

Candidate Conservation Agreement with Assurances
for
Gunnison Sage-grouse (*Centrocercus minimus*)
between the
Colorado Division of Wildlife and the U.S. Fish and Wildlife Service

April 2005



Artwork by Brian Maxfield

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15 July 2006

This Candidate Conservation Agreement with Assurances (CCAA) effective and binding on the date of the last signature below, is between the Colorado Division of Wildlife (CDOW) and the U.S. Fish and Wildlife Service (Service). Participating landowners may also be included under the CCAA by signing a Certification of Inclusion (CI), subject to approval by CDOW and concurrence by the Service. Administrators of this Agreement are:

CDOW: Colorado Division of Wildlife
6060 Broadway
Denver, CO 80216
(303) 297-1192

Service: Western Colorado Supervisor
U.S. Fish and Wildlife Service
764 Horizon Drive, Building B
Grand Junction, CO 81506
(970) 245-3920

Tracking Number: TE117730-0

1. Responsibilities of the Parties

(a) Landowners:

Enroll in the CCAA by completing and submitting a CI application (Appendix A), which will include conservation measures. An approved CI will provide landowner protection under the Enhancement of Survival Permit (Permit) associated with the CCAA if the species is listed.

(b) CDOW:

Implement and administer the CCAA by:

1. Encouraging enrollment of landowners under the CCAA through CIs when their property is occupied, vacant/unknown or potentially suitable habitat as defined below.
2. Working with landowners to ensure CIs incorporate applicable conservation strategies in the Gunnison Sage-grouse Rangewide Conservation Plan (RCP) (Gunnison Sage-grouse Rangewide Steering Committee 2005) and best management practices in Monsen's Restoration Manual for Colorado Sagebrush and Associated

Shrubland Communities (Monsen 2005), and other provisions consistent with this CCAA.

3. Reviewing and signing CIs. At least 30 days prior to enrolling participating landowners under this CCAA, CDOW will provide the completed CI to the Service for concurrence and signature.
4. Being the primary party responsible for conducting monitoring activities as specified in Sections 12 and 13 of this CCAA.
5. Working with landowners to ensure appropriate implementation of the provisions of CIs.
6. Submitting an annual report to the Service that documents activities implemented under the CCAA, their effects, and effects of activities undertaken in prior years that require multi-year monitoring.

(c) Service:

1. Issue a permit to CDOW, under section 10(a)(1)(A) of the Endangered Species Act (ESA), in accordance with 50 CFR 17.22 and 17.32 (d), with a term of 20 years, that will provide the CDOW with authorization for incidental take of Gunnison Sage-grouse and provide regulatory assurances should the species be listed under the ESA in the future. The permit will authorize incidental take of Gunnison Sage-grouse resulting from otherwise lawful activities on the lands enrolled under CIs approved by CDOW and the Service. Such activities will be specified in each CI, as applicable, and may include, but are not limited to crop cultivation and harvesting, livestock grazing, farm equipment operation and recreational activities.
2. Within 30 days of receipt of a completed CI notify CDOW as to whether the Service concurs that the CI is adequate to enroll the subject lands. If the Service concurs with the CI, it will sign it and return it to CDOW. If the Service does not concur, it will contact CDOW to agree on measures that would create an adequate CI for Service signature. If after 30 days the Service has not responded, concurrence is automatically conveyed.
3. Review within 60 days those monitoring and other reports submitted by CDOW to the Service for compliance with the terms of the CCAA and the CIs, and notify CDOW of any possible amendments to the CCAA or CIs that may warrant consideration.

2. Covered Species

This CCAA covers the Gunnison Sage-grouse (*Centrocercus minimus*).

3. Authorities and Purpose

Sections 2, 7, and 10 of the Endangered Species Act ("Act") of 1973, as amended, allow the U.S. Fish and Wildlife Service to enter into this CCAA. Section 2 of the Act states that encouraging interested parties, through Federal financial assistance and a system of incentives, to develop and maintain conservation programs is a key to safeguarding the Nation's heritage in fish, wildlife, and plants. Section 7(a)(1) of the Act requires the Service to review programs that it administers and to utilize such programs in furtherance of the purposes of the Act. By entering into this CCAA, the Service is utilizing its Candidate Conservation Programs to further the conservation

of the Nation's fish and wildlife. Lastly, section 10(a)(1)(A) of the Act authorizes the issuance of permits to "enhance the survival" of a listed species.

The purpose of this CCAA is for the Service to join with the CDOW and participating private landowners to implement conservation measures for Gunnison Sage-grouse in a manner that is consistent with the Service's Policy on Candidate Conservation Agreements with Assurances (64 FR 32726) and applicable regulations. The conservation goal of this Agreement is to achieve the protection and management necessary to preclude listing by obtaining agreements for grouse habitat protection and/or enhancements on private lands. The conservation goal will be met by giving the State of Colorado and private landowners incentives to implement conservation measures. Landowners will be provided with regulatory certainty concerning land use restrictions that might otherwise apply should Gunnison Sage-grouse become listed under the ESA. The CCAA supports CDOW's ongoing efforts to sustain and enhance the existing populations of the species. This CCAA is considered an umbrella CCAA under which owners of non-Federal properties comprising occupied, vacant/unknown, or potentially suitable Gunnison Sage-grouse habitat (as defined in Section 4, below) are eligible to participate.

4. Enrolled Lands

This CCAA pertains to non-federal lands in Colorado encompassed by the current distribution of Gunnison Sage-grouse, and to those non-Federal lands that provide potential habitat that may be occupied by the species in the future, referred to in the RCP as 'vacant/unknown' and 'potentially suitable' habitats (Gunnison's Sage-grouse Rangewide Steering Committee 2005). In Colorado, the currently occupied habitat on all land ownerships covers approximately 850,000 acres while another 200,000 acres are classified as 'vacant/unknown' and 700,000 acres are 'potentially suitable habitat' (Gunnison's Sage-grouse Rangewide Steering Committee 2005).

"Suitable habitat," as used in the definitions below, means habitat that currently meets one or more life history requirements of Gunnison Sage-grouse.

Definitions of mapped categories of habitat, taken from RCP are as follows:

Occupied Habitat: Areas of suitable habitat known to be used by Sage-grouse within the last 10 years from the date of mapping. Areas of suitable habitat contiguous with areas of known use, which do not have effective barriers to Sage-grouse movement from known use areas, are mapped as occupied habitat unless specific information exists that documents the lack of Sage-grouse use. The habitat may be mapped from any combination of telemetry locations, sightings of Sage-grouse or Sage-grouse sign, local biological expertise, Geographic Information System (GIS) analysis, or other data sources.

Vacant or Unknown Habitat: Suitable habitat for Sage-grouse that is separated (not contiguous) from occupied habitats that either:

- 1) Has not been adequately inventoried, or
- 2) Has not had documentation of grouse presence in the past 10 years

Potentially Suitable Habitat: Unoccupied habitats that could be suitable for occupation of Gunnison Sage-grouse if practical restoration were applied. Soils or other historic information

(photos, maps, reports, etc.) indicate sagebrush communities occupied these areas. As examples, these sites could include areas overtaken by pinyon-juniper invasions or converted rangelands

5. Description of Existing Conditions

Sage-grouse are known for their elaborate mating ritual wherein males congregate and perform a courtship dance on a specific strutting ground called a lek. Sage-grouse species in North America were once abundant and widespread but have declined throughout their range. Currently two distinct species of Sage-grouse are recognized by the American Ornithologists' Union: the Greater Sage-grouse (*Centrocercus urophasianus*) and the Gunnison Sage-grouse (*Centrocercus minimus*) (American Ornithologists' Union 2000). Gunnison Sage-grouse are significantly smaller than Greater Sage-grouse and there are distinctive plumage differences. Geographic isolation, distinct genetic differences, and behavioral differences in strutting display also separate these species (Kahn et al. 1999, Oyler-McCance et al. 1999, Schroeder et al. 1999, Young 1994, Young et al. 2000).

Most research exploring the life history and habitat requirements of Sage-grouse has been conducted on the Greater Sage-grouse. Comparably little research has been done specifically on Gunnison Sage-grouse. Except where referenced, the following brief life history information is taken from Schroeder et al. (1999) which was written prior to species separation, but the information still applies to both greater and Gunnison Sage-grouse.

Gunnison Sage-grouse populations are closely associated with sagebrush (*Artemisia* spp.) habitats. Sage-grouse require sagebrush throughout the year for food and cover, but also require moist bottomlands (e.g., riparian areas and wet meadows) during brood rearing. Breeding activities occur from March to early June. Male Sage-grouse display on leks in early morning and late evening to attract hens. Lek sites are typically open areas within sagebrush stands that have good visibility for predator detection and acoustical qualities so the sounds of display activity can be heard by other Sage-grouse. Dominant males will breed with more than one female. Males provide no paternal care or resources. Hens leave the lek and begin their nesting effort after mating.

Nests are typically shallow bowls lined with leaves, feathers and small twigs placed on the ground at the base of a live sagebrush. Eggs are incubated by the female for approximately 25-29 days after the last egg is laid. Clutch size ranges from 6-10 eggs. If the first nest is lost, some hens will re-nest but second clutch sizes are smaller. Gunnison Sage-grouse are less apt to re-nest than Greater Sage-grouse (Young 1994).

Chicks are able to leave the nest with the hen shortly after hatching. Hens with chicks feed on succulent forbs and insects where cover is sufficiently tall to conceal broods and provide shade and cover from predators. As chicks mature, hens typically move with their broods to riparian areas and wet meadows. Groups of unsuccessful hens and flocks of males follow similar habitat use patterns but are less dependent on riparian areas and wet meadows than are hens with broods.

As fall approaches intermixed flocks of young and adult birds move from riparian areas to sagebrush dominated landscapes that continue to provide green forbs. During the winter, Sage-

grouse feed exclusively on sagebrush and are generally found in areas with extensive sagebrush stands. During severe winters, Sage-grouse are dependent on very tall sagebrush where sagebrush exposure above snow is maximized, providing a consistently available food source (Hupp 1987). Gunnison Sage-grouse are capable of making long movements of as much as 27 miles to find appropriate habitat (Apa 2004). As spring approaches, flocks of Sage-grouse return to breeding areas used the prior year.

Determination of the historic range of Gunnison Sage-grouse is problematic for many reasons, most notably the widespread loss of sagebrush habitats, which preceded scientific study of Gunnison Sage-grouse. Additionally, the species may have been extirpated from many areas for which no useful zoological records or specimens exist. A recent review of historical records, museum specimens and potential Sage-grouse habitat concluded that the Gunnison Sage-grouse is believed to have historically occurred in southwestern Colorado, northwestern New Mexico, northeastern Arizona, and southeastern Utah. Currently Gunnison Sage-grouse are estimated to occupy only 8.5% of their historical range (Schroeder et al. 2003).

Gunnison Sage-grouse currently occur in seven widely scattered and isolated populations in Colorado and 1 in Utah. The following table (Table 1) summarizes information about the Colorado populations and is from the RCP (Gunnison Sage-grouse Rangewide Steering Committee 2005)

Table 1. Population and land ownership summary for Colorado Gunnison Sage-grouse populations.

Local Population	Estimated Population Size (2004)	Population Target, as long-term average:	Occupied Habitat (# acres)	Current Range in Private Ownership (# acres and %)	Conservation Easements on Private Land within Occupied Habitat (# acres and %)
Cerro/ Cimarron/ Sims Mesa	39	TBD	37,160	28,219 (76%)	2,805(7.5%)
Crawford	128	275	35,014	8,240 (24%)	523 (1.6%)
Dove Creek	10	200	28,262	24,538(87%)	1,012(3.6%)
Gunnison Basin	2,443	3,000	592,926	182,916(31%)	26,145 (4%)
Piñon Mesa	142	200	38,890	27,295(70%)	7,314 (19%)
Poncha Pass	39	75	20,415	4,845(24%)	
San Miguel Basin	245	450	100,537	52,423(52%)	884(<1%)
Totals	3,046		853,216	328,819(39%)	38,683(4.5%)

On January 18, 2000, the Service designated the Gunnison Sage-grouse as a candidate species for listing as threatened or endangered. The Service's 2004 annual assessment of the species and the RCP describe potential threats to the Gunnison Sage-grouse. The size of the range and habitat quality have been reduced by direct habitat loss, fragmentation, and habitat degradation from building development, road and utility corridors, fences, energy development, conversion of native habitat to hay or other crop fields, alteration or destruction of wetland and riparian areas, drought, inappropriate livestock management, competition for winter range by big game, and creation of large reservoirs. In particular, on-going and potential land subdivision has been identified as being of particular concern for habitat on non-Federal land in the Gunnison Basin,

Sims Mesa, Dove Creek, Pinon Mesa, and Poncha Pass areas. Such development also poses a risk of indirect losses through degradation of surrounding habitat, including that on public lands, due to increased human activities associated with larger human populations in the area. The RCP includes additional information regarding the current and projected conditions of each of the local populations (RCP, pages 255-304).

6. Conservation Measures

A. General Description of Conservation Measures

Primary threats to the species that can be addressed under a CCAA include habitat loss, fragmentation, and degradation from urban/human population growth, roads, energy development, invasive weeds, grazing, conversion to agriculture, fire, powerlines, and fences. Based on a review and analysis of information regarding the overall status of the species and each of the local populations, the RCP states: “There is no other issue more fundamental to the longer-term preservation of GUSG than protection of the sagebrush and other habitats on which they depend.” (Gunnison Sage-grouse Rangewide Steering Committee 2005, p. 149). Therefore, emphasis will be placed on Type 1 agreements as described below. Other concerns include lek viewing, disease, predation, recreational disturbance, and drought.

The CCAA incorporates by reference all conservation strategies in the RCP (including local conservation plan strategies) that are relevant to non-Federal lands. The CDOW and Service will draw from those strategies and Best Management Practices from Monsen (2005) while developing conservation measures in the CIs and implementing actions for the Gunnison Sage-grouse on lands enrolled in this CCAA. However, it is possible that the RCP or Monsen (2005) does not cover all needs for certain circumstances, so site specific measures outside of these references will be determined as necessary in consultation with landowners.

Conservation measures from the RCP and Monsen (2005) may include, but are not limited to the following activities:

- Reclaiming disturbed areas from any threats listed above, or other activities, with plants native to the sagebrush communities;
- Protecting habitat from permanent loss;
- Protecting, enhancing, and restoring habitat linkages for interchange of Sage-grouse between populations;
- Where appropriate and necessary, limiting or avoiding housing or structural development in Sage-grouse habitat;
- Encouraging and obtaining conservation easements with Sage-grouse management plans incorporated;
- Avoiding or minimizing placement of roads in important areas of Sage-grouse habitat, and where necessary, relocating or closing roads that are impacting Sage-grouse;
- Developing and implementing control measures for invasive weeds in areas of impact to Sage-grouse habitat;
- If possible, incorporating suggested management practices for energy development on non-Federal land from Appendix L of the RCP, including applying a 0.6 mile radius “no surface occupancy” stipulation near lek sites for energy development, avoiding or

limiting human disturbance associated with energy development, and incrementally reclaiming habitat impacted by energy development activities;

- Managing livestock grazing using various techniques to meet habitat guidelines for the Sage-grouse;
- Prescribing fire in small mosaic patterns to reduce encroachment of trees and shrubs, preventing catastrophic fire and rejuvenating sagebrush communities, and suppressing wildfires where they may increase the abundance of cheatgrass or other weeds;
- Avoiding or minimizing powerline placement near lek or other important habitats, burying powerlines, marking overhead powerlines to reduce collision, and retrofitting powerlines to limit raptor predation;
- Placing new fences outside of leks or other important areas of Sage-grouse habitat, marking fences to reduce risk of collision by Sage-grouse, removing unused fences, and reducing facilitation of raptor predation with fencing materials or modification;
- Managing lek viewing by not allowing access for such viewing, or reducing lek viewing impacts through incorporation of lek viewing protocols;
- Monitoring and minimizing disease through vector control, to the extent feasible;
- Reducing recreational impacts to Sage-grouse populations and habitat;
- Developing additional water sources for wildlife and livestock during drought, to reduce impacts to riparian, wetland, and wet meadow areas important to Sage-grouse; managing invasive vegetation to improve water tables; and adjusting grazing management, prescriptive fire, and vegetation management to reduce additive impacts of drought.
- Implementing habitat treatments to enhance, maintain, or restore Sage-grouse habitat. Possible techniques include removal of pinyon, juniper and gambel oak trees or encroaching shrubs, reduction in density of sagebrush if understory forbs and grasses would benefit, and planting of native or beneficial non-native forbs, grasses, and sagebrush and other shrubs. Methods to reduce trees, shrubs or competition from other vegetation may include chaining, hydro-axing, chainsawing, bulldozing, using harrows, shredders, mowers, aerators, plows, disks, herbicides, and fire. Planting of seeds or seedlings may include use of a variety of drills, seeders, or other equipment to plant and disturb soil.

B. Certificates of Inclusion

The CDOW will contact individual non-Federal landowners within Gunnison Sage-grouse range to encourage their participation in the CCAA program. The CDOW will provide interested landowners with information regarding current Gunnison Sage-grouse use of their property and will ask landowners for any additional information they may have about Sage-grouse populations and habitats on their property. CDOW will work with willing landowners in the development of the materials necessary for successful CI application. CIs will be of two basic types:

- Type 1 -- CIs maintain existing conditions and broad management actions, and
- Type 2 -- CIs that enhance habitat conditions through changes or additions to existing management actions (this may be in addition to maintaining some existing conditions and management actions).

In addition to including a description of conservation measures to be taken on the enrolled property, the CI will provide, or reference, appropriate background information on the specific covered parcels to facilitate reporting and monitoring of the CCAA progress and effects. The information will be maintained by the CDOW. CIs will include specific agreements for monitoring based on the type of CI. The monitoring information required for each type of CI is described below.

Type 1: Securing Habitat Only Agreements: For landowners participating in a CI that does not include habitat treatments or enhancements of their property, the following information will be assembled as part of the CI process:

- a. Map of area and general description of habitat type covered by the CI's with photo point locations, as well as a legal description.
- b. Baseline inventory information on habitat condition at the time of enrollment. This report will be a narrative description of current uses and current management practices with sufficient description to allow assessment of any change in management practice (such as livestock numbers, periods, recreation use, etc.), general assessment of condition of habitat, and an estimate of current Gunnison Sage-grouse use.
- c. Established permanent photo point locations per general CDOW instruction on photo points, with GPS coordinates and initial photos taken.

Type 2: Enhancement of Habitat Through Changes or Additions to Management Actions: Those CI applications that include treatments to improve or restore habitat resources will address the improvements to be made, the expected effectiveness of the improvements to Sage-grouse, the source of funding for improvements, responsibility for completion of improvements, a time frame, and a monitoring plan to ascertain the success of improvements. The following information will be assembled during the CI development process:

- a. Map of area and general description of habitat type covered by the CI with photo point locations, as well as a legal description. Areas where treatments are to be applied would be specifically delineated.
- b. A baseline inventory of conditions using techniques described below, at the time of enrollment in the CCAA to include description of the current condition of various habitat features. For those areas that will receive treatments to enhance habitat conditions, the report will also include the treatment type, conditions under which treatments are to occur, timeline for treatment and expected condition or objectives for treatment including management to be applied during or post-treatment.
- c. Photo point locations per general photo point instruction with GPS coordinates.
- d. Sampling area for treatment monitoring with respect to the baseline conditions. Sampling will use standard techniques (e.g. Daubenmire, line transect, etc.) applicable to the type of treatment, and will use fixed points associated with photo points. Sampling timelines, protocols and schedules will be based on the treatment type.
- e. A list assembled by CDOW of applicable monitoring and treatment methodologies, application of the methods, and reporting protocols will be developed and incorporated in the CI.

Rangeland health assessment techniques will be used to measure how close a range site is to its site potential following guidance in U.S. Department of Interior TR1734-6 (Pellant et al. 2000). By examining attributes of a range site's soil/site stability, hydrologic function and the integrity

of its biotic community, managers can determine the site's current condition (Pellant et al. 2000). By determining deviation from the potential, managers can determine if restoration is advisable and how it can be accomplished. Deviations are measured as none to slight, slight to moderate, moderate, moderate to extreme, and extreme. Seventeen criteria used to measure rangeland health and the dominance of a particular vegetation type will be recorded for each range site and used to rank deviation from its site potential. These rankings will then be applied to the three attribute categories that rank soil/site stability, hydrologic function, and biotic integrity.

Properties being considered for a CI that contain range sites where deviations from potential are ranked as none to slight, or slight to moderate will not require improvements (i.e. they can be Type 1 CIs), although voluntary improvements may be implemented at the joint discretion of the landowner, CDOW, and the Service. Properties being considered for a CI that contain range sites that rank as moderate or moderate to extreme may require improvements if the indicators that score as moderate or extreme are limiting function of important Sage-grouse habitat. Properties that are ranked extreme will require improvements to be enrolled in the CCAA program, i.e. they will be Type 2 CIs.

Habitat measurement transects will be conducted and the measurements will be directly compared to Gunnison Sage-grouse habitat guidelines. The combination of the rangeland health measurements and the habitat transects will provide direction on habitat conservation measures that need to be implemented for Type 2 CIs.

For purposes of the CCAA, lands in public ownership are assumed to be protected and should be managed for grouse benefits, and hence, were not considered when establishing CCAA protection targets. Lands or habitats meeting any of the following conditions will be considered under protection in assessing progress toward the overall habitat protection targets for each population listed in Tables 2-4:

- a. A parcel has a conservation easement that restricts incompatible uses.
- b. A CI agreement has been negotiated, signed, and approved for that parcel.
- c. The parcel is enrolled in a Farm Bill or other recognized program that preserves compatible land use and provides for one or more habitats identified in the RCP.
- d. Federal, State, or local land use regulations prohibit incompatible uses on a parcel.
- e. A parcel is in an area of expansion of seasonally important habitats (documented by CDOW) not previously identified or mapped, which may occur in vacant/unknown or potentially suitable habitats.
- f. A habitat modification project is implemented that converts a parcel into a seasonally important habitat.
- g. If parcels at risk of being developed are converted to incompatible uses, this conversion may be offset by the protection of other equivalent lands in the population area, thereby leading to "no net loss" of protected habitat.
- h. Private lands that are not at risk of development and where current land use practices are compatible with Gunnison Sage-grouse management goals will be considered in assessing progress toward, and maintenance of, protection targets. Inclusion of a parcel in this consideration would be lost if incompatible uses are identified on the parcel, or if the parcel becomes at risk for conversion to incompatible uses or development.

The RCP objective (Gunnison Sage-grouse Rangewide Steering Committee 2005) is to secure and maintain 90% of the identified seasonally important habitats (breeding, summer-fall, and winter) for each Gunnison Sage-grouse population area. The protection goal of the RCP is adopted herein as the enrollment objective for occupied habitat under CIs, with the assumptions regarding protected acreages listed in a-h above. The only exception is for the Cerro/Cimarron/Sims Mesa population, where the management objective is 75% of the occupied habitat; this area appears to act as a habitat linkage to the San Miguel Basin population from the Gunnison, and possibly Crawford, populations. The protection goal of the RCP is adopted herein as the enrollment objective for occupied habitat under CIs as displayed in Tables 2, 3 and 4. There is no enrollment objective for potentially suitable or vacant/unknown habitat, but enrollment of those lands is desirable to allow for future restoration or enhancement of habitat to encourage expansion of the Gunnison Sage-grouse. These are targets that the CDOW and Service believe are reasonable to achieve and that we believe will contribute substantially to conserving the Gunnison Sage-grouse into the foreseeable future, based on the best scientific information available. If seasonally important habitats are not mapped for a given population, the objective is to maintain 90% of all “likely used vegetation communities” within currently mapped occupied habitats. These vegetation communities are a subset of the presently mapped occupied range and exclude vegetation types not typically used by Gunnison Sage-grouse.

The goal of the CCAA is to reduce threats to the Gunnison Sage-grouse and help provide for secure, self-sustaining local populations by enrolling, protecting, maintaining, and enhancing or restoring necessary non-federally owned Colorado habitats of Gunnison Sage-grouse. To help achieve this goal a prioritization of lands to enroll under the CCAA is needed and is described below. For each Gunnison Sage-grouse population, the CDOW will identify non-Federal lands of high habitat importance (i.e. either seasonal habitat mapped as breeding, summer-fall, and winter habitat or unmapped important habitat per local CDOW biologists) to focus on initially for enrollment in CIs. The RCP and the knowledge of local CDOW biologists will be used in establishing priority for enrollment in CIs. The “Prioritization of Habitat Protection Efforts” (RCP page 160) and the “Spatially Explicit Analysis of additional housing units in GUSG Habitat” (Gunnison’s Sage-grouse Rangewide Steering Committee 2005) will also be used in considering initial focus areas for enrollment. Many factors, including the importance of a specific property to Gunnison Sage-grouse, willingness of the landowner to participate in the CCAA, and the size of the parcel will also influence decisions on which lands are enrolled in the CCAA. Therefore, the following priorities are recognized as broad guidance and not an absolute ranking system. The general priorities for enrolling land under the CCAA are as follows:

- Non-Federal lands that contain important occupied habitat that are at risk of development within five years, as known by CDOW or the Service.
- Non-Federal lands that contain important habitat areas, are at risk of development within five years as known by CDOW or the Service, and are in vacant/unknown habitat, potentially suitable habitat, or in habitat linkage areas.
- Non-Federal lands that are enrolled under Farm Bill or other Federal, State, County or non-governmental conservation programs into the foreseeable future that eliminate or reduce threats to the Sage-grouse such that habitats on the land are maintained or improved for the Sage-grouse. Due to uncertainty over length of enrollment in a conservation program or existence of the program it is desirable to still enroll these lands

under a CI, but given a level of existing protection from habitat modification, these lands are lower priority than the other categories. Removal of lands from these programs may elevate the lands to one of the higher priority categories.

- Non-Federal lands that contain important occupied habitat, but are not at risk of development within five years as known by CDOW or the Service.
- Non-Federal lands that contain important habitat areas, are in vacant/unknown habitat, potential habitat, or habitat linkage areas and are not at risk of development within five years as known by CDOW or the Service.
- Non-Federal lands that do not contain areas identified by CDOW as important habitat, are not at risk of development within five years of the date of this CCAA or in the future to CDOW or Service knowledge, but are within occupied habitat..
- Non-Federal lands that do not contain areas identified by CDOW as important habitat, are not at risk of development within five years as known by CDOW or the Service, but are within vacant/unknown habitat, potentially suitable habitat, or habitat linkage areas

Table 2. Targets for Habitat Protection in populations without seasonal habitats mapped.

Population Name	Utilized habitat w/in Occupied Habitat (ac.) (All Ownerships)	Utilized habitat w/in Occupied Habitat (ac.) on Federal Lands	Utilized Habitat in Private Ownership (ac.)	Cons. Easements on pvt. Land in Utilized habitat (ac.) (considered protected)	Remaining pvt land needing protection (ac.)	Utilized Habitat w/in Occupied that is not included in target for protection (*1) (ac.)	Target for CCAA Protection: (Remaining Pvt land minus non-targeted acres) See footnote 2
Crawford	34,908	26,775	8,186	552	7,634	3,491	4,143
Dove Creek	86,483	3,725	23,588	997	22,591	8,648	13,943
Pinon Mesa	24,185	11,595	15,059	4,005	11,054	2,419	8,635
Poncha Pass	14,781	15,092	4,054	0	4,054	1,478	2,576
San Miguel	85,999	37,078	47,110	821	46,289	8,599	37,690

**1: 90% of utilized habitats within occupied habitat are targeted for protection, leaving 10% not-targeted.*

Table 3. Target for habitat protection in population with seasonal habitats mapped.

Population Name	Seasonal Habitats (ac.)	Seasonal Habitat in Federal Ownership (ac.)	Seasonal Habitat in Private Ownership (ac.)	Cons. Easements on pvt. Land in Seasonal habitat (ac.)	Remaining pvt land needing protection (ac.)	Seasonal habitats not included in target for protection (*1)	Target for CCAA Protection: (Remaining Pvt land minus non-targeted acres) See footnote 2
Gunnison Basin	369,294	245,591	113,393	21,162	92,231	36,929	55,302

**1: 90% of seasonal habitats are targeted for protection, leaving 10% not-targeted.*

Table 4. Target for habitat protection in population with unique protection objective

Population Name	Occupied Habitat (ac.)	Occupied Habitat in Federal Ownership (ac.)	Occupied Habitat in Private Ownership (ac.)	Cons. Easements on pvt. Land in Occupied Habitat (ac.)	Remaining pvt land needing protection (ac.)	Occupied Habitat not included in target for protection (*1)	Target for CCAA Protection: (Remaining Pvt land minus non-targeted acres) (ac.) See footnote 2
Cerro/Cimarron/Sims Mesa	37,145	4,896	28,219	2,805	25,414	9,286	16,128

**1: 75% of occupied habitat is targeted for protection, leaving 25% not-targeted.*

**2: Achievement of targets does not guarantee a particular USFWS decision regarding listing the Gunnison Sage-grouse under the ESA.*

7. Expected Benefits

As identified in the FWS's Candidate Conservation Agreement with Assurances Final Policy (64 FR 32726), and regulations at 50 CFR 17.22, to enter into a CCAA and issue a permit and assurances, the Service must determine that the conservation measures and expected benefits, when combined with those benefits that would be achieved if it is assumed that similar conservation measures were also implemented on other necessary properties, would preclude or remove the need to list Gunnison Sage-grouse. Consistent with the CCAA policy, meeting the CCAA standard does not depend on the number of acres enrolled, and adoption of the CCAA and enrollment of landowners does not guarantee that listing will be unnecessary. Through a separate finding, the Service has determined that this CCAA meets the standard specified in the CCAA policy and regulations.

Conservation benefits for Gunnison Sage-grouse from implementation of the CCAA will accrue in a step-wise manner. First and foremost, habitats for the grouse will be protected on non-Federal lands enrolled through CIs. Secondly, habitat enrolled through CIs will contribute to keeping landscapes intact by protecting currently occupied, vacant/unknown, and potential habitats, and by precluding future habitat fragmentation for the duration of the CCAA. Thirdly, enrolled lands may, if restoration/enhancements are determined to be needed and detailed in the CI, be enhanced by the application of recommended treatments (Monsen 2005). These efforts are intended to contribute to the habitats necessary to achieve the optimum population goals cited in the RCP. The scope and scale of the benefits will depend on the amount and distribution of lands enrolled.

Further, Gunnison Sage-grouse conservation will be enhanced by providing ESA regulatory assurances for participating landowners. There will be a significant measure of security for participating landowners in the knowledge that they will not incur additional land use restrictions if the species is listed under the ESA in the future. The CCAA will provide substantial benefits to conservation of the species by offering landowners incentives, and potential state and federal funding in exchange for utilizing best management practices to protect and enhance grouse habitat and to sustain and increase grouse populations.

8. Level/Type of Take/Impacts

Specific authorization of incidental take is provided as part of the Permit issued by the Service in conjunction with this CCAA. Should the Gunnison Sage-grouse become listed under the Act, authorization for incidental take under the Permit is limited to agricultural, recreational, and other related activities (e.g. crop cultivation and harvesting, livestock grazing, farm equipment operation, off-road vehicle use) of the participating landowners. Incidental take by landowners enrolled under a CI and the resulting effects to Gunnison Sage-grouse are expected to be minimal. Since grouse habitat protection and enhancement measures will be in place on enrolled lands, impacts would be limited to minor disturbance from various agricultural or recreational activities or from activities related to sage- grouse habitat protection or improvement.

Incidental take will likely occur sporadically on enrolled lands, and is not expected to nullify the conservation benefits expected to accrue under the CCAA. The actual level of take of Gunnison Sage-grouse is largely unquantifiable but will be monitored indirectly through habitat monitoring strategies. These include monitoring the extent of occupied habitat and habitat conditions. Livestock grazing, other agricultural management practices, and housing development are not expected to degrade habitat on a large scale on enrolled lands, since best management practices will be utilized to meet the goals of agriculture while also meeting Sage-grouse habitat and population targets, and housing development will be very limited or non-existent on enrolled properties. Some direct impacts could occur from related activities such as farm equipment operation. However, there is no evidence that equipment operation has resulted in direct mortality of grouse in the past. Nonetheless, landowners will be required to report mortality from incidental take to the CDOW who will report annually to the Service.

The Service recognizes that this level and type of take is consistent with the overall goal of precluding the need to list the species, and that if conservation measures outlined in the RCP

were implemented on necessary non-federal and federal properties, there would be no need to list the species.

9. Assurances Provided

Through this CCAA, the Service provides the CDOW and participating landowners enrolled through CI's with assurances that no additional conservation measures or additional land, water, or resource use restrictions, beyond those voluntarily agreed to and described in the "Conservation Measures" section of this CCAA and associated CI's, will be required should the Gunnison Sage-grouse become listed as a threatened or endangered species in the future. These assurances will be authorized with the issuance of an Enhancement of Survival Permit under section 10(a)(1)(A) of the Endangered Species Act.

10. Assurances Provided to Property Owner in Case of Changed or Unforeseen Circumstances

The assurances listed below apply to participating landowners. The assurances apply only for the enrolled properties and are applicable only with respect to the species covered by this CCAA, the Gunnison Sage-grouse.

- (1) *Changed circumstances provided for in the CCAA.* The impact of various factors such as wildfire, drought, West Nile Virus, and energy development are addressed broadly by conservation measures in the RCP. However, the Parties agree that if significant changes in these factors occur, a review of the changes and their impact on habitats, or the ability of habitat to reduce the impact, will be made. If this review supports the conclusion that additional habitat conservation measures are necessary, the Parties will take an adaptive management approach and address the change by minor amendment to the conservation measures, or take other actions as permitted within the CCAA. The Parties agree to work together in good faith to address the changed circumstance to the best of their abilities. Methods to address these changed circumstances are described below:
 - (a) **Wildfire.** Wildfire impacts affecting single or limited numbers of individual CI's will be handled on a case by case basis with the individual landowners to determine the management practices to be applied. If one or more wildfires destroy or effectively eliminates a substantial amount of Sage-grouse habitat, within a population as identified in the RCP, to the extent that the ability to reach the protected habitat objective is not possible within the CCAA time frame, CDOW will notify the Service within 30 days of that determination. Within 90 days of notification, the parties will meet and evaluate the conservation measures and identify potential actions which could be employed to address the change in circumstances. The Parties will meet with the CI holder and develop habitat restoration plans (including activities such as seeding and invasive weed control) to be implemented on an agreed upon schedule. Adaptive management

approaches will be applied to make adjustments that will maximize likelihood of success.

- (b) Variation in precipitation amount is not an uncommon event, within Gunnison Sage-grouse range. Annual monitoring and conservation measures in the CCAA and CIs are expected to address minor year to year variations in precipitation amounts. However, prolonged or deep droughts in one or more of the population areas identified in the RCP may create conditions that reduce seasonally available habitat beyond normal annual variation and cause changed circumstances on the landscape. Prolonged periods are defined here as 3 years or more. In this event, the CDOW will notify the Service within 30 days of that determination. Within 90 days of notification, the parties will meet and evaluate the drought conditions and, if opportunities exist, employ changes to the conservation measures to address local conditions. The Parties will identify potential actions which could be employed to address the change in circumstances for a given parcel of land. The Parties will meet with CI holders that graze their lands to evaluate if current livestock grazing practices should be temporarily modified and if the CI holder would be willing to do so. Conservation measures that may be used to address drought conditions include grazing deferment, rotation, or other management changes designed to retain residual and live vegetation; development of grass banks for use during drought conditions; development of additional water sources for livestock and Sage-grouse and prescribed fire management, and/or vegetation management to minimize additive impacts.
- (c) West Nile Virus. Where WNV has been detected, mosquito control with EPA approved larvicides or adulticides will be investigated and implemented as appropriate.
- (d) Energy development. Some population areas identified in the RCP are in areas that have, or are believed to have the potential for energy development. The best management practices identified in the RCP would be applied to CI covered lands where the landowner owns and controls the mineral and surface rights. In cases where the landowner controls only surface rights and is required to open their lands to energy development after the CI is signed all efforts to apply the best management practices will be made. Determination on the impact of energy development on individual CIs will be made by the CDOW through the monitoring process. Modifications or additions to management practices may be adopted for the individual CI, in concert with the CI holder, based on the adaptive management approach and the circumstances on each CI. If, however, extensive development of energy resources begins to occur where the landowners do not hold the mineral rights, and the mineral owner (often the United States) and energy developer does not implement the Best Management Practices on sufficient habitat areas, and the CDOW estimates that the ability to achieve the habitat protection targets could be compromised, then a changed circumstance is deemed to be in effect. The CDOW will notify the Service within 30 days of that determination. Within 90 days of notification, the parties

will meet and evaluate the circumstances in the population area and determine if opportunities exist to change the conservation measures to address the habitat protection target. The Parties may determine that the cumulative energy development affects the potential to reach the habitat protection objectives. The Parties would seek to develop additional or modified conservation measures that could be applied outside the CCAA process or additional conservation measures to be considered by the CI holders or in future CIs.

Adaptive management principles will be included in all CIs, for which the above changed circumstances may be applicable.

(2) *Changed circumstances not provided for in the CCAA.* If additional conservation measures not provided for in the CCAA or CIs are necessary to respond to changed circumstances, the Service and CDOW will not require any conservation measures in addition to those provided for in the CCAA and CIs without the consent of landowners. Conservation strategies from the RCP will be drawn from to the utmost extent possible, to address changed circumstances not provided for in the CCAA or CIs. Funding for additional conservation measures warranted under this section will be sought by CDOW and/or other partners, including the USFWS and/or the landowner if he or she desires.

(3) *Unforeseen circumstances.*

- (a) If additional conservation measures are necessary to respond to unforeseen circumstances, the Director of the Service may require additional measures of the landowner, but only if such measures are limited to modifications within the CCAA's conservation strategy, which includes conservation strategies from the RCP, for the affected species, and only if those measures maintain the original terms of the CCAA to the maximum extent possible. Additional conservation measures will not involve the commitment of additional land, water, or financial compensation, or additional restrictions on the use of land, water, or other natural resources available for development or use under the original terms of the CCAA without the consent of the landowner. Funding for conservation measures warranted under this section will be sought by CDOW and/or other partners, including the USFWS and/or the landowner if he or she desires.
- (b) The Service will have the burden of demonstrating that unforeseen circumstances exist, using the best scientific and commercial data available. These findings must be clearly documented and based upon reliable technical information regarding the status and habitat requirements of Gunnison Sage-grouse. The Service will consider, but not be limited to, the following factors:
 - (1) Size of the current range of the Gunnison Sage-grouse;
 - (2) Percentage of range adversely affected by the CCAA;
 - (3) Percentage of range conserved by the CCAA;
 - (4) Ecological significance of that portion of the range affected by the CCAA;

- (5) Level of knowledge about Gunnison Sage-grouse and the degree of specificity of the species' conservation program under the CCAA; and
- (6) Whether failure to adopt additional conservation measures would appreciably reduce the likelihood of survival and recovery of the Gunnison Sage-grouse in the wild.

11. Monitoring Provisions

Three types of monitoring will be required for this CCAA: (1) Ascertaining general compliance for those CI's which secure habitat only; (2) Monitoring of treatment actions for each CI that includes treatment; and (3) Assessing the overall habitat status of each population of Gunnison Sage-grouse for the CCAA. By taking these steps, the assumption is that what is good for Sage-grouse habitat is good for Sage-grouse. Direct links to Sage-grouse population increases from habitat improvement projects is difficult to assess due to other non-habitat related factors that influence population numbers (for instance: predation, disease, permanent habitat loss/conversion elsewhere in the population, etc.). The following protocols are required for each type of monitoring. Note that activities may be performed by approved contractors, but the named parties are ultimately responsible for monitoring.

- (1) *General CI Compliance* - These monitoring activities are required for Type 1 or Type 2 CIs:
 - a. Annual CDOW contact with landowners and a site visit by a CDOW employee.
 - b. Annual review of the baseline documentation for maintenance of the habitat conditions that were documented at the time the CI was approved. A report will be completed by CDOW and provided to the landowner.
 - c. New photographs of photopoints from the baseline report will be taken at least every three years by CDOW. If noticeable changes are seen during a site visit, photos will be taken more frequently. In addition, the landowner will be queried as to what caused the change, if not apparent, and asked if he/she would be willing to conduct habitat treatments to enhance the habitat if caused by factors outside the landowner's control.
 - d. Non-compliance by landowners with any of the terms of the CI will be reported immediately to CDOW and the Service. Also any significant change in habitat conditions regardless of cause will also be reported. An investigation of the facts will determine if further review is necessary, if amending monitoring or management protocols is necessary, or CI revocation or suspension is needed.
 - e. If it is determined that further review is necessary, a review team will be assembled, that will include, at a minimum, CDOW and USFWS personnel as well as the landowner, and a full review will be completed. A report will be filed with the Service, with recommended action potentially including more rigorous monitoring, enforcement of the terms of the CI, habitat treatments, or revocation of the CI.
- (2) *Treatment Monitoring* - These monitoring activities are required for Type 2 CI's that include lands for which a habitat treatment is necessary to improve the habitat quality.-
 - a. Annual CDOW contact with landowners and a site visit by a CDOW employee.

- b. A baseline report must be developed by CDOW before treatment is applied. Fixed photo points will be established in this report that will be used for future evaluation of the effectiveness of treatment.
- c. A post-treatment evaluation based on appropriate monitoring protocols will be conducted by CDOW either annually or at a periodic basis of two, three or five years, depending on the treatment type.
- d. Post-treatment evaluation reports will include a general assessment of conditions and progress, and will be provided by CDOW to the landowner as well as to the Service through the annual report.

(3) *Habitat Status Monitoring by Local Population* - These monitoring activities are required to assess the progress towards CCAA compliance. The cumulative impacts of individual CI activities on the preservation and potential enhancement of Gunnison Sage-grouse habitats and populations may be addressed by these monitoring actions, but not individual compliance by each separate CI. Reports will be made annually by CDOW to the Service.

- a. An assessment technique will be designed by CDOW to assess overall habitat conditions in each population. The assessments will be conducted periodically (e.g., every three to five years).
- b. Protocols will be developed and utilized by CDOW for random sampling of treatment effectiveness across treated areas in each population. Sampling frequency will be appropriate to the treatment types.
- c. A baseline report will be generated by CDOW detailing acceptable habitat and unacceptable habitat needing treatment for each population.
- d. CDOW will prepare annual reports summarizing the number and range/location of current and anticipated CI's for the habitats listed in the baseline.

In addition to the above monitoring activities, the CDOW will provide the Service with a summary annual report related to the CCAA. Information in the annual summary report will include, but is not limited to: 1) a list of participating landowners enrolled under the CCAA over the past year, including copies of the completed CIs 2) monitoring reports relating to overall habitat and population status, as conducted that year; 3) a summary of any funds used under the ESA Private Landowner Incentive Program or other federal and state programs as related to the CCAA; and 4) other information that CDOW deems pertinent to the Gunnison Sage-grouse CCAA. Reports will be due January 1 of each year and a copy will be made available to the Administrators of this Agreement and any participating landowners.

Also, the CDOW will develop and maintain a GIS-based database of the CI's associated with the CCAA, including electronic images of data sheets, baseline reports and monitoring reports. This will help track extent of land covered by CIs, possibly the extent of occupied habitat, overall habitat conditions, habitat treatments implemented, and habitat treatment conditions.

12. Compliance Monitoring

All Parties are responsible for complying with and implementing the conservation measures, monitoring, reporting, and other requirements specified in this CCAA, including the level and type of take authorized by the Permit. The CDOW will be responsible for monitoring and reporting specified herein related to implementation of the CCAA and fulfillment of its provisions. The Service, after reasonable prior notice to the CDOW, may enter the enrolled properties with CDOW to ascertain compliance with the CCAA. If mutually agreed upon by the Parties and a willing landowner, the Service, after reasonable prior notice to the landowner may enter the enrolled properties without the CDOW to ascertain compliance with the CCAA.

13. Notification of Take Requirement

By signature of this CCAA and any associated CIs, participating landowners agree to provide the CDOW or the Service with an opportunity to rescue individuals of Gunnison Sage-grouse before any authorized take occurs. Notification that such take will occur must be provided to CDOW and the Service at least 60 days in advance of the action or immediately upon recognition that take will occur if it is not possible at least 60 days prior.

14. Duration of CCAA and Permit

The CCAA will be in effect for a duration of 20 years following its approval and signing by the Parties. The Permit authorizing take of the species will become effective on the date of the final rule listing the Gunnison Sage-grouse under the ESA, in the event listing occurs, and will expire when this CCAA expires or is otherwise suspended or terminated. The Permit and the CCAA may be extended beyond their initial term under regulations of the Service in force on the date of such extension. If the CDOW desires to extend the permit and CCAA, it will so notify the Service at least 180 days before the then-current term is scheduled to expire. Extension of the permit and CCAA are subject to any modifications that the Service may require at the time of extension.

15. Modification of the CCAA

Any party may propose modifications or amendments to this CCAA or the Permit by providing written notice to, and obtaining the written concurrence of, the other Parties. Such notice shall include a statement of the proposed modification, the reason for it, and its expected results. The Parties will use their best efforts to respond to proposed modifications within 60 days of receipt of such notice. Proposed modifications will become effective upon the other Parties' written concurrence.

16 Termination of the CI's and CCAA

As provided for in Part 8 of the Service's CCAA Policy (64 FR 32726), a landowner may terminate implementation of the CI's voluntary management actions prior to the CI's expiration date, even if the expected benefits have not been realized. However, the landowner will relinquish his or her take authority (if the species has become listed) and the assurances granted by the Permit. The landowner is required to give 60 days written notice to the other Parties of

their intent to terminate the CI, and must give the CDOW and Service an opportunity to relocate Gunnison Sage-grouse within 90 days of the notice.

If the CDOW determines, pursuant to the monitoring activity described in Sections 11 and 12 or otherwise that the landowner has failed to comply with or implement the conservation measures, monitoring, reporting or other requirements specified in this CCAA or in the landowner's CI, the CDOW may terminate the landowner's participation in the CCAA or otherwise revoke the landowner's CI. Such termination/revocation is effective upon receipt of written notice of termination/revocation from the CDOW and the landowner will no longer be covered under the provisions of the CI and the CCAA and relinquishes any take authority specified therein.

17 Permit Suspension or Revocation

The Service may suspend or revoke the Permit for cause in accordance with the laws and regulations in force at the time of such suspension or revocation (50 CFR 13.28(a)). The Service may also, as a last resort, revoke the Permit if continuation of permitted activities would likely result in jeopardy to the Gunnison Sage-grouse (50 CFR 17.22/32(d)(7)). Consistent with the CCAA regulations, the Service will revoke because of jeopardy concerns only after first implementing all practicable measures to remedy the situation. If the Service suspends or revokes the Permit, upon the effective date of that suspension or revocation, the CDOW and all participating landowners are released from any and all obligations under the CCAA and their individual CIs.

18. Remedies

All Parties will have all remedies otherwise available to enforce the terms of the CCAA and the Permit. No party shall be liable in damages for any breach of this CCAA, any performance or failure to perform an obligation under this CCAA, or any other cause of action arising from this CCAA. The Parties agree to work together in good faith to resolve any disputes, using dispute resolution procedures agreed upon by all Parties.

19. Succession and Transfer

This CCAA shall be binding on and shall inure to the benefit of the Parties and their respective successors and transferees, (i.e., new owners) in accordance with applicable regulations (50 CFR 13.24 and 13.25). The rights and obligations under this CCAA and associated CIs will run with the ownership of the enrolled property and are transferable to subsequent non-Federal property owners pursuant to 50 CFR 13.25. The Permit that is incorporated into each CI is also transferable to the new owner(s) pursuant to 50 CFR 13.25. If the CCAA and permit are transferred, the new owner(s) will have the same rights and obligations with respect to the enrolled property as the original owner. The new owner(s) also will have the option of receiving CCAA assurances by signing a new CI. The landowner shall notify the CDOW and the Service in writing of any transfer of ownership, so that the CDOW and/or the Service can attempt to contact the new owner, explain the baseline responsibilities applicable to the property, and seek to interest the new owner in signing the existing CI or a new one to benefit the listed species on the property. Assignment or transfer of the CI under the permit shall be governed by Service regulations in force at the time.

20 Availability of Funds

Implementation of this CCAA is subject to the requirements of the Anti-Deficiency Act and the availability of appropriated funds. Nothing in this CCAA will be construed by the Parties to require the obligation, appropriation, or expenditure of any funds from the U.S. Treasury. The Parties acknowledge that the Service will not be required under this CCAA to expend any Federal agency's appropriated funds unless and until an authorized official of that agency affirmatively acts to commit to such expenditures as evidenced in writing.

21. No Third-Party Beneficiaries

This CCAA does not create any new right or interest in any member of the public as a third-party beneficiary, nor does it authorize anyone not a party to this CCAA to maintain a suit for personal injuries or damages pursuant to the provisions of this CCAA. The duties, obligations, and responsibilities of the Parties to this CCAA with respect to third parties will remain as imposed under existing law.

22. Notices and Reports

Any notices and reports, including monitoring and annual reports, required by this CCAA will be delivered to the persons listed on page one of this CCAA.

IN WITNESS WHEREOF, THE PARTIES HERETO have, as of the last signature date below, executed this CCAA to be in effect as of the date that the Service issues the Permit.

Director
Colorado Division of Wildlife

Date

Deputy Regional Director
U.S. Fish and Wildlife Service

Date

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Appendix A

CERTIFICATION OF INCLUSION in the Candidate Conservation Agreement with Assurances for the Gunnison Sage-grouse in Colorado Between Colorado Division of Wildlife and the U.S. Fish and Wildlife Service

This certifies that the enrolled property owner described below is included within the scope of Permit No. **(INSERT PERMIT NO.)**, issued on **(INSERT DATE)** to the Colorado Division of Wildlife under the authority of Section 10(a)(1)(A) of the Endangered Species Act of 1973, as amended, 16 U.S.C. 1539(a)(1)(B). Such permit authorizes incidental take of the Gunnison sage-grouse as part of a Candidate Conservation Agreement with Assurances. This incidental take is allowed due to conservation measures incorporated on the owner's property that will benefit the Gunnison sage-grouse and/or its habitat within its range in Colorado. These conservation measures are listed below. Pursuant to that permit and this certificate of inclusion, the holder of this certificate is authorized to engage in any otherwise lawful activity on the described property that may result in the incidental taking of Gunnison sage-grouse, as appropriate, subject to the terms and conditions of the permit and the CCAA. Permit authorization is subject to carrying out the conservation measures described below and the terms and conditions of the permit and the CCAA. By signing this certification of inclusion, the property owner agrees to carry out all of the conservation measures described.

During the life of this CI, changes in the understanding of sage-grouse management and sage habitat management are anticipated. Additionally, changes in events that lead to changes in habitats or uses can not be ruled out. Therefore, the property owner is advised that there is a possibility that circumstances may create a need to modify aspects of conservation measures if the circumstances show the measures to be ineffective or needing improvement to insure the purpose of the CCAA. Currently the circumstances that are believed to have the most potential to change from the current assumptions or conditions and which may impact survival of the Gunnison sage-grouse on a rangewide or population level, are from new findings on habitat management or species needs, wildfire, drought, West Nile Virus, and energy development that does not follow conservation strategies and best management practices stated in the CCAA. In the event that these circumstances do occur the CDOW and U.S. Fish and Wildlife Service will use adaptive management to address the circumstances in order to avoid impacts to survival of the species throughout its range or in critical populations as identified in the Rangewide Conservation Plan. Further needs to modify existing best management practices applied to a CI issued under this CCAA will occur through consultation and agreement between with the property owner and the CDOW. The umbrella CCAA between the CDOW and Service may be referenced for additional information on recommendations to address these issues.

Participating Property Owner's Name and Address:

Legal Description of Enrolled Properties or Attach Detailed Map with Enrolled Properties Identified:

Total Acres of Enrolled Properties (all properties covered by permit): _____

Is there a Conservation Easement that would provide protection of the sage grouse habitat on the property? _____ If so, attach a copy of the easement if applicable.

Description of existing Gunnison sage-grouse habitat (include photos and/or a map):

Duration of Certificate of Inclusion (years): _____ (From date of last signature)

Gunnison sage-grouse Conservation Measures to be Taken on the Enrolled Property:

[For the conservation properties, indicate the specific conservation measures the property owner and/or Colorado Division of Wildlife will take to benefit Gunnison sage-grouse conservation (protection of existing habitat, grazing modifications, habitat improvement projects, etc.), and the conservation benefits expected from these measures. Conservation measures should be no less restrictive than those described in the Conservation Measures section of the umbrella CCAA.]

The property owner agrees to allow the Colorado Division of Wildlife employees or its agents with reasonable prior notice to the property owner of record on this Certificate of Inclusion, to enter the enrolled properties to complete the monitoring disclosed in the CCAA. Additionally the property owner agrees to allow the U. S. Fish and Wildlife Service employees or its agents with reasonable prior notice to the property owner of record in the Certificate of Inclusion to enter the enrolled properties to complete monitoring activities necessary to maintain or enforce the CCAA.

The property owner agrees to give 60 days written notice to the Colorado Division of Wildlife of its intent to terminate the certificate of inclusion, and must give the Division or the U.S. Fish and Wildlife Service an opportunity to relocate affected sage-grouse within 45 days of the notice.

The property owner agrees to give 30 days notice to the Colorado Division of Wildlife of its intent to sell the enrolled property so the Division or the U.S. Fish and Wildlife Service can offer the new owner the option of receiving CCAA assurances by signing a new CI.

Property Owner

Date

Colorado Division of Wildlife

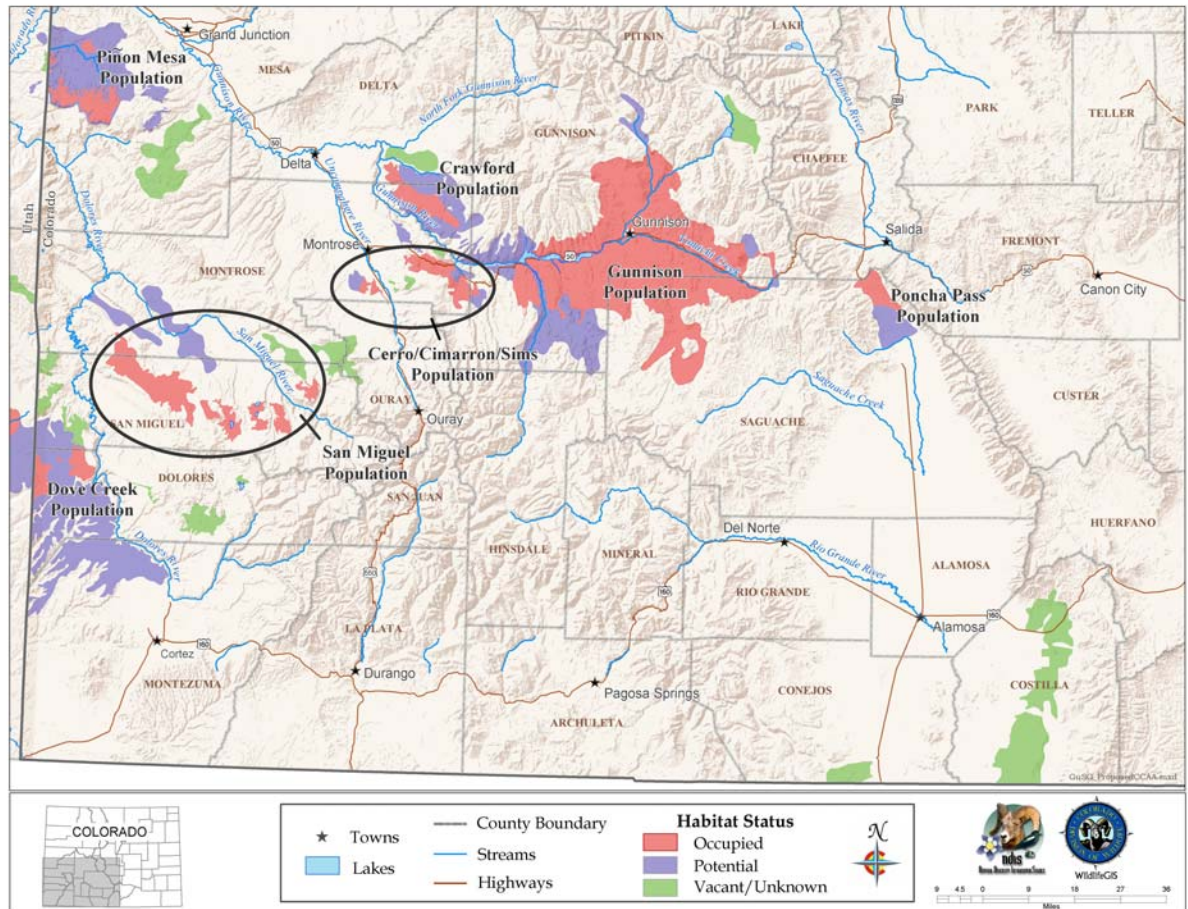
Date

FWS Concurrence

Date

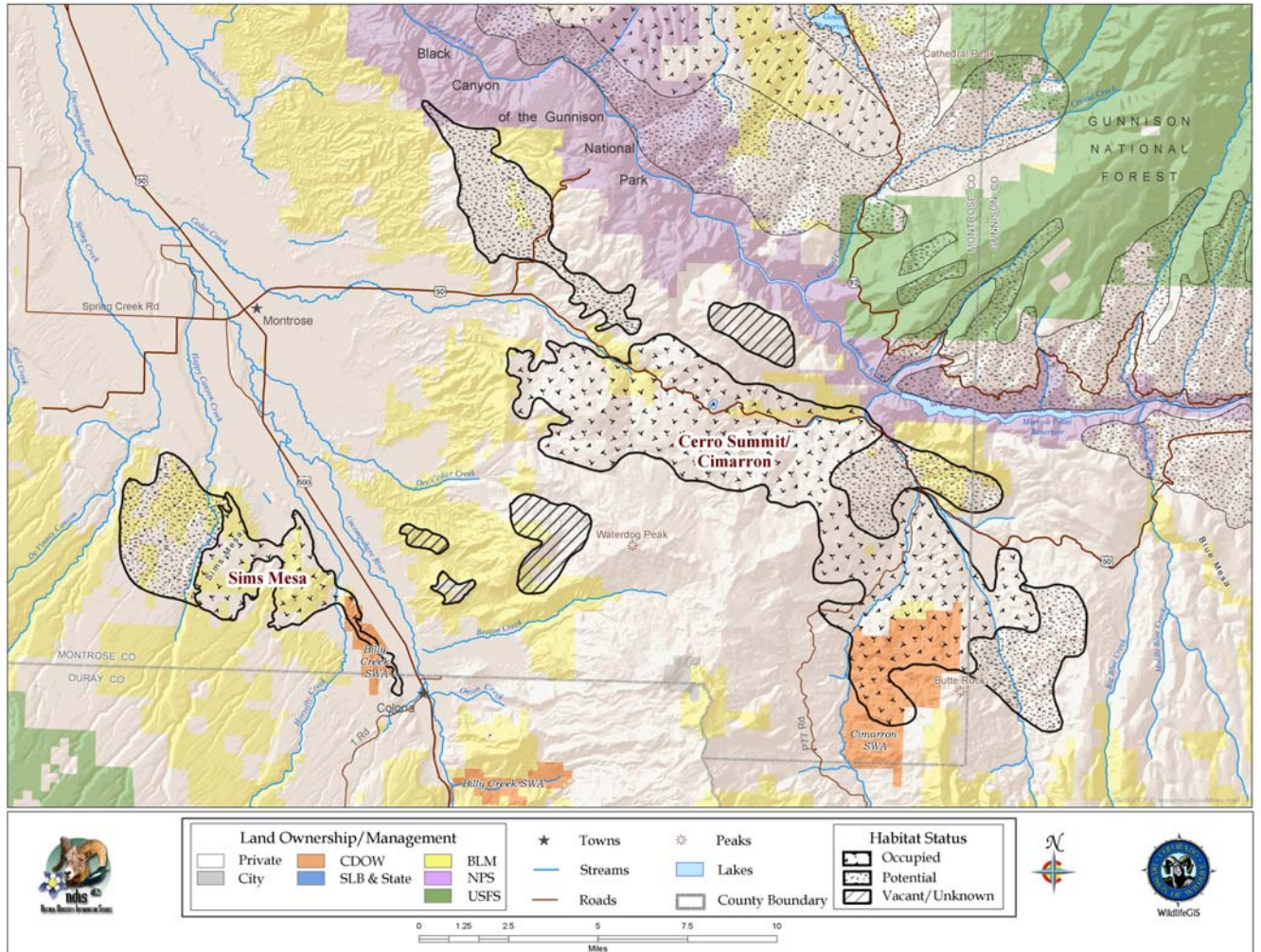
Appendix B.

Figure 1. Location of Gunnison Sage-grouse CCAA Coverage Area



Appendix C.
Location of Gunnison Sage-grouse CCAA coverage area by population

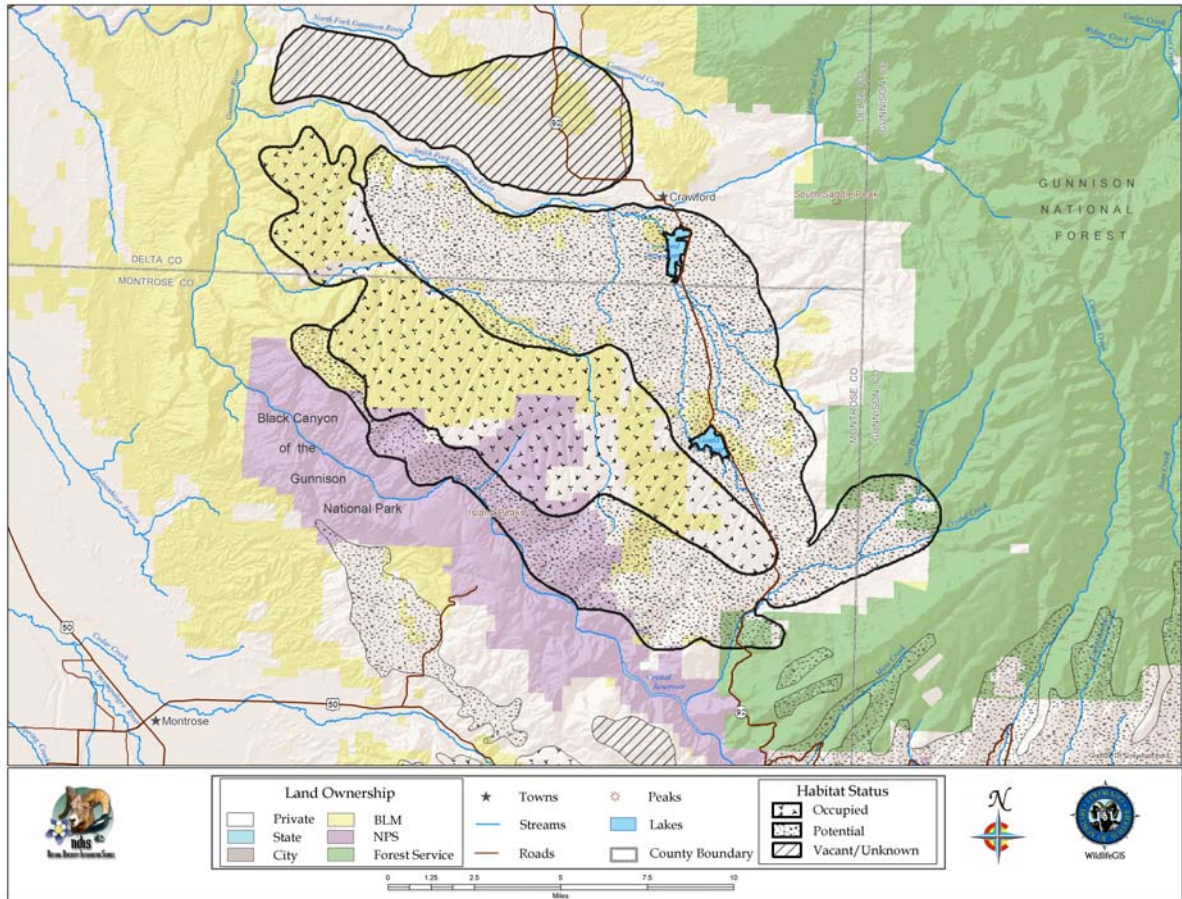
Figure 2. Location, landownership, and habitat status of Cerro Summit, Cimarron, and Sims Mesa Population.



Note: Acronyms in the legend of Figures 2-8 translate as follows:
CDOW = Colorado Division of Wildlife, State Wildlife Areas
SLB & State = State Land Board and other State owned lands
BLM = Bureau of Land Management lands
NPS = National Park Service lands
USFS = U.S. Forest Service lands

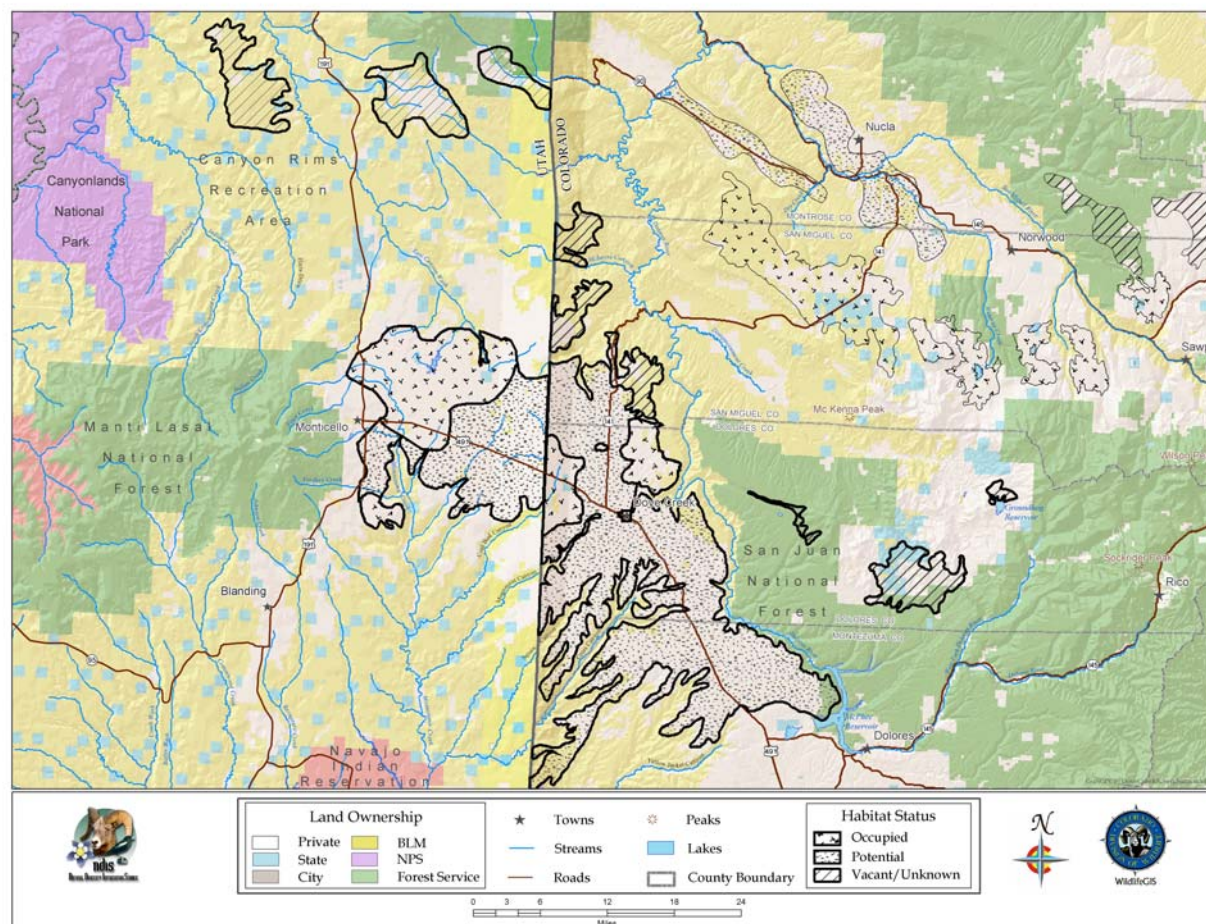
Appendix C, Con't.

Figure 3. Location, landownership, and habitat status of Crawford population.



Appendix C, Con't.

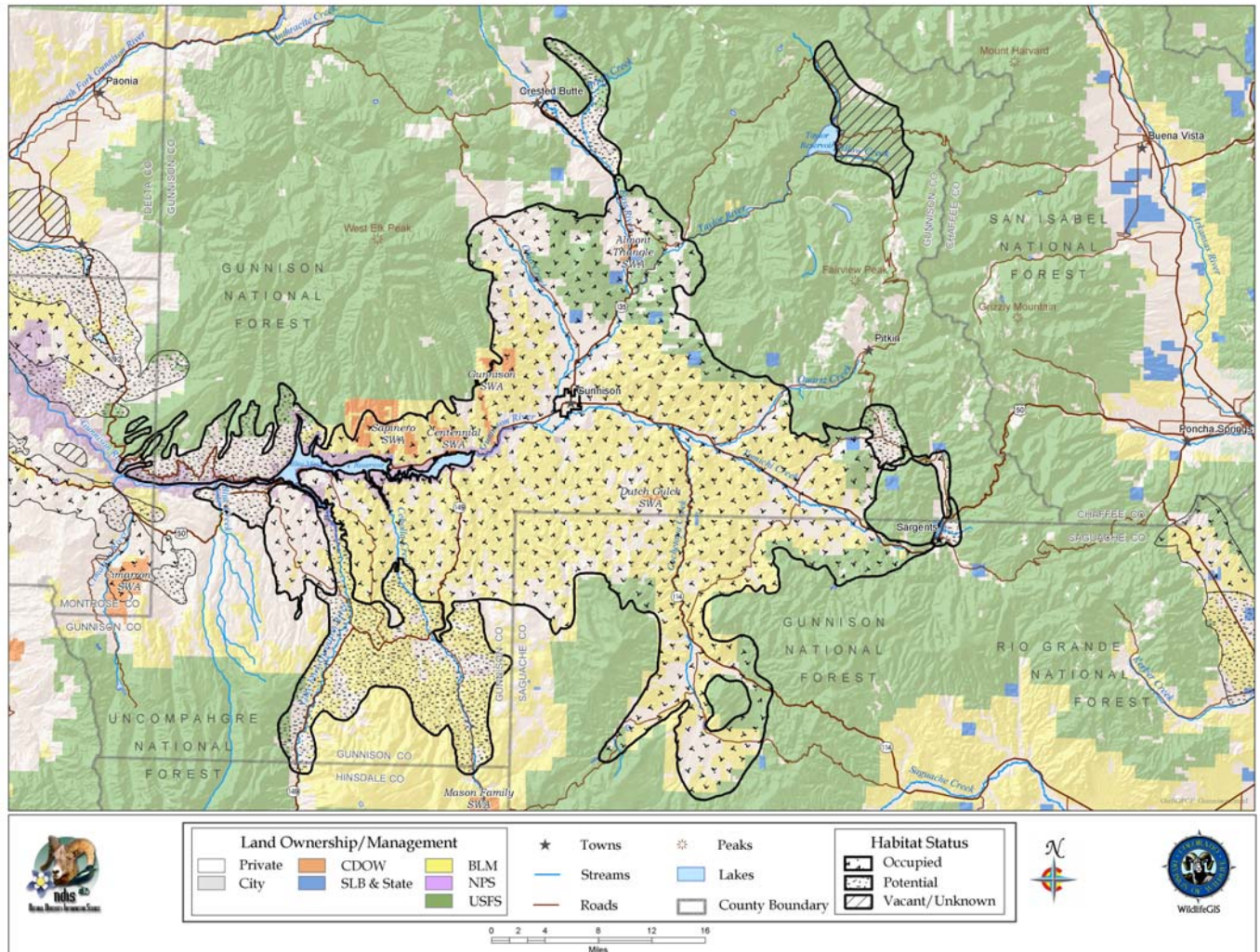
Figure 4. Location, landownership, and habitat status of Dove Creek, Colorado and San Juan County, Utah



Note: This Umbrella CCAA is for Colorado Gunnison sage-grouse areas only; the area depicted on this figure in Utah is not covered under this agreement.

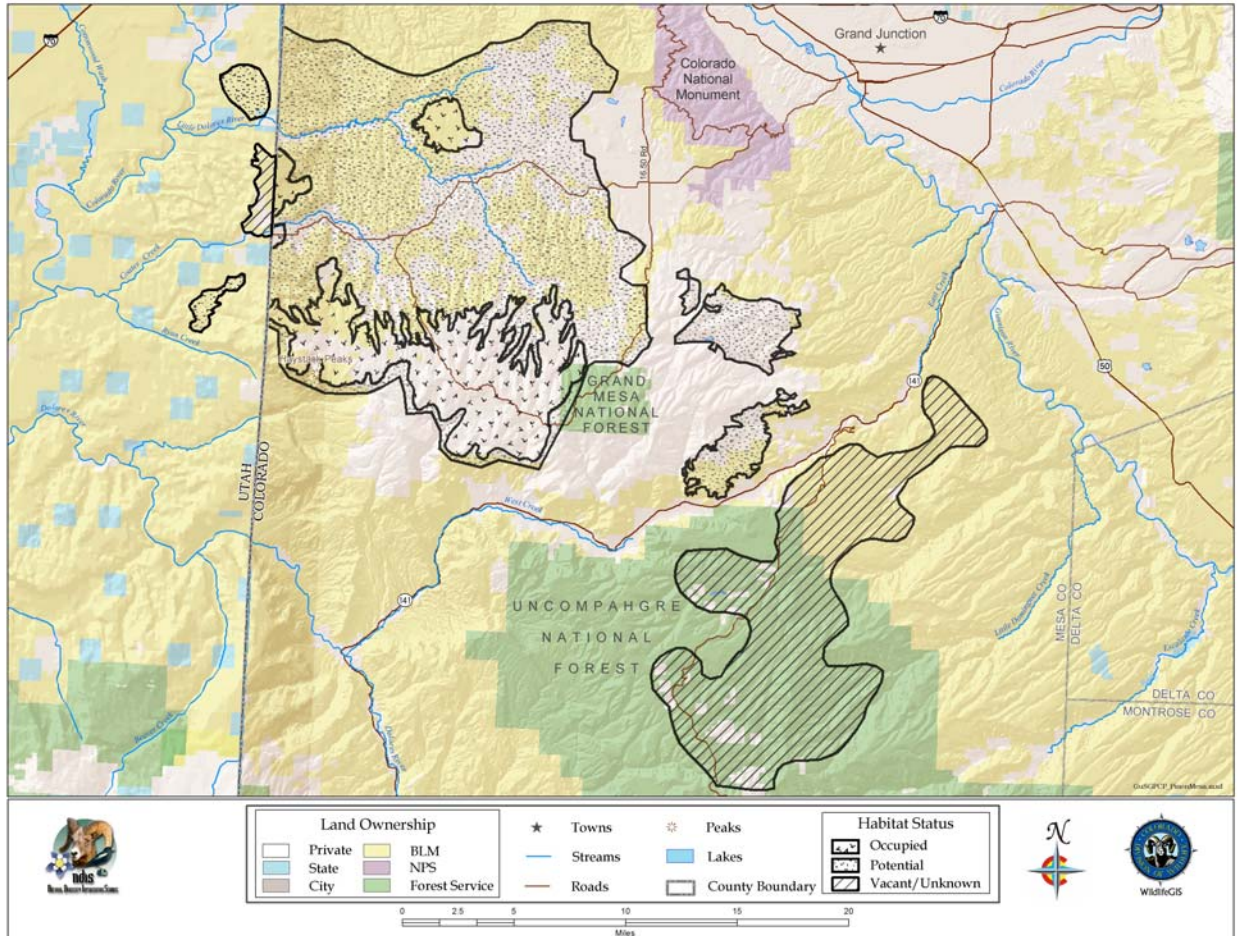
Appendix C, Con't.

Figure 5. Location, landownership, and habitat status of Gunnison Basin Population.



Appendix C, Con't.

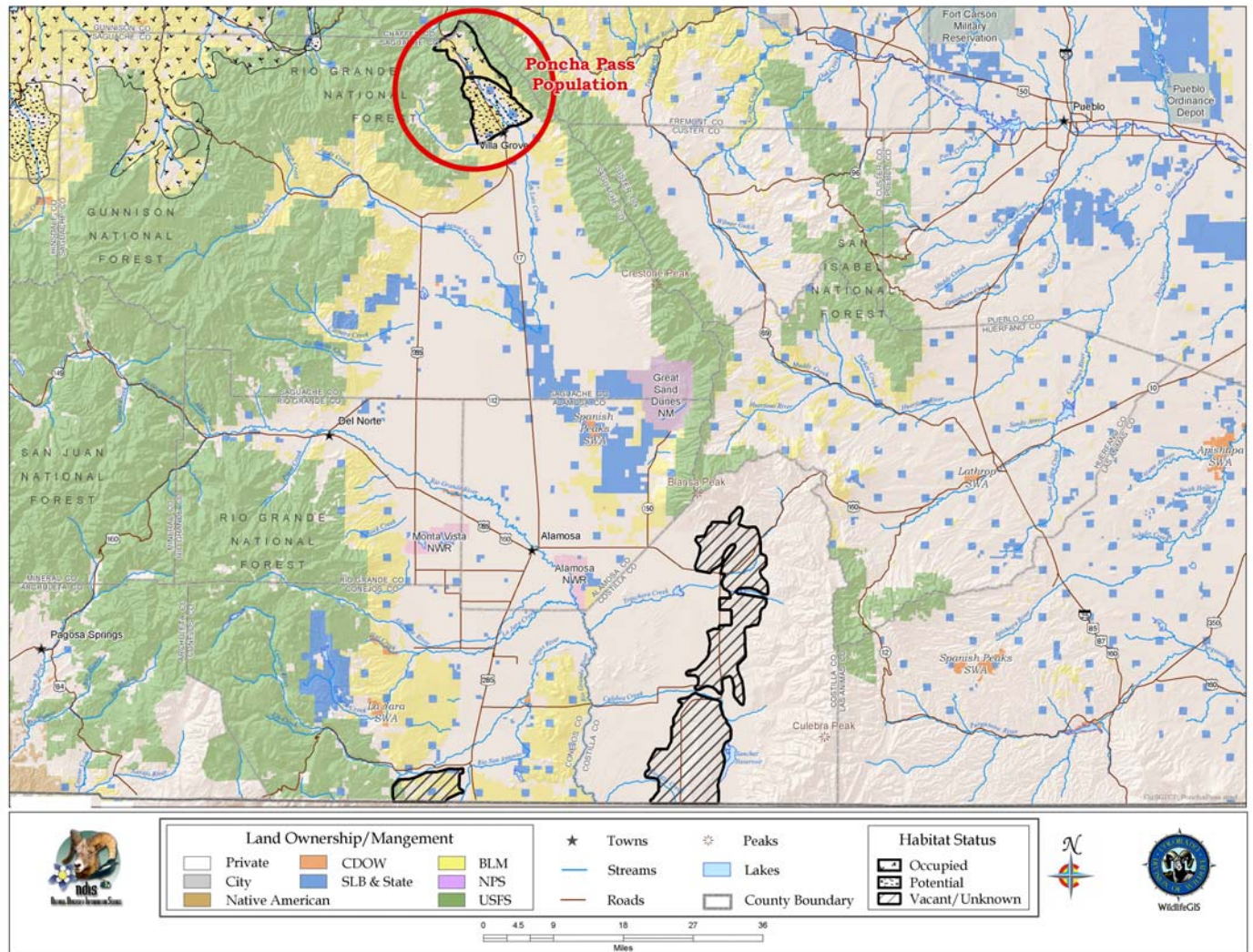
Figure 6. Location, landownership, and habitat status of Piñon Mesa Population.



Note: This Umbrella CCAA is for Colorado Gunnison sage-grouse areas only; the area depicted on this figure in Utah is not covered under this agreement.

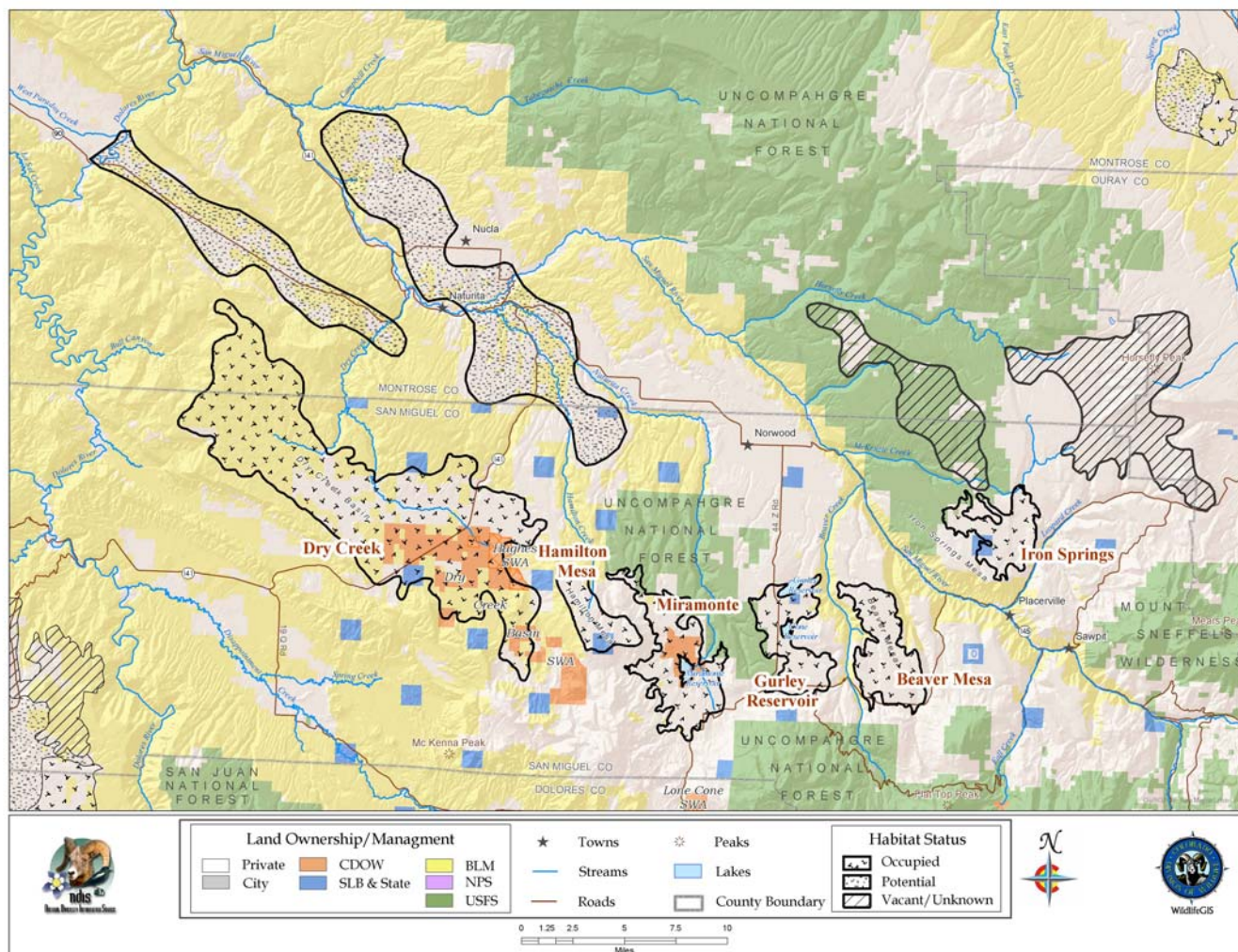
Appendix C, Con't.

Figure 7. Location, landownership, and habitat status of Poncha Pass Population and other areas within the San Luis Valley.



Appendix C, Con't.

Figure 8. Location, landownership, and habitat status of San Miguel Basin population.



Appendix D
Portions of Gunnison Sage-grouse Rangewide Conservation Plan:
Plan Implementation and Funding Allocation *in* Rangewide Strategy Section
and
Local Strategy Section

Plan Implementation and Funding Allocation

An important part of any successful planning process is an implementation schedule with associated costs, and identification of current or potential funding. This plan endeavors to meet criteria identified by the USFWS for evaluation of conservation efforts when making listing decisions (PECE). The PECE criteria call for:

- The conservation effort; the party(ies) to the agreement or plan that will implement the effort; and the staffing, funding level, funding source, and other resources necessary to implement the effort are identified.
- Explicit objectives for the conservation effort and dates for achieving them are stated.
- Provisions for monitoring and reporting progress in implementation (based on compliance with the implementation schedule) and effectiveness (based on evaluation of quantifiable parameters) of the conservation effort are provided.

For each strategy or task, this plan has identified the responsible parties and the completion date where appropriate. Funding mechanisms are summarized in Appendix C. However, the estimated cost of the tasks has not yet been developed and a comprehensive implementation schedule must be developed.

Objective 1: Meet the PECE criteria with regards to implementation of the plan, identification of costs and funding sources, and mechanism to report progress.	
Strategies	Responsible Group
1. Develop a multi-year implementation plan that includes implementation schedule, costs, funding mechanisms, prioritization, and tasks leads.	RSC
	Completion Date: 2005
2. Develop provisions for monitoring and reporting progress in plan implementation.	RSC
	Completion Date: 2005
3. Report on plan effectiveness utilizing provisions developed in #2.	RSC
	Completion Date: Annually

C. Local Conservation Targets and Strategies

For each GUSG population, we offer a discussion of and rationale for the conservation target. Specific recommended strategies are divided into 3 sections for each population: (1) Habitat Protection; (2) Habitat Improvement; and (3) Population Management. Many of the strategies refer the local reader/manager to broader protocols or strategies in the preceding “Rangewide Strategy” section. Note that the strategies are not presented in any order of priority; all the strategies given for each population are important. The guidance provided here may be used to update local conservation plans. The targets and recommended strategies are thought to be sufficient to conserve GUSG. However, local groups may choose to aim for additional conservation measures.

Local conservation targets were established by analyzing the modeled population capacity based on the current occupied acreage, the currently un-occupied (but apparently suitable) habitat, and the amount of habitat that could potentially be created through restoration and management of currently unsuitable, but potential habitat (Table 32). Potential, but currently unsuitable habitat was a broad category that included areas not likely to be convertible to sage-grouse habitat given any degree of economic sustainability (such as cropland in Dove Creek and Monticello, or houses in Piñon Mesa), so not all habitat in that category was considered when establishing targets. Assumptions used about habitat suitability are discussed within each population summary.

For data analysis in this section as well as in “Analysis of Population Size in Relation to the Amount of Available Habitat” (pg. 186), we refined the “Occupied Habitat” category. Local CDOW and UDWR biologists identified vegetation classes that are used by GUSG within the “Occupied Habitat” category for each population (data from the CVCP or the Utah Gap Analysis dataset). For instance, the “Occupied Habitat” boundary may have included classes not used by grouse, but found scattered within the boundary (e.g., ponderosa pine). These classes were eliminated from the analysis used to determine acreage needed to support certain numbers of grouse. Hence, the “Occupied Habitat” numbers in tables within this section are a subset of the actual occupied habitat acreage and are referenced as selected classes. The “Vacant” and “Potential” habitat categories were not refined or changed.

Table 32. Occupied, vacant, and potential habitat, modeled population capability, recent population size, and future population target, by GUSG population. See “RCP Habitat Mapping” for definitions of habitat types (pg. 54), and see “Status and Distribution of Individual Populations” (pg. 56) for maps of occupied, vacant, and potential habitat for each population.

Population	Habitat Estimates (acres)			Modeled Population Capability (males), total ¹			Recent Population ²		
	Occupied ³	Vacant ⁴	Potential ⁵	Occupied ⁶	Occupied + Vacant	Occupied + Vacant + Potential	Males	Total	Future Target
Gunnison	530,464	22,879	157,240	(620) 3,039	(647) 3,174	(836) 4,099	605	2,968	3,000
Crawford	34,908	18,136	61,848	(25) 122	(47) 229	(121) 593	40	196	275
San Miguel	85,999	41,360	61,783	(86) 423	(136) 666	(210) 1,030	62	304	450
Dove Creek	26,907	52,747	237,492	(15) 75	(79) 385	(364) 1,783	30	147	200
Monticello, UT	59,576	56,824	75,285	(54) 267	(123) 602	(213) 1,045	37	182	300
Piñon Mesa	24,185	63,584	136,361	(12) 59	(88) 433	(252) 1,236	26	128	200
Poncha Pass	14,781	0	27,794	(1) 4	(1) 4	(34) 167	8	39	75
Cerro Summit - Cimarron - Sims	37,145	4,874	20,462	(28) 35	(33) 164	(58) 284	7	34	TBD

¹ Estimated from regression of occupied habitat vs. population estimate derived from high count of males.

² Based on multiple-year average of lek counts with comparable sampling effort; time period for each population same as habitat model (see pp. 186-187).

³ Acreage of habitat within each population thought to be occupied by sage-grouse, as delineated by local biologists. Vegetation classes that are used by grouse were selected by local biologists within occupied range boundary.

⁴ Acreage of apparently suitable habitat that is not currently known to be occupied habitat, as delineated by local biologists.

⁵ Acreage of habitat that could, with intensive management, be suitable for sage-grouse, as delineated by local biologists.

⁶ Population estimate converted from average of recent lek counts as: (average number of males/0.53) + [(average number of males/0.53)*(1.6)]; (see pg. 45).

Cerro Summit - Cimarron - Sims Mesa

Primary Issues to be Addressed

The areas of primary focus for this population are the need to obtain better population monitoring data, the need for development of habitat linkages between these areas and other populations, protection of habitat from permanent loss, habitat enhancement and restoration, maintenance of genetic diversity, and grazing management.

Population monitoring is critical for this small population. It is suspected that lek counts underestimate the total number of males in the population, but lack of road access, snow depth, and extensive private land make searches difficult.

A significant portion of the population area is private property in relatively small tracts and could be at risk for development. The most significant of these is the subdivided area south of Montrose Lake. However, at the Cerro Summit - Cimarron area the Cimarron SWA provides a protected core area, and some conservation easements have been negotiated (see Fig. 9, pg. 61, Appendix D, and Fig. 1 in Appendix F). At Sims Mesa much of the core GUSG use area is in private hands (Fig. 2 in Appendix F), and though there is some risk of development on private land, property prices are high. Substantial funds would be needed to protect adequate habitat for this population.

The habitat in this area is highly fragmented and restricted in size, and much of the habitat consists of even-aged stands of sagebrush, as well as areas with piñon-juniper encroachment. At Cerro Summit – Cimarron habitat fragmentation has occurred primarily through sagebrush removal and oakbrush advancement. Landowners should be encouraged to thin, rather than remove, sagebrush. Poor habitat conditions in the Sims Mesa area include lack of understory in non-treated sagebrush areas (primarily private lands), lack of understory diversity in treated areas (domination by crested wheatgrass in the plowed and seeded areas on BLM property), piñon-juniper invasion, sheet erosion, gully formation, and invasive weeds, primarily cheatgrass. Nearly all BLM-managed property on Sims Mesa was plowed and seeded with crested wheatgrass for grazing in the 1980's. Though the sagebrush has slowly returned, the understory remains almost entirely crested wheatgrass.

The limited available habitat suggests that local extinctions may occur without intervention. The current habitat needs to be managed and protected to make the risk of extinction as low as possible. Periodic demographic rescue may be necessary, and infusions of genetic material to counter loss of genetic diversity will probably be necessary.

Livestock grazing needs to be better managed through adjustments in stocking levels and timing to allow for enhancing, restoring, and/or maintaining sage-grouse habitat to meet recommended guidelines. Pasture fencing on some lands may be an effective means of improving grazing management to allow for sage-grouse habitat improvement.

Strategies to assist with these and other issues are provided in this section.

Population Target

We lack sufficient information on population size, historical trends, and habitat suitability to effectively plan conservation efforts for this population. Since 1999, counts of males on 4 known leks (2 currently used) have ranged from 5 to 12. Genetic information

suggests this population is not functionally connected to the Gunnison Basin or to Crawford, but may have received migrants from the San Miguel Basin. It appears unlikely that habitats in these areas are capable of supporting more than about 100 grouse (Table 32, pg. 256), and that may require extensive habitat improvement. Even at that, the 50-year extinction probability would be about 35%. Under current habitat conditions and population sizes, extinction is highly likely without intervention. This population also has relatively low potential for serving as a reservoir for demographic or genetic rescue of other populations. The main conservation value of this area may be to serve as a potential linkage area for genetic dispersal. As such, habitat protection efforts and priorities related to linking populations, rather than population goals, are suggested for this area until and unless further research indicates substantially larger population size or potential.

Table 33. Vegetation classification of occupied habitat and adjacent areas that are delineated as “vacant/unknown” and “potentially suitable” (for definitions, see pg. 54) in the Cerro Summit – Cimarron – Sims Mesa population area. Classification is based on GIS data (Colorado Division of Wildlife 2004b).

Vegetation Classification	Category					
	Currently Occupied		Vacant/Unknown use		Potentially Suitable	
	Acres *	Percent	Acres	Percent	Acres	Percent
Sagebrush dominant	18,926	51	1,725	35	8,834	43
Grass/forb rangeland	3,893	11	442	9	1,973	10
Gambel Oak	2,766	7	70	1	1,578	8
Mountain shrub	2,639	7	415	9	460	2
Piñon-Juniper dominant	3,863	10	1,172	24	3,193	16
Coniferous/deciduous trees	681	2	689	14	628	3
Agriculture	2,972	8	-	-	3,438	17
Other	1,405	4	351	7	358	2
Total	37,145	100	4,864	100	20,462	100

*Note: In this population area, acreage includes all vegetation types within the delineated boundary of the Occupied Habitat. Not enough information is known about which vegetation classes are selected by sage-grouse in this area to select utilized vegetation classes.

Formation of a local work group and development of a local conservation plan is encouraged. Further research is clearly warranted. The habitat protection goal enumerated should be sufficient to maintain dispersal through this area, and to maintain grouse if a significant population is detected.

Recommended Conservation Strategies

HABITAT PROTECTION

Strategy 1: If research indicates this area functions as an effective linkage for gene flow among populations, maintain 75% of occupied habitat (combined public and private), by protecting the necessary proportion of those private lands that are at risk of development from conversion to unsuitable housing densities (see “Spatially Explicit Analysis of Impacts of Additional Housing Units”, pg. 154 and Appendix F).

Task(s)	Responsible Group(s)	When
1. Select from available options (see “Habitat Protection from Permanent Loss” rangewide strategy, pg. 223) to permanently protect occupied sage-grouse habitats at significant risk of permanent loss.	BLM, CDOW, County Governments, NGO’s	Ongoing and by 2020
2. Establish Local Work Group for this population and develop work group plan.	BLM, CDOW, County Governments, NGO’s, NPS, NRCS, Private Landowners	2008

HABITAT IMPROVEMENT

Strategy 1: Improve existing habitat on Sims Mesa to meet habitat quality guidelines (Appendix H).

Task(s)	Responsible Group(s)	When
1. Improve, where deficient, understory grass and forb components within nesting and early brood-rearing areas associated with the Sims Mesa lek (see “Habitat Enhancement” rangewide strategy, pg. 214 and Monsen 2005).	BLM	2020

Strategy 2: Develop additional GUSG habitat in un- or under-utilized Occupied Habitat as well as in Potential Habitat areas.

Task(s)	Responsible Group(s)	When
1. Remove piñon-juniper that is invading sagebrush parks within currently occupied or potential habitat on Sims Mesa (see “Habitat Enhancement” rangewide strategy, pg. 214 and Monsen 2005).	BLM	2020

Strategy 3: Use grazing to manage for high quality GUSG habitat.		
Task(s)	Responsible Group(s)	When
1. Incorporate grazing management practices (such as those presented on page 212) for both cattle and sheep that are compatible with, or enhance, GUSG habitat (see Appendix H) on federal and state lands during the permit renewal process, or when monitoring indicates need.	BLM, CDOW, NRCS, Private Landowners	ASAP

Strategy 4: Minimize GUSG habitat fragmentation and degradation.		
Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Human Infrastructure: Powerlines, Other Utility Corridors, Wind Turbines, Communication Towers, Fences, and Roads” (pg. 225).	BLM, CDOW, County Governments, NPS, Utility Companies	As needed
2. Implement recommendations from rangewide strategy on “Noxious and Invasive Weeds” (pg. 232).	BLM, CDOW, County Governments, Local Work Group, NPS	ASAP
3. Implement recommendations from rangewide strategy on “Oil & Gas Development and Mining” (pg. 233).	BLM, Oil and Gas Companies, Private Landowners	As needed

Strategy 5: Monitor existing and new GUSG habitat for quality.		
Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Habitat Monitoring” (pg. 220).	BLM, CDOW, Local Work Group	As needed
2. Evaluate suitability of vacant/unknown habitat classification and determine if habitat improvement techniques may enhance suitability.	BLM, CDOW, Local Work Group	2005-06

POPULATION MANAGEMENT

Strategy 1: Monitor population and area to detect changes in GUSG numbers and distribution.

Task(s)	Responsible Group(s)	When
1. Implement recommendations in the “Population Monitoring and Targets” rangewide strategy (pg. 242).	CDOW	Annually

Strategy 2: Minimize disturbances to GUSG population (see Appendix I).

Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Lek Viewing” (pg. 231).	BLM, CDOW, Local Work Group	As needed
2. Implement timing restrictions provided in rangewide “Human Infrastructure: Powerlines, Other Utility Corridors, Wind Turbines, Communication Towers, Fences, and Roads” strategy (pg. 225), and “Oil & Gas and Mining” strategy (pg. 233).	BLM, Local Work Group, Utility Companies	As needed

Strategy 3: Augment population and genetic diversity.

Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Population Augmentation” (pg. 241), if and when population size is determined to be large enough to warrant.	CDOW, Local Work Group	As needed
2. Implement recommendations from rangewide strategy on “Genetics” (pg. 208), if and when population size is determined to be large enough to warrant.	CDOW	As needed

Strategy 4: Manage predators to reduce excessive predation.

Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Predation” (pg. 243).	CDOW, Local Work Group, Private Landowners, USDA (APHIS)	As needed

Strategy 5: Collect field information to refine and map habitat and GUSG use areas.		
Task(s)	Responsible Group (s)	When
1. Conduct inventory of vacant/unknown habitat areas using inventory technique developed at a rangewide level (see “Habitat Monitoring” rangewide strategy, pg. 220)	BLM, CDOW, NPS	Begin in 2006; Complete in 2008
2. Search for new or unknown existing leks utilizing survey methodology developed at rangewide level (see “Habitat Monitoring” rangewide strategy, pg. 220)	BLM, CDOW, NPS	Begin in 2006; Repeat every 3-5 years
3. Map GUSG seasonal habitats in a GIS as defined per “Habitat Monitoring” rangewide strategy, Objective 1, Strategy #7 (see pg. 220).	BLM, CDOW, NPS	July, 2006

Crawford

Primary Issues to be Addressed

The issues of primary focus for this population are habitat enhancement and restoration, expansion of occupied habitat, and protection of habitat from permanent loss, especially in potential areas of expansion.

The apparent recent decline in the Crawford population (Table 10, pg. 64) may be due in part to drought conditions that reduced forbs, insect production, and wet meadow areas, all of which are important elements of brood habitat. In addition, past management activities, including fire suppression and selective livestock grazing, have resulted in piñon-juniper encroachment as well as late-seral shrub growth, specifically serviceberry and oakbrush. Several known historic lek sites are believed to be inactive because of piñon-juniper invasion or overgrowth of sagebrush and grass in what were once more open areas. The local work group has used funding from the BLM, CDOW, and the North Fork Habitat Partnership Program to increase available habitat by reducing acreage of piñon/juniper through controlled burns (2,845 acres), cutting (700 acres), or roller chopping (1,050 acres) trees. Analysis of GIS vegetation data indicates another 13,000 acres of sagebrush habitat could be added through piñon/juniper removal.

The local work group has accomplished other significant habitat improvement. Brood-rearing habitat, particularly late brood-rearing habitat along wet meadows or riparian habitat appears limiting. Efforts to cut, brushbeat, or otherwise control juniper, oakbrush, or other tall shrubs near lek sites that could conceal predators should continue. Steve Monsen, a noted shrubland restoration expert (USFS, retired) has commented that of the GUSG population areas he has visited, the Crawford Area is the most productive and favorable for accomplishing sagebrush restoration (S. Monsen, personal communication).

Expansion of the area occupied by sage-grouse is necessary in this population in order to meet population goals (see below). Piñon-juniper and late-seral shrub expansion have contracted the range of sage-grouse at Crawford. Currently identified Potentially Suitable Habitat (see Fig. 11, pg. 67) could support additional sage-grouse with the application of habitat restoration measures such as piñon -juniper and oakbrush removal and/or thinning.

Overall, threats due to habitat conversion or development within currently occupied range have been largely mitigated in Crawford. The majority of occupied sagebrush habitat is publicly owned (76%). Another 9% of occupied habitat is privately owned but protected by easement, bringing the total protected acreage to 85%, near the 90% habitat protection goal. The NPS has a conservation easement on about 2,000 acres, while the CDOW has secured an easement on a 560-acre parcel, and is working with the same landowner on an additional easement on a nearby parcel of 300 acres. An elk ranch that occupies the eastern edge of the main grouse habitat area auctioned off several hundred acres of land in the summer of 2004 in 40-acre plots for cabin/home sites. Fortunately, 7 of these lots were purchased by a landowner who is interested in working with the CDOW on protecting them with easements. Protection of many of the 45 lots in the east-central portion of the occupied area should be a priority. Potential habitat that birds may expand to with habitat

improvement is a mix of public and private, and additional habitat protection strategies may be necessary if and when birds utilize these areas.

Strategies to assist the local work group with these issues, as well as others, are provided in this section.

Population Target

We have set a goal of a long-term average breeding population of 275 birds at Crawford (Table 32, pg. 256). At stable growth rates, this population size has a 50-year extinction probability of approximately 9%, without intervention. A population that averages 275 birds (over approximately 10 years) would be expected to fluctuate between 159 and 484. Currently, based on extrapolations from male counts, there may be about 125 birds in Crawford, but populations in the late 1990s may have been as high as 175 to 200 birds. We estimate about 35,000 acres of habitat is currently occupied (Table 34). Based on our habitat model (see GUSG linear model, discussion begins pg. 186), that amount of habitat, if of average quality, should support an average of about 122 sage-grouse.

We estimate there is an additional 18,000 acres that is suitable but unused, which increases the modeled capacity to 229 sage-grouse (Table 34). Even at that, it is apparent additional habitat must be added and/or habitat quality must be enhanced if we are to meet our population target. We have identified a potential, but currently unoccupied area of 61,848 acres. About 41% of this area is currently dominated by sagebrush communities (Table 34). Removing piñon-juniper and Gambel's oak stands could make much of this area usable by grouse.

Table 34. Vegetation classification of occupied habitat and adjacent areas that are delineated as "vacant/unknown" and "potentially suitable" (see pg. 54 for definitions) in the Crawford population area. Classification is based on GIS data (Colorado Division of Wildlife 2004b).

Vegetation Classification	Category					
	Currently Occupied – Selected Classes		Vacant/Unknown use		Potentially Suitable	
	Acres	Percent	Acres	Percent	Acres	Percent
Sagebrush dominant	27,759	80	5,585	31	25,481	41
Saltbush	182	<1	5,647	31	328	1
Irrigated Agriculture	-		4,599	25	-	-
Agriculture	465	1	458	3	13,069	21
Piñon-Juniper dominant	3,213	9	476	3	6,826	11
Gambel oak dominant	953	3	-	-	6,738	11
Other	2,336	7	1,371	7	9,406	15
Totals	34,908	100	18,136	100	61,848	100

The CACP (1998) stated a population goal of a minimum of 225 individuals in the spring, with the objective of increasing that to 480 individuals by 2010. Neither of those goals is likely to be attainable. A minimum population of 225 would correspond to an

average population of about 375 birds. Our regression analysis suggests maintaining an average population size of 375 birds would require over 76,000 acres of habitat, and 480 birds would require about 94,000 acres of habitat, both significantly above what is currently occupied (~35,000 acres), or what could probably be added through intensive management.

Recommended Conservation Strategies

HABITAT PROTECTION

Strategy 1: Maintain 90% of those vegetation communities likely used by GUSG within occupied habitat (combined public and private), as well as additional habitat in areas of expansion (if and when GUSG use them), by protecting the necessary proportion of those private lands that are at risk of development from conversion to unsuitable housing densities (see “Spatially Explicit Analysis of Impacts of Additional Housing Units”, pg. 154 and Appendix F).		
Task(s)	Responsible Group(s)	When
1. Use all available options (see “Habitat Protection from Permanent Loss” rangewide strategy, pg. 223) to permanently protect GUSG habitat on private land.	CDOW, County Governments, NGO’s	Ongoing and by 2020

HABITAT IMPROVEMENT

Strategy 1: Develop 3,500 acres of additional GUSG habitat in un- or under-utilized Occupied Habitat as well as in Potential Habitat areas.		
Task(s)	Responsible Group(s)	When
1. Remove encroaching piñon/juniper from 3,500 acres within currently occupied or potential habitat (see “Habitat Enhancement” rangewide strategy, pg. 214 and Monsen 2005).	BLM, CDOW, NPS, NRCS	2015
2. Develop an additional 5–10 wet-meadow habitat areas for potential brood-rearing sites and conduct annual maintenance on existing structures (see “Habitat Enhancement” rangewide strategy, pg. 214 and Monsen 2005).	BLM, CDOW, NRCS	2010

Strategy 2: Complete an assessment of breeding/early brood-rearing habitat quality based on “GUSG Structural Habitat Guidelines” (Appendix H); develop and implement a plan to improve areas that are deficient.

Task(s)	Responsible Group(s)	When
1. Complete habitat quality assessment to determine areas not meeting structural guidelines; develop plan to improve areas that are deficient (see “Habitat Enhancement” rangewide strategy, pg. 214 and Monsen 2005).	BLM, CDOW	2006
2. Brush beat or otherwise control sagebrush and other shrubs on lek sites (Monsen 2005). (see “Habitat Enhancement” rangewide strategy, pg. 214 and Monsen 2005).	BLM, CDOW, Local Work Group, NRCS	As needed
3. Improve understory grass and forb component within nesting and early brood-rearing areas where necessary to meet habitat guidelines (see “Habitat Enhancement” rangewide strategy, pg. 214 and Monsen 2005).	BLM, CDOW	2006 and ongoing

Strategy 3: Use grazing to manage for high quality GUSG habitat.

Task(s)	Responsible Group(s)	When
1. Incorporate recommendations from rangewide strategy on “Grazing” (pg. 211) into grazing management plans on 25,000 acres.	BLM, CDOW, NRCS	2010
2. Incorporate grazing management practices (such as those presented on page 212) for both cattle and sheep that are compatible with, or enhance, GUSG habitat (see Appendix H) on federal and state lands during the permit renewal process, or when monitoring indicates need.	BLM, CDOW, NRCS, Private Landowners	ASAP

Strategy 4: Minimize GUSG habitat fragmentation and degradation.

Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Human Infrastructure: Powerlines, Other Utility Corridors, Wind Turbines, Communication Towers, Fences, and Roads” (pg. 225).	BLM, CDOW, County Governments, NPS, Utility Companies	ASAP

Strategy 4: Minimize GUSG habitat fragmentation and degradation.		
Task(s)	Responsible Group(s)	When
2. Implement recommendations from rangewide strategy on “Noxious and Invasive Weeds” (pg. 232).	BLM, CDOW, County Governments, Local Work Groups, NPS	ASAP

Strategy 5: Monitor existing and new GUSG habitat for quality.		
Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Habitat Monitoring” (pg. 220).	BLM, CDOW, Local Work Group, NPS	Ongoing
2. Evaluate suitability of vacant/unknown habitat classification and determine if habitat improvement techniques may enhance suitability.	BLM, CDOW, Local Work Group, NPS	2005-06

POPULATION MANAGEMENT

Strategy 1: Monitor population and area to detect changes in GUSG numbers and distribution.		
Task(s)	Responsible Group(s)	When
1. Implement recommendations in the “Population Monitoring and Targets” rangewide strategy (pg. 242).	CDOW, Local Work Group	Annually

Strategy 2: Minimize disturbances to GUSG population (see Appendix I).		
Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Lek Viewing” (pg. 231).	BLM, CDOW, Local Work Group	2005
2. Implement timing restrictions provided in rangewide “Human Infrastructure: Powerlines, Other Utility Corridors, Wind Turbines, Communication Towers, Fences, and Roads” strategy (pg. 225), and “Oil & Gas and Mining” strategy (pg. 233).	BLM, CDOW, Local Work Group, NPS, Utility Companies	As needed

Strategy 3: Augment population and genetic diversity.		
Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Population Augmentation” (pg. 241).	CDOW, Local Work Group	As needed

Strategy 3: Augment population and genetic diversity.		
Task(s)	Responsible Group(s)	When
2. Implement recommendations from rangewide strategy on “Genetics” (pg. 208).	CDOW	As needed

Strategy 4: Manage predators to reduce excessive predation.		
Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Predation” (pg. 243).	CDOW, Local Work Group, Private Landowners, USDA (APHIS)	As needed

Strategy 5: Collect field information to refine and map habitat and GUSG use areas.		
Task(s)	Responsible Group (s)	When
1. Conduct inventory of vacant/unknown habitat areas using inventory technique developed at a rangewide level (“Habitat Monitoring”, pg. 220)	BLM, CDOW, NPS, USFS	Begin in 2006; Complete in 2008
2. Search for new or unknown existing leks utilizing survey methodology developed at rangewide level (“Habitat Monitoring”, pg. 220)	BLM, CDOW, NPS, USFS	Begin in 2006; Repeat every 3-5 years
3. Map GUSG seasonal habitats in a GIS as defined per “Habitat Monitoring” rangewide strategy, Objective 1, Strategy #7 (see pg. 220).	BLM, CDOW, NPS, USFS	July, 2006

Gunnison Basin

Primary Issues to be Addressed

Primary issues for the Gunnison Basin population include protection of habitat from permanent loss, grazing management, habitat enhancement and restoration, the need for management of lek viewing, and the importance of the population for research and augmentation efforts.

The main threat to GUSG in the Gunnison Basin is loss and fragmentation of habitat, especially due to residential development (risk of development is discussed in detail in “Habitat – Risk of Permanent Loss”, pg. 149). Although a majority (69%) of occupied habitat within the Gunnison Basin is under public ownership and protected from conversion, about a third of lek sites (37%), production areas (34%), and winter range (32%) are privately owned. GUSG in the Ohio Creek drainage are particularly vulnerable because much of the land, including lek sites, is privately owned and in danger of development.

Livestock management in the Basin continues to need to be administered to maintain high quality grouse habitat while optimizing livestock utilization through stocking levels, timing of stocking, and livestock use of riparian areas. Grazing allotments up for permit renewal need to have conservation objectives incorporated into the grazing management.

Exotic plant invasions (e.g., cheatgrass) in some areas may lead to deterioration or loss of habitat, and a lack of adequate forb and or grasses in sagebrush understory also reduces habitat quality in some areas. Mapping and condition assessment of sage-grouse habitats in the Gunnison Basin need to be continued, so that habitat below recommended guidelines can be identified and improved. Data on nest success and chick survival (indexed by chicks per hen in the harvest) suggested that habitat quality was about average in the Gunnison Basin, although there appears to be a recent declining trend in productivity (see “Gunnison Basin Population”, pg. 73). Habitat treatments designed to increase vegetation cover, particularly understory vegetation, at nest sites could presumably increase nest success. The relative gain may not be great, given site potential and reasonably good nest success already. Targeting brood-rearing habitat might be a more effective approach. Habitat improvement aimed at increasing the forb component of deficient early brood-rearing habitat or wet meadow/riparian habitats for late brood-rearing may be very beneficial.

The public has demonstrated interest in viewing GUSG in the Gunnison Basin, particularly strutting males at leks. Providing managed lek viewing opportunities limited to a single area allows for this activity while reducing potential impacts to many leks. Management of the site is needed to provide guidance for human activities and development of facilities to minimize potential impacts to the grouse, as well as to provide informational and educational opportunities to the public.

As the core population of GUSG, the Gunnison Basin population will continue to be invaluable for conducting needed research, as well as contributing birds to augment other populations and genetic diversity in other populations, when necessary.

Strategies to assist the local work group with these issues, as well as others, are provided in this section.

Population Target

The population target for the Gunnison Basin is set at a long-term (10-year) average of 3,000 breeding birds (Table 32, pg. 256). The average population estimate from 1995-2004 was less than 3,000 birds, based on an extrapolation of lek counts. Because of the importance of this population to the overall conservation of the species, it is essential to obtain accurate estimates of the true size of this population. The challenge will be to protect and enhance enough of the important seasonal habitats to direct and mitigate effects of development that will continue to occur so that the population remains at this level over the long term. Although a great deal of work has already been done toward the protection and improvement of GUSG habitat in the Gunnison Basin, development and other conversions of sagebrush habitats continue in the Basin. Habitat protection through easements, fee-title acquisition, land-use restrictions, or by other means is the highest conservation priority for this population.

In our PVA analysis, an initial population size of 3,000 had extinction probabilities of less than 1% at all growth rates used in the model, and a nearly zero probability of extinction at stable growth rates. In the *VORTEX* simulations, this population size also retained from 90-93% (depending on assumptions of the percent of males which breed) of genetic diversity over 50 years. A population with a long-term average of 3,000 breeding birds could expect normal fluctuations between 1,730 and 5,280 breeding birds, based on analysis of long-term trends in high counts of males on leks in North Park (see “Analysis: GUSG Population Size in Relation to the Amount of Available Habitat”, pg. 186).

Based on analysis of data collected during the Basinwide vegetation classification project (Colorado Division of Wildlife 2004b), we estimate sage-grouse occupy about 530,500 acres of sage-grouse habitat in the Gunnison Basin (Table 35). Our analysis of long-term average population sizes at varying habitat acreages suggests the occupied acreage, if of “average quality” would support about 3,039 birds (see Table 32, pg. 256). Including the 23,000 acres of apparently suitable, but currently unoccupied habitat suggests the GUSG population could be about 3,174 birds. About 56% of this vacant habitat is dominated by coniferous vegetation (suggesting use may be seasonal) or located northeast of the current population near Taylor Reservoir (which would require transplanting GUSG that could potentially create a new isolated population). Therefore, we consider vacant habitat will not provide many opportunities for expanding the current GUSG range. Another 157,000 acres of potential habitat was delineated which, if improved, could support grouse. Just under half (46%) of this category was in sagebrush communities, while 31% was classified as some type of forested habitat. If about half of this potential habitat category could be improved to support grouse (78,620 acres), this habitat could add almost an additional 400 grouse. However, complex landownership patterns may limit the opportunities for expanding the current GUSG population into areas with unsuitable habitat (Fig. 14, pg. 74). The greatest potential is perhaps in the Curecanti region of the Basin (Fig. 5, pg. 50). Furthermore, qualitative assessments of sagebrush habitat in some of the potential sites suggest restoration will require a long-term habitat management plan that will not likely produce immediate increases in the GUSG population.

Table 35. Vegetation classification of occupied habitat and adjacent areas that are delineated as “vacant/unknown” and “potentially suitable” (see pg. 54 for definitions) in the Gunnison Basin. Classification is based on GIS data (Colorado Division of Wildlife 2004b).

Vegetation Classification	Category					
	Currently Occupied – Selected Classes		Vacant/Unknown use		Potentially Suitable	
	Acres	Percent	Acres	Percent	Acres	Percent
Sagebrush dominant	407,045	77	7,990	35	72,308	46
Coniferous/deciduous trees	27,917	5	12,779	56	52,398	33
Willow	2871	<1	1,325	6	1,655	1
Grass/forb rangeland	42,763	8	-	-	14,404	9
Other	49,867	9	785	3	16,475	11
Total	530,464	100	22,879	100	157,240	100

The GBCP (1997) described a minimum spring breeding population of 2,600 sage-grouse on 25 leks, and an optimum spring population goal of 3,600 on 30 leks. If the 2,600 birds was a true minimum (i.e., the lowest the population would get), then that population would be expected to average about 4,300 birds, well above the optimum population goal. It is more likely the stated 2,600 bird target would represent an average population size, in which case the population would fluctuate between about 1,560 and 4,575.

Several entities, including the CDOW, hold conservation easements on 23,836 acres of private land within occupied range. The top conservation priority for this population should be to protect seasonally important habitats on private land that are at significant risk of conversion. About 6,500 acres of privately owned severe winter range, nesting and brood-rearing areas are projected to increase to unsuitable housing densities by 2020. There is significant overlap between seasonal habitats at risk of development; protection of many individual properties will protect multiple seasonal habitats.

Recommended Conservation Strategies

HABITAT PROTECTION

Strategy 1: Maintain 90% of seasonally important habitats (combined public and private, as mapped), by protecting the necessary proportion of those private lands that are at risk of development from conversion to unsuitable housing densities (see “Spatially Explicit Analysis of Impacts of Additional Housing Units”, pg. 154, and Appendix F).

Task(s)	Responsible Group(s)	When
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Strategy 1: Maintain 90% of seasonally important habitats (combined public and private, as mapped), by protecting the necessary proportion of those private lands that are at risk of development from conversion to unsuitable housing densities (see “Spatially Explicit Analysis of Impacts of Additional Housing Units”, pg. 154, and Appendix F).

Task(s)	Responsible Group(s)	When
1. Select from available options (see “Habitat Protection from Permanent Loss” rangewide strategy, pg. 223) to permanently protect important seasonal sage-grouse habitats from permanent loss.	BLM, CDOW, County Governments, NPS, USFS	Ongoing and by 2020

HABITAT IMPROVEMENT

Strategy 1: Identify areas where GUSG habitat is significantly below guidelines.

Task(s)	Responsible Group(s)	When
1. Use demographic data, habitat use data, vegetation data, and Basin-wide data to identify and map areas where habitat quality is below recommended levels and may be limiting sage-grouse productivity.	BLM, CDOW, Local Work Group, NPS, NRCS, USFS	2006

Strategy 2: Improve 15,000 acres of existing seasonal habitats to meet habitat quality guidelines (Appendix H).

Task(s)	Responsible Group(s)	When
1. Improve summer - fall habitat where forb component is significantly below guidelines through fencing, spring development, or other means (see “Habitat Enhancement” rangewide strategy, pg. 214 and Monsen 2005).	BLM, CDOW, Local Work Group, NPS, NRCS, USFS	2010
2. Improve understory grass and forb component within nesting and early brood-rearing areas where necessary to meet habitat guidelines (see “Habitat Enhancement” rangewide strategy, pg. 214 and Monsen 2005).	BLM, CDOW, Local Work Group, NPS, NRCS, USFS	2015
3. Complete habitat improvement options on approximately 1,000 acres as specified in NFWF and Wetlands Initiative Grant in Long Gulch. Improve breeding habitat in Long Gulch through treatments that may include, but are not limited to: enhancing water sources, fencing, vegetation treatments, prescribed fire, interseeding, brush beating (see “Habitat Enhancement” rangewide strategy, pg. 214 and Monsen 2005).	BLM, CDOW	2007

Strategy 2: Improve 15,000 acres of existing seasonal habitats to meet habitat quality guidelines (Appendix H).		
Task(s)	Responsible Group(s)	When
4. Incorporate sage-grouse habitat recommendations into existing conservation easements that don't contain them, where possible.	CDOW, NGO's	2010

Strategy 3: Use grazing to manage for high quality GUSG habitat.		
Task(s)	Responsible Group(s)	When
1. Establish GUSG local conservation plan objectives on grazing allotments up for permit renewal. This is an ongoing project in the Gunnison Basin. Currently, 113,000 acres of allotments without local conservation objectives are up for renewal.	BLM, Local Work Group, Private Landowners, NRCS, USFS	2009
2. Incorporate grazing management practices (such as those presented on page 212) for both cattle and sheep that are compatible with, or enhance, GUSG habitat (see Appendix H) on federal and state lands during the permit renewal process, or when monitoring indicates need.	BLM, CDOW, NRCS, Private Landowners, USFS	ASAP

Strategy 4: Minimize GUSG habitat fragmentation and degradation.		
Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide "Human Infrastructure: Powerlines, Other Utility Corridors, Wind Turbines, Communication Towers, Fences, and Roads" strategy (pg. 225).	BLM, CDOW, County Governments, NPS, STL, USFS, Utility Companies	As needed
2. Implement recommendations from rangewide strategy on "Noxious and Invasive Weeds" (pg. 232).	BLM, CDOW, County Governments, Local Work Group, NPS, STL, USFS	ASAP

Strategy 5: Monitor existing and new GUSG habitat for quality.		
Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on "Habitat Monitoring" (pg. 220).	BLM, CDOW, Local Work Group, NPS, NCRS, USFS	Ongoing

Strategy 5: Monitor existing and new GUSG habitat for quality.		
Task(s)	Responsible Group(s)	When
2. Monitor recovery of sagebrush stands that recently died or experienced defoliation due to drought and associated stresses, and implement restoration treatments if necessary.	BLM, CDOW, NRCS, USFS	As needed
3. Evaluate suitability of vacant/unknown habitat classification and determine if habitat improvement techniques may enhance suitability.	BLM, CDOW, Local Work Group, NPS, USFS	2005-06

POPULATION MANAGEMENT

Strategy 1: Monitor population and area to detect changes in GUSG numbers and distribution.		
Task(s)	Responsible Group(s)	When
1. Implement recommendations in the “Population Monitoring and Targets” rangewide strategy (pg. 242).	CDOW, Local Work Group	Annually

Strategy 2: Minimize disturbances to GUSG population (see Appendix I).		
Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Lek Viewing” (pg. 231).	BLM, CDOW, Local Work Group, NPS	2005 and ongoing
2. Implement recommendations from rangewide strategy on “Recreational Activity” (pg. 245).	BLM, Local Work Group, NPS, USFS	As needed
3. Implement timing restrictions provided in rangewide “Human Infrastructure: Powerlines, Other Utility Corridors, Wind Turbines, Communication Towers, Fences, and Roads” strategy (pg. 225), and “Oil & Gas and Mining” strategy (pg. 233).	BLM, CDOW, Local Work Group, NPS, STL, Utility Companies	As needed

Strategy 3: Contribute birds to augment population and genetic diversity of other populations.		
Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Population Augmentation” (pg. 241).	CDOW, Local Work Group	ASAP and ongoing
2. Implement recommendations from rangewide strategy on “Genetics” (pg. 208).	CDOW	As needed

Strategy 4: Manage predators to reduce excessive predation.		
Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Predation” (pg. 243).	CDOW, Local Work Group, Private Landowners, USDA (APHIS)	As needed

Strategy 5: Collect field information to refine and map habitat and GUSG use areas.		
Task(s)	Responsible Group (s)	When
1. Conduct inventory of vacant/unknown habitat areas using inventory technique developed at a rangewide level (see “Habitat Monitoring” rangewide strategy, pg. 220).	BLM, CDOW, NPS, USFS	Begin in 2006; Complete in 2008
2. Search for new or unknown existing leks utilizing survey methodology developed at rangewide level (“Habitat Monitoring”, pg. 220).	BLM, CDOW, NPS, USFS	Begin in 2006; Repeat every 3-5 years
3. Map GUSG seasonal habitats in a GIS as defined per “Habitat Monitoring” rangewide strategy, Objective 1, Strategy #7 (see pg. 220).	BLM, CDOW, NPS, USFS	July, 2006

Monticello, Utah and Dove Creek, Colorado

Primary Issues to be Addressed

Primary issues for this population include habitat loss to subdivision and issues surrounding CRP renewal, poor habitat quality and quantity, increased oil and gas development (in Utah), low existing genetic diversity, and lack of linkages between Monticello and Dove Creek as well as between sub-groups of birds within the Dove Creek area.

The threat to GUSG in the Dove Creek area from subdivision development is discussed in detail in “Habitat – Risk of Permanent Loss”, pg. 149. Almost all occupied habitats in both states are in private ownership. Population growth in this area does not present a great risk, but tract sizes are relatively small and important habitats are at some risk. Much of the core habitat available and used by birds north of Dove Creek occurs within the 2,700-acre Secret Canyon Ranches subdivision. Full build-out of this subdivision, plotted largely to 35- and 40-acre lots, would probably extirpate the Colorado subpopulation. One individual has bought up many of the more critical lots and has attempted for several years to interest the BLM in a trade of some sort. It is essential that the 733 acres he now owns, which connect existing BLM and CDOW parcels, come into public ownership or protection in some way. About 800 acres in the Dove Creek area have been enrolled in 20-year term easements. UDWR and BLM have obtained about 2,700 acres in perpetual easements in the Monticello area.

The CRP represents another short-term (10-15 year) habitat protection program. In Utah, almost 37,000 acres of privately owned cropland within the CCA have been enrolled in CRP, while Dolores County, Colorado, also has about 37,000 acres of CRP. Forty thousand acres of CRP are up for renewal under the Farm Bill in the next 2 to 3 years. CRP has protected this area from agricultural use and development. If this program is not continued, most of these lands will most likely be put back into agricultural production, primarily with winter wheat crops, or used as pastures for cattle grazing. It is critical to this GUSG population that those parcels are renewed.

CRP has provided a considerable amount of brood-rearing habitat because of its forb component. Grazing of CRP in Utah occurred in 2003 under emergency Farm Bill provisions, due to drought. A new Farm Bill program which allows grazing of CRP is available to eligible landowners. Grazing of CRP would significantly reduce cover for sage-grouse broods.

The CRP has not greatly increased the amount of sagebrush cover. Significant use of CRP as nesting or winter habitat will require establishment of sagebrush stands in these fields, and this should be a conservation priority. UDWR has had some success establishing sagebrush seedlings in CRP, but has had little success so far planting sagebrush seed. On CRP fields where sagebrush plantings have occurred, grazing could be used as a tool to reduce competition from established grasses.

Habitat quality and quantity within this area are characterized by low elevation sagebrush stands that have low understory cover, lack diversity, and are dominated by aggressive non-native species. In Monticello, most nesting areas are in poor condition due to lack of herbaceous cover as a result of drought and grazing management practices. Long-

term drought has also reduced the availability of wet meadow habitat for brood-rearing. CRP fields are used heavily by grouse as brood-rearing areas but vary greatly in plant diversity and forb abundance, and generally lack any shrub cover. Sagebrush patches have progressively become smaller and highly fragmented limiting the amount of available winter habitat for this subpopulation. Sage-grouse sub-populations in both states show very restricted movements both daily, seasonally, and from leks to nest and brood-rearing sites (Apa 2004; Swenson 2003). They also had relatively low survival and low nest success, all indicative of poor habitat. Sage-grouse in smaller populations with more fragmented and poorer quality habitat had higher mortality rates than did sage-grouse in larger and more contiguous habitats (Apa 2004).

Additional risks to GUSG habitat exist from oil, gas, and wind power development. In the Monticello area, oil and gas leases have been acquired or applied for on state and federal mineral rights on over 5,000 acres of private property in current occupied grouse habitat. One drill has been constructed and additional drilling could be expected to occur in the next few years. There is also current interest and speculation in wind energy development on GUSG habitat in the Monticello area. A wind test tower (anemometer) has been erected at a site approximately 1.5 miles from a lek site. Landowners in the area have been contacted by power company contractors about leases for wind power development.

From a conservation standpoint, several key points stand out. Because of poor recruitment and somewhat elevated adult mortality (both likely aggravated by drought), counts of males on the Colorado side have declined to 8 in 2003 and 2 in 2004. Oyler-McCance (1999) reported low genetic diversity in this population even when populations were substantially larger, and suggested translocations to augment genetic diversity. Colorado population centers appear to be isolated to the point where they communicate sparingly, and while apparently still genetically linked to Utah birds, they do not appear well linked demographically to Utah birds. Converting cropland back to functional sagebrush communities will be difficult, and while feasible on a small scale, may not be feasible on a large scale except for what can be accomplished through set-aside programs under the Federal Farm Bill; CRP, CREP, and Grassland Reserve. Currently, county-level acreage caps, allowance of seed mixes without sagebrush seed, and emergency (or managed) haying and grazing in these programs restrict their ability to help conserve sage-grouse.

Strategies to assist the local work groups with these issues, as well as other, are provided in this section.

Population Target

These populations appear genetically linked, or at least they were in the recent past. It is assumed that they either are, or could be, demographically linked through dispersal, so population targets will be combined to determine extinction probabilities. Because this population straddles 2 states and 2 local work groups, a suggested allocation of this joint target to each state and local work group is proposed. Declines in numbers of males counted on leks have been dramatic in Dove Creek in recent years, probably due to drought impacting recruitment. We may be undercounting males slightly due to our difficulty in locating leks, which seem to be moving around as grass cover increases in CRP fields. Given current population levels at Dove Creek, translocations for demographic rescue and to increase

genetic diversity will be required when drought-induced habitat deficiencies subside. Re-establishing habitat linkages between Colorado and Utah population centers will be critical to long-term persistence. Otherwise, these population centers will function as 3 small populations with high extinction probabilities.

A combined population goal (average) of 500 is probably attainable, with habitat protection and improvement (see Table 32, pg. 256). At stable growth rates, this population size has a 50-year extinction probability of about 5%, without intervention. A population that averages 500 birds (over 10 years) would be expected to fluctuate between 288 and 880. The current population is well below the lower limit of this range now. Utah, based on a high count of 30 males in 2003, estimates a spring population of 100-120. Dove Creek had over 50 males in 1999, suggesting a population of about 150 birds, but has since declined to 8 males in 2003 and 2 males in 2004.

UDWR estimates that sage-grouse currently occupy about 60,000 acres of sagebrush and cropland, while CDOW estimates about 27,000 acres of sagebrush habitats currently exist in Dove Creek (Tables 39 and 40). Based on recent trends in lek counts and the amount of habitat currently used and potentially available (Tables 36 and 37), an allocation of the 500-bird target of 300 to Utah, and 200 to Colorado, seems defensible. This population is threatened by continued conversion of sagebrush habitats to agriculture, or to subdivisions on the Colorado side. To ensure the long-term persistence and achievement of the 500-bird population objective, large amounts of habitat (~100,000 acres) must be protected and enhanced. Based on our model, approximately 13,000 acres of additional habitat is required to obtain this goal (see GUSG linear model, discussion begins pg. 186).

Population targets in the respective local conservation plans were 500 breeding individuals by 2015 in the Monticello subpopulation and a minimum of 200 and an optimum of 480 breeding individuals in Dove Creek. It is highly unlikely that any of these population objectives are feasible as long-term averages, given any degree of economic sustainability.

Table 36. Vegetation classification of occupied habitat and adjacent areas that are delineated as “vacant/unknown” and “potentially suitable” (see pg. 54 for definitions) in Monticello area. Classification is based on GIS data (Edwards et al. 1995).

	Category					
	Currently Occupied – Selected Classes		Vacant/Unknown use		Potentially Suitable	
Vegetation Classification	Acres	Percent	Acres	Percent	Acres	Percent
Sagebrush dominant	30,774	52	35,416	62	14,459	19
Grassland/dry meadow	2,805	5	5,797	10	1,797	3
Gambel Oak	2,889	5	2,560	5	2,340	3
Mountain shrub	157	~0	181	<1	62	~0
Piñon-Juniper dominant	-	-	7,740	14	10,718	14
Agriculture	22,951	38	2,550	4	44,610	59
Other	-	-	2,580	5	1,298	2
Totals	59,576	100	56,824	100	75,284	100

Table 37. Vegetation classification of occupied habitat and adjacent areas that are delineated as “vacant/unknown” and “potentially suitable” (see pg. 54 for definitions) in Dove Creek. Classification is based on GIS data (Colorado Division of Wildlife 2004b).

Vegetation Classification	Category					
	Currently Occupied – Selected Classes		Vacant/Unknown use		Potentially Suitable	
	Acres	Percent	Acres	Percent	Acres	Percent
Sagebrush dominant	6,211	23	7,552	14	29,745	13
Grass/forb rangeland	3,567	13	10,766	20	28,590	12
Gambel Oak	1,165	4	6,380	12	4,339	2
Mountain shrub	1,307	5	6,160	12	3,954	2
Piñon-Juniper dominant	3,749	14	16,859	32	17,121	7
Rabbitbrush/grass mix	3,953	15	108	—	24,444	10
Agriculture	6,798	25	3	—	109,071	46
Other	157	<1	4,919	9	20,228	9
Totals	26,907	100	52,747	100	237,492	100

Recommended Conservation Strategies

HABITAT PROTECTION

Strategy 1: Maintain 90% of those vegetation communities likely used by GUSG within occupied habitat (combined public and private), by protecting the necessary proportion of those private lands that are at risk of development from conversion to unsuitable housing densities (see “Spatially Explicit Analysis of Impacts of Additional Housing Units”, pg. 154 and Appendix F). In addition, retain protection through CRP re-enrollment of 25,000 acres in Monticello, Utah, and 15,000 acres in Dove Creek, Colorado.

Task(s)	Responsible Group(s)	When
1. Select from available options (see “Habitat Protection from Permanent Loss” rangewide strategy, pg. 223) to permanently protect important seasonal sage-grouse habitats from permanent loss in Monticello, Utah area.	BLM, County Governments, NGO’s, UDWR	Ongoing and by 2020
2. Develop prioritization criteria for and strongly recommend the re-enrollment of 25,000 acres of CRP in occupied and potential sage-grouse habitat in Monticello, Utah, and 15,000 acres of CRP in Dove Creek, Colorado.	CDOW, UDWR, NRCS	By 2007

Strategy 1: Maintain 90% of those vegetation communities likely used by GUSG within occupied habitat (combined public and private), by protecting the necessary proportion of those private lands that are at risk of development from conversion to unsuitable housing densities (see “Spatially Explicit Analysis of Impacts of Additional Housing Units”, pg. 154 and Appendix F). In addition, retain protection through CRP re-enrollment of 25,000 acres in Monticello, Utah, and 15,000 acres in Dove Creek, Colorado.

Task(s)	Responsible Group(s)	When
3. Select from available options (see “Habitat Protection from Permanent Loss” rangewide strategy, pg. 223) to permanently protect important seasonal sage-grouse habitats at significant risk of permanent loss in Dove Creek. Develop, cooperatively with the BLM and Secret Canyon Homeowners Association, a strategy for development that protects important sage-grouse areas.	BLM, CDOW, County Governments, NGO’s, Secret Canyon Homeowners Association	By 2020

HABITAT IMPROVEMENT

Strategy 1: Develop 4,200 acres of additional GUSG habitat in Dove Creek and 5,800 acres in Monticello, and create a habitat linkage between the 2 subpopulations.

Task(s)	Responsible Group(s)	When
1. Eliminate piñon/juniper from and develop sage-grouse habitat on 800 acres between Hickman Flat and the Utah-Colorado state line, or at the periphery of occupied habitat (see “Habitat Enhancement” rangewide strategy, pg. 214 and Monsen 2005).	BLM, Local Work Group, NRCS, UDWR	2010
2. Eliminate piñon/juniper from 1,200 acres between currently occupied habitat north of Dove Creek and vacant/unknown habitat encompassing the Spud Patch area (see “Habitat Enhancement” rangewide strategy, pg. 214 and Monsen 2005).	BLM, Local Work Group, NRCS, UDWR	2010
3. Use habitat improvement techniques identified in (Monsen 2005) to establish sagebrush in 5,000 acres of CRP, other idled cropland, or other areas within 3 miles of lek sites within Utah.	BLM, Local Work Group, NRCS, UDWR	2010
4. Use habitat improvement techniques identified in (Monsen 2005) to establish sagebrush in 3,000 acres of CRP, other idled cropland, or other areas within 4 miles of lek sites within Colorado.	CDOW, Local Work Group, NRCS	2010

Strategy 2: Improve existing breeding habitat to meet habitat quality guidelines (Appendix H) on 500 acres in Dove Creek and 500 acres in Monticello.		
Task(s)	Responsible Group(s)	When
1. Brush beat or otherwise control sagebrush and other shrubs on lek sites (see “Habitat Enhancement” rangewide strategy, pg. 214 and Monsen 2005).	BLM, CDOW, Local Work Groups, NRCS, UDWR	As needed
2. Improve understory grass and forb component within nesting and early brood-rearing areas where necessary to meet habitat guidelines on west side of Dove Creek subpopulation and in Utah subpopulation area (see “Habitat Enhancement” rangewide strategy, pg. 214 and Monsen 2005).	BLM, CDOW, NRCS, UDWR	2010
3. Protect brood-rearing habitat in CRP by restricting haying and grazing, or providing incentives not to hay and graze.	CDOW, NRCS, Private Landowners, UDWR	2005

Strategy 3: Minimize GUSG habitat fragmentation and degradation.		
Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Oil & Gas Development and Mining” (pg. 233).	BLM, Local Work Groups, NRCS, STL, Utility Companies	As needed
2. Implement recommendations from rangewide strategy on “Human Infrastructure: Powerlines, Other Utility Corridors, Wind Turbines, Communication Towers, Fences, and Roads” (pg. 225).	BLM, CDOW, Local Work Group, STL, UDWR, Utility Companies	As needed
3. Incorporate grazing management practices (such as those presented on page 212) for both cattle and sheep that are compatible with, or enhance, GUSG habitat (see Appendix H) on federal and state lands during the permit renewal process, or when monitoring indicates need.	BLM, CDOW, NRCS, Private Landowners, UDWR	As needed
4. Implement recommendations from rangewide strategy on “Noxious and Invasive Weeds” (pg. 232).	BLM, CDOW, County Governments, Local Work Groups, UDWR	As needed

Strategy 4: Monitor existing and new GUSG habitat for quality.		
Task(s)	Responsible Group(s)	When

Strategy 4: Monitor existing and new GUSG habitat for quality.		
Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Habitat Monitoring” (pg. 220).	CDOW, Local Work Groups, UDWR	Ongoing
2. Evaluate suitability of vacant/unknown habitat classification and determine if habitat improvement techniques may enhance suitability.	BLM, CDOW, Local Work Group, UDWR	2005-06
3. Investigate opportunities to expand currently occupied habitat into Vacant/Unknown or Potentially Suitable habitats that would also begin to establish linkages between sub-populations.	BLM, CDOW, Local Work Group	2008
4. Monitor recovery of sagebrush stands that recently died or experienced defoliation due to drought and associated stresses, and implement restoration treatments if necessary.	BLM, CDOW, Local Work Group, UDWR	As needed

POPULATION MANAGEMENT

Strategy 1: Monitor population and area to detect changes in GUSG numbers and distribution, and to evaluate potential areas for expansion.		
Task(s)	Responsible Group(s)	When
1. Implement recommendations in the “Population Monitoring and Targets” rangewide strategy (pg. 242).	CDOW, Local Work Groups, UDWR	Annually
2. Evaluate vacant habitat at La Sal, Lisbon Valley, and Hatch Point (Utah), and Spud Patch (Colorado) to determine habitat suitability and potential for re-introduction.	BLM, CDOW, Local Work Group, UDWR	2005-06
3. Evaluate the Near Draw/Far Draw area of “the Glade” to determine habitat suitability and potential for reintroduction.	BLM, CDOW	2005-06

Strategy 2: Minimize disturbances to GUSG population (see Appendix I).		
Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Lek Viewing” (pg. 231).	BLM, CDOW, Local Work Group, UDWR	As needed

Strategy 2: Minimize disturbances to GUSG population (see Appendix I).		
Task(s)	Responsible Group(s)	When
2. Implement timing restrictions provided in rangewide “Human Infrastructure: Powerlines, Other Utility Corridors, Wind Turbines, Communication Towers, Fences, and Roads” strategy (pg. 225), and “Oil & Gas and Mining” strategy (pg. 233).	BLM, NRCS, Local Work Groups, STL, Utility Companies, Oil and Gas Companies	As needed

Strategy 3: Augment population and genetic diversity.		
Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Population Augmentation” (pg. 241). Conduct transplant of 40 or more birds over several years to recover population and increase genetic diversity in Dove Creek.	CDOW, Local Work Group, UDWR	ASAP
2. If vacant habitat at La Sal, Lisbon Valley, and Hatch Point (Utah), and Spud Patch (Colorado) is determined to be suitable, reintroduce birds following recommendations from rangewide strategy on “Population Augmentation” (pg. 241).	CDOW, UDWR	2007 or later
3. If the Near Draw/Far Draw area of “the Glade” is determined to be suitable, reintroduce birds following recommendations from rangewide strategy on “Population Augmentation” (pg. 241).	CDOW	2007 or later

Strategy 4: Manage predators to reduce excessive predation.		
Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Predation” (pg. 243).	CDOW, Local Work Groups, Private Landowners, UDWR, USDA (APHIS)	As needed
2. Given nest success is below the 25% trigger indicated in the predator management strategy, determine specific predators reducing nest success and evaluate effectiveness of control methods on these predators.	CDOW, Local Work Group, UDWR	2005-06

Strategy 5: Collect field information to refine and map habitat and GUSG use areas.		
Task(s)	Responsible Group (s)	When
1. Conduct inventory of vacant/unknown habitat areas using inventory technique developed at a rangewide level (see “Habitat Monitoring” rangewide strategy, pg. 220)	BLM, CDOW, UDWR, USFS	Begin in 2006; Complete in 2008
2. Search for new or unknown existing leks utilizing survey methodology developed at rangewide level (see “Habitat Monitoring” rangewide strategy, pg. 220).	BLM, CDOW, UDWR	Begin in 2006; Repeat every 3-5 years
3. Map GUSG seasonal habitats in a GIS as defined per “Habitat Monitoring” rangewide strategy, Objective 1, Strategy #7 (see pg. 220).	BLM, CDOW, UDWR	July, 2006

Piñon Mesa

Primary Issues to Be Addressed

Primary threats to this population are habitat loss from development and subdivision, declines in habitat quality, genetic isolation and associated lack of genetic diversity, and the need to increase acreages of occupied habitat by establishing connectivity with other suitable or potentially suitable habitats, and with other populations.

A serious long-term threat for the entire area is the subdivision of private lands into increasingly smaller parcels for development (risk of development is discussed in detail in “Habitat – Risk of Permanent Loss”, pg. 149). The proximity of the Glade Park area to Grand Junction has made it an attractive area for development. This development has resulted in fragmentation and loss of sage-grouse habitat. The eastern 1/3rd of the occupied range is essentially all privately owned. The southern portion of this area contains about 2,000 acres in tracts less than 160 acres, and an additional 3,600 acres in tracts between 160 and 320 acres that could be subdivided.

Habitat quality concerns include the invasion of piñon and juniper into sagebrush areas, inadequate grass and forbs in sagebrush understory, poor vegetation conditions on leks, and a short supply of wet areas, meadows, and water sites. In addition, invasive species such as cheatgrass have increased in some areas and are out-competing native grasses and shrubs.

This population has very low genetic diversity, indicative of its isolation from other populations. Historically, connectivity to other populations probably occurred along the Uncompahgre Plateau south and west towards the San Miguel Basin, and possibly to the east towards Crawford.

The expansion of sage-grouse in this population is limited by currently available suitable habitat. A large area of potentially suitable habitat exists adjacent to currently occupied habitat (see Fig. 17, pg. 90) and offers options for acreage and population expansion.

Strategies to assist the Local Work Group with these issues, as well as others, are provided in this section.

Population Target

Although the local conservation plan for this population calls for a minimum spring count of 120 males (thought to correspond to 480 breeding birds by 2010), because of restricted habitat this goal is highly unlikely. Our habitat model suggests 480 birds would need about 94,000 acres, or almost 4 times what is currently thought to be occupied (see GUSG linear model, discussion begins pg. 186). Counts in the last 6 years have fluctuated between 23 and 33 males. We currently estimate that sage-grouse occupy about 24,000 acres, with another 63,000 acres adjacent to the occupied area that was historically occupied (Table 38). With continued habitat protection, restoration, and expansion through piñon-juniper removal, it is possible that a long-term (10 year) average population of 200 breeding birds, ranging between 115 and 352, could be maintained. At stable growth rates, this population size has an extinction probability of about 15%.

Transplants to augment the population's low genetic diversity are needed as a short-term fix, while potential connectivity through habitat treatments and transplants along the Uncompahgre Plateau should be investigated. Sage-grouse occupied the Dominguez Creek area of the northern Uncompahgre Plateau as recently as the 1980's. Potentially suitable habitat exists to the north of Piñon Mesa and also to the east on Clark's Bench and Snyder Flats (see Fig. 17, pg. 90). Habitat improvement in these areas could provide additional occupied acreage for this population.

Seventy percent of occupied habitat, and 75% of potentially suitable habitat is privately owned. Protecting seasonally important habitats from development will be critical. About a quarter (7,314 acres) of the currently occupied habitat has already been protected by conservation easements.

Table 38. Vegetation classification of occupied habitat and adjacent areas that are delineated as "vacant/unknown" and "potentially suitable" (see pg. 54 for definitions) in Piñon Mesa area. Classification is based on GIS data (Colorado Division of Wildlife 2004b).

Vegetation Classification	Category					
	Currently Occupied – Selected Classes		Vacant/Unknown use		Potentially Suitable	
	Acres	Percent	Acres	Percent	Acres	Percent
Sagebrush dominant	18,799	78	21,354	34	45,343	33
Grass/forb rangeland	1,214	5	2,104	3	4,321	3
Gambel Oak	-	-	13,084	21	10,467	8
Mountain shrub	2,295	9	5,671	9	5,620	4
Piñon -Juniper dominant	1,640	7	11,930	19	57,368	42
Coniferous/deciduous trees	-		6,784	11	4,595	3
Other	237	1	2,657	4	8,647	6
Totals	24,185	100	63,584	100	136,361	100

Recommended Conservation Strategies

HABITAT PROTECTION

Strategy 1: Maintain 90% of those vegetation communities likely used by GUSG within occupied habitats (combined public and private), by protecting the necessary proportion of those private lands that are at risk of development from conversion to unsuitable housing densities (see "Spatially Explicit Analysis of Impacts of Additional Housing Units", pg. 154, and Appendix F).

Task(s)	Responsible Group(s)	When
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Strategy 1: Maintain 90% of those vegetation communities likely used by GUSG within occupied habitats (combined public and private), by protecting the necessary proportion of those private lands that are at risk of development from conversion to unsuitable housing densities (see “Spatially Explicit Analysis of Impacts of Additional Housing Units”, pg. 154, and Appendix F).

Task(s)	Responsible Group(s)	When
1. Select from available options (see “Habitat Protection from Permanent Loss” rangewide strategy, pg. 223) to permanently protect occupied sage-grouse habitats at significant risk of permanent loss on Piñon Mesa.	BLM, CDOW, County Governments, Local Work Group, NGO’s	Ongoing and by 2015

Strategy 2: Maintain 90% of occupied habitats (combined public and private), by protecting the necessary proportion of those private lands that are at risk of development from conversion to unsuitable housing densities (see “Spatially Explicit Analysis of Impacts of Additional Housing Units”, pg. 154 and Appendix F) on Glade Park and other currently unoccupied areas, if and when they become occupied.

Task(s)	Responsible Group(s)	When
1. Select from available options (see “Habitat Protection from Permanent Loss” rangewide strategy, pg. 223) to permanently protect important sage-grouse habitats at significant risk of permanent loss on Glade Park.	BLM, CDOW, County Governments, NGO’s	By 2015

HABITAT IMPROVEMENT

Strategy 1: Develop 5,000 acres of additional GUSG habitat.

Task(s)	Responsible Group(s)	When
1. Eliminate piñon/juniper from 5,000 acres on Piñon Mesa (see “Habitat Enhancement” rangewide strategy, pg. 214 and Monsen 2005).	BLM, CDOW, Local Work Group, NRCS	2010

Strategy 2: Improve 2,000 acres of existing breeding habitat to meet habitat quality guidelines (Appendix H).

Task(s)	Responsible Group(s)	When
1. Brush beat or otherwise control sagebrush and other shrubs on lek sites (see “Habitat Enhancement” rangewide strategy, pg. 214 and Monsen 2005).	BLM, CDOW, Local Work Group, NRCS	As needed

Strategy 2: Improve 2,000 acres of existing breeding habitat to meet habitat quality guidelines (Appendix H).		
Task(s)	Responsible Group(s)	When
2. Use habitat improvement techniques identified in (Monsen 2005) to improve nesting cover (sagebrush canopy, understory) associated with leks on Piñon Mesa to meet minimum vegetation guidelines (Appendix H) or until nest success averages 50% (see “Habitat Enhancement” rangewide strategy, pg. 214).	BLM, CDOW, Local Work Group, NRCS	2010
3. Use habitat improvement techniques identified (Monsen 2005) to improve forb component of brood-rearing habitat associated with leks on Piñon Mesa where hens are known to remain to raise young (see “Habitat Enhancement” rangewide strategy, pg. 214).	BLM, CDOW, Local Work Group, NRCS	2010

Strategy 3: Use grazing to manage for high quality GUSG habitat.		
Task(s)	Responsible Group(s)	When
1. Incorporate recommendations from rangewide strategy on “Grazing” (pg. 211) into grazing management plans on 10,000 acres for existing conservation easements.	CDOW, NGO’s Private Landowners	2010
2. Incorporate grazing management practices (such as those presented on page 212) for both cattle and sheep that are compatible with, or enhance, GUSG habitat (see Appendix H) on federal and state lands during the permit renewal process, or when monitoring indicates need.	BLM, CDOW, NRCS, Private Landowners, USFS	ASAP

Strategy 4: Minimize GUSG habitat fragmentation and degradation.		
Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Human Infrastructure: Powerlines, Other Utility Corridors, Wind Turbines, Communication Towers, Fences, and Roads” (pg. 225).	BLM, CDOW, County Governments, Utility Companies	As needed

Strategy 4: Minimize GUSG habitat fragmentation and degradation.		
Task(s)	Responsible Group(s)	When
2. Implement recommendations from rangewide strategy on “Noxious and Invasive Weeds” (pg. 232).	BLM, CDOW, County Government, Local Work Group, USFS	ASAP
3. Implement recommendations from rangewide strategy on “Oil & Gas Development and Mining” (pg. 233).	BLM, CDOW, Oil and Gas Companies, Private Landowners	ASAP

Strategy 5: Monitor existing and new GUSG habitat for quality.		
Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Habitat Monitoring” (pg. 220), particularly monitoring of status of recovery of sagebrush die-off areas.	BLM, CDOW, Local Work Group, UDWR	As needed
2. Evaluate suitability of vacant/unknown habitat classification and determine if habitat improvement techniques may enhance suitability.	BLM, CDOW, Local Work Group	2005-06
3. Investigate opportunities to expand currently occupied habitat into Vacant/Unknown or Potentially Suitable habitats that would also begin to establish linkages between other populations.	BLM, CDOW, Local Work Group, UDWR	2008

POPULATION MANAGEMENT

Strategy 1: Monitor population and area to detect changes in GUSG numbers and distribution.		
Task(s)	Responsible Group(s)	When
1. Implement recommendations in the “Population Monitoring and Targets” rangewide strategy (pg. 242).	CDOW, Local Work Group	Annually

Strategy 2: Minimize disturbances to GUSG population (see Appendix I).		
Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Lek Viewing” (pg. 231).	BLM, CDOW, Local Work Group	2005 and ongoing

Strategy 2: Minimize disturbances to GUSG population (see Appendix I).		
Task(s)	Responsible Group(s)	When
2. Implement timing restrictions provided in rangewide “Human Infrastructure: Powerlines, Other Utility Corridors, Wind Turbines, Communication Towers, Fences, and Roads” strategy (pg. 225), and “Oil & Gas and Mining” strategy (pg. 233).	BLM, Local Work Group, Utility Companies	As needed

Strategy 3: Augment population and genetic diversity.		
Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Population Augmentation” (pg. 241).	CDOW, Local Work Group	As needed
2. Implement recommendations from rangewide strategy on “Genetics” (pg. 208).	CDOW	As needed

Strategy 4: Manage predators to reduce excessive predation.		
Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Predation” (pg. 243).	CDOW, Local Work Group, Private Landowners, USDA (APHIS)	As needed

Strategy 5: Collect field information to refine and map habitat and GUSG use areas.		
Task(s)	Responsible Group (s)	When
1. Conduct inventory of vacant/unknown habitat areas using inventory technique developed at a rangewide level (see “Habitat Monitoring” rangewide strategy, pg. 220)	BLM, CDOW, UDWR, USFS	Begin in 2006; Complete in 2008
2. Search for new or unknown existing leks utilizing survey methodology developed at rangewide level (see “Habitat Monitoring” rangewide strategy, pg. 220).	BLM, CDOW, UDWR, USFS	Begin in 2006; Repeat every 3-5 years
3. Map GUSG seasonal habitats in a GIS as defined per “Habitat Monitoring” rangewide strategy, Objective 1, Strategy #7 (see pg. 220).	BLM, CDOW, UDWR, USFS	July, 2006

Poncha Pass

Primary Issues to be Addressed

The threat of extinction of this population is relatively high, because of its small size, and there is limited opportunity for habitat expansion to improve the outlook for the population. In addition, there are some risks to GUSG and their habitat from residential development, recreation, and mining.

Due to the small size of currently available habitat, the associated small sage-grouse population size that can be supported may be subject to local extinctions without intervention. Periodic demographic rescue may be necessary and infusions of genetic material to counter loss of genetic diversity will be required over time. However, depending upon available resources, efforts may need to be weighed against needs of other small populations having much larger acreages of available habitat, and hence, greater probability of being self-sustaining.

Residential development on private land is a threat to GUSG at Poncha Pass (risk of development is discussed in detail in “Habitat – Risk of Permanent Loss”, pg. 149). The area is scenic, easily accessed via Highway 285, and some interior parcels of land are in small tracts and currently for sale.

There is some threat from cumulative physical disturbances associated with recreation in the area. In addition, a mica mine was recently proposed near Poncha Pass, and although the application has been withdrawn, the possibility of a mine (and potential negative impacts on GUSG and their habitat) remains.

Strategies to assist the Local Work Group with these issues, as well as others, are provided in this section.

Population Target

Historical information on population size is very limited since lek counts were not conducted prior to the recent transplant (2000). This population was thought to have been established and has persisted since the initial transplants in the early 1970's. It is possible there were 50-75 sage-grouse during this interval. This population size has about a 40-60% extinction probability over a 50-year time period. This population has relatively low potential for serving as a reservoir for demographic or genetic rescue of other populations. We set a long-term (10-year) average target of 75 birds (Table 32, pg. 256), but extraordinary efforts will not be undertaken to achieve it because the functional difference between a population of 30-40 and 75 is not great.

Clearly all populations that fluctuate independently of Gunnison Basin have conservation value and merit protection, but extraordinary attempts to sustain Poncha Pass that divert resources from other, larger populations more likely to persist, are probably not warranted. Nevertheless, available suitable but unused habitat makes translocation a viable option. Habitat quality is generally good, and recent efforts have improved it. About 24% of the currently occupied habitat is privately owned.

Habitat expansion opportunities at Poncha Pass are very limited, although sage-grouse do have opportunities to expand into some apparently suitable, but un-used habitat (Table 39). At this small acreage (15,000) the habitat model (see pg. 186) is not instructive.

Although no habitat protection goal is enumerated, opportunities to permanently protect private habitat that do not directly compete with protection of privately held habitat in other populations (such as BLM land trades or easements) should be explored.

Table 39. Vegetation classification of occupied habitat and adjacent areas that are delineated as “vacant/unknown” and “potentially suitable” (see pg. 54 for definitions) in Poncha Pass area. Classification is based on GIS data (Colorado Division of Wildlife 2004b).

	Category					
	Currently Occupied –Selected Classes		Vacant/Unknown use		Potentially Suitable	
Vegetation Classification	Acres	Percent	Acres	Percent	Acres	Percent
Sagebrush dominant	9,478	64			48	-
Grass or grass/forb	1,777	12			3,225	12
Rabbitbrush/grass mix	2	0			4,932	18
Shrub/grass/forb mix	1,614	11			14,825	53
Piñon -Juniper dominant	398	3			698	3
Riparian shrub, sedge, forb	77	<1			2,987	11
Other	1,434	10			1,079	4
Totals	14,781	100	-	-	27,794	100

Recommended Conservation Strategies

HABITAT PROTECTION

Strategy 1: Maintain 90% of those vegetation communities likely used by GUSG within occupied habitats (combined public and private), by protecting the necessary proportion of those private lands that are at risk of development from conversion to unsuitable housing densities (see “Spatially Explicit Analysis of Impacts of Additional Housing Units”, pg. 154 and Appendix F).

Task(s)	Responsible Group(s)	When
1. Select from available options (see “Habitat Protection from Permanent Loss” rangewide strategy, pg. 223) to permanently protect occupied sage-grouse habitats at significant risk of permanent loss.	BLM, CDOW, County Government, NGO’s	Ongoing

HABITAT IMPROVEMENT

Strategy 1: Use grazing to manage for high quality GUSG habitat.

Task(s)	Responsible Group(s)	When
1. Incorporate grazing management practices (such as those presented on page 212) for both cattle and sheep that are compatible with, or enhance, GUSG habitat (see Appendix H) on federal and state lands during the permit renewal process, or when monitoring indicates need.	BLM, CDOW, NRCS, Private Landowners, USFS	ASAP

Strategy 2: Minimize GUSG habitat fragmentation and degradation.

Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Human Infrastructure: Powerlines, Other Utility Corridors, Wind Turbines, Communication Towers, Fences, and Roads” (pg. 225).	BLM, CDOW, County Governments, STL, USFS, Utility Companies	As needed
2. Implement recommendations from rangewide strategy on “Noxious and Invasive Weeds” (pg. 232).	BLM, CDOW, County Governments, STL, USFS	ASAP
3. Implement recommendations from rangewide strategy on “Recreational Activity” (pg. 245).	BLM, Local Work Group, USFS	As needed

Strategy 3: Monitor existing and new GUSG habitat for quality.

Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Habitat Monitoring” (pg. 220), particularly monitoring of status of recovery of sagebrush die-off areas.	BLM, Local Work Group	Ongoing
2. Evaluate suitability of vacant/unknown habitat classification and determine if habitat improvement techniques may enhance suitability.	BLM, CDOW, STL, USFS	2005-06

POPULATION MANAGEMENT

Strategy 1: Monitor population and area to detect changes in GUSG numbers and distribution.

Task(s)	Responsible Group(s)	When
1. Implement recommendations in the “Population Monitoring and Targets” rangewide strategy (pg. 242).	BLM, CDOW, Local Work Group	Annually

Strategy 2: Minimize disturbances to GUSG population.

Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Lek Viewing” (pg. 231).	BLM, CDOW, Local Work Group	As needed
2. Implement timing restrictions provided in rangewide “Human Infrastructure: Powerlines, Other Utility Corridors, Wind Turbines, Communication Towers, Fences, and Roads” strategy (pg. 225), and “Oil & Gas and Mining” strategy (pg. 233).	BLM, CDOW, Local Work Group, STL, USFS, Utility Companies	As needed

Strategy 3: Augment population and genetic diversity.

Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Population Augmentation” (pg. 241).	CDOW, Local Work Group	As needed
2. Implement recommendations from rangewide strategy on “Genetics” (pg. 208).	CDOW	As needed

Strategy 4: Manage predators to reduce excessive predation.

Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Predation” (pg. 243).	CDOW, Local Work Group, Private Landowners, USDA (APHIS)	As needed

Strategy 5: Collect field information to refine and map habitat and GUSG use areas.

Task(s)	Responsible Group (s)	When
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Strategy 5: Collect field information to refine and map habitat and GUSG use areas.		
Task(s)	Responsible Group (s)	When
1. Conduct inventory of vacant/unknown habitat areas using inventory technique developed at a rangewide level (“Habitat Monitoring” strategy, pg. 220)	BLM, CDOW, USFS	Begin in 2006; Complete in 2008
2. Search for new or unknown existing leks utilizing survey methodology developed at rangewide level (“Habitat Monitoring” strategy, pg. 220)	BLM, CDOW, USFS	Begin in 2006; Repeat every 3-5 years
3. Map GUSG seasonal habitats in a GIS as defined per “Habitat Monitoring” rangewide strategy, Objective 1, Strategy #7 (see pg. 220).	BLM, CDOW, USFS	July, 2006

San Miguel Basin

Primary Issues to be Addressed

Primary threats to this population are recent dramatic increases in natural gas development, habitat loss to development and subdivision, poor habitat quality, and effects of drought. An additional challenge facing GUSG management in the area is the large amount of privately controlled land. Cooperating with private landowners in the protection and management of GUSG will be key to the long-term success of the GUSG preservation effort.

Oil and gas exploration activities in the San Miguel Basin have increased dramatically in recent months. Exploration and production activities are scheduled to expand in the near future and associated probable affects on sage-grouse are of great concern.

Residential development is a major threat to GUSG in the San Miguel Basin, especially at Iron Springs and Gurley Reservoir. Good progress has been made on fee title acquisition in the Miramonte Reservoir and Dry Creek Basin areas (1,350 and 1,500 acres, respectively), with discussions/negotiations on additional easements (by CDOW, San Miguel Open Space) and land swaps (BLM) ongoing here and in other areas. The local work group is currently (November 2004) working to establish a process to prioritize habitat protection among the subpopulations.

Past or current sagebrush removal has reduced habitat at Dry Creek Basin, Gurley Reservoir, and Beaver Mesa. At Dry Creek Basin remaining sagebrush patches were subjected in the past to overgrazing and continue to succeed to a late-seral sagebrush community dominated by sagebrush, lacking in understory, and not ideal for GUSG use. Habitat loss in the form of piñon-juniper encroachment is also a problem in some areas, particularly in Dry Creek Basin. The southern third of the range at Beaver Mesa is private property managed by working ranches, and past conversion of sagebrush habitat to seasonally irrigated pasturelands has left little sagebrush cover in most of this area.

Following the drought of 2002, approximately 75% of the total sagebrush canopy in Dry Creek Basin was lost to sagebrush defoliation (Wenger et al. 2003). Although most plants survived and exhibited signs of recovery in 2003, there were significant areas, particularly in the low sage, where over 90% of the plants died (Wenger et al. 2003). The decrease in lek attendance in Dry Creek Basin is of great immediate concern and is most likely related to poor habitat conditions exacerbated by the recent drought. Additions to the breeding population in Dry Creek Basin through augmentation should be seriously considered.

Strategies to assist the local work group with these issues, as well as others, are provided in this section.

Population Target

A long-term (10-year) average population target of 450 birds was established (Table 32, pg. 256). Although recent population peaks may have approached this level, maintaining it as a long-term average will be a challenge given the current condition of vegetation and poor site potential of Dry Creek Basin (which comprises about 60% of occupied habitat for the population), and development pressures elsewhere. At stable growth rates, this

population size has a 50-year extinction probability of about 5%, without intervention. A population that averages 450 birds would be expected to fluctuate between 260 and 792. A breeding population with a long-term average of 450 would require about 90,000 acres of average quality habitat (see GUSG linear model, discussion begins pg. 186). This is close to the total acreage now occupied, (85,999 occupied, with an additional 41,524 vacant and 61,783 potentially suitable, Table 40). However, this habitat exists in 6 distinct and separated geographic areas which probably reduces its ability to maintain grouse.

We identified 41,360 acres of presumably suitable habitat in the Basin as vacant or of unknown use (Table 40). Analysis of plant communities in this vacant category suggests this area would be suitable primarily for late summer brood rearing (dominated by mesic mountain shrubs [23%], Gambel oak [18%], rangeland [13%], conifers and/or deciduous trees [17%], and subalpine grass communities [10%]), with less than 7% of the acreage dominated by sagebrush communities. It is likely much of this vacant, unknown use category currently receives summer use by grouse, and unlikely this category has potential to increase populations year round.

Although an additional 62,000 acres was identified as potential habitat, much of this is privately held (63%) and only 34% is currently classified with sagebrush as the dominant vegetation. While about a third of the vegetation is dominated by piñon-juniper, only about 5% has sagebrush or mountain shrubs as an understory to the piñon-juniper. While some gains can no doubt be realized by piñon-juniper removal and other treatments, it is unlikely much of this can be converted to suitable habitat in the future.

Table 40. Vegetation classification of occupied habitat and adjacent areas that are delineated as “vacant/unknown” and “potentially suitable” (see pg. 54 for definitions) in San Miguel Basin. Classification is based on GIS data (Colorado Division of Wildlife 2004b).

Vegetation Classification	Category					
	Currently Occupied – Selected Classes		Vacant/Unknown use		Potentially Suitable	
	Acres	Percent	Acres	Percent	Acres	Percent
Sagebrush dominant	40,890	48	4,026	10	25,481	41
Grass/forb rangeland	19,136	22	5,435	13	4,548	7
Gambel Oak	7,338	9	7,433	18	6,738	11
Mountain shrub	8,069	9	9,616	23	18	-
Piñon -Juniper dominant	-		410	1	5,640	9
Coniferous/deciduous trees	1,350	1	7,408	18	1,849	3
Agriculture	920	1	91	-	13,069	21
Other	8,296	10	6,941	17	4,440	7
Totals	85,999	100	41,360	100	61,783	100

The SMBCP (1998) listed minimum population goals of 255 sage-grouse by spring of 2002, and an optimum goal of 480 by 2007-2012.

Protecting significant seasonal habitats in private ownership within core areas like Miramonte, Dry Creek, and Hamilton Mesa will be essential to either meet this target or maintain GUSG in this population. Maintaining breeding sub-populations in the Gurley Reservoir and Beaver Mesa - Iron Springs areas will be particularly challenging given that these areas are almost entirely privately held (91, 100, and 92%, respectively) and land prices are high. Collectively these areas have represented 33-41% of the breeding population of the entire San Miguel Basin in recent years, so they are very significant. Areas of immediate and high conservation importance include the area west and south of Gurley Reservoir that is already subdivided into small lots, and currently offered for sale. As discussed earlier, additional habitat protection in Miramonte and Hamilton Mesa will be necessary in time, while protection of Iron Springs Mesa may be beyond our means.

Recommended Conservation Strategies

HABITAT PROTECTION

Strategy 1: Maintain 90% of those vegetation communities likely used by GUSG within occupied habitats (combined public and private), by protecting the necessary proportion of those private lands that are at risk of development from conversion to unsuitable housing densities (see “Spatially Explicit Analysis of Impacts of Additional Housing Units”, pg. 154), and Appendix F.		
Task(s)	Responsible Group(s)	When
1. Select from available options (see “Habitat Protection from Permanent Loss” rangewide strategy, pg. 223) to permanently protect occupied sage-grouse habitats at significant risk of permanent loss in the San Miguel Basin.	BLM, CDOW, County Government, NGO’s, USFS	Ongoing and by 2020

HABITAT IMPROVEMENT

Strategy 1: Develop 1,000 acres of additional GUSG habitat.		
Task(s)	Responsible Group(s)	When
1. Eliminate piñon /juniper from 1,000 acres within Dry Creek Basin (see “Habitat Enhancement” rangewide strategy, pg. 214 and Monsen 2005).	BLM, CDOW, Local Work Group, NRCS	2010

Strategy 2: Improve 560 acres of existing breeding habitat to meet habitat quality guidelines.		
Task(s)	Responsible Group(s)	When

Strategy 2: Improve 560 acres of existing breeding habitat to meet habitat quality guidelines.		
Task(s)	Responsible Group(s)	When
1. Brush beat or otherwise control sagebrush and other shrubs on lek sites (see “Habitat Enhancement” rangewide strategy, pg. 214 and Monsen 2005).	BLM, CDOW, Local Work Group, NRCS	As needed
2. Use habitat improvement techniques identified in Monsen (2005) to improve nesting cover (sagebrush canopy, understory) associated with leks within Dry Creek Basin to meet minimum vegetation guidelines or until nest success averages 50% (see “Habitat Enhancement” rangewide strategy, pg. 214).	BLM, CDOW, Local Work Group, NRCS, USFS	2010
3. Use habitat improvement techniques identified in (Monsen 2005) to improve forb component of brood-rearing habitat associated with leks within the Dry Creek Basin where hens are known to remain to raise young (see “Habitat Enhancement” rangewide strategy, pg. 214).	BLM, CDOW, Local Work Group, NRCS, USFS	2010

Strategy 3: Use grazing to manage for high quality GUSG habitat.		
Task(s)	Responsible Group(s)	When
1. Develop and implement grazing management plans on 5,000 acres by incorporating sage-grouse habitat objectives into conservation easements.	CDOW, NGO's, NRCS	2010
2. Incorporate grazing management practices (such as those presented on page 212) for both cattle and sheep that are compatible with, or enhance, GUSG habitat (see Appendix H) on federal and state lands during the permit renewal process, or when monitoring indicates need.	BLM, CDOW, NRCS, Private Landowners, USFS	ASAP

Strategy 4: Minimize GUSG habitat fragmentation and degradation.		
Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Human Infrastructure: Powerlines, Other Utility Corridors, Wind Turbines, Communication Towers, Fences, and Roads” (pg. 225).	BLM, CDOW, County Government, STL, USFS, Utility Companies	As needed
2. Implement recommendations from rangewide strategy on “Noxious and Invasive Weeds” (pg. 232).	BLM, CDOW, County Government, STL, USFS	ASAP

Strategy 4: Minimize GUSG habitat fragmentation and degradation.		
Task(s)	Responsible Group(s)	When
3. Implement recommendations from rangewide strategy on “Oil & Gas Development and Mining” (pg. 233).	BLM, CDOW, Oil and Gas Companies, Private Landowners, STL, USFS	ASAP
4. Move road away from Desert Lek.	BLM, County Government, Private Landowner	2007

Strategy 5: Monitor existing and new GUSG habitat for quality.		
Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on Habitat Monitoring” (pg. 214), particularly monitoring of status of recovery of sagebrush die-off areas.	BLM, Local Work Group, USFS	Ongoing
2. Evaluate suitability of vacant/unknown habitat classification and determine if habitat improvement techniques may enhance suitability.	BLM, CDOW, Local Work Group, USFS	2005-06

POPULATION MANAGEMENT

Strategy 1: Monitor population and area to detect changes in GUSG numbers and distribution.		
Task(s)	Responsible Group(s)	When
1. Implement recommendations in the “Population Monitoring and Targets” rangewide strategy (pg. 242).	CDOW, Local Work Group	Annually

Strategy 2: Minimize disturbances to GUSG population.		
Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Lek Viewing” (pg. 231).	BLM, CDOW, Local Work Group, USFS	2005
2. Implement timing restrictions provided in rangewide “Human Infrastructure: Powerlines, Other Utility Corridors, Wind Turbines, Communication Towers, Fences, and Roads” (pg. 225) strategy, and “Oil & Gas and Mining” strategy (pg. 233).	BLM, CDOW, Local Work Group, Oil and Gas Companies, STL, USFS, Utility Companies	ASAP

Strategy 3: Augment population and genetic diversity.		
Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Population Augmentation”) pg. 241).	CDOW, Local Work Group	As needed
2. Implement recommendations from rangewide strategy on “Genetics” (pg. 208).	CDOW	As needed

Strategy 4: Manage predators to reduce excessive predation.		
Task(s)	Responsible Group(s)	When
1. Implement recommendations from rangewide strategy on “Predation” (pg. 243).	CDOW, Local Work Group, Private Landowners, USDA (APHIS)	As needed

Strategy 5: Collect field information to refine and map habitat and GUSG use areas.		
Task(s)	Responsible Group (s)	When
1. Conduct inventory of vacant/unknown habitat areas using inventory technique developed at a rangewide level (“Habitat Monitoring”, pg. 214)	BLM, CDOW, USFS	Begin in 2005; Complete in 2008
2. Search for new or unknown existing leks utilizing survey methodology developed at rangewide level (“Habitat Monitoring”, pg. 214)	BLM, CDOW, USFS	Begin in 2006; Repeat every 3-5 years
3. Map GUSG seasonal habitats in a GIS as defined per “Habitat Monitoring” rangewide strategy, Objective 1, Strategy #7 (see pg. 214).	BLM, CDOW, USFS	July, 2006

D. Adaptive Management Process

Adaptive management is considered a flexible, iterative approach to long-term management of biological resources that is directed over time by the results of ongoing monitoring and research activities and other information. This means that objectives, biological management techniques, and the assumptions behind both are regularly evaluated in light of monitoring results and new information on species needs, land use, and a variety of other factors. These evaluations are used to adapt both management objectives and techniques to better achieve overall management goals as defined by measurable biological objectives.

The RCP describes the measures believed at this time to be necessary to conserve GUSG. In addition, monitoring populations and habitats are recommended strategies for each GUSG population (“Local Conservation Targets and Strategies”, beginning pg. 255), and follow-up monitoring is advised for all habitat treatments, and in the “Fire and Fuels Management” and “Grazing” rangewide strategies (see pgs. 206 and 211, respectively). However, as the status of the species and its habitats change, the information available on species requirements and management prescriptions increases. A more formal adaptive management process to deal with these changing issues will be needed. This process will assess the effectiveness of the existing conservation strategy and propose additional or alternative conservation measures, as appropriate.

Development of the adaptive management process will be completed in a cooperative and coordinated manner with, and under, the direction of the RSC, and with direct input from the signatories of the RCP and the local work groups. The RSC will facilitate implementation of the adaptive management process by annually evaluating the status of meeting the identified habitat and population goals. The annual evaluation will involve the RSC working with the local work groups to (1) monitor GUSG population trends and ecosystem health; and (2) evaluate the effectiveness of management activities in meeting the habitat and population goals of the RCP and in ameliorating the threats identified in the RCP, or any threats identified in the future.

The adaptive management process will provide an objective, quantitative evaluation of the effectiveness of (1) management actions in attaining strategies and objectives outlined in the RCP; and (2) inventory, monitoring, and research results and interpretation. The adaptive management process should provide scientifically sound data and analysis to assist resource managers in allocating and providing funds and scientific resources when undertaking resource management and conservation actions.

E. Summary

Within the conservation strategy section we have established population targets for 6 of the 7 populations, evaluated their relative extinction probabilities using results from a PVA analysis, and developed conservation strategies that we feel can be used to maintain populations at, or above, the population targets. These population targets and extinction probabilities, as well as the range of population sizes expected over time, are summarized in Table 41. Each population is also assigned a relative level of conservation importance, from a rangewide perspective (Table 41). Not surprisingly, Gunnison Basin is ranked as the very highest in terms of conservation importance, because it is the current core population of the entire species. Crawford, San Miguel Basin, Monticello - Dove Creek, and Piñon Mesa are considered high value for conservation importance, and conservation actions should continue to be directed to these populations as well. These populations provide expansion and connection opportunities for GUSG and may serve to maintain the species, should a catastrophic event occur in Gunnison Basin. Until additional population information can be gathered for the Cerro Summit – Cimarron – Sims Mesa area, conservation strategies are recommended to maintain habitat and reduce disturbance (beginning on pg. 259), but a population target is not identified.

A summary of the relative importance of each topic addressed under “Rangewide Conservation Strategies” (beginning pg. 202) for each population is provided in Table 42. This table, along with the detailed “Local Conservation Targets and Strategies”, will enable local work groups and others to evaluate which rangewide strategies should be pursued for each population. Table 42 can help direct resources and efforts through applicable rangewide strategies.

Table 41. Population targets, expected ranges, 50-year extinction probabilities, and conservation importance of GUSG populations.

Population	Target, as Long-term Average¹	Range Low – High	50-year Extinction Probability²	Conservation Importance
Gunnison Basin	3,000	1,730-5,280	< 1%	Very High
Crawford	275	159-484	~ 10%	High
San Miguel Basin	450	260-792	~ 6%	High
Monticello – Dove Creek	500 (300/200)	288-880	~ 7%	High
Piñon Mesa	200	115-352	~ 15%	High
Poncha Pass	75	43-132	~ 42 %	Low
Cerro Summit - Cimarron – Sims Mesa	TBD	N/A	-	Uncertain
Total	4,500	-	-	-

¹ Long-term average is 10-year average for GUSG.

² Extinction probabilities are for stable population growth over 50 years ($r_s = 0.0$).

Table 42. Relative importance of individual threats and opportunities for each population of GUSG, ranked among and within populations. These issues are identified in “Rangewide Conservation Strategies” (beginning pg. 202), and appear in the table in the same order they occur in that section. Relative ranks are as follows: L = Low, LM = Low-Medium, M = Medium, MH = Medium-High, H = High, VH = Very High

ISSUE OR THREAT	POPULATION						
	Cerro Summit – Cimarron – Sims Mesa	Crawford	Gunnison Basin	Monticello – Dove Creek	Piñon Mesa	Poncha Pass	San Miguel Basin
Risk of Disease and Parasites	LM	LM	LM	M	LM	LM	LM
Risk of Wildfire or Need for Fire and Fuels Management	LM	LM	M	M	LM	LM	MH
Risk of Genetic Problems	MH	M	LM	H	H	LM	L
Need for Grazing Management	MH	M	MH	MH	M	M	MH
Need for Habitat Enhancement / Restoration	MH	MH	MH	VH	LM	LM	MH
Need for Development of Habitat Linkages	H	H	L	VH	VH	LM	H
Need for Habitat Monitoring	H	H	H	H	H	H	H
Need for Habitat Protection from Permanent Loss	MH	MH	H	H	M	L	H
Need for Management of Human Infrastructure	L	L	M	M	L	L	H
Need for Management of Hunting	L	L	L	L	L	L	L
Need for Information and Education	H	H	H	H	H	H	H
Need for Management of Lek Viewing	L	M	MH	M	L	L	L
Risk from Mining / Energy Development	L	L	M	H	L	L	VH
Risk from Noxious and Invasive Weeds	LM	L	M	MH	L	L	LM
Risk from Pesticides	L	L	L	M	L	L	L
Need for Population Monitoring	VH	L	M	L	H	L	M
Need for Predation Management	L	L	L	M	L	L	M
Risk from Recreational Activity	LM	L	M	L	LM	L	LM
Need for Research	H	MH	MH	MH	MH	LM	MH
Need for Translocations	M	M	L	VH	VH	MH	M
Weather / Drought Impacts	M	M	M	H	M	M	VH