all populations, and the potential loss of this already small population is not expected to impact the Bi-State DPS to the extent that the remaining two PMUs with the smallest populations (i.e., Mount Grant and White Mountains PMUs) or the DPS as a whole would be considered in danger of extinction.

Because multiple sage-grouse are still observed through monitoring activities, and from one to eight active leks are present within each of these three smaller populations (within the Pine Nut, Mount Grant, and White Mountains PMUs), we do not believe the combined sage-grouse populations in all three of these PMUs are currently in danger of becoming extinct. Additionally, the threats acting upon these small populations are not geographically concentrated and exist in all six PMUs throughout the range of the Bi-State DPS. Rather, the combination of the small population size, isolation due to fragmented habitat, peripheral locations, and the presence of several threats to the populations in the Pine Nut, Mount Grant, and White Mountains PMUs makes these

populations more vulnerable than the populations in the Bodie, Desert Creek-Fales, and South Mono PMUs but not to the degree that they are in danger of extinction.

In conclusion, we find that the overall scope and significance of threats affecting the Bi-State DPS are essentially uniform throughout the DPS's range, indicating no other portion of the range of the DPS warrants further consideration of possible endangered status under the Act. Therefore, we find there is no significant portion of the Bi-State DPS's range that may warrant a different status.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing results in public awareness, and conservation by Federal, State, Tribal, and local agencies; private organizations; and individuals. The Act encourages cooperation with the States and requires that recovery actions be carried out for all listed species. The protection required by Federal agencies and the prohibitions against certain activities are discussed, in part, below.

The primary purpose of the Act is the conservation of endangered and threatened species and the ecosystems upon which they depend. The ultimate goal of such conservation efforts is the recovery of these listed species so that they no longer need the

protective measures of the Act. Subsection 4(f) of the Act requires the Service to develop and implement recovery plans for the conservation of endangered and threatened species. The recovery planning process involves the identification of actions that are necessary to halt or reverse the species' decline by addressing the threats to its survival and recovery. The goal of this process is to restore listed species to a point where they are secure, self-sustaining, and functioning components of their ecosystems.

Recovery planning includes the development of a recovery outline shortly after a species is listed and preparation of a draft and final recovery plan. The recovery outline guides the immediate implementation of urgent recovery actions and describes the process to be used to develop a recovery plan. Revisions of the plan may be done to address continuing or new threats to the species, as new substantive information becomes available. The recovery plan identifies site-specific management actions that set a trigger for review of the five factors that control whether a species remains endangered or may be downlisted or delisted, and methods for monitoring recovery progress. Recovery plans also establish a framework for agencies to coordinate their recovery efforts and provide estimates of the cost of implementing recovery tasks. Recovery teams (composed of species experts, Federal and State agencies, nongovernmental organizations, and stakeholders) are often established to develop recovery plans. When completed, the recovery outline, draft recovery plan, and the final recovery plan will be available on our website (*http://www.fws.gov/endangered*), or from our Nevada Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**).

Implementation of recovery actions generally requires the participation of a broad range of partners, including other Federal agencies, States, Tribes, nongovernmental organizations, businesses, and private landowners. Examples of recovery actions include habitat restoration (e.g., restoration of native vegetation), research, captive propagation and reintroduction, and outreach and education. The recovery of many listed species cannot be accomplished solely on Federal lands because their range may occur primarily or solely on non-Federal lands. To achieve recovery of these species requires cooperative conservation efforts on private, State, and Tribal lands.

If this species is listed, funding for recovery actions will be available from a variety of sources, including Federal budgets, State programs, and cost share grants for non-Federal landowners, the academic community, and nongovernmental organizations. In addition, pursuant to section 6 of the Act, the States of Nevada and California would be eligible for Federal funds to implement management actions that promote the protection or recovery of the Bi-State DPS. Information on our grant programs that are available to aid species recovery can be found at: *http://www.fws.gov/grants*.

Although the Bi-State DPS of greater sage-grouse is only proposed for listing under the Act at this time, please let us know if you are interested in participating in recovery efforts for this species. Additionally, we invite you to submit any new information on this species whenever it becomes available and any information you may have for recovery planning purposes (see **FOR FURTHER INFORMATION CONTACT**).

Section 7(a) of the Act requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as an endangered or threatened species and with respect to its critical habitat, if any is designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any action that is likely to jeopardize the continued existence of a species proposed for listing or result in destruction or adverse modification of proposed critical habitat. If a species is listed subsequently, section 7(a)(2) of the Act requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of the species or destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into consultation with the Service.

Federal agency actions within the species' habitat that may require conference or consultation or both as described in the preceding paragraph include management and any other landscape-altering activities on Federal lands administered by the USFS, BLM, or Department of Defense (Hawthorne Army Depot and Marine Corps' Mountain Warfare Training Center); issuance of section 404 Clean Water Act (33 U.S.C. 1251 *et seq*.) permits by the U.S. Army Corps of Engineers; and construction and maintenance of roads or highways by the Federal Highway Administration.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to all endangered and threatened wildlife. The prohibitions of section 9(a)(2) of the Act, codified at 50 CFR 17.21 for endangered wildlife, in part, make it illegal for any person subject to the jurisdiction of the United States to take (includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect; or to attempt any of these), import, export, ship in interstate commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce any listed species. Under the Lacey Act (18 U.S.C. 42–43; 16 U.S.C. 3371–3378), it is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to agents of the Service and State conservation agencies.

We may issue permits to carry out otherwise prohibited activities involving endangered and threatened wildlife species under certain circumstances. Regulations governing permits are codified at 50 CFR 17.22 for endangered species, and at 17.32 for threatened species. With regard to endangered wildlife, a permit must be issued for the following purposes: for scientific purposes, to enhance the propagation or survival of the species, and for incidental take in connection with otherwise lawful activities.

It is our policy, as published in the **Federal Register** on July 1, 1994 (59 FR 34272), to identify to the maximum extent practicable at the time a species is listed, those activities that would or would not constitute a violation of section 9 of the Act. The intent of this policy is to increase public awareness of the effect of a proposed listing on

proposed and ongoing activities within the range of species proposed for listing. The following activities could potentially result in a violation of section 9 of the Act; this list is not comprehensive:

(1) Unauthorized collecting, handling, possessing, selling, delivering, carrying, or transporting of the species, including import or export across State lines and international boundaries, except for properly documented antique specimens of these taxa at least 100 years old, as defined by section 10(h)(1) of the Act.

(2) Actions that would result in the loss of sagebrush overstory plant cover or height. Such activities could include, but are not limited to, the removal of native shrub vegetation by any means for any development or infrastructure construction project; direct conversion of sagebrush habitat to agricultural land use; habitat improvement or restoration projects involving mowing, brush-beating, disking, plowing, chemical treatments, or prescribed burning; and prescribed burning and fire suppression activities.

(3) Actions that would result in the loss or reduction in native herbaceous understory plant cover or height, a reduction or loss of associated arthropod communities, or ground disturbance that would result in removal or depletion of surface and ground water resources that impact brood-rearing habitat. Such activities could include, but are not limited to: Livestock grazing; application of herbicides or insecticides; prescribed burning and fire suppression activities; seeding of nonnative plant species that would compete with native species for water, nutrients, and space; groundwater pumping; and water diversions for irrigation and livestock watering.

(4) Actions that would result in the Bi-State DPS's avoidance of an area during one or more seasonal periods. Such activities could include, but are not limited to, the construction of vertical structures such as power lines, fences, communication towers, and buildings; motorized and non-motorized recreational use; and activities such as mining or well drilling, operation, and maintenance, which would entail significant human presence, noise, and infrastructure.

Questions regarding whether specific activities would constitute a violation of section 9 of the Act should be directed to the Nevada Fish and Wildlife Office for activities in Nevada and to the Ventura Fish and Wildlife Office for activities in California (see **FOR FURTHER INFORMATION CONTACT**).

Proposed Special Rule

Under section 4(d) of the Act, the Secretary of the Interior has discretion to issue such regulations as she deems necessary and advisable to provide for the conservation of threatened species. Our implementing regulations (50 CFR 17.31) for threatened wildlife generally incorporate the prohibitions of section 9 of the Act for endangered wildlife, except when a "special rule" is promulgated under section 4(d) of the Act with respect to a particular threatened species. In such a case, the general prohibitions at 50 CFR 17.31 would not apply to that species; instead, the special rule would define the specific take prohibitions and exceptions that would apply, and that we consider necessary and

advisable to conserve, that particular threatened species. The Secretary also has the discretion to prohibit by regulation with respect to a threatened species any act prohibited by section 9(a)(1) of the Act. Exercising this discretion, which has been delegated to the Service by the Secretary, the Service has developed general prohibitions that are appropriate for most threatened wildlife at 50 CFR 17.31 and exceptions to those prohibitions at 50 CFR 17.32.

For the Bi-State DPS, we have determined that a 4(d) special rule may be appropriate. This 4(d) special rule is proposed for take incidental to activities conducted pursuant to either: (1) Conservation programs developed by or in coordination with the State agency or agencies responsible for the management and conservation of fish and wildlife within Nevada and California, or their agents, with a clear mechanism for application to lands occupied by the Bi-State DPS; or (2) routine livestock ranching activities conducted in a manner congruous with maintaining the local ecological integrity. Both conservation programs and maintenance of large blocks of intact habitat provide a conservation benefit to the Bi-State DPS. When making a determination as to whether a program would be covered pursuant to this 4(d) rule, we would consider the following:

(1) Whether the program comprehensively addresses all the threats affecting the Bi-State DPS within the program area;

(2) Whether the program establishes objective, measurable biological goals and objectives for population and habitat necessary to ensure a net conservation benefit, and provides the mechanisms by which those goals and objectives will be achieved;

(3) Whether the program administrators demonstrate the capability and funding mechanisms for effectively implementing all elements of the conservation program, including enrollment of participating landowners, monitoring of program activities, and enforcement of program requirements;

(4) Whether the program employs an adaptive management strategy to ensure future program adaptation as necessary and appropriate; and

(5) Whether the program includes appropriate monitoring of effectiveness and compliance.

As discussed elsewhere in this proposed rule, the Bi-State DPS faces many threats. Foremost among these is the continuing loss and degradation of habitat, which further fragment and isolate already small populations. The Service proposes this 4(d) special rule in recognition of the significant conservation planning efforts occurring throughout the range of the Bi-State DPS for the purpose of reducing or eliminating threats affecting the DPS. Multiple partners (including private citizens, nongovernmental organizations, and Federal and State agencies) are engaged in conservation efforts across the entire range of the DPS on public and private lands, and these efforts have provided and will continue to provide a conservation benefit to the DPS. Two recent examples of conservation programs in the Bi-State area are the Bi-State Action Plan, which was finalized on March 15, 2012, and addresses the entire range of the DPS on public and

private lands; and the NRCS's Sage-Grouse Initiative (SGI). Efforts associated with both programs will facilitate conservation benefits in the Bi-State area, and these programs will continue to provide conservation benefits to the DPS into the future. Currently, existing programs do not yet fully address the suite of factors contributing to cumulative habitat loss and fragmentation, which is our primary concern across the Bi-State DPS's range. However, the Bi-State Action Plan, if completely refined and fully implemented, may result in the removal of threats to the Bi-State DPS so that the protections of the Act may no longer be warranted, especially in combination with other actions, including Federal land management agencies' ongoing efforts to ensure regulatory mechanisms are adequate for the DPS.

Conservation efforts occurring across the range of the Bi-State DPS include, but are not limited to:

- Limiting infrastructure development and human disturbance in sage-grouse habitat;
- Removing woodland plant species that encroach upon sagebrush habitats absent sufficient disturbance to maintain the sagebrush habitat;
- Managing wildfire and invasive species to limit the occurrence of large, high-intensity fire, and fire that facilitates the dominance of invasive species such as cheatgrass;
- Protecting private lands as sagebrush habitat through purchase or conservation easement;
- Managing feral horses in a manner that maintains natural ecosystem functions

and avoids facilitating the dominance of cheatgrass;

- Managing and restoring wet meadow and upland habitats to provide important functions for all life stages of sage-grouse;
- Protecting against risks associated with small population size;
- Monitoring and addressing disease and predation threats; and
- Conducting research and monitoring actions, and adapting management accordingly.

The proposed criteria presented here are meant to encourage the continued development and implementation of a coordinated and comprehensive effort to improve habitat conditions and the status of the Bi-State DPS across its entire range. For the Service to approve coverage of a conservation effort under this proposed 4(d) special rule, the program would have to provide a net conservation benefit to the Bi-State DPS populations. Conservation, as defined in section 3(3) of the Act, means "to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to the Act are no longer necessary." The program would also have to be periodically reviewed by the Service and determined to continue to provide a net conservation benefit to the Bi-State DPS. As a result of this proposed provision, the Service expects that rangewide conservation actions would be implemented with a high level of certainty that the program will lead to the long-term conservation of the Bi-State DPS.

Conservation programs associated with restoring and improving natural

ecological conditions have the potential to affect the Bi-State DPS. Some activities have the potential to positively affect the DPS (e.g., woodland and meadow treatments intended to maintain habitat condition in the absence of natural disturbance); however, some of these activities have the potential to negatively affect the DPS depending on when and where the activities are conducted (e.g., direct take from conducting research activities).

While section 9 of the Act provides general prohibitions on activities that would result in take of a threatened species, the Service recognizes that the conservation efforts listed above, even those with the potential to incidentally take Bi-State DPS, may be necessary to restore the entire range of the DPS to a naturally functioning condition. The Service also recognizes that it is, in the long term, a benefit to the Bi-State DPS to maintain, as much as possible, those aspects of the landscape that can aid in the recovery of the DPS. We believe this proposed 4(d) special rule would further conservation of the DPS by enabling restoration and research activities and by minimizing further subdivision of privately owned lands with the intent to restore, understand, and protect the entire range of the DPS to an intact and naturally functioning state.

Conservation Activities To Be Exempted by the Proposed Special Rule

Infrastructure Development and Human Disturbance

In some instances, it may be necessary to install various infrastructure features

(such as, for example, fences to improve livestock management or a similar barrier to limit access by people into sensitive locations) in order to obtain management objectives that benefit the Bi-State DPS. While these developments may negatively affect the Bi-State DPS by providing perches for predators, increasing collision risk, and/or causing disturbance during installation, they have the potential to provide a net benefit to conservation by protecting sensitive habitats, such as upland meadows and strutting grounds. In these instances when habitat conservation is the goal, the Service recognizes the need to install small infrastructure features and is therefore including these activities in this proposed special rule. The Service encourages limiting the installation of new infrastructure in habitat used by the Bi-State DPS. Further, in instances when placement of these features outside of occupied habitat cannot occur because it will not achieve management objectives, we recommend the impact posed by these features be minimized to the greatest extent possible. This may include timing construction during periods of sage-grouse absence, using alternative fencing methods (e.g., let-down or electric fencing), marking fences with visual markers, and micro-sighting features to minimize impact.

Woodland Treatments

Pinyon-juniper woodlands are a native vegetation community dominated by pinyon pine and various juniper species. These woodlands can encroach upon, infill, and eventually replace sagebrush habitat. The root cause of this conversion from shrubland to woodland is debatable but variously influenced by livestock grazing, fire suppression that

has altered the natural fire disturbance regime, and changes in climate and levels of atmospheric carbon dioxide that influence sites' suitability to tree establishment and tree competitiveness. Some portions of the Bi-State DPS's range are also impacted by *Pinus jeffreyi* (Jeffrey pine) encroachment. Regardless of the type of woodland encroachment, sage-grouse response is negative, and forest or woodland encroachment into occupied sage-grouse habitat reduces (and likely eventually eliminates) sage-grouse use (Commons *et al.* 1999, p. 238; Doherty *et al.* 2008, p. 187; Freese 2009, pp. 84–85, 89–90).

Treatment of sites currently supporting trees with the intent of restoring the location to a condition dominated by a sagebrush vegetation community may potentially negatively affect the Bi-State DPS by disturbing or displacing birds utilizing adjacent habitats or by disturbing remaining shrub and herbaceous vegetation and soils. The Service recognizes that it is, in the long-term, a benefit to the DPS to maintain, as much as possible, those locations currently trending toward a woodland vegetation community in a shrub-dominated condition. The Service also recognizes that, in the course of conducting this conservation program, take of Bi-State DPS may occur. However, the Service believes the net benefit gained through these actions would provide significant conservation benefit for the DPS, and is therefore including these activities in this proposed special rule. The Service recommends that potential impacts caused by these activities be minimized by conducting actions during periods when birds are not present and by using methods that minimize understory disturbance (e.g., chainsaw) and incorporate appropriate measures to improve native understory vegetation composition.

Fire and Nonnative Invasive Species Management

Both lightning-caused and human-caused fire in sagebrush ecosystems is one of the primary risks to the greater sage-grouse, especially as part of the positive feedback loop between nonnative, invasive annual grasses and fire frequency. As the replacement of native perennial bunchgrass communities by invasive annuals is a primary contributing factor to increasing fire frequencies in the sagebrush ecosystem, every effort must be made to retain and improve this native plant community.

Fire management activities (i.e., preventing, suppressing, and restoring) may have a beneficial effect (e.g., limiting amount of sagebrush habitat burned), neutral effect (e.g., staging equipment outside of suitable habitat), or negative effect (e.g., removal of sagebrush to create fire breaks) on the Bi-State DPS. In order to prevent or minimize the spread of wildfires in rangelands, there may be a need to construct fire breaks or conduct treatments of invasive species. If these activities occur in sagebrush habitat, the potential for take of the Bi-State DPS may occur due to loss of habitat or displacement of sage-grouse. However, the Service recognizes the critical importance of fire management in native shrublands, and is therefore including activities associated with wildfire prevention, suppression, and restoration in this proposed special rule.

Conservation Easement

A conservation easement is an agreement between a private land conservation organization or government entity to constrain (in a specific location) the exercise of rights otherwise held by a landowner so as to achieve a conservation objective. This tool is being employed in the Bi-State area, and, typically, the rights constrained are associated with development and water. For example, a landowner could agree not to subdivide their property for housing development and not sell their water rights for offsite use.

Private lands in the Bi-State area are important to the Bi-State DPS due to the high percentage (up to approximately 75 percent (Service 2013b, unpublished data)) of late brood-rearing habitat that occurs on private lands, and the importance of maintaining these lands in a naturally functioning condition for the conservation of the DPS. The Service recognizes the critical importance of maintaining large, contiguous patches of sagebrush habitat for the Bi-State DPS and is including activities associated with procuring conservation easements in this proposed special rule.

Feral Horse Management

Feral horse presence may negatively affect sagebrush vegetation communities and habitat suitability for the Bi-State DPS. Feral horses have utilized sagebrush communities since they were brought to North America at the end of the 16th century (Wagner 1983, p. 116; Beever 2003, p. 887). Horses are generalists, but seasonally their diets can be almost entirely grasses (Wagner 1983, pp. 119–120). Areas without horse

grazing can have 1.9 to 2.9 times more grass cover and higher grass density (Beever *et al*. 2008, p. 176), whereas sites with horse grazing have less shrub cover and more fragmented shrub canopies (Beever *et al*. 2008, p. 176), less plant diversity, altered soil characteristics, and 1.6 to 2.6 times greater abundance of cheatgrass (Beever *et al*. 2008, pp. 176–177). Therefore, feral horse presence may negatively affect sagebrush vegetation communities and habitat suitability for sage-grouse by decreasing grass cover, fragmenting shrub canopies, altering soil characteristics, decreasing plant diversity, and increasing the abundance of invasive cheatgrass.

In order to minimize the impact feral horses have on the local landscape, land-managing agencies (on occasion) remove and relocate feral horses. These activities may potentially take individual sage-grouse within the range of the Bi-State DPS. For example, helicopters used during feral horse round-up and removal activities may disturb and displace sage-grouse in the immediate vicinity of these activities. However, the Service recognizes the importance of maintaining feral horse numbers at appropriate levels such that degradation of habitat is not realized. Therefore, we are including this conservation program in this proposed special rule.

Meadow and Upland Restoration

Meadow, riparian, and other mesic habitats are an important seasonal component in the annual life cycle of sage-grouse. These locations are used by sage-grouse during the summer and fall, and are a critical component in population dynamics as they play a

significant role in facilitating recruitment of juvenile birds into the population. Loss and degradation of these habitats has occurred across the range of the Bi-State DPS and restoration of these areas will be of significant importance affecting the conservation of the DPS.

A variety of methods (e.g., mechanical, chemical) may be employed in the act of restoring these types of habitats depending on the associated cause of degradation. For example, the hydrologic function of a site may be compromised due to down-cutting of stream or creek beds and a meadow (in the absence of disturbance) may become dominated by shrubs and lose the herbaceous diversity critical to sage-grouse. Restoration activities associated with these examples may require use of heavy machinery, mowing, or use of herbicides to remove shrubs. These activities may potentially take individual sage-grouse within the Bi-State DPS through disturbance or displacement of birds adjacent to the activity. However, the Service recognizes the importance of restoring and maintaining mesic sites such that loss of habitat is not realized, and we are therefore including this conservation program in this proposed special rule.

Similarly, restoration efforts for the Bi-State DPS targeting upland sites may require methods that could displace or disturb sage-grouse adjacent to the activity. These activities may include restoration efforts following a fire, or restoration in areas degraded by grazing or recreational use. However, as with other restoration activities, the Service recognizes the long-term benefit of these actions to the conservation of the DPS and is

including this conservation program in this proposed special rule.

Small Population Maintenance and Scientific Research and Monitoring

Within the range of the Bi-State DPS, there are populations of sage-grouse for which persistence may be challenged, in part due to the limited number of sage-grouse present. In order to improve redundancy and distributional extent across the range of the Bi-State DPS, it may become necessary to capture and relocate sage-grouse in order to repopulate an extirpated location or to augment a small population. The capture and relocation of sage-grouse may potentially take individuals due to capture-related mortality. However, the Service recognizes the importance of multiple, well-distributed populations across the range of the Bi-State DPS in order to ensure the conservation of the DPS. Therefore, we consider the potential conservation benefit gained through this effort, should it become necessary, to be a net gain and are therefore including this conservation effort in this proposed special rule.

Similarly, scientific research and monitoring activities of the Bi-State DPS have the potential to take sage-grouse through capture and handling mortalities or through disturbing or displacing breeding sage-grouse on leks. During a 3-year study in the Bi-State area in which 145 sage-grouse were radio-marked, the deaths of 4 birds were attributed to handling (Casazza *et al.* 2009, p. 45). Across the West, the mortality rate associated with capture, handling, and subsequent marking was estimated at 2.7 percent in 2005 (see 75 FR 13910 on March 23, 2010, pp. 13965-13966). While direct mortality

of sage-grouse can occur, the Service considers the level of impact to be negligible and further considers the information gained through these efforts to be a significant benefit to the conservation of the DPS. We are therefore including scientific investigations (including annual lek monitoring activity) in this proposed special rule.

Routine Livestock Ranching and Agricultural Activities

Livestock ranching is a dynamic process, which requires the ability to adapt to changing environmental and economic conditions. However, many of the activities essential to successful ranching are considered routine and are undertaken at various times and places throughout the year as need dictates. Although this proposed special rule is not intended to provide a comprehensive list of those ranching activities considered routine, examples include (but are not limited to): Grazing management; planting, harvest, and rotation of forage crops; maintenance and construction of corrals, ranch buildings, fences, and roads; discing of field sections for fire prevention management; control of noxious weeds by prescribed fire or by herbicides; placement of mineral supplements and water developments; and removal of trees in rangelands.

Routine activities associated with livestock ranching have the potential to affect the Bi-State DPS. Some routine activities have the potential to positively affect the DPS (e.g., maintaining irrigated pasture, brood-rearing habitats), while other activities may be neutral with respect to the DPS (e.g., constructing ranch buildings in areas unsuitable for sage-grouse foraging or movement). However, other routine ranching activities have the

potential to negatively affect the DPS depending on when and where the activities are conducted (e.g., direct take from harvesting pasture hay).

While section 9 of the Act provides general prohibitions on activities that would result in take of a threatened species, the Service recognizes that routine ranching activities, even those with the potential to incidentally take the Bi-State DPS, may be necessary components of livestock operations. The Service also recognizes that it is, in the long term, a benefit to the Bi-State DPS to maintain (as much as possible) those aspects of the ranching landscape that can aid in the recovery of the DPS. We believe this proposed special rule would further conservation of the Bi-State DPS by discouraging further conversions of the ranching landscape into habitats entirely unsuitable for the DPS, and encouraging landowners and ranchers to continue managing the remaining landscape in ways that meet the needs of their operation and that provide suitable habitat for the Bi-State DPS.

Routine Livestock Ranching Activities That Would Be Exempted by the Proposed Special Rule

The activities mentioned above and discussed below are merely examples of routine ranching activities that would be exempted by the proposed special rule. Routine activities may vary from one ranching operation to another, and vary with changing environmental and economic conditions. Routine ranching activities include the activities described below and any others that a rancher may undertake to maintain a

sustainable ranching operation. Our premise for not attempting to regulate routine activities is that, ultimately, we believe that a rancher acting in the best interest of maintaining a sustainable ranching operation also is providing incidental but significant conservation benefits for the Bi-State DPS.

In this proposed special rule, we describe and recommend best management practices for carrying out routine ranching activities in ways that would minimize take of the Bi-State DPS, but we would not require these practices. Overall, we believe that minimizing the regulatory restrictions on routine ranching activities would increase the likelihood that more landowners would voluntarily allow the Bi-State DPS to persist or increase on their private lands, and that the benefits of maintaining a rangeland landscape where sage-grouse can coexist with a ranching operation far outweigh the impacts to the DPS from such activities.

Sustainable Livestock Grazing. The act of grazing livestock on rangelands in a sustainable manner (i.e., is consistent with and maintains local ecological conditions) has the potential for take of the Bi-State DPS. Grazing livestock in areas occupied by sage-grouse may cause nest destruction or abandonment, or influence nesting success by removing cover surrounding a nest site (Hagen *et al*. 2007, p. 46; Coates *et al*. 2008, pp. 425–426). Unmanaged livestock grazing (overgrazing) also compacts soils, decreases herbaceous abundance, increases soil erosion, and increases the probability of invasion of nonnative, invasive plant species (Braun 1998, p. 147; Dobkin *et al.* 1998, p. 213; Reisner *et al*. 2013, p. 10). Livestock management and associated infrastructure (such as

water developments and fencing) can degrade important nesting and brood-rearing habitat for the Bi-State DPS, as well as facilitate the spread of WNv.

By contrast, sustainable grazing can be neutral or even beneficial to the Bi-State DPS in several ways. Grazing by sheep and goats has been used strategically in sage-grouse habitat to control invasive weeds (Merritt *et al.* 2001, p. 4; Olsen and Wallander 2001, p. 30; Connelly *et al.* 2004, p. 7-49) and woody plant encroachment (Riggs and Urness 1989, p. 358). Furthermore, Evans (1986, p. 67) reported that sage-grouse used grazed meadows significantly more during late summer because grazing had stimulated the regrowth of forbs, and Klebenow (1982, p. 121) noted that sage-grouse used openings in meadows created by cattle. Also, in the absence of natural meadow habitat, sage-grouse utilize irrigated pasture during late summer/brood-rearing period; these created habitats are of significant importance to population persistence in the Nevada portion of the Bi-State area.

The greatest benefit to the Bi-State DPS provided by working ranches is likely found in the retention of large, contiguous blocks of native shrubland. Frequently, as ranch properties are sold, these native shrublands are divided and converted to nonagricultural uses, such as low density housing developments. This has and continues to occur in the Bi-State area, most notably in the Pine Nut and Desert Creek–Fales PMUs. Therefore, we consider the potential benefits of sustainable livestock grazing, according to normally acceptable and established levels of intensity to prevent overgrazing, to provide justification for including this routine activity in this proposed

special rule.

Planting, Harvest, and Rotation of Forage Crops

In the Bi-State area, irrigated pasture associated with livestock operations is the principle form of agricultural land conversions. Producers plant and harvest these sites periodically from early summer to early fall. During the course of the activities, take of the Bi-State DPS may potentially occur if sage-grouse are killed by farm machinery or disturbed and displaced from the field. However, in some portions of the Bi-State DPS's range, these irrigated pastures play an important role in the sage-grouse's annual life cycle as these locations, at times, act as brood-rearing habitat in the absence of natural meadows. Therefore, the Service considers maintenance of these sites a net benefit for the DPS, and we are therefore including activities associated with maintaining pastures in this proposed special rule.

As these irrigated pastures may be used by young-of-the-year sage-grouse within the Bi-State area, and potentially at a time when birds are still incapable of flight, we recommend that timing of harvest activity be delayed to the greatest extent practicable until such time as the sage-grouse are more mobile. In practice, this period of time within the Bi-State area is from approximately mid-May to late June. Further, we suggest that harvesting occur from the inside of the field working outward to ensure that sage-grouse have the ability to move away from machinery and into adjacent cover.

Maintenance and Construction of Corrals, Ranch Buildings, Fences, and Roads

Maintenance and construction of infrastructure associated with routine livestock practices can potentially negatively affect the Bi-State DPS and may potentially lead to take of the DPS by direct mortality due to collision or through facilitating predation and the spread of nonnative, invasive species. However, these activities may also prove beneficial by improving operations and ultimately range condition. Therefore, the Service is including activities associated with the maintenance and construction of small infrastructure features in this proposed special rule.

The Service encourages limiting the installation of new infrastructure in habitat used by the Bi-State DPS. Further, in instances when placement of these features outside of the DPS's occupied habitat cannot occur because it will not achieve ranch objectives, we recommend the impact posed by these features be minimized to the greatest extent possible. This may include (but it not limited to): Timing construction during periods of sage-grouse absence; using alternative fencing methods (e.g., let-down or electric fencing); marking fences with visual markers; micro-sighting features to minimize impact; and conducting routine monitoring and treatment of noxious weeds.

Control of Noxious Weeds

Controlling noxious weeds through a variety of methods (i.e., chemical, mechanical, or fire) can be an important action affecting conservation of the Bi-State

DPS because these nonnative species can alter sagebrush habitats and render them unsuitable to sage-grouse. However, these actions may potentially cause take of the DPS by disturbance, displacement, or direct mortality. Regardless, the Service considers the benefit gained through active weed suppression to outweigh potential negative consequences to the Bi-State DPS, and is therefore including these activities in this proposed special rule.

The Service encourages these activities to be minimized to the greatest extent practicable, but, in instances when the action is considered necessary, and depending on the method used, appropriate minimization measures may be employed. This may include altering timing of application to minimize disturbance or probability of prescribed fire escape. Further, effort should be taken to minimize collateral damage to shrubs and desirable herbaceous species when applying herbicide(s).

Mineral Supplements and Water Developments

Mineral supplements and water developments can negatively affect the Bi-State DPS's habitat through facilitating the spread of nonnative, invasive species; facilitating disease transmission; or potentially causing direct mortality of sage-grouse through drowning. However, these developments may also have a beneficial effect on the DPS by dispersing livestock use and ultimately improving range condition. Therefore, the Service is including this activity in this proposed special rule.

The Service encourages that mineral supplements and water developments be minimized to the greatest extent practicable to achieve ranch objectives, but, in instances when the action is considered necessary, appropriate minimization and maintenance measures may be employed. These should include maintaining native meadows surrounding springs, placing wildlife escape ramps in watering facilities to prevent drowning, and periodically treating noxious weeds to prevent establishment. Furthermore, it may be prudent to periodically change the location of these facilities in conjunction with weed treatments to minimize the extent to which a single location is overly used and ultimately degraded.

Additional Routine Livestock Ranching Activities

Additional routine ranching activities may include woodland treatment to improve degraded shrub habitats or the creation of fire breaks to prevent the loss of home or property. As discussed above, these activities can negatively affect the Bi-State DPS and may cause take of the DPS. However, the Service considers these actions to produce a net gain to the conservation of the DPS, when conducted in an appropriate manner, and we are therefore including these activities in this proposed special rule.

This provision of the proposed 4(d) special rule for agricultural activities would promote conservation of the Bi-State DPS by encouraging landowners and ranchers to continue managing the remaining landscape in ways that meet the needs of their operation while simultaneously providing suitable habitat for the DPS.

Provisions of the Proposed Special Rule

Section 4(d) of the Act states that "the Secretary shall issue such regulations as [s]he deems necessary and advisable to provide for the conservation" of species listed as a threatened species. Conservation is defined in the Act as, "to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to [the] Act are no longer necessary." Additionally, section 4(d) of the Act states that the Secretary, "may by regulation prohibit with respect to any threatened species any act prohibited under section 9(a)(1)."

The courts have recognized the extent of the Secretary of the Interior's discretion under this standard to develop rules that are appropriate for the conservation of a species. For example, the Secretary may find that it is necessary and advisable not to include a taking prohibition, or to include a limited taking prohibition. See *Alsea Valley Alliance* v. *Lautenbacher*, 2007 U.S. Dist. Lexis 60203 (D. Or. 2007); *Washington Environmental Council* v. *National Marine Fisheries Service*, and 2002 U.S. Dist. Lexis 5432 (W.D. Wash. 2002). In addition, as affirmed in *State of Louisiana* v. *Verity,* 853 F.2d 322 (5th Cir. 1988), the rule need not address all the threats to the species. As noted by Congress when the Act was initially enacted, "once an animal is on the threatened list, the Secretary has an almost infinite number of options available to him with regard to the permitted activities for those species. [S]he may, for example, permit taking, but not

importation of such species," or the Secretary may choose to forbid both taking and importation but allow the transportation of such species, as long as the measures will "serve to conserve, protect, or restore the species concerned in accordance with the purposes of the Act" (H.R. Rep. No. 412, 93rd Cong., 1st Sess. 1973).

Section 9 prohibitions make it illegal for any person subject to the jurisdiction of the United States to take (including harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect; or attempt any of these), import or export, ship in interstate commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce any wildlife species listed as an endangered species, without written authorization. It also is illegal under section 9(a)(1) of the Act to possess, sell, deliver, carry, transport, or ship any such wildlife that is taken illegally. Prohibited actions consistent with section 9 of the Act are outlined for threatened species at 50 CFR 17.31(a) and (b). We are proposing a 4(d) special rule for the Bi-State DPS that would apply all of the prohibitions set forth at 50 CFR 17.31(a) and (b) to the Bi-State DPS with the exceptions detailed above and summarized below.

First, we propose that none of the provisions at 50 CFR 17.31 would apply to actions associated with a conservation program developed by or in coordination with the State agency or agencies responsible for the management and conservation of fish and wildlife within the affected State(s), or their agent(s), and that the Service determines provides a net conservation benefit for the Bi-State DPS, as described earlier in this **Proposed Special Rule** section. The proposed 4(d) special rule identifies a set of criteria

the Service proposes to use to evaluate such programs. Among additional considerations, the approval criteria would require that the program provide the Bi-State DPS populations and habitat targets necessary to ensure a net conservation benefit for the DPS across the program area, in addition to mechanisms for achieving those targets. In this way, actions in the program would ultimately contribute to the conservation of the DPS. If this provision of the proposed special rule is adopted, the Service expects that rangewide conservation actions would be implemented with a high level of certainty that the program would lead to the long-term conservation of the Bi-State DPS.

Second, we also propose that none of the provisions in 50 CFR 17.31 would apply to routine livestock ranching activities conducted in a sustainable manner, as described earlier in this **Proposed Special Rule** section. According to the proposed listing rule, the primary factors supporting the proposed threatened status for the Bi-State DPS are the impacts of cumulative habitat loss and fragmentation. Allowing the continuation of existing ranching and agricultural operations consistent with these criteria would encourage landowners to continue managing the remaining landscape in ways that meet the needs of their operations while simultaneously providing suitable habitat for the Bi-State DPS.

Based on the rationale above, the provisions included in this proposed 4(d) special rule are necessary and advisable to provide for the conservation of the Bi-State DPS. Nothing in this proposed 4(d) special rule changes in any way the recovery planning provisions of section 4(f) of the Act, consultation requirements under section 7 of the

Act, or the ability of the Service to enter into partnerships for the management and protection of the Bi-State DPS.

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 the **ADDRESSES** section. 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 (42 U.S.C. 4321 et seq.)

We have determined that environmental assessments and environmental impact statements, as defined under the authority of the National Environmental Policy Act (NEPA; 42 U.S.C. 4321 *et seq.*), need not be prepared in connection with listing a species as an endangered or threatened species under the Endangered Species 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 references cited in this rulemaking is available on the Internet at *http://www.regulations.gov* under Docket No. FWS–R8–ES–2013–0072 and upon request from the Nevada Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this proposed rule are the staff members of the Service's Nevada Fish and Wildlife Office and Region 8 Regional Office.

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—[AMENDED]

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

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

2. Amend § 17.11(h) by adding an entry for "Sage-grouse, greater (Bi-State DPS)" to the List of Endangered and Threatened Wildlife in alphabetical order under BIRDS to read as follows:

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

SPECIES		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
* * * * * * *							
BIRDS							
* * * * * * *							
Sage-grouse, greater (Bi-State DPS)	*Centrocercus urophasianus*	U.S.A. (CA, NV)	Entire	T		NA	17.41(d)
* * * * * * *							

3. Amend §17.41 by adding paragraph (d) to read as follows:

§ 17.41 Special rules—birds.

(d) Bi-State DPS of Greater Sage-grouse (*Centrocercus urophasianus*).

(1) *Prohibitions.* Except as noted in paragraphs (d)(2)(i) and (d)(2)(ii) of this section, all prohibitions and provisions of §§ 17.31 and 17.32 apply to the Bi-State distinct population segment (DPS) of greater sage-grouse.

(2) *Exemptions from prohibitions.* Incidental take of the Bi-State DPS of greater sage-grouse will not be considered a violation of section 9 of the Act if the take results from any of the following:

(i) Implementation of a comprehensive conservation program for the Bi-State DPS of greater sage-grouse that:

(A) Was developed by or in coordination with State agency or agencies, or their agent(s), responsible for the management and conservation of fish and wildlife within the affected State(s).

(B) Is intended to conserve the Bi-State DPS of greater sage-grouse by:

(1) Addressing threats affecting the DPS within the program area;

(2) Implementing objective, measurable biological goals and objectives for the populations and habitat necessary to ensure a net conservation benefit, and providing the mechanisms by which those goals and objectives would be achieved;

(3) Ensuring the establishment of funding mechanisms to effectively implement all elements of the conservation program;

(4) Employing an adaptive management strategy to ensure future program adaptation as necessary and appropriate; and

(5) Including appropriate monitoring of effectiveness and compliance.

(C) Is reviewed by the Service as meeting the objectives for which it was originally established under paragraph (d)(2)(i)(B) of this section.

(ii) Conservation practices on privately owned lands that:

(A) Are carried out in accordance with a conservation plan that meets the requirements of paragraph (d)(2)(i) of this section; and

(B) Involve the following types of conservation activities:

(*1*) Installing infrastructure features that allow land managers to meet management objectives that benefit the Bi-State DPS of greater sage-grouse.

(*2*) Treating woodland sites that have encroached upon, infilled, and replaced sagebrush habitat, and restoring the location to a condition dominated by a sagebrush vegetation community.

(*3*) Conducting fire management activities (i.e., preventing, suppressing, and restoring) to prevent or minimize the spread of wildfires in rangelands.

(*4*) Conducting activities that constrain development and water rights related to procuring conservation easements.

(*5*) Conducting land management activities that minimize the impact of feral horses on the local landscape in the Bi-State area.

(*6*) Conducting restoration and maintenance activities (e.g., mechanical or chemical treatments) in meadow, riparian, and other mesic habitats that are used by the Bi-State DPS of greater sage-grouse to facilitate recruitment of juvenile greater sage-grouse, as well as restoration activities in upland sites that are degraded by grazing or recreational use.

(*7*) Performing population maintenance activities, and conducting scientific research and monitoring. These activities may include disturbing, displacing, or capturing and relocating greater sage-grouse in order to repopulate an extirpated location.

(*8*) Conducting routine livestock ranching and agricultural activities (i.e., sustainable livestock grazing) that adapt to changing environmental and economic conditions and provide a long-term conservation benefit to the Bi-State DPS of greater sage-grouse by maintaining (as much as possible) those aspects of the ranching landscape that can aid in the recovery of the Bi-State DPS of greater sage-grouse.

(*9*) Planting, harvesting, and rotating forage crops in irrigated pastures associated with livestock operations, specifically in locations where these irrigated pastures serve as brood-rearing habitat for greater sage-grouse in the absence of natural meadows.

(*10*) Maintaining and constructing infrastructure (i.e., corrals, ranch buildings, fences, and roads) associated with routine livestock practices when these actions provide a long-term conservation benefit to the Bi-State DPS of greater sage-grouse by improving operations and ultimately range conditions, thereby aiding in the recovery of the Bi-State DPS of greater sage-grouse.

(*11*) Controlling noxious weeds (i.e., nonnative plant species) through a variety of methods (i.e., chemical, mechanical, or fire) to prevent or minimize alteration of sagebrush habitats, which can render affected areas unsuitable for the Bi-State DPS of greater sage-grouse.

(*12*) Installing water developments and using mineral supplements (only when necessary) by employing appropriate minimization and maintenance measures. Exemption applies only when installing these water development features or using mineral supplements results in long-term maintenance of native meadows surrounding springs, avoidance of sage-grouse drowning by placing wildlife escape ramps in watering facilities, periodic treatment of noxious weeds to prevent establishment, or relocation of these facilities to minimize the extent to which a single location becomes overly used and degraded.

(*13*) Conducting routine ranching activities not described in this paragraph (d)(2)(ii)(B) that include woodland treatments to improve degraded shrub habitats or create fire breaks, which in turn prevent the loss of home or property, and produce a net gain to the conservation of the Bi-State DPS of greater sage-grouse.

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Dated: ____September 17, 2013.

Signed: Daniel M. Ashe,

Director, U.S. Fish and Wildlife Service.

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