United States Department of the Interior

FISH AND WILDLIFE Service
Ecological Services
764 Horizon Drive, Building B
Grand Junction, Colorado 81506-3946

IN REPLY REFER TO:
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July 30, 2013

Memorandum

To: Field Manager, Bureau of Land Management, Gunnison Field Office, Gunnison, Colorado

From: Western Colorado Supervisor, Fish and Wildlife Service, Ecological Services, Grand Junction, Colorado

Subject: Conference Opinion for the Gunnison Basin Candidate Conservation Agreement and Effects on Gunnison Sage-Grouse

In accordance with section 7 of the Endangered Species Act of 1973 as amended (16 U.S.C. 1531 et seq. [ESA],), and the Interagency Cooperation Regulations (50 CFR 402), this document transmits the Fish and Wildlife Service's (Service) conference opinion (CO) for the Gunnison Basin Candidate Conservation Agreement (CCA) (proposed action) and effects on Gunnison sage-grouse (*Centrocercus minimus*) (bird). Your April 12, 2013, biological assessment (BA) and letter requesting section 7 formal conference were received by our office on April 12, 2013.

This CO is based on information provided in the April 12, 2013, BA; various discussions between our staffs; and other sources of information. A complete administrative record of this CO is on file at this office.

INTRODUCTION

On January 11, 2013, Gunnison sage-grouse was proposed by the Service for listing as endangered (78 FR 2486) under the ESA. Concurrently, approximately 1.7 million acres were proposed as critical habitat for the species (78 FR 2540). Final determinations on the listing and critical habitat proposals are due March 31, 2014.

In January 2010, the Bureau of Land Management (BLM), U.S. Forest Service (USFS), National Park Service (NPS) (collectively, action agencies), and other members of the Gunnison Basin Sage-Grouse Strategic Committee (Strategic Committee) began preparing a CCA with the Service to promote the conservation of the Gunnison Basin population of Gunnison sage-grouse. The CCA was completed and signed by the action agencies and members of the Strategic Committee on August 23, 2012. Upon conclusion of this CO, the Service will also sign the

CCA. The CCA addresses three categories of land uses (or threats) to Gunnison sage-grouse on Federal lands in the Gunnison Basin: land development, recreation, and livestock grazing.

The BLM led and initiated this voluntary section 7 CO on the CCA. Conferencing under the ESA is only required when a Federal agency proposes an activity that is likely to jeopardize the continued existence of a species that has been proposed for listing under the ESA, or when the proposed activity will destroy or adversely modify proposed critical habitat (50 CFR 402.10). However, voluntary conferencing may occur for candidate or proposed species to promote conservation of species that has not yet been listed under the ESA. Upon listing of a species under the ESA, a CO may be adopted by the Service as a biological opinion (BO), upon written request from the action agency. The BLM, USFS, and NPS anticipate adoption of this CO as a BO if Gunnison sage-grouse is listed and critical habitat is designated.

The Service commends the BLM, other participating action agencies, and the Strategic Committee for their efforts in the design of the CCA and implementation of conservation measures to benefit Gunnison sage-grouse. Overall, we expect the CCA and its strategies to promote the conservation of this species, while facilitating the multiple-use mandate for Federal lands. Approximately 87 percent of the rangewide population of Gunnison sage-grouse occurs in the Gunnison Basin population. Further, the CCA provides a strategic model for other Federal lands and offices outside the Gunnison Basin to advance the conservation of Gunnison sage-grouse. As such, we encourage adoption of the CCA, or a similar strategy, in those areas.

SPECIES ADDRESSED

Consistent with the BA, this CO is limited to effects of the proposed action on Gunnison sage-grouse and proposed, occupied critical habitat over the next 20 years. Effects on proposed unoccupied critical habitat would require future, separate consultation. Also, effects on other proposed or listed species would require future, separate consultation, pursuant to section 7 of the ESA.

As described in the BA, depending on the component or program of the proposed action, the anticipated effects include: "no effect", "not likely to adversely affect", and "likely to adversely affect." For the purposes of section 7 consultation, because adverse effects are expected at some level as a result of certain components of the proposed action, the proposed action as a whole "may affect, is likely to adversely affect" Gunnison sage-grouse. The remainder of this CO addresses effects on Gunnison sage-grouse.

CONSULTATION HISTORY

Federal and private partners commenced efforts on the CCA as early as January 2010. Various drafts of the CCA were reviewed by the Service thereafter and throughout 2012. Multiple meetings were held between the BLM and other action agencies to discuss content of the CCA and section 7 requirements. The Service provided comments and recommendations for those drafts related to scope, effects determinations, conservation measures, and more. A complete administrative record of the consultation history is on file at this office. A draft BA was submitted by the BLM on December 18, 2012. The Service provided comments on the draft BA on January 28, 2013. A final BA was submitted by the BLM on April 12, 2013, and received by our office on the same date.

CONFERENCE OPINION

I. DESCRIPTION OF THE PROPOSED ACTION

This section provides a brief summary of the proposed action and its scope. For more details on the proposed action, refer to the CCA/ BA and its conservation measures (Part 3 of the BA). More details on the proposed action and conservation measures are also provided in the Effects section of this CO. This CO considers effects on Gunnison sage-grouse from specific land use projects and conservation measures as proposed in the CCA and BA. Conservation measures describe the nondiscretionary measures necessary to avoid, minimize, or mitigate project effects on the species and its habitat.

The CCA addresses the majority of the most common land use authorizations on Federal lands in the Gunnison Basin where Gunnison sage-grouse occur (described below). The plan does not cover all land use projects or authorizations on Federal lands. Certain projects may fit under the overall land use programs above, but may not meet the criteria described herein, or for which the agencies determine the CCA and its measures are not appropriate or feasible. In those cases, separate section 7 consultation would be required for any actions that may affect Gunnison sage-grouse. The proposed action includes implementation of the CCA and its conservation measures (see Conservation Measures section below), associated with three Federal land use programs: development, recreation, and livestock grazing. The BA describes the projects and actions, and their scope, and the associated conservation measures that would occur under seven categories within the three land use programs (Table 1). This includes new projects and their associated access, maintenance, and operations into the future. Also, maintenance and operations associated with certain existing projects and infrastructure will occur under the proposed action. The proposed conservation measures further define the scope of the proposed action by limiting the scale of projects covered under the CCA (e.g., small-scale infrastructure).

Table 1. Project categories addressed under this CO.

Motorized roads and trails, non-motorized trails, and closure implementation
Permitted recreation events and outfitters
BLM Urban Interface Recreation Areas- Hartman Rocks (existing), Signal Peak (conceptual), and Van Tuyl (conceptual)
Livestock grazing management- Five conservation measures will be incorporated into grazing permit renewals and transfers to ensure Gunnison sage-grouse habitat is maintained and improved.
Small-scale infrastructure and water developments- Small-scale administrative infrastructure such as signs and kiosks and stock ponds
Medium-scale infrastructure- New utility lines and pipelines, existing overhead utility lines, communication sites, meteorological towers, and similar infrastructure.
Fences- Construction of new fences and exclosures

The CCA addresses approximately 395,000 acres of occupied Gunnison sage-grouse habitat on Federal land in the Gunnison Basin area (Figure 1; Table 2). The CCA/ BA will be implemented over the next 20 years. Likewise, this CO evaluates effects and provides incidental take coverage over a 20-year period, through July 29, 2033.

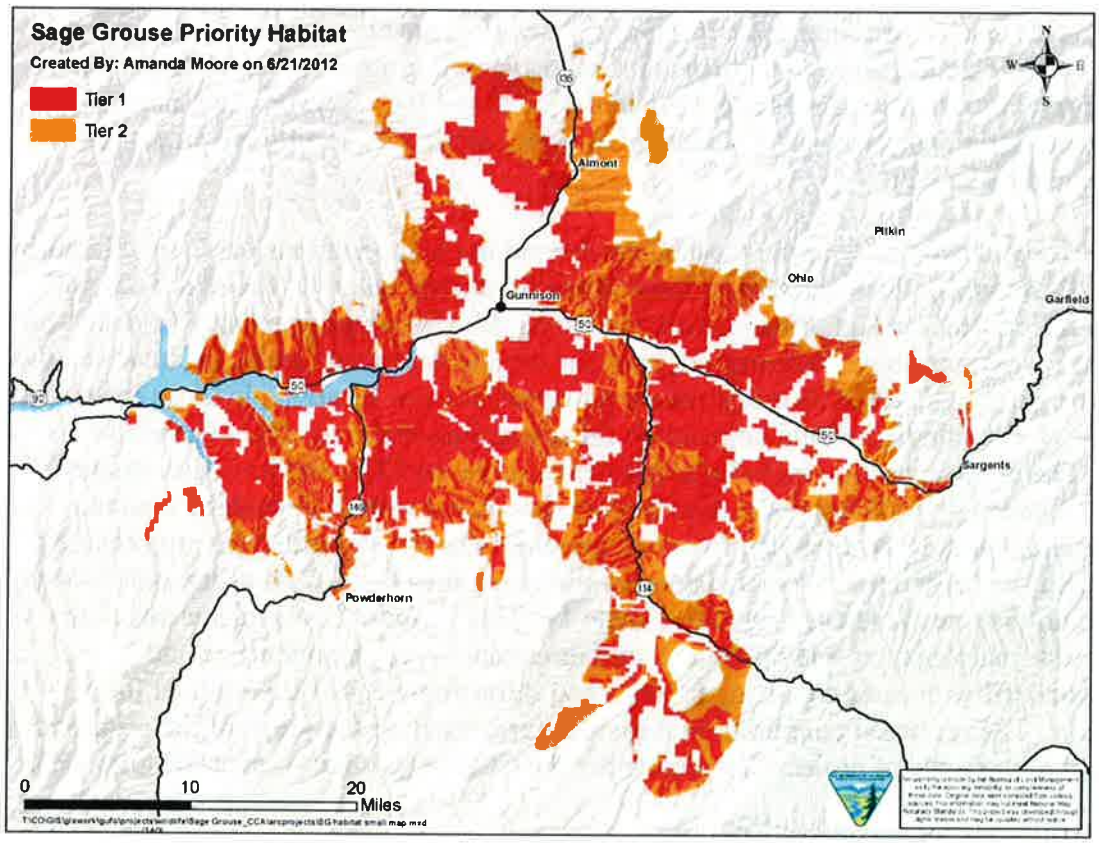


Figure 1. Tier 1 and Tier 2 Gunnison sage-grouse habitat on Federal lands in the Gunnison Basin.

Conservation Measures

Conservation measures are non-discretionary actions that the action agencies agree to implement to further the recovery of listed species. The beneficial effects of conservation measures are taken into consideration for determining both jeopardy and destruction/ adverse modification analyses. In this section, proposed conservation measures are summarized briefly. Relevant Parts of the BA are parenthetically noted and incorporated by reference below.

The BA's proposed conservation measures include standard/ general minimization measures (Part 6.1), site-specific measures (Part 3), and best management practices (Part 6.2 – 6.4) for the proposed project types (Table 1). The standard or general minimization measures include seasonal restrictions and closures during sensitive time periods for sage-grouse, siting and construction restrictions, and follow-up/reclamation standards. Site-specific measures are guided primarily by project type and a habitat stratification approach. The Habitat Prioritization Tool (HPT) (Part 10) stratifies Gunnison sage-grouse occupied habitat in the Gunnison Basin into two types: Tier 1 Habitat, considered the highest value habitat for the species; and Tier 2 Habitat, which includes the remainder of occupied habitat generally of lower value (Table 2). Broadly, for a given project occurring under the CCA, more restrictive conservation measures are required in Tier 1 Habitats to ensure protection or maintenance of those values. A key component of the

site-specific measures are conditions for offsetting habitat loss or disturbance such that there is a net increase in Tier 1 Habitat, and no net loss (maintenance) of Tier 2 Habitat. For some projects (e.g., livestock grazing, Part 3.5), an adaptive management approach is incorporated to ensure Gunnison sage-grouse habitats and requirements are achieved and maintained. Proposed best management practices include invasive plant management and prevention measures, road maintenance and ground disturbance restrictions, right-of-way restrictions, communication tower standards, and grazing management guidelines.

Table 2. Gunnison sage-Grouse occupied habitat (acres) on Federal lands in the Gunnison Basin.

	Tier 1[a]	Tier 2[b]	Total Acres (Tiers 1 and 2)
BLM	212,554	89,300	301,854
USFS	33,033	50,993	84,026
NPS	4959	4619	9,578
Total Acres	250,546	144,912	395,458

[a] Tier 1- mapped portion of occupied habitat in the Gunnison Basin identified as high value to Gunnison sage-grouse
[b] Tier 2- mapped remainder of occupied habitat in the Gunnison Basin identified as lower value to Gunnison sage-grouse than Tier 1 areas

Further, the CCA and BA include detailed plans and guidance for adaptive management (Part 4), offsite mitigation (Part 5), monitoring for various projects and project phases (Part 7), and annual reporting requirements (Part 8). While not technically conservation measures, these components provide a means to ensure that conservation efforts are effective, that the goals and objectives set forth by the CCA are being achieved.

When possible, conservation measures will be recommended for interrelated or interdependent activities on private lands. Interrelated activities are those that are part of the larger measures under consideration for consultation and depend on a larger measure for their justification. Interdependent activities are those that have no significant independent utility apart from the measure that is under consideration for consultation. If a given activity on private land is interrelated or interdependent to a covered Federal action, and the CCA conservation measures cannot be applied on the non-Federal portion of the action, then the activity would not be covered under the CCA or this CO and, therefore, may require separate consultation if the bird is listed to ensure ESA requirements are met.

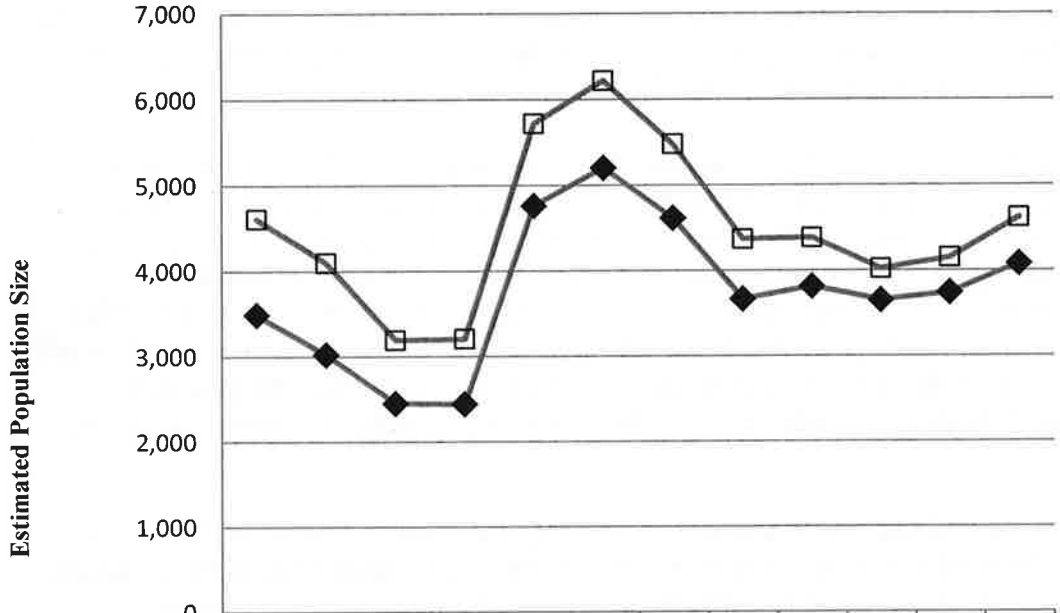
II. STATUS OF THE SPECIES

On January 11, 2013, the Service proposed to list the Gunnison sage-grouse as an endangered species (78 FR 2486). Concurrently, the Service proposed to designate 1.7 million acres of critical habitat for the species (78 FR 2540). Following is a brief description of the current distribution of the species' rangewide and an assessment of the Gunnison Basin population and trends. More detail on the species status is provided in 78 FR 2486. A detailed discussion of Gunnison sage-grouse taxonomy, the species description, historical distribution, habitat, and life-history characteristics can be found in the Service's 12-month finding for Gunnison sage-grouse, published September 28, 2010 (75 FR 59804).

Gunnison sage-grouse currently occur in seven widely scattered and isolated populations in Colorado and Utah, occupying 3,795 square kilometers (km^2) (1,511 square miles [mi^2]) (Gunnison Sage-grouse Rangewide Steering Committee) [GSRSC] 2005, pp. 36–37; CDOW 2009a, p. 1). The seven populations are Gunnison Basin, San Miguel Basin, Monticello–Dove Creek, Piñon Mesa, Crawford, Cerro Summit–Cimarron–Sims Mesa, and Poncha Pass (Figure 1). Population trends over the last 12 years indicate that six of the populations are in decline. The largest population, the Gunnison Basin population, while showing variation over the years, has been relatively stable through the period (CDOW 2010, p. 2; CPW 2012, pp.1-4). Six of the populations are very small and fragmented (all with less than 40,500 hectares (ha) (100,000 acres [ac]) of habitat likely used by grouse and, with the exception of the San Miguel population, less than 50 males counted on leks (communal breeding areas)) (CDOW 2009, p. 5; CPW 2012, p. 3). The San Miguel population is the second largest and comprises six fragmented subpopulations.

The Gunnison Basin is an intermontane basin that includes parts of Gunnison and Saguache Counties, Colorado. The current Gunnison Basin population, which is the focus of this conference, is distributed across approximately 240,000 ha (593,000 ac), roughly centered on the town of Gunnison. Elevations in the area occupied by Gunnison sage-grouse range from 2,300 to 2,900 meters (m) (7,500 to 9,500 feet [ft]). Approximately 70 percent of the land area occupied by Gunnison sage-grouse in this population is managed by Federal agencies (67 percent) and CPW (3 percent), and the remaining 30 percent is primarily private lands. Wyoming big sagebrush *(Artemisia tridentata* ssp. *wyomingensis)* and mountain big sagebrush *(A. t.* ssp. *vaseyana)* dominate the upland vegetation and have highly variable growth form depending on local site conditions.

In 1961, Gunnison County was one of five counties containing the majority of all sage-grouse in Colorado (Rogers 1964, p. 20). The vast majority (87 percent) of Gunnison sage-grouse are now found only in the Gunnison Basin population. The 2012 population estimate for the Gunnison Basin was 4,082 (CPW 2012, pp. 1-2) (Figure 2). In 2011, 42 of 83 leks surveyed in the area were active (at least two males in attendance during at least two of four 10-day count periods), 6 were inactive (inactive for at least 5 consecutive years), 11 were deemed historic (inactive for at least 10 consecutive years), and 24 were of unknown status (variability in counts resulted in lek not meeting requirements for active, inactive, or historic) (CPW 2011b, pp. 27–29). Approximately 45 percent of leks in the Gunnison Basin occur on private land and 55 percent on public land, primarily land administered by the BLM (GSRSC 2005, p. 75).



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Gunnison Basin	3,493	3,027	2,453	2,443	4,763	5,205	4,616	3,669	3,817	3,655	3,743	4,082
Totals	4,611	4,101	3,194	3,208	5,720	6,220	5,480	4,371	4,386	4,023	4,150	4,621

[a]Gunnison Sage-grouse Rangewide Steering Committee
[b]Colorado Parks and Wildlife

Figure 2. Population estimates by year for the Gunnison Basin population and the rangewide total Gunnison sage-grouse population derived from Gunnison sage-grouse Rangewide Conservation Plan formula (GSRSC 2005, pp. 44–45) applied to high male counts on leks (CPW 2012, pp. 1-3).

III. ENVIRONMENTAL BASELINE

The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in an action area, the anticipated impacts of all proposed Federal projects in an action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions that are contemporaneous with the consultation in process (50 CFR 402.02). Ongoing actions include residential development, agricultural production, State and county road maintenance activities, vehicle traffic on area roads, livestock grazing, hunting, human infrastructure, and others. Each of these activities has the potential to affect Gunnison sage-grouse and its habitat (see further discussion below).

Action Area

As described in the Proposed Action section above, the CCA addresses approximately 395,000 acres of occupied Gunnison sage-grouse habitat on Federal land in the Gunnison Basin area (Table 2). However, ESA regulations require that the action area evaluated in this CO includes all areas to affected directly or indirectly by the Federal actions and not merely the immediate area(s) involved in the actions (50 CFR 402.02). Because of uncertainty regarding the precise location, size, and frequency of the proposed projects described in the CCA, it is difficult to predict the extent of possible effects and, therefore, the appropriate scope of the action area. However, it is reasonable to assume that effects from projects on occupied Federal lands will extend to adjoining or nearby unoccupied Federal lands; as well as any private, State, and other lands, occupied and unoccupied.

This concept is discussed further in the Effects section below. Based on this information, for the purposes of this analysis, the Service considers the Gunnison Basin Unit (Unit 6) of proposed critical habitat as the action area (Figure 3).

Unit 6 of proposed critical habitat for Gunnison sage-grouse includes approximately 736,802 acres, of which 592,952 acres (80.5 percent) are occupied and 143,850 (19.5 percent) acres are unoccupied by Gunnison sage-grouse. The unit is comprised of Federal, State, and local government-owned lands, and private lands in Gunnison, Hinsdale, Montrose, and Saguache Counties, Colorado (78 FR 2540). Note the similar configuration and extent of the CCA analysis area (Figure 1) and the action area (Figure 3). The Gunnison Basin Unit encompasses the entire area (occupied and unoccupied habitats) the Service reasonably expects may be affected by actions proposed under the CCA.

Importantly, the defined action area does not change the scope or nature of the proposed action which includes only projects in occupied habitat on Federal lands in the Gunnison Basin population area (Figure 1; Table 1). Actions and projects in areas outside of occupied habitat for Gunnison sage-grouse would not be subject to the terms of this CO. Rather, the intent of the action area is to account for and evaluate the full range of potential effects, including indirect or offsite (outside the project footprint) effects, on the species and its habitat.

Description of the Action Area

Threats to Gunnison sage-grouse and its habitat in the action area include habitat loss and fragmentation due primarily to human development and infrastructure such as roads and power lines, water developments, invasive plants, fences, improper livestock grazing, wild ungulate herbivory, recreation, fire, climate change, disease (West Nile virus), predation, and the inadequacy of existing regulatory mechanisms. Ongoing conservation efforts in the Gunnison Basin are expected to minimize the impact of these threats. Threats to Gunnison sage-grouse and the Gunnison sage-grouse population are described in detail in the Service's proposed rule to list Gunnison sage-grouse as endangered (78 FR 2486, entire). Consistent with the scope of the CCA, the BA analyzes effects resulting from Federal projects related to development, recreation, and grazing.

The Gunnison Basin population of Gunnison sage-grouse is critical to the continued survival and recovery of the species. Considering total occupied habitat and the abundance of birds on Federal lands in the Gunnison Basin, the significance of conservation efforts in those areas is evident. The vast majority (87 percent) of Gunnison sage-grouse occur in the Gunnison Basin population, and bird numbers and population trends in the Gunnison Basin are a key influence on the species' rangewide trend (Figure 2). Furthermore, approximately 67 percent of occupied habitat in the Gunnison Basin is managed by the BLM, USFS, and NPS, and is included in the CCA and proposed action. Approximately 3 percent of occupied habitat in the Gunnison Basin is managed by CPW; and 30 percent is in private ownership, including portions held by the Ute Mountain Ute Tribe.

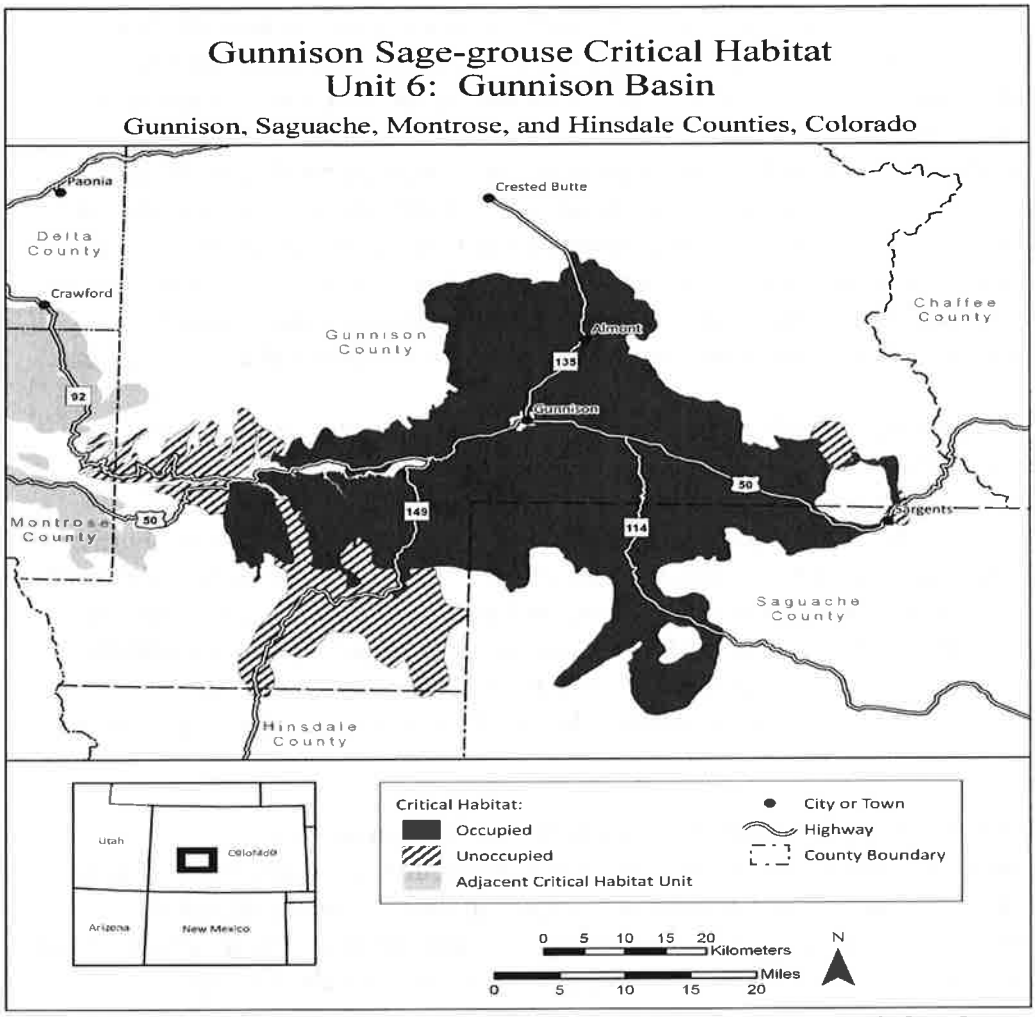


Figure 3. Action area for the CCA and CO, based on proposed occupied and unoccupied critical habitat in the Gunnison Basin Unit (Unit 6) (78 FR 2540).

IV. EFFECTS OF THE ACTION

The effects of the action include the direct and indirect impacts of the proposed Federal action on the species and critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02).

We anticipate that the CCA will provide a long-term, net benefit for Gunnison sage-grouse and its habitat on a landscape scale. Broadly, for a given project occurring under the CCA, more restrictive conservation measures are required in Tier 1 Habitats to ensure protection or maintenance of those values. A key component of the site-specific measures for most land use types are requirements for offsetting habitat loss or disturbance such that there is a net increase in Tier 1 Habitat, and no net loss (maintenance) of Tier 2 Habitat (see Proposed Action section). A number of other conservation measures are proposed to avoid and minimize project impacts on Gunnison sage-grouse.

Considering the nature and scope of the proposed projects and the associated conservation measures, we anticipate the majority of any adverse effects will occur within the project area, or occupied habitat. However, as described above where we define the action area, impacts may extend beyond occupied habitat. For instance, there is potential for projects to directly or indirectly affect individual birds that utilize or migrate through areas currently identified as unoccupied. This could have consequences in terms of bird movements and habitat connectivity and, ultimately, genetic exchange with satellite populations of Gunnison sage-grouse. Further, actions within occupied habitat may lead to impacts in unoccupied habitat. For instance, weed invasion could spread from projects implemented in occupied habitat to areas of mapped unoccupied habitat that may nevertheless be important to sage-grouse survival and persistence.

Below, we provide a summary of the key effects of the proposed land uses to Gunnison sage-grouse. We expect some of these effects to be synergistic. For example, human development may result in behavioral disturbance of birds, subsequent displacement of individual birds, an increased risk of predation, and potential mortality of those birds. Further, climate change and drought could amplify any of these effects. Part 3 of the BA provides a more detailed analysis of effects by land use category, associated conservation measures, and rationale for the effects determinations. Table 3 in this CO summarizes the range of potential effects on the species from the proposed action. Table 4 provides the BA's regulatory effects determination for each land use category, accounting for the beneficial or minimizing effects of associated conservation measures.

Motorized roads and trails, non-motorized trails, and closure implementation.
Surface-disturbing activities associated with travel route construction, or route closures, may flush individual birds within the vicinity, temporarily exposing them to increased risk of predation. Disturbance of vegetation may also contribute to weed introduction or spread. Road traffic may collide with birds, or impede bird movements. Indirectly, roads may facilitate predation or alter nearby habitats via an increase in invasive plants. Noise-related disturbance from roads may result in behavioral avoidance of those areas by Gunnison sage-grouse. Conservation measures for travel routes include, among others, off-site mitigation such that there will be a reduction in overall route density and mileage in Tier 1 habitat, and no net increase in overall route density and mileage in Tier 2 habitat.

Permitted recreation events and outfitters
Potential effects from recreation events and outfitters activities include temporary disturbance and displacement of Gunnison sage-grouse. Birds may expend energy avoiding disturbance, rather than foraging or nesting. Flushed birds may be more exposed to predation. Action agencies will direct recreation events and outfitters to areas outside of occupied habitat when possible. Motorized activities will be limited to existing disturbance and designated routes.

BLM Urban Interface Recreation Areas
Route construction and use can lead to actual and functional habitat loss, and disturbance or displacement of birds to less suitable habitat, potentially exposing them to greater predation and reduced nest success. Concentrated use of urban interface areas will minimize recreation demands and associated impacts in surrounding habitats and at the landscape level. Conservation measures include seasonal closures, rerouting and decommissioning of routes near leks and in riparian areas, and others.

Livestock grazing management
Direct impacts to Gunnison sage-grouse from livestock grazing include physical disturbance of nests and birds, at times leading to temporary or permanent abandonment of nests and/or chicks. Forage use by livestock may reduce herbaceous vegetation that provides nesting or hiding cover, or which harbors insect prey, thereby influencing susceptibility to predation, nesting success, and the overall survival of birds. Livestock grazing can also impact habitat quality via compacted soil, accelerated erosion, and spread of invasive weeds. Livestock grazing that meets habitat objectives for Gunnison sage-grouse may be beneficial to Gunnison sage-grouse. Conservation measures include standardizing permit terms and conditions to incorporate the Gunnison sage-grouse Rangewide Conservation Plan (RCP) habitat guidelines (GSRSC 2005), consistent with the primary constituent elements for proposed critical habitat for Gunnison sage-grouse; and an adaptive management and monitoring approach to ensure conditions are maintained or improved for sage-grouse.

Small-scale infrastructure and water developments
This land use category includes small-scale construction and maintenance of small-scale (less than 1 acre in size) water developments, signs, kiosks, vault toilets, vehicle barriers, concentrated parking areas, culverts, gates, cattle guards, and exclosures. Effects on Gunnison sage-grouse would be similar to those described above for travel routes, primarily due to habitat disturbance. Conservation measures include lek buffers for certain infrastructure, the standard minimization measures, and others. Most infrastructure would be installed within existing disturbed areas.

Medium-scale infrastructure
This land use category includes medium scale right-of-way actions and construction activities for utility lines and pipelines, communication sites and towers, and comparable infrastructure. It also includes existing right-of-way amendments, routine maintenance, and operations. Major or large projects (as defined in the BA) are not covered under the CCA. By providing avian predator perches, power lines may increase predation of sage-grouse. Power lines are also a collision hazard and possible movement barrier for Gunnison sage-grouse. Construction or maintenance of medium-scale infrastructure would result in habitat loss and degradation, as well as other direct or indirect effects on birds, similar to those described under travel routes. Conservation measures include, among others, installation of perch deterrents, collocation of infrastructure, standard minimization measures, and offsite mitigation measures depending on the project.

New fences and exclosures
Fences may result in habitat loss or degradation, similar to effects described above for travel route construction. Fences may introduce perches for avian predators of Gunnison sage-grouse, and may pose a physical barrier or disturbance to grouse movements. Depending on topography, proximity to leks, habitat type, and other numerous factors, bird-fence collisions may occur, resulting in injury or mortality of birds, as documented in greater sage-grouse populations. Conservation measures include, among others, wildlife-friendly design, flagging or marking of fences in high collision risk areas, and standard minimization measures.

Table 3. Range of categorical effects, or species' responses, from the proposed action.

- Habitat fragmentation, modification and/or degradation (e.g., vegetation, soil, water quality impacts; structural barriers; sagebrush or understory component changes)
- Behavioral disturbance or harassment of birds (e.g., displacement of birds to less suitable habitats, disruption of breeding behavior, energy loss)
- Increased risk of predation (e.g., displaced birds may be more exposed to predation)
- Weed invasion (e.g., due to ground or vegetation disturbance)
- Decreased lek attendance (e.g., due to behavioral disturbance, alteration of vegetation communities near leks, or increased risk of predation)
- Destruction, depredation, or abandonment of nests, eggs, or young (e.g., due to physical disturbance, trampling, etc.)
- Short- and long-term localized impacts on site-specific primary constituent elements for proposed critical habitat, and/ or functional habitat modification
- Increased fire risk (power lines, construction activities, etc.)
- Increased risk of disease (e.g., water developments, mosquito vectors of West Nile virus)
- Bird collisions (e.g., due to fences and transmission lines)
- Bird mortality (eggs, young, or adults)

Based on this analysis, the BA provides regulatory effects determinations and rationale for each of the land uses (Table 4). Five of the seven land use categories covered under the CCA are "likely to adversely affect" (Table 4) and may result in take of Gunnison sage-grouse, and thus require incidental take coverage if the species is listed. These categories include 1) motorized roads and trails, non-motorized trails, and route closure implementation, 2) BLM Urban Interface Recreation Areas, 3) livestock grazing management and operations, 4) medium-scale infrastructure, and 5) new fences and exclosures. The remaining land use categories, permitted

recreation events and outfitters; and small-scale infrastructure and water developments, are expected to have no effect, or discountable and/or insignificant effects on the species and its proposed critical habitat. Therefore, no incidental take is expected from these two land use categories.

Table 4. Regulatory effects determinations from the BA.

Land Use Category	Species	Proposed Critical Habitat
Motorized roads and trails, non-motorized trails, and route closure implementation	LAA	LAA
Permitted recreation events and outfitters	NLAA	NE
BLM Urban Interface Recreation Areas	LAA	LAA
Livestock grazing management and operations	LAA	LAA
Small-scale infrastructure and water developments	NLAA	NLAA
Medium-scale infrastructure	LAA	LAA
New fences and exclosures	LAA	NLAA

NE- no effect
NLAA- may affect, not likely to adversely affect
LAA- may affect, likely to adversely affect

Interrelated and Interdependent Effects
Interrelated activities are those that are part of the larger measures under consideration for consultation and depend on a larger measure for their justification. Interdependent activities are those that have no significant independent utility apart from the measure that is under consideration for consultation. The BA concludes the same effects determination would apply for interrelated and interdependent activities associated with a covered project when those activities are of similar nature and magnitude. For example, a new utility line may extend across Federal and non-Federal lands, and the entirety of the line may result in short- and long-term adverse effects on the species and/or critical habitat.

Summary of Effects
Primarily short-term and localized adverse effects are expected to occur from projects implemented under the CCA. For example, increased human presence, equipment and vehicle use, and associated noise disturbance, may affect Gunnison sage-grouse behavior. Noise disturbance may disrupt or displace birds during critical breeding, nesting or foraging periods. Vegetation disturbance may adversely affect the availability of nesting habitat, cover from predators, or prey (invertebrate) availability, and adversely affect Gunnison sage-grouse. Soil disturbance may increase erosion, adversely affect soil stability, increase sediment deposits, and alter channel morphology. Livestock grazing may also alter vegetation composition, structure, and nutritive quality and adversely affect availability of nesting habitat, cover from predators, or prey habitat.

Long-term negative effects may also occur, however, such as permanent habitat loss or mortality of individual birds. Proposed conservation measures are expected to avoid, minimize, or offset those effects. These measures are designed to conserve habitat and reduce fragmentation, the greatest known threat to Gunnison sage-grouse. Expected benefits would outweigh the short-term negative impacts to individuals or localized areas of habitat. Implementation of the proposed action and its conservation measures will result in strategic management of several primary threats known to affect the species and Gunnison Basin population.

Furthermore, beneficial effects are expected to accrue over time. Conservation measures include standard/ general minimization measures (Section 6.1), site-specific measures (Section 3), and best management practices (Section 6.2 – 6.4) for the proposed projects. Broadly, for a given project occurring under the CCA, more restrictive conservation measures are required in Tier 1 Habitats to ensure protection or maintenance of those values. A key component of the site-specific measures for most land use types are requirements for offsetting habitat loss or disturbance such that there is a net increase in Tier 1 Habitat, and no net loss (maintenance) of Tier 2 Habitat (see Proposed Action section). Based on this measure, in particular, and all other of conservation measures, we anticipate that the CCA will provide a long-term, net benefit for Gunnison sage-grouse and its habitat on a landscape scale.

Methods, Assumptions, and Rationale for Anticipated Effects and Incidental Take
This section discusses some of the key methods and assumptions made to estimate impacts and incidental take from the proposed action. For additional details, or to cross-reference by land use category, refer to Appendices A and B. Estimated incidental take provided in this CO is based primarily on the risk of birds to disturbance, and the likelihood of their injury or mortality, or reduced breeding, feeding, or sheltering. We estimate risk by evaluating the potential exposure and likely response of individual birds to project-related effects described in this CO. Importantly, not all birds exposed to a particular disturbance will respond negatively such that effects reach the level of take. In other words, adverse effects may occur, such as flushing of birds, but may be insignificant such that vital rates (reproduction success, survival, etc.) are not affected.

The Service assessed the adverse effects or potential risk(s) to the species and its habitat from implementation of the CCA. Scientific data that quantify the effects of the proposed projects on sage-grouse, or gallinaceous birds, is very limited. Thus, there is uncertainty in generating specific metrics for anticipated adverse effects (such as number of expected mortalities of individuals, or numbers of habitat acres temporarily or permanently lost or temporarily affected). A complex range of factors will influence the response or fate of individual birds to impacts. Factors contributing to this uncertainty include, but are not limited to: 1) inability to accurately predict the location, frequency, timing, duration, etc. of proposed projects; 2) inability to accurately measure the nature or extent of potential effects; 2) limited ability to pinpoint the source, or combined sources, of effect; 3) accounting for confounding or stochastic events such as drought; 4) sources of risk that emerge outside Federal lands covered under the CCA.

Where data are lacking regarding exposure and mortality rates for Gunnison sage-grouse due to the various land use types, we applied reasonable estimates for these factors based on professional knowledge and input from the action agencies. Appendix A identifies the key assumptions made by the Service to predict the exposure of birds to disturbance from projects, the potential effects of disturbance, and the anticipated incidental take of individual birds.

Possible implications of the assumptions are also evaluated. These assumptions and metrics are also identified and referenced in the incidental take tables provided in Appendix B.

However, some metrics for anticipated adverse effects were based on, or adapted from, scientific studies. For instance, models for fence collision risk (Stevens et al. 2013) and mitigation (Stevens 2011) have been developed such that we can reasonably estimate the potential exposure and mortality rate of Gunnison sage-grouse. We estimated that only 9.2 percent of action area is at high risk of fence collision. We derived the 9.2 percent estimate from Stevens et al. (2013) which modeled fence collision risk across 10 states where Gunnison sage-grouse occur based on the average distance from leks and topographic ruggedness. The study indicated that a small proportion of the total landscape (6-14 percent) is at "high risk" of fence collisions, or greater than one collision per year. The study did not evaluate Gunnison sage-grouse habitats in Colorado. However, greater sage-grouse habitats in Wyoming were evaluated, and approximately 9.2 percent of that area was found to be high risk for fence collision. Of the areas studied, we felt conditions in Wyoming are most comparable to the Gunnison Basin population area in terms of lek numbers, available breeding habitat, and topography.

Estimated incidental take provided in this CO is based primarily on the risk of birds to disturbance, and the likelihood of their injury or mortality, or reduced breeding, feeding, or sheltering. We estimate risk by evaluating the potential exposure and likely response of individual birds to project-related effects described in this CO. We evaluated current (baseline) and future use from the various land use categories and the resultant disturbance in occupied habitat as an indicator of potential impacts on Gunnison sage-grouse. To be clear, the current or baseline use is distinct from the assessment of the environmental baseline (see Environmental Baseline section) which considers the impacts of most current or proposed projects in the action area. Per the more limited scope of the BA, we evaluate the current or baseline use for the three specific land use types to account for, and estimate incidental take for, those impacts.

To predict the number of birds potentially exposed to project impacts, we estimated bird numbers per acre (density) across the project area defined in the CCA, and by agency (Table 5). Based on the 12-year average population size of 3,747 birds in the Gunnison Basin (592,936 acres of occupied habitat), there are approximately .00632 birds/ acre. Using this density, we estimated that 2,499.169 birds occur on Federal lands (395,458 acres) in the Gunnison Basin.

Since we expect a difference in habitat selection and, consequently, bird densities, exposure rates, and impacts, depending on a given project's location, we stratified the distribution of 2,499.169 birds according to habitat type. CPW telemetry data from 2004 to 2010 for approximately 500 collared birds showed that, of 10,140 radio locations, approximately 79.63 percent (8,074) and 15.65 percent (1,587) points occurred in Tier 1 habitat and Tier 2 habitats, respectively (including all occupied habitat in the Gunnison Basin regardless of ownership) (Gunnison County 2013). This indicates a preference for modeled Tier 1 habitats by the Gunnison Basin birds. Assuming individual bird distribution (or temporal preference) for the population on Federal lands in the Gunnison Basin (2,499.169 birds) at any given time is proportional to these figures, we estimated that 1,990.09 birds (79.63 percent) would typically occupy Tier 1 habitat, and 391.12 birds (15.65 percent) would typically occupy Tier 2 habitat. The remaining 117.96 birds (4.72 percent) were assumed to occur outside of the project area, i.e., potentially in unoccupied habitat (see Gunnison County 2013). Multiplying the average bird density within Tier 1 or Tier 2 habitats by total acres impacted by land use projects, we estimated

exposure rates for individual birds (Appendix B). These estimates assume that birds are evenly distributed across the habitat type and that all birds, at all age classes, have an equal probability of being exposed to the various practices.

Table 5. Estimated bird abundance and densities in Tier 1 and Tier 2 habitats.

Habitat Type	Estimated bird abundance[a]	Total Occupied Habitat (acres)	DENSITY (birds/acre)
Tier 1	1,990.09	250,546	**0.00794**
Tier 2	391.12	144, 912	**0.00270**
Tiers 1 and 2	2,381.21	395,458	.00602

[a]BLM, USFS, NPS combined, per HPT analysis

Based on the BA and discussion with the action agencies, we estimated the approximate number and size of current (baseline) and future projects, and resulting disturbed areas, expected to occur under the CCA over the next 20 years. For several land use categories, we calculated disturbance based on the typical size of the *authorized area* of construction, maintenance, and operations for that project type (also see Appendix A):

- 8' wide corridor for fences and exclosures
- 30' wide corridor for motorized routes
- 5' wide corridor for non-motorized routes
- 5' wide corridor; and 1/8 mile per each existing water line

The above metrics provide an indicator of potential exposure and incidental take for all but two of the land use categories, livestock grazing management and medium-scale infrastructure. While the majority of public lands are actively grazed by livestock, we do not anticipate that injury or mortality (incidental take) would occur across all of those lands. Instead, we assumed that take is most likely to occur on 25 percent of grazed lands where more significant impacts may be expected. For instance, heavier use by livestock is expected in typical concentrated use areas such as riparian, watering areas, fence lines, salting areas, and similar areas. Further, we assume that anticipated take in those areas is reduced by the beneficial effects of conservation measures (Appendix A and B). Medium-scale infrastructure (power lines and communication sites) dimensions vary widely (see Table 5 in the BA). The BA provided estimates for total acres affected by various existing power lines and fences, by land ownership, but did not describe the proportion of those developments across Tier 1 and Tier 2 habitats. Therefore, to estimate current use, we assumed fence and power line distribution is proportional to the available habitat, i.e., approximately 63 percent in Tier 1, and 37 percent in Tier 2 habitat (Appendix A and B).

As noted above, we recognize that these estimates are based on a number of assumptions. For instance, to estimate exposure, we assumed that birds are evenly distributed across the habitat type and that all birds, at all age classes, have an equal probability of being exposed to the various practices. We feel these assumptions result in an overestimate of take from the proposed action, rather than an underestimate of those effects, and thus provide a more cautious approach. As noted above, we also expect that conservation measures including offsite mitigation will minimize adverse effects including the injury and death of individual birds. For some proposed land uses, we assume that incidental take may be reduced by as much as 95 percent (i.e., the rate

of mortality or injury would be 5 percent). Again, please refer to Appendices A and B which detail these and other assumptions used to estimate exposure rates and incidental take of individual birds.

V. CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, Tribal, local, or private actions that are reasonably certain to occur in the action area. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA. The action area includes a mixed ownership of lands including private, State, and Tribal held lands interspersed with BLM, USFS, and NPS lands. Future non-Federal actions reasonably certain to occur in the action area include residential development, agricultural production, State and county road maintenance activities, vehicle traffic on area roads, livestock grazing, hunting, and human infrastructure. Each of these activities has the potential to affect Gunnison sage-grouse and its habitat.

VI. CONCLUSION

Based on a review of the current status of affected species, the environmental baseline for the action area, effects of the proposed action, and cumulative effects, it is the Service's CO that the proposed action is not likely to jeopardize the continued existence of Gunnison sage-grouse, and is not likely to destroy or adversely modify proposed critical habitat. We have reached these conclusions because:

1. Implementation of the CCA will provide a long-term, net benefit for Gunnison sage-grouse on a landscape scale. Implementation of the proposed action and its conservation measures will result in strategic management of several primary threats known to affect the species and the Gunnison Basin population, including habitat loss and fragmentation. These beneficial effects are expected to accrue over time. A key component of the site-specific measures are requirements for offsetting habitat loss or disturbance such that there is a net increase in high quality habitat (Tier 1), and no net loss (maintenance) of secondary habitat (Tier 2).

2. Primarily short-term, localized, and unavoidable adverse effects to the species and its proposed critical habitat are expected to occur from projects implemented under the CCA. Long-term negative effects may also occur, however, such as permanent habitat loss or mortality of individual birds. The proposed conservation measures are expected to avoid, minimize, and offset those effects.

VII. INCIDENTAL TAKE STATEMENT

Note: Prohibitions against taking the species found in section 9 of the ESA do not apply if, and until, the species is listed. The incidental take statement would become effective upon listing of Gunnison sage-grouse and designation of critical habitat, and following adoption of the CO as a BO.

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect." Harm is further defined by the Service to include "significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns including

breeding, feeding, or sheltering." Harass is defined by the Service as "… an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering." Incidental take is defined as take that is incidental to, and not the purpose of, carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

For coverage under section 7(o)(2) exemptions, the measures described below are understood as non-discretionary, and must be implemented and applied by the BLM, USFS, and NPS as binding conditions of any project, or contract issued to parties conducting activities under the CCA. Furthermore, actions and projects inconsistent with the proposed action as described, and its proposed conservation measures, are not covered for incidental take provided in this CO.

Estimated Incidental Take

Applying the methods and assumptions described above in the Effects section, the estimated incidental take of Gunnison sage-grouse due to the proposed action is **77 birds**, or an average of 3.85 birds per year across the action area. This includes 52 birds on BLM, 19 birds on USFS, and 6 birds on NPS administered lands (Appendix B). Seventy-seven birds is approximately 1.89 percent of the Gunnison Basin 2012 population estimate of 4,082 birds; 2.05 percent of the Gunnison Basin 12-year average population size of 3,747 birds; and 1.67 percent of the species' 2012 rangewide population of 4,621 birds.

Monitoring Incidental Take

Incidental take is expected to vary by agency, land use type, habitat type, and other factors. For several land use categories, we calculated disturbance based on the typical size of the *authorized area* of construction, maintenance, and operations for that project type. Tracking and reporting project disturbance to measure incidental take shall also be based on the *authorized or permitted area* for any given project. Generally, these calculations should be based on the same metrics we used to estimate incidental take (see Methods, Assumptions, and Rationale section above; and Appendices A and B). However, as described earlier, we expect some projects such as medium-scale infrastructure (power lines) to vary widely in terms of the overall authorized (affected) area for construction, maintenance, and operations. In those instances, the specified or anticipated authorized or permitted area should be the basis of the estimated disturbance for tracking and reporting purposes.

Because we estimate incidental take based primarily on disturbance of occupied habitat, incidental take coverage is premised on a future use disturbance "limit" by project type over the 20-year term. For instance, over the 20-year period, for road and trail projects on BLM lands, 900 and 2,100 acres of new disturbance may be authorized in Tier 1 and Tier 2 habitats, respectively. In this case, the limit of total route miles would depend on what proportion of routes were non-motorized versus motorized, since the anticipated area of disturbance, or authorized area, would differ between the two route types (e.g., a 30-foot corridor for motorized routes and a 5-foot corridor for non-motorized routes). Accounting for the current (baseline) travel routes in occupied habitat, the proposed action would result in the take of approximately three birds (Appendix B).

Furthermore, due to the unique assumptions made for each land use category regarding exposure rates, injury and mortality rates, and the beneficial effects of conservation measures, tracking of future project use (disturbance) should be categorized by land use type (rather than "sharing" disturbance limits between land use categories). Therefore, each agency will track incidental take by land use type with respect to the 20-year disturbance limits (Appendix B), and provide such information in its annual reports as described in the BA. Annual disturbance by land use type may exceed future annual use estimates in Appendix B, provided the 20-year disturbance limit is not exceeded. Off-site mitigation (habitat offsets) is accounted for in the incidental take estimates (reductions in injury and mortality rates) and, therefore, cannot be used to increase or extend the anticipated incidental take. The Service will coordinate with the action agencies to help develop tracking tools, as necessary.

If any new information indicates that the proposed land uses and conservation measures are resulting in take levels different than that described herein, conferencing or consultation may be reinitiated to evaluate changes to the CO.

Effect of the Take

We have determined that the level of anticipated take is not likely to result in jeopardy to Gunnison sage-grouse. Implementation of the proposed conservation measures will advance the recovery of the species and result in a net increase in available habitat to the species over the long term. However, the Service advises the agencies to consider implementing the following reasonable and prudent measures. If this CO is adopted as a BO following a listing or critical habitat designation, these measures and their terms and conditions, will be non-discretionary.

VIII. REASONABLE AND PRUDENT MEASURES

The Service believes that the following reasonable and prudent measures and their implementing terms and conditions are necessary and appropriate for the BLM, NPS, and USFS, to minimize impacts of incidental take of Gunnison sage-grouse. If the species is listed, in order to be exempt from the prohibitions of Section 9 of the ESA, the action agencies must ensure that implementation of the CCA complies with the following Terms and Conditions which implement the Reasonable and Prudent Measures.

Reasonable and Prudent Measures

1. The BLM, NPS, and USFS shall immediately report any known injury or mortality of Gunnison sage-grouse individuals, or damage or loss of nests or eggs resulting from implementation of the CCA.
2. Track incidental take (future use disturbance) by land use type with respect to the 20-year disturbance limits, and provide such information in its annual reports as described in the BA.

Terms and Conditions

1. Any observations or evidence of Gunnison sage-grouse injury or mortality, or damage or loss of nests or eggs, shall be reported immediately to the Service, and will be documented in the annual reports. Within 90 days of receiving the report from the action agencies, a determination shall be made as to what, if any, changes are needed to the proposed action and/or incidental take statement.

2. With respect to the 20-year disturbance limits, incidental take (future use disturbance) information by land use type will be provided in the action agencies annual reports, as described in the BA.

IX. CONSERVATION RECOMMENDATIONS

Section 7(a) (1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. We recommend the following:

- The Service commends the action agencies for their commitment to Gunnison sage-grouse conservation and for the hard work and effort that went into development of the CCA. We recommend that the action agencies continue sharing their knowledge and strategies with adjacent Federal units so that similar conservation plans may be developed for the remaining satellite populations of Gunnison sage-grouse.
- Amend your proposal to include unoccupied proposed or designated critical habitat for Gunnison sage-grouse to advance conservation of the species and streamline section 7 requirements.

X. REINITIATION NOTICE

This concludes the Service's CO for potential effects of the proposed action. Reinitiation of formal consultation is required and shall be requested by the Federal agency or by the Service, where discretionary Federal involvement or control over the action has been retained or is authorized by law and: (a) If the amount or extent of taking specified in the incidental take statement is exceeded; (b) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (c) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the BO; or (d) If a new species is listed or critical habitat designated that may be affected by the identified action.

If Gunnison sage-grouse is listed and critical habitat is designated, you may request that the Service adopt the CO as a BO through formal consultation. The request must be submitted in writing. If the Service reviews the proposed action and finds that there have been no significant changes in the action as planned or in the information considered during the CO, the Service will adopt the CO as the BO on the project, and no further section 7 consultation will be required.

If you have any comments or questions, please contact Charlie Sharp at (970) 623-0919, or Charles_Sharp@fws.gov; or Patty Gelatt at (970) 243-2778, extension 26, or Patty_Gelatt@fws.gov.

Cc: Ken Stahlnecker, National Park Service
Clay Speas, U.S. Forest Service
Jim Cochran, Gunnison County

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78 FR 2486. Endangered and threatened wildlife and plants; endangered status for Gunnison sage-grouse; proposed rule. January 11, 2013.

78 FR 2540. Endangered and threatened wildlife and plants; designation of critical habitat for Gunnison sage-grouse; proposed rule. January 11, 2013.

Appendix A: Key assumptions used to estimate impacts on, and incidental take of, GUSG.

Assumptions/ Source of Uncertainty	Direction of Potential Bias	Likely Significance with Respect to Estimated Impacts, and Rationale
1. Incidental take is reduced as a result of conservation measures (i.e., injury and mortality of exposed birds would be reduced to 5 percent).	May underestimate impacts.	Probably minor. Proposed conservation measures, best management practices, an adaptive management approach, and other standards of the CCA address known and potential impacts to the species, and indicate that take of birds will be considerably reduced.
2. Incidental take for certain project types will vary from the above 5 percent rate, due to the unique pattern and distribution of the particular land use (see assumptions 3 and 4 below).	Unknown. May underestimate or overestimate impacts depending on the location and pattern of future projects.	Probably minor. At the local level, more severe impacts are expected where concentrated use will occur. Some of those impacts would be offset by minimizing land use impacts that might otherwise occur in adjacent habitats (e.g., Urban Interface Recreation Areas).
3. Concentrated use and therefore local, more severe impacts are expected to occur in Urban Interface Recreation Areas than surrounding habitats. Therefore, we estimated that incidental take would be 20 percent in those areas, while accounting for the beneficial effects of conservation measures.	Unknown. May underestimate or overestimate impacts depending on the location and pattern of future projects.	Probably minor. At the local level, more severe impacts are expected where concentrated use will occur. Some of those impacts would be offset by minimizing impacts that might otherwise occur in adjacent habitats (e.g., Urban Interface Recreation Areas).
4. Although the majority of occupied habitat on Federal lands in the Gunnison Basin is actively grazed by livestock, we do not anticipate all of this area will cause 5 percent of all exposed birds to be injured or killed. Rather, we estimated that 25 percent of all grazed Federal lands in the Gunnison Basin might experience impacts such that take is probable. In those areas, incidental take would be further reduced to 5 percent due to conservation measures.	Unknown. May underestimate or overestimate impacts depending on the location and pattern of future projects.	Probably minor. More severe impacts are expected wherever concentrated use occurs or other areas where impacts are unavoidable.
5. Livestock grazing use and total AUMs will not change over the 20-year term of the CCA.	May overestimate impacts.	Possibly major. If AUMs are significantly reduced over time, per recent livestock industry trends, impacts on habitat and Gunnison sage-grouse would change.

Assumptions/ Source of Uncertainty	Direction of Potential Bias	Likely Significance with Respect to Estimated Impacts, and Rationale
		Because we have no information on what forage use reductions might look like in the Gunnison Basin, and because the CCA is designed to facilitate the continued use of those lands for grazing values, we assume that AUMs will remain static over this period.
6. Gunnison sage-grouse at all age classes prefer Tier 1 habitat over Tier 2 habitats (stratified occupied habitat generated by the Habitat Prioritization Tool).	Unknown. May underestimate or overestimate impacts depending on the location and pattern of future projects.	Probably minor. The assumption is well supported, as a recent study by CPW showed that approximately 79.63 percent of radio locations occurred in Tier 1 habitats, while 15.65 percent of data points occurred in Tier 2 habitats (see Methods, Assumptions section above for more details).
7. Within Tier 1 and Tier 2 habitats, birds at all age classes are evenly distributed across the landscape (provides the basis of bird density estimates for Tier 1 and Tier 2 habitats).	Unknown. May underestimate or overestimate impacts depending on the location and pattern of future projects, as well as habitat selection of birds.	Probably minor. The assumption provides the most reasonable estimate upon which we can measure and evaluate the likelihood of individual birds being exposed to stressors.
8. The frequency and extent of future land use projects will be lower in Tier 1 habitats than in Tier 2 habitats.	May underestimate impacts.	Probably minor. The CCA prescribes more restrictive standards for projects occurring in Tier 1 habitats (including a 2:1 offsite mitigation requirement) than in Tier 2 habitats. Thus, there will be strong incentive to locate projects outside of Tier 1 habitats.
9. Average 30' width for motorized travel routes, average 5' width for non-motorized routes, and average 8' width for fences and exclosure fencing.	Unknown. May underestimate or overestimate impacts.	Probably minor. The estimated width of disturbance from travel routes is based primarily on the permitted area, and may not represent actual disturbance. Conversely, the estimates do not account for potential indirect, or offsite, impacts associated with linear disturbances.
10. The frequency and extent of certain future land use projects and actions used are estimated.	Unknown. May underestimate or overestimate impacts.	Probably minor. The predicted frequency and extent of land uses are based on discussions and input from the action agencies and their knowledge of past Federal projects and activities as well as future needs in the Gunnison Basin.
11. Take (injury, mortality, or significant habitat modification affecting the survival of the species) would be most likely to occur by way	May underestimate impacts.	Probably minor. The CCA prescribes measures to avoid or minimize the indirect effects of actions, such as weed invasion. Further, the CCA requires

Assumptions/ Source of Uncertainty	Direction of Potential Bias	Likely Significance with Respect to Estimated Impacts, and Rationale
of direct effects from land use projects. Indirect effects (occurring later in time), or offsite impacts, would be less likely to result in the take of Gunnison sage-grouse. Therefore, incidental take can be estimated based on the number of acres affected directly by a given land use project, i.e., as an index (rather than adding buffers to all affected areas)).		measures to avoid offsite impacts, such as noise and behavioral disturbance of birds on nearby leks. Accounting for those measures, it is reasonable to assume that the majority of incidental take of individual birds, or significant habitat modification affecting the survival of the species, would be greatest in the areas directly affected by a given project (occupied habitat). Importantly, this does not mean that we think indirect effects will not occur, only that they will likely be less severe in terms of species response.
12. Not all individual birds exposed to disturbance will experience injury, mortality, or reduced survival.	May underestimate impacts.	Probably minor. Even without conservation measures, impacts from land use projects would be very unlikely to result in take of all exposed birds. Proposed conservation measures, best management practices, an adaptive management approach, and other standards of the CCA address known and potential impacts to the species, and indicate that take of birds will be considerably reduced.
13. Assume distribution of existing (baseline) fences/ exclosures and power lines are proportional to the availability of Tier 1 and Tier 2 habitats. Thus, 63 percent of structures are estimated to occur in Tier 1, and 37 percent are estimated to occur in Tier 2 habitats.	Unknown. May underestimate or overestimate impacts.	Probably minor. A higher density of structures in breeding or other important seasonal habitats (i.e., Tier 1 habitats) may result in higher exposure and strike rates than estimated. Conversely, if fences are concentrated largely in Tier 2 habitats, generally outside of lek areas and priority habitats, then overall exposure would be lower and strike rates, injury, and mortality would be expected to be much lower than estimated.
14. Estimated that only 9.2 percent of action area is at high risk of collision. We derived the 9.2 percent estimate from Stevens et al. (2013) which modeled fence collision risk across 10 states where sage-grouse occur based on average distance from leks and topographic ruggedness. The study indicated that a small proportion of the total landscape (6-14 percent) is at "high risk" of fence collisions, or > 1 collision per year. The study did not include evaluate sage-grouse habitats in	Unknown. May underestimate or overestimate impacts.	Possibly major. More rugged terrain, reportedly higher flight levels of birds, and other factors may result in much lower risk of collision than that estimated for greater sage-grouse in Wyoming. Conversely, the 9.2 percent figure accounts only for breeding habitats primarily near leks during the breeding season. Fences located in other seasonally important habitats (summer-fall, winter, etc.) may contribute further to fence-related

Assumptions/ Source of Uncertainty	Direction of Potential Bias	Likely Significance with Respect to Estimated Impacts, and Rationale
Colorado. However, greater sage-grouse habitats in Wyoming were evaluated, and approximately 9.2 percent of that area was found to be high risk for fence collision. We felt conditions in Wyoming would be most comparable to the Gunnison Basin population area in terms of lek numbers, available breeding habitat, and topography.		injury and mortality. Therefore, impacts may be higher than estimated.
15. For 9.2 percent of the total action area, where we assumed there to be high risk of sage-grouse fence collisions, 100 percent of exposed birds would experience injury or mortality (take) without conservation measures.	May overestimate impacts.	Probably minor. Not all exposed birds are expected to actually collide with fences. Though collisions will likely result in injury of individual birds, mortality may not occur in all instances.
16. The sage-grouse fence collision risk model (Stevens et al. 2013) was developed for breeding habitats in general and does not directly account for local bird densities. To be consistent, we estimated exposure of birds based solely on acres of habitat affected by fences, rather than factoring in unique bird densities in Tier 1 and Tier 2 habitats (which include multiple seasonal habitat types across the Gunnison Basin).	Unknown. May underestimate or overestimate impacts.	Possibly major. As noted above, the collision risk models are based on breeding habitats only, thus potentially underestimating impacts. Conversely, not factoring in local bird densities, or the differences between Tier 1 and 2 habitats, may result in a considerable overestimate of impacts.
17. Assume all fences in high collision risk areas (often near leks) will be marked or strategically designed to reduce collision risk, with an 83 percent reduction of take (17 percent injury/ mortality rate) (Stevens 2011) per acre of that fence design.	Unknown. May underestimate or overestimate impacts.	Probably minor. New fence construction will be minimal over the next 20 years, and will be marked and/ or designed to avoid or minimize sage-grouse collisions. Most avoidance and minimization efforts would be expected in high risk areas for collision (i.e., near leks or in flat topography), although similar efforts may occur in other seasonal habitats. Marking or modifying existing fences or exclosures in high risk areas will depend on available funding and resources of the action agencies.

Appendix B

Incidental take estimates of GUSG for BLM proposed actions (some numbers may not sum due to rounding).

Land Use Type	Habitat Type[a]	Current/ Baseline Use (acres)[b]	Annual Future Use (acres)[c, d]	20-Year Future Use (acres)[e]	Total Use (acres) (current plus future use over 20 years)	Estimated Exposure to Land Use (Birds)[f]	Rate of injury or mortality for Land Use (Birds)[g]	Incidental Take (Birds)[h]
Motorized roads and trails, and non-motorized trails	Tier 1	1736.36[i]	30[i]	900	2636.36	20.94	1.05[j]	2
	Tier 2	986.67[i]	70[i]	2100	3086.67	8.33	.42[j]	1
	Total	2723.03[i]	100[i]	3000	5723.03	29.27	1.46[j]	**3**
BLM Urban Interface Recreation Areas	Tier 1	101.21[i]	15[i]	450	551.21	4.38	.88[k]	1
	Tier 2	319.39[i]	25[i]	750	1069.39	2.89	.58[k]	1
	Total	420.61[i]	40[i]	1200	1620.61	7.26	1.45[k]	**2**
Livestock grazing management	Tier 1	210882[l,m]	n/a	n/a	210882[l]	418.76[m]	20.94[j]	21
	Tier 2	89916[l,m]	n/a	n/a	89916[l]	60.67[m]	3.03[j]	4
	Total	300,797[l,m]	n/a	n/a	300797[l]	479.43[m]	23.97[j]	**25**
Medium-scale infrastruc-ture and water dev.	Tier 1	1380[n]	20	600	1979.56	15.724	.79[j]	1
	Tier 2	810[n]	50	1500	2310.22	6.235	.31[j]	1
	Total	2190[n]	70	2100	4289.77	21.959	1.10[j]	**2**
Fences and Exclosures	Tier 1	709[n,o]	1	30	738.75	67.965[p]	11.55j,[q]	12
	Tier 2	416[n,o]	2	60	476.25	43.815[p]	7.45j,[q]	8
	Total	1125[n,o]	3	90	1,215	111.78[p]	19.00j,[q]	**20**
							TOTAL	**52**

a Defined and mapped by the Habitat Prioritization Tool (see BA for discussion).
b Current use estimates based on the BA where that information was provided; otherwise, estimates were made with input from action agencies.
c Future use estimates based on the BA, where provided, and input from action agencies.
d Generally assumes the frequency/ extent of future land use projects will be lower in Tier 1 than Tier 2 habitats.

e With the exception of livestock grazing management, each land use and demand is expected to increase over time. Therefore, total use was assumed to double over the 20-year term. Figures in this column represent future "use limits" covered under the incidental take statement.
f Calculated by multiplying total use (disturbance) and average bird density per habitat type (See Table 5).
g Assumes an equal probability of injury/ mortality across all age classes. Also assumes not all birds exposed to impacts from land use will be injured or killed.
h Incidental take is estimated as the injury/ mortality rate rounded up to the nearest whole number (individual bird).
i Based on figures provided in BA. Assumes a 30' corridor for motorized routes and a 5' corridor for non-motorized trails.
j Assumes injury/ mortality rates are reduced to 5 percent as a result of the beneficial effects of conservation measures.
k Assumes injury/ mortality rates are reduced to 20 percent with conservation measures. Relative to other land uses and associated estimated injury/ mortality rates, we assumed that concentrated use from urban interface areas would result in more significant, localized impacts and, thus, higher incidental take.
l Assumes future use does not change from current use.
m Current use estimates are based first on the proportion of Tier 1 and Tier 2 habitats administered by the BLM and NPS (BLM administers the grazing permits on NPS land), as provided in the BA. Further, approximately 98 percent of this area on BLM (78 FR 2486), and approximately 52 percent of the area on NPS are actively grazed (Theresa Childers, personal communication). Assumes bird exposure is most likely to occur on 25 percent of grazed lands where more significant impacts may be expected due to livestock grazing, such that injury and mortality are more likely. For instance, heavier use and more significant impacts from livestock would be expected in discrete, concentrated use areas such as riparian, watering areas, fence lines, salting areas, and similar areas.
n Assumes distribution of existing fences and power lines is proportional to the availability of Tier 1 and Tier 2 habitats, that is, approximately 63 percent occurring in Tier 1 habitat, and 37 percent in Tier 2 habitat.
o Assumes an 8' wide corridor for fences, resulting in approximately 1 acre of habitat affected per mile of fence authorized.
p Estimated that 9.2 percent of the area affected by fences are high-risk collision areas (Stevens et al. 2013), where we assumed high probability of injury/ mortality without conservation measures.
q Assumes high collision risk areas (often near leks) will be visually marked, or designed or sited to reduce collision risk, resulting in an 83 percent reduction of collision events (Stevens 2011), or a 17 percent injury/ mortality rate.

Incidental take estimates of GUSG for USFS proposed actions (some numbers may not sum due to rounding).

Land Use Type	Habitat Type[a]	Current/ Baseline Use (acres)[b]	Annual Future Use (acres)[c, d]	20-Year Future Use (acres)[e]	Total Use (acres) (current plus future use over 20 years)	Estimated Exposure to Land Use (Birds)[f]	Rate of injury or mortality for Land Use (Birds)[g]	Incidental Take (Birds)[h]
Motorized roads and trails, and non-motorized trails	Tier 1	223.03[i]	2[i]	60	283.03	2.25	.11[j]	1
	Tier 2	355.15[i]	5[i]	150	505.15	1.36	.07[j]	1
	Total	578.18[i]	7[i]	210	788.18	3.61	.18[j]	**2**
BLM Urban Interface Recreation Areas	Tier 1	0[i]	0[i]	0	0	0	0	0
	Tier 2	7.27[i]	5[i]	150	157.27	.42	.08[k]	1
	Total	7.27[i]	5[i]	150	157.27	.42	.08[k]	**1**
Livestock grazing management	Tier 1	33,033[l,m]	n/a	n/a	33,033[l]	65.60[m]	3.28[j]	4
	Tier 2	50,933[l,m]	n/a	n/a	50,993[l]	101.26[m]	5.06[j]	6
	Total	84,026[l,m]	n/a	n/a	84,026[l]	166.85[m]	8.34[j]	**10**
Medium-scale infrastruc-ture and water dev.	Tier 1	55[n]	10	300	354.81	2.82	.14[j]	1
	Tier 2	32[n]	20	600	632.19	1.71	.09[j]	1
	Total	87[n]	30	900	987	4.52	.23[j]	**2**
Fences and Exclosures	Tier 1	97[n,o]	.50	15	112.13	10.32[p]	1.75[j,q]	2
	Tier 2	57[n,o]	1	30	87.05	8.01[p]	1.36[j,q]	2
	Total	154[n,o]	1.50	45	199.18	18.32[p]	3.12[j,q]	**4**
							TOTAL	**19**

a Defined and mapped by the Habitat Prioritization Tool (see BA for discussion)
b Current use estimates based on the BA where that information was provided; otherwise, estimates were made with input from action agencies
c Future use estimates based on the BA, where provided, and input from action agencies.
d Generally assumes the frequency/ extent of future land use projects will be lower in Tier 1 than Tier 2 habitats.

e With the exception of livestock grazing management, each land use and demand is expected to increase over time. Therefore, total use was assumed to double over the 20-year term. Figures in this column represent future "use limits" covered under the incidental take statement.
f Calculated by multiplying total use (disturbance) and average bird density per habitat type (Table 5).
g Assumes an equal probability of injury/ mortality across all age classes. Also assumes not all birds exposed to impacts from land use will be injured or killed.
h Incidental take is estimated as the injury/ mortality rate rounded up to the nearest whole number (individual bird).
i Based on figures provided in BA. Assumes a 30' corridor for motorized routes and a 5' corridor for non-motorized trails.
j Assumes injury/ mortality rates are reduced to 5 percent as a result of the beneficial effects of conservation measures.
k Assumes injury/ mortality rates are reduced to 20 percent with conservation measures. Relative to other land uses and associated estimated injury/ mortality rates, we assumed that concentrated use from urban interface areas would result in more significant, localized impacts and, thus, potentially higher incidental take.
l Assumes future use does not change from current use.
m Assumes all occupied habitat on USFS lands are permitted for livestock grazing. Assumes bird exposure is most likely to occur on 25 percent of grazed lands where more significant impacts may be expected due to livestock grazing, such that injury and mortality are more likely. For instance, heavier use and more significant impacts from livestock would be expected in discrete, concentrated use areas such as riparian, watering areas, fence lines, salting areas, and similar areas.
n Assumes distribution of existing fences and power lines is proportional to the availability of Tier 1 and Tier 2 habitats, that is, approximately 63 percent occurring in Tier 1 habitat, and 37 percent in Tier 2 habitat.
o Assumes an 8' wide corridor for fences, resulting in approximately 1 acre of habitat affected per mile of fence authorized.
p Estimated that 9.2 percent of the area affected by fences are high-risk collision areas (Stevens et al. 2013), where we assumed high probability of injury/ mortality without conservation measures.
q Assumes high collision risk areas (often near leks) will be visually marked, or designed or sited to reduce collision risk, resulting in an 83 percent reduction of collision events (Stevens 2011), or a 17 percent injury/ mortality rate.

Incidental take estimates of GUSG for NPS proposed actions (some numbers may not sum due to rounding).

Land Use Type	Habitat Type[a]	Current/ Baseline Use (acres)[b]	Annual Future Use (acres)[c, d]	20-Year Future Use (acres)[e]	Total Use (acres) (current plus future use over 20 years)	Estimated Exposure to Land Use (Birds)[f]	Rate of injury or mortality for Land Use (Birds)[g]	Incidental Take (Birds)[h]
Motorized roads and trails, and non-motorized trails	Tier 1	10.91[i]	.05	1.50	12.41	.10	.0049[j]	1
	Tier 2	27.98[i]	.25	7.50	35.48	.10	.0048[j]	1
	Total	38.89[i]	.30	9	47.89	.19	.0097[j]	**2**
Livestock grazing management	Tier 1	0[k]	0	0	0	0	0	0
	Tier 2	0[k]	0	0	0	0	0	0
	Total	0[k]	0	0	0	0	0	**0**
Medium-scale infrastructure and water dev.	Tier 1	90	20	600	690.47	5.484	.27[j]	1
	Tier 2	53	30	900	953.13	2.573	.13[j]	1
	Total	144	50	1500	1643.60	8.057	.40[j]	**2**
Fences and Exclosures	Tier 1	0[k]	.25[l]	7.50	7.50[l]	.690[m]	.12[j,n]	1
	Tier 2	0[k]	.50[l]	15.00	15[l]	1.380[m]	.23[j,n]	1
	Total	0[k]	.75[l]	22.50	22.50[l]	2.070[m]	.35[j,n]	**2**
							TOTAL	**6**

a Defined and mapped by the Habitat Prioritization Tool (see BA for discussion)
b Current use estimates based on the BA where that information was provided; otherwise, estimates were made with input from action agencies
c Future use estimates based on the BA, where provided, and input from action agencies.
d Generally assumes the frequency/ extent of future land use projects will be lower in Tier 1 than Tier 2 habitats.
e With the exception of livestock grazing management, each land use and demand is expected to increase over time. Therefore, total use was assumed to double over the 20-year term. Figures in this column represent future "use limits" covered under the incidental take statement.
f Calculated by multiplying total use (disturbance) and average bird density per habitat type (Table 5).
g Assumes an equal probability of injury/ mortality across all age classes. Also assumes not all birds exposed to impacts from land use will be injured or killed.
h Incidental take is estimated as the injury/ mortality rate rounded up to the nearest whole number (individual bird).
i Based on figures provided in BA and personal communication with Theresa Childers. Assumes a 30' corridor for motorized routes and a 5' corridor for non-motorized trails.

j Assumes injury/ mortality rates are reduced to 5 percent as a result of the beneficial effects of conservation measures.
k All livestock grazing permits and associated fences on NPS lands are administered by the BLM. Therefore, incidental take for livestock grazing and existing fencing on NPS lands is estimated in the BLM table above.
l Assumes an 8' wide corridor for fences, resulting in approximately 1 acre of habitat affected per mile of fence authorized.
m Estimated that 9.2 percent of the area affected by fences are high-risk collision areas (Stevens et al. 2013), where we assumed high probability of injury/ mortality without conservation measures.
n Assumes high collision risk areas (often near leks) will be visually marked, or designed or sited to reduce collision risk, resulting in an 83 percent reduction of collision events (Stevens 2011), or a 17 percent injury/ mortality rate.

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