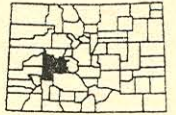


Gunnison Sage Grouse Conservation Plan



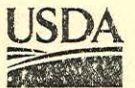
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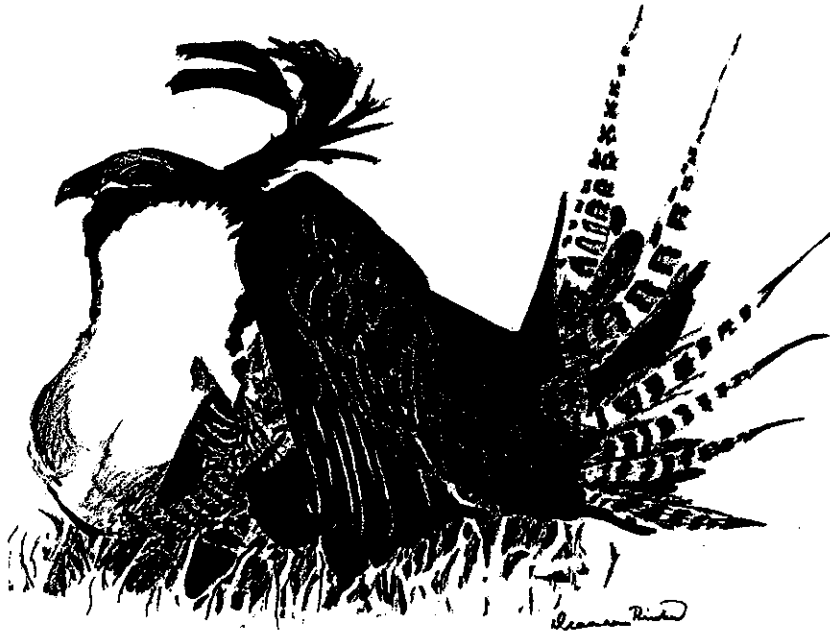


Black Canyon Audubon Society



Gunnison Basin - Colorado

Gunnison Sage Grouse
Conservation Plan
Gunnison Basin - Colorado



June 1997

Participants

Black Canyon Audubon Society
Bureau of Land Management
Citizens of Gunnison County
Colorado Division of Wildlife
Gunnison County Weed Commission
Gunnison County Planning Commission
Gunnison County Stockgrowers
High Country Citizens' Alliance
Natural Resources Conservation Service
U.S. Fish and Wildlife Service
U.S. Forest Service
U.S. Park Service

PREAMBLE

Sage grouse are restricted to sagebrush rangelands in western North America and occur nowhere else in the world. The distribution and abundance of sage grouse have markedly decreased and the species has been extirpated from at least three states and one province; its long-term existence in at least six states and two provinces is uncertain. This uncertainty has resulted in public discussion of classifying sage grouse as federally threatened or endangered. Complicating the concern about status of sage grouse is the recent description of a new species of sage grouse from southwestern Colorado and southeastern Utah. This new species, the Gunnison sage grouse has a limited distribution and a relatively small population size. The largest area of contiguous distribution and, consequently, population size of the new species is in the Gunnison Basin (see Overview Map). This newly described species may become a candidate species for federal listing as threatened or endangered. Conservation plans provide unique opportunities for resource agencies and private groups to work jointly for more effective conservation of candidate species and more efficient land management.

While this plan describes conservation strategies for the Gunnison Basin specifically, other efforts involving resource agencies, private landowners and interested citizens are on-going in the Crawford area and farther south in the Dry Creek Basin of Colorado. Early in the planning stages of the Gunnison effort, it was decided these efforts which focus on smaller populations of sage grouse, were out of the scope of this conservation plan. However, biologists and concerned parties involved with all efforts remained linked in their attempt to develop effective strategies to improve the situation for sage grouse and information sharing between these efforts is an on-going process.

The Colorado Sage Grouse Working Group is a state level, multi-interested forum representing landowners, sportsmen, land management agencies, the Colorado Division of Wildlife, and the Colorado Cattlemen's Association. The common goal of the group is to assist in providing stable and healthy populations of sage grouse in Colorado. The working group exists to help coordinate and support localized efforts to achieve this goal.

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I. THE PLAN AND ITS PURPOSE

This document establishes a process and puts in place a framework that will guide management efforts directed at improving sage grouse habitat and reversing the long term decline of the Gunnison Sage Grouse in the Gunnison Basin watershed. Central to this process is the idea of citizen, community, and agency involvement in determining appropriate management activities designed to meet jointly developed goals and objectives.

The purpose of the Gunnison Sage Grouse Conservation Plan is to provide for coordinated management across jurisdictional/ownership boundaries and to develop community-wide support necessary to assure the survival of the Gunnison sage grouse. Designed to be dynamic, the plan will be flexible enough to include new information and issues, as well as results from previous conservation efforts. It is designed to answer questions and collect data necessary for future resource management decision making.

Working together, the citizens of Gunnison County, Federal, State and County governments will strive to use the Conservation Plan and the process it establishes to achieve sage grouse management objectives that over time will result in increased populations of sage grouse in the Basin.

II. THE CONSERVATION PLAN PROCESS

Overview

The plan from the outset was designed to be heavily dependent on and influenced by wide citizen involvement. The cornerstone of this plan is the belief that citizens and their local governments coming together to work with Federal and State resource management agencies is the best way in which effective actions can be implemented that will reverse the decline

of the sage grouse in the Basin. From the start, collaboration between these entities has been the rule and it is the strong desire among all those who have participated in the Conservation Plan that collaboration and community support will continue as Conservation Strategies are implemented.

In an open public process, concerned citizens and government land management agencies established specific goals and objectives that will guide actions directed at improving sage grouse conditions in the Basin. This group also established a process by which they will collaborate to select and put into effect management actions that help accomplish the goals and objectives of the plan.

The Conservation Plan consists of two parts. The first part, the **Habitat Conservation Assessment**, describes sage grouse distribution, habitat conditions, and factors that influence or affect sage grouse.

The second part, the **Conservation Strategy**, outlines the goal and objectives, conservation actions, an implementation plan, and monitoring requirements.

Key Components of the Conservation Plan Process

Although many factors are responsible for sage grouse population decline in the Gunnison Basin, those strategies seeking to resolve habitat issues such as habitat loss, fragmentation, or quality, seem to hold the most promise toward improving the current situation. The Conservation Strategy proposed in this plan concentrates on habitat but also addresses non-habitat factors as well.

Based on identification of issues, assessment of current conditions, potential for improvement, and human needs identified during plan development, the Gunnison Sage Grouse Working Group developed the Problem Statement and Goal to bring their efforts into focus.

People, Their Values, and Land Uses

It is the Gunnison Sage Grouse Working Group's intention that every effort be made to keep sage grouse management in balance with social - cultural community values and the economic viability of the area.

Throughout the conservation planning process, citizens, local government officials, and special interests emphasized the need to openly involve the public in the management of the sage grouse in the Basin. Views were expressed, numerous times throughout the planning process about the importance of honoring cultural values and a person's tie to the land or sense of place. Also, the importance of maintaining a viable and diverse economic base was identified.

Gunnison County is populated by people with diverse values, lifestyles, interests and livelihoods. Diverse recreational opportunities also bring many people into the area year around. Both groups have expectations, place demands on natural resources, infrastructure and community facilities. Both may affect and are impacted by the management of sage grouse in the Basin and can be considered as stakeholders in the conservation process.

Guiding Principles

The following guiding principles are designed to guide sage grouse management efforts, particularly the selection of conservation actions and the way in which they are implemented.

- a. To gain a long term commitment from those involved in this conservation plan to fund, collect, and analyze data over a long enough period of time to be able to make appropriate resource management decisions.
- b. Promote public involvement in planning and decision making.
- c. Maintain an atmosphere of cooperation

and participation among land managers, land owners, and other stakeholders.

- d. Recognize the need for continual updating and testing of data, and applying this information to local situations. Monitoring and evaluation is an important part of the plan and any adjustments to the goal, objectives, and conservation actions will consider the best available current data.
- e. Implement conservation actions in a way that meets the needs of sage grouse and is least disruptive and encourages a stable and diverse economic base in Gunnison County.
- f. Respect individual views and values and implement conservation actions on a collaborative basis in ways that have broad community support.
- g. Every effort will be made to seek efficiency and integration of efforts especially between agencies in the implementation of conservation actions.

III. HABITAT CONSERVATION ASSESSMENT

Setting

The Gunnison Basin watershed is an intermontane basin that includes parts of Gunnison and Saguache counties in west central Colorado. The Basin is semi-arid with a mean annual precipitation of 11 inches at Gunnison. Approximately 48% of the annual precipitation occurs as winter snowfall. Winters are cold with mean temperatures between -10 °F and 33 °F from January through March. Uplands are moderately to steeply rolling with slopes ranging from 5 to 30 degrees. Steep-sloped mesas with broad, flat tops occur in several areas of the Basin. Uplands are dissected by permanent and intermittent stream drainages. Shallow, eroded gulches are common on uplands slopes.

Big sagebrush (*Artemisia tridentata*) dominates the upland vegetation with highly variable growth forms dependent on site conditions. Big sagebrush on dry south slopes is short and widely spaced while sagebrush on wetter sites can be tall and vigorous.

Species Description

Description

Sage grouse are large (2.0-7.0 lbs) brown/gray chicken-like birds with conspicuous black (belly, underthroat) and white markings (breast of males, undertail coverts). They are brown-gray above barred with black, with rounded brown wings with some black barring. Males during the breeding season (March-May) have conspicuous neck plumes, white upper breast with yellow-green air sacs and with prominent, long spiked tail feathers. Both sexes have yellow green eye combs, which are less prominent in females, and a fringe of pectinations along the toes which are most noticeable in winter and early spring. Males weigh from 3.0 to 7.0 pounds, while females weigh from 2.0 to 4.0 pounds.

Sage grouse in southwestern Colorado (Gunnison sage grouse) differ in size (males are 3.0 to 5.0 lbs, vs. 5.5 to 7.0 lbs in northern Colorado; females are 2.0 to 3.0 lbs vs 3.3 to 4.0 lbs in northern Colorado), bill shape and size, and tail patterns (longer, more distinct white barring of tail feathers).

Life History and Habitat Requirements of the Sage Grouse in Gunnison Basin

Sage grouse are dependent upon sagebrush (*Artemisia* spp.), primarily subspecies of big sagebrush (*Artemisia tridentata*), and do not occur throughout the year in areas where an abundance of this shrub is absent. Breeding activities occur from mid March to early June in Colorado, depending upon elevation. The earliest breeding activities occur in lower areas of Moffat County and the latest in high (>6500 ft.) mountain parks

and valleys. Male sage grouse display on leks (strutting grounds) in early morning and late evening to attract hens. The mating system is polygamous where only a few males actually breed. Average number of males per lek is about 20-25 but in areas of good habitat, over 100 males have been counted on individual leks.

Sites chosen for display are openings with an abundance of sagebrush within 300-650 feet for escape cover. These sites may be in broad valleys or broad ridges, benches, and mesas. Sites used are generally close to or in large expanses of sagebrush and have good visibility (for predator detection) and acoustical qualities (so sounds of breeding displays will carry). After breeding in late March-early April (later for hens unsuccessful in their first nest attempt), hens disperse from lek sites and choose nest sites from 650-980 feet to over 5 miles from the lek of mating. About 70-80% of all hens nest within 1.75-2.5 miles of the lek of mating. Nest sites are in taller (> 20 in.), more dense (> 25% canopy cover) than average sagebrush areas that have an abundance of forbs (>5-8% canopy cover) and grasses (>20% canopy cover). Residual cover of grasses and forbs is important for nesting hens because few herbaceous plants are growing in mid to late April when hens initiate nesting activities.

Nests are typically placed at the base of a live sagebrush bush. Other shrubs and even clumps of grass have been used for nest cover but sagebrush cover has predominated in all nest studies. Clutch size ranges from 6-10 eggs with 7-9 being most common.

Incubation occurs for 27-28 days and, unlike most grouse, sage grouse are not determined nesters and nest abandonment is common if the hen is disturbed during nesting. Extent of reneating, if the initial clutch is depredated or abandoned, varies with population and probably with moisture/vegetative conditions. If reneating occurs, most hens will reneat within 0.6 mile of the original nest site. Clutch size of second nest attempts varies from 4 to 7 eggs.

Hatching of eggs can start by May 5-10 but most eggs hatch in June with a peak by June 10-20. Clutches hatching after July 1 are usually the result of renesting attempts by hens unsuccessful in their initial attempt. Few clutches hatch in August.

Upon hatching their clutches, hens with chicks remain in sagebrush uplands as long as vegetative conditions are adequate. During this time, sage grouse feed on succulent forbs and insects. Ideal conditions are those where succulent green forbs and associated insects are abundant and grass cover is sufficiently tall to hide hens and chicks, with some live sagebrush plants for shade and cover. Free water is not required but will be used if available. As chicks mature and vegetation in the sagebrush uplands becomes desiccated, hens with broods, move towards wet meadow areas which may be irrigated hay meadows or riparian areas. Preferred areas are those with an abundance of forbs, grasses for hiding cover, and with live sagebrush along the periphery for escape cover.

The importance of wet meadow habitats for sage grouse has been repeatedly demonstrated throughout their range (Klebenow 1969, Wallestad 1971, and others). The results of early studies were used by Braun et al. (1977) to recommend leaving a 100 m (approximately 330 ft.) strip of live sagebrush around the edges of meadows. More recent study of sage grouse summer habitat use in northwest Colorado indicated that 100 m was inadequate as sage grouse consistently used a 200 m (approximately 660 ft.) strip around wet meadows (Dunn and Braun 1986). These authors also recommended use of 150-200 m (approximately 490-660 ft.) guideline for the interspersions of stand and cover types on sage grouse summer range. Gunnison Valley is fortunate to have large complexes of wet meadows associated with irrigation of private lands for hay production during brood-rearing. Radio-tracking studies in the Gunnison Basin have found that the majority of sage grouse broods are generally within 10-15 m (approximately 35-50 ft.) occasionally up to 50 m (approximately 165 ft.) of

the edge of the sagebrush stands along hay meadows with broods occasionally occurring within 50 m of sagebrush stands.

Groups of unsuccessful hens and male flocks follow the same pattern but are less dependent on wet meadows and riparian areas than hens with broods. Summer rainfall decreases use of wet meadows and riparian areas as sage grouse disperse into sagebrush uplands for several days following significant (> 0.2 in.) moisture events. Movements of sage grouse to and from areas with succulent green vegetation are common from July into September.

Cohesion of broods and family units (hens with chicks) decreases in July and August depending upon age of the chicks. Intermixing of broods and flocks is common and becomes pronounced by mid September. By mid September, flocks typically include unsuccessful and successful hens, and chicks from several broods. Adult and yearling males usually occur in separate flocks on benches and along ridges some distance from wet meadows. Areas preferred by all sage grouse from mid September into November are those with denser (>20% canopy cover) sagebrush and some green forbs (especially buckwheat-*Eriogonum* spp., clover-*Trifolium* spp., and dandelion-*Taraxacum* spp.).

Movements of sage grouse in fall and early winter (September-December) can be extensive with some movements exceeding 20 miles. Areas used are extensive stands of sagebrush from north facing slopes (early) to broad flat benches and valleys. Leaves of sagebrush are the primary food with preference shown for Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and mountain big sagebrush (*Artemisia tridentata* spp. *vaseyana*). As winter progresses and, if snow cover becomes extensive (>80%) and deep (>12 in.), sage grouse forage in tall (>16 in.) sagebrush in valleys and lower flat areas and roost in shorter sagebrush along ridge tops. In periods of extreme cold and deep snow, sage grouse will spend nights and portions of the day, when not foraging, in snow roosts/burrows

which they dig by scratching with their feet or wing movements if the snow has the proper texture. Flock size in winter is variable (15-100+ birds) with flocks frequently being unisexual. Flocks of males are smaller than those of hens but both sexes may make extensive (>20 mi.) movements to locate suitable foraging and roosting areas. By early March, flocks of sage grouse are usually within 2-3 miles of breeding areas used the previous year.

Species Status and Distribution

Geographic Distribution

Sage grouse occur only in western North America. Historically, they occurred from western Oklahoma and northern New Mexico north through western Colorado into Wyoming, Nebraska, the Dakota's into Saskatchewan and Alberta and west into southern British Columbia. They occurred in all states of the Intermountain West including eastern areas of Washington, Oregon, and California. Their historic status in Arizona and Kansas is unclear. Thus, the original range of the species encompassed suitable habitats in at least 15 states and 3 provinces in western North America. Within Colorado, sage grouse historically occurred in at least 23 and probably 27 counties.

Two races of sage grouse have been described with the Western race occurring in west-central Oregon and Washington and the eastern race from eastern Oregon east, north, and south throughout the described distribution. More recently, a third group of sage grouse has been described from the Gunnison Basin, Colorado. This group differs from all other sage grouse populations studied by being significantly smaller in size, having different breeding behaviors and specialized feathers, and a markedly narrow (one) range of genetic haplotypes. The present distribution of the Gunnison sage grouse is south of the Colorado and Eagle rivers in Colorado extending east to the Arkansas River and San Luis Valley. It also occurs east of the Colorado River in extreme southeastern Utah.

In the Gunnison Basin, sage grouse historically occurred in all suitable sagebrush habitats from east of Sargents (Marshall Creek, upper Tomichi Creek), west to Blue Creek (further west to at least Colorado Highway 347), north to at least Brush Creek and Taylor Park (seasonally used by sage grouse in recorded history), and south to the Hinsdale-Gunnison County boundary and Cochetopa Park in Saguache County. The seasonal distribution was generally below 9,000-9,300 feet in elevation although summer use may have occurred to 9,500 feet in suitable sagebrush areas.

At present, sage grouse are uncommon (see glossary) east of Sargents, in Cochetopa Park, the Waunita Hot Springs area, north of Almont, and are absent in Taylor Park. Generally, there has been a shrinkage in area occupied at the periphery of the historic range.

Current Status

Sage grouse have been extirpated from British Columbia, Nebraska, New Mexico, and Oklahoma and most likely from Kansas and Arizona as well. However, formal documentation in the latter two states has not been accepted by the scientific community. Sage grouse numbers in some states and provinces are thought to be small (<2000-3000 birds/state or province) and populations can be considered secure in only 5 of the at least 15 states and 3 provinces where the species once was known to occur. In Colorado, sage grouse are known to occur in 15 of the 27 presumed counties where they once existed. Populations are considered secure (>500 breeding males) in only 5 counties. Within the range of the Gunnison sage grouse (i.e., southwest Colorado), only Gunnison County has a secure population.

Conservation biologists in the 1980's suggested that 500 breeding individuals were necessary for long-term maintenance of genetic variability in quantitative characters (Franklin 1980, Soule 1980). This number was generally adopted as the basis for management plans for captive and wild populations (Lande 1988). This number (500)

was thought to be adequate to prevent inbreeding depression and, as a consequence, population extinction (Frankham 1995). More recently, Lande (1995) argued that 500 breeding individuals were too few to prevent extinction and suggested the number for effective population size should be "about 5,000". He further speculated that real-world numbers should be even higher - at least 10,000.

Since mating in Gunnison sage grouse is not random (i.e. yearling and most two year old birds are socially excluded from breeding) because of the polygamous mating system (Young 1994), it is logical that the 500 number is too low to prevent inbreeding depressions. Consequently, the arbitrary distinction of 500 (based on scientific literature dating to 1980) for a "secure" population of sage grouse is too low when only 10-15% of the males actually breed.

There is a potential that the U.S. Fish and Wildlife Service will list this species as threatened or endangered. It is important to note that the overall sage grouse population decline is a more critical factor which might lead to listing of this species than the population decline in the Gunnison Basin. Sage grouse lek counts have been conducted in the Gunnison Basin since at least 1953, although the data have been sporadic and inconsistent (Appendix A). Lek counts provide managers with an estimate of minimum population size. Studies have documented that during the breeding season the sex ratio of a sage grouse population is approximately 2 females for every male. If the number of males is known it is

possible to calculate a minimum population size. It is important to understand that a count will not represent all of the males in the population and any calculated population size will be lower than the actual population size.

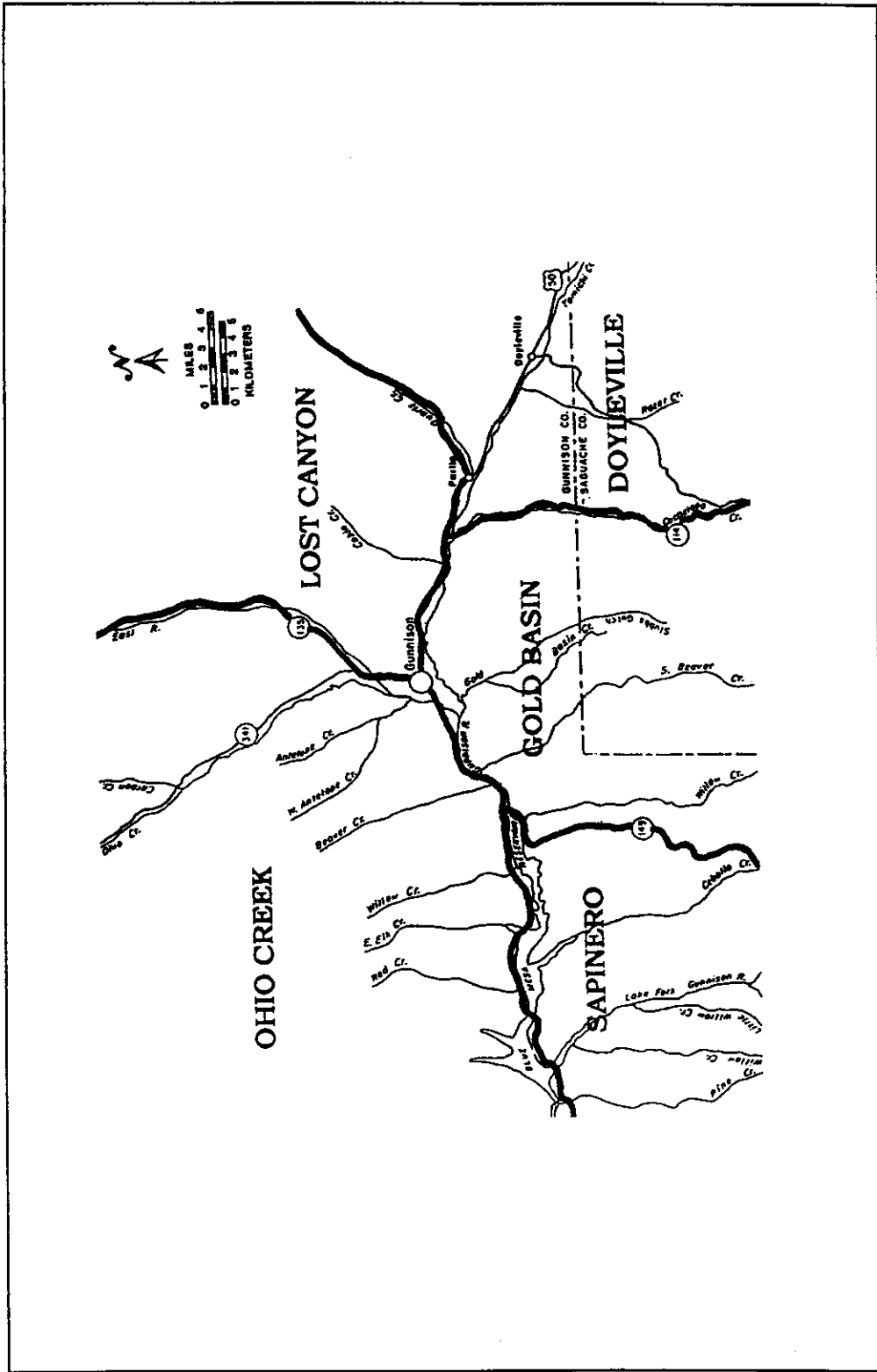
Discussion with long-term employees of the Colorado Division of Wildlife reveal that only accessible leks were initially counted because of personnel and equipment. Priorities changed over the years resulting in no counts being made in some years. Efforts to relocate grounds and to locate new grounds were sporadic. Consequently, lek count data reflect general trends in the sage grouse population except for specific leks that were counted in most years. In 1995, the spring population of sage grouse in the Gunnison Basin was about 2200 birds (hens and males).

Sage grouse habitat in the Gunnison Basin tends to be linear from east to west following Tomichi Creek and the Gunnison River. Major exceptions are drainages north and south of the main east-west distribution including Quartz Creek, the main Gunnison River north of the town of Gunnison, Ohio Creek, and the mesas south and west of Blue Mesa Reservoir.

These physiographic divisions allow identification of somewhat discrete areas for convenience of measuring the effects of specific management actions. Consequently, the Gunnison Basin was subdivided into five zones (Figure 1). These zones differ slightly (addition of Lost Canyon and redefinition of Ohio Creek) from those used in harvest analyses in recent years.

Figure 1.

Sage Grouse Count Data Zone Map



The Problem

The long term decline of Gunnison sage grouse in the Gunnison Basin watershed.

Factors Contributing to Decline

Evidence from throughout the distribution of sage grouse is accumulating that indicates that as management and use (including short term uses resulting in physical disturbance to sage grouse) within sagebrush rangelands have intensified, sage grouse populations have decreased with no sustained increases in population size.

Factors clearly implicated in the long-term decline of sage grouse are habitat loss (i.e., land conversion from sagebrush steppe to roads, reservoirs, hay and other crops, town and ranch development, energy development, etc.); habitat fragmentation (caused by roads, powerlines, reservoirs, land conversion, land treatments, etc.) which make areas unsuitable for sage grouse use; and habitat degradation caused by land treatments and other uses which have changed grass, forb, and sagebrush composition, reduced organic material in the soil, and increased the loss/movement of soil resulting in changes in water table levels and basic soil productivity (see Appendix C). These changes are cumulative and, while areas may superficially appear to be in "better" condition now than in 1934 or 1950, etc., in reality these areas are smaller, more fragmented, and subject to more intensive use than prior to settlement. Further, sage grouse are specialists of sage brush ecosystems and have not adapted to changing land uses.

IV. CONSERVATION STRATEGY

OVERALL GOAL

To manage the Gunnison Basin watershed in a manner that restores Gunnison sage grouse distribution and numbers as determined by the

carrying capacity of the habitat:

The minimum spring population would be at least 25 known active lek areas each with an average of 26 males. Active lek areas would be well distributed throughout the Gunnison Basin with a total spring breeding population of 2,600 sage grouse.

The optimum spring population would be 30 known active lek areas each with an average of 30 males. Active lek areas would be well distributed throughout the Gunnison Basin with a total spring breeding population of 3,600 or more sage grouse.

The intent of this Conservation Plan is to achieve the optimum spring population goal in 15 years. Achievement of this goal will be applied site specifically and adjusted as appropriate to account for variations in site potential. **A detailed description of how this goal and the specific population numbers were derived is contained in Appendix B.**

GENERAL CONSERVATION OBJECTIVES

Using this goal as a target, the Gunnison Sage Grouse Working Group developed general objectives. These general conservation objectives were developed largely based on the issues or factors that had been identified as in some way contributing to the decline of the Gunnison sage grouse or affecting the quantity or quality of sage grouse habitat in the Basin. A description for each issue discussed is in Appendix C.

The purpose of these general conservation objectives is to guide the identification of more specific objectives and conservation actions. These objectives are also useful to explain the overall thrust of the conservation strategy. Three dominant themes or categories emerged from the issue discussion which helped frame these general objectives. These objectives are shown along with the issues which seem to best correspond.

Sage Grouse Habitat Quality

Description: Habitat quality is an indication of how well habitat meets the needs of sage grouse. Habitat in poor condition is of lower quality than habitat which is in good condition because higher quality habitat provides more of the essential components such as food, water, cover, etc. Generally, this objective and the group of factors that affect habitat quality and/or fragmentation (discussed in the following section) are considered to be the most important to the Gunnison sage grouse recovery.

Issues or factors that affect habitat quality:

- Poor habitat quality and quantity
- Lack of grasses and forbs
- Condition of winter habitat
- Loss of topsoil
- Degradation of soil quality
- Effects of land treatments on winter habitat
- Poor management of land treatments
- Land treatments
- Lack of land treatments
- Poor nest and brood survival
- Weeds
- Fragmentation
- Degradation of riparian areas
- Fire suppression
- Timing, intensity and duration of livestock grazing
- Changes in livestock grazing (more efficient grazers due to genetic manipulation- bigger livestock)
- Historic overgrazing
- Increased numbers of elk and deer
- Pollution
- Herbicides
- Acid rain
- Global warming
- Loss of the ozone layer
- Drought

General Conservation Objective:

Maintain and improve the quality of Gunnison sage grouse habitat.

Sage Grouse Habitat Loss/Fragmentation

Description: Loss of sage grouse habitat refers to areas that once provided habitat, but no longer do because that habitat no longer exists or is not available. It should be thought of as a permanent loss in area. An example is the habitat that once existed prior to the construction of Blue Mesa Reservoir which eliminated sage grouse habitat (the area is now underwater and no longer available to sage grouse). Another example of habitat loss occurs when a subdivision occupies an area that once was a sagebrush community.

Fragmentation refers to the distribution or location of habitat in terms of its physical position or connectiveness.

Issues that affect Gunnison sage grouse habitat loss/fragmentation:

- Reductions in the numbers of riparian areas
- Blue Mesa Reservoir
- Poor land zoning
- Changes in land uses
- Subdivisions
- Mining
- Uranium Mill Tailings Remedial Action (UMTRA)
- Increased human population
- Powerlines
- Roads
- Land Treatments
- Fire Suppression

General Conservation Objective:

Reduce fragmentation by preventing, minimizing, and mitigating past, present and future loss of Gunnison sage grouse habitat.

Physical Disturbance to Populations

Description: This refers to the physical disturbance to sage grouse, the birds themselves. Physical disturbance can result in sage grouse death or stress particularly if disturbance occurs during biologically critical periods.

Issues that can cause disturbance to sage grouse:

- Hunting
- Poaching
- Predators (coyotes, ground squirrels, weasels, skunks, badgers, eagles)
- Protection of other species
- Bird watchers (watchable wildlife)
- Scientific lek harassment (disturbance during monitoring/research)
- Conflicting uses during critical biological activity periods
- Motorcycle/OHV use

General Conservation Objective:

Identify and manage physical disturbances to reduce adverse effects to Gunnison sage grouse.

SPECIFIC CONSERVATION OBJECTIVES

Introduction

Conservation objectives apply to all uses such as big game and livestock management, recreation and land development, etc. In the development of specific habitat conservation objectives, the Gunnison Sage Grouse Working Group examined how each of the three general areas of concern (habitat quality, habitat loss/fragmentation, physical disturbance) expressed as general conservation objectives related to specific sage grouse habitat types. Because each habitat type fulfills specific needs for sage grouse, performs a unique function, and has specific requirements, each habitat type can be affected differently by any given activity. As a result, specific habitat conservation objectives were developed around the primary types of sage grouse habitat.

The seasonal habitats are interrelated. For example, the number of hens in nesting habitat depends on the survival determined by the quality, amount and location of winter habitat. Likewise, the number of birds using the fall and winter habitat depends on the quality of nesting and

brood-rearing habitat which determines the annual production of young.

While it is difficult to identify which seasonal habitat is most important, if sage grouse do not survive the winter period in sufficient health to successfully breed, population stability will be problematic. Thus, sufficient winter habitat to sustain the desired number of breeding birds throughout the potential distribution within the Gunnison Basin is extremely critical. Management of habitat should focus on the most severe winter (for example, 1983-84) to ensure that sufficient habitat is available and uses are not detrimental to sustain the desired breeding population.

It is recognized that the desired future condition which would result from implementing the objectives would not be the same vegetatively as the description for the potential natural community (PNC). The values for the minimum requirements stated in the objectives are less than the average PNC values for these sites (big sagebrush) and do not take into consideration species composition (amount and kind of vegetation) as is the case when determining PNC or seral expression. It may be that the minimum requirements stated may not "provide for a multitude of uses" however, this is not the intent of these **minimum** requirements for sage grouse. Additional management objectives such as those stated in the Resource Management Plan (RMP) and Forest Plan address resources such as watershed condition or other wildlife species. Any improvement to the average existing conditions will benefit not only sage grouse but improve vegetation and watershed condition. In areas where livestock grazing occurs, improvement to the average existing conditions has the potential to benefit livestock operations in terms of quality and quality of forage production.

The purpose of these specific objectives is the development of specific conservation actions that would be designed to reverse the declining trend in Gunnison sage grouse numbers and improve the quality and condition of their habitat. These

specific objectives will also serve as milestones upon which to measure progress and serve as the basis for defining what will be accomplished in the plan. The following objectives allow flexibility to manage human activities and land uses in sage grouse habitat within the Gunnison Basin by emphasizing only a portion of the total area identified as sage grouse habitat. Desired conditions within sage grouse emphasis areas are further defined by identifying seasonal use periods and **minimum** vegetation requirements for only a portion of these emphasis areas allowing land managers additional flexibility. **These objectives will be applied site specifically and adjusted as appropriate to account for variations in site potential.**

Leks

Location: Lek sites within the Gunnison Basin are displayed in Figure 2. A more detailed map showing lek site locations is available at the Bureau of Land Management office in Gunnison, Colorado.

Description/Desired Future Condition: These are areas used by sage grouse during the mating season where males display to attract receptive females. These sites are characterized by low vegetation with sparse shrubs often surrounded by big sagebrush dominated plant communities.

The desired future condition of the low, open vegetation of the display ground is similar to present conditions (unless it is determined that such open areas need to be expanded or modified to enhance the value of these areas for sage grouse). The big sagebrush areas within 400 yards from the edge of the display areas have the following vegetative description. Big sagebrush canopy cover is a minimum of 20% with an average height of at least 12 inches; grass canopy cover is at least 25%. Grass leaf height (not including blue grama) averages 6 inches (previous

years' residue or new growth) between March 20 and May 15.

Fragmentation/Permanent Loss of Habitat Objective

Existing ground disturbances that fragment this habitat would be modified or reduced. New ground disturbances resulting in fragmentation or permanent loss of lek habitat or adjacent habitat would be discouraged and would not occur without adequate mitigation which meets the goal of this plan.

Physical Disturbance Objective

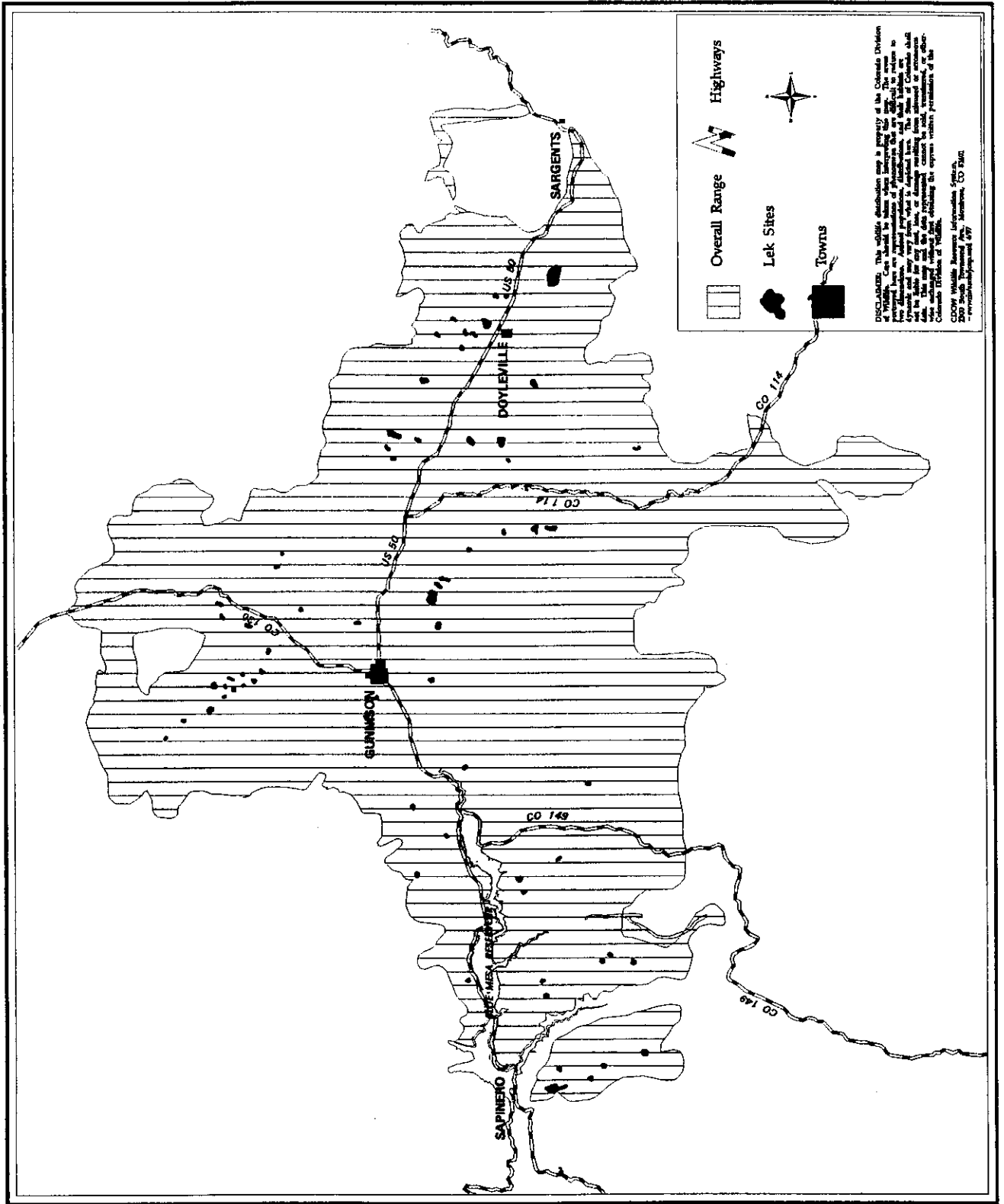
Physical disturbance from human activities or by predators to sage grouse while on leks from March 20 to May 15 or within sage grouse viewing or hearing distances would be minimal and not exceed a point where the breeding group of sage grouse at any lek are unable to contribute to new individuals to the population required to meet the goal of this plan.

Habitat Quality Objective

The vegetative description defined in the desired future condition would be evident on at least 50% in each area within 5 years.

Rationale: Successful breeding is essential to maintain a viable population. The lek system of mating requires the birds to congregate on small areas. Poor quality habitat or disturbance to birds on leks can have significant detrimental effects on the birds' ability to reproduce. Adequate hiding cover provided by sagebrush plant communities adjacent to the display areas is important to minimize predation of birds, both females coming to the leks and males resting during the day after displaying. Excessive disturbance to birds while mating can increase mortality or cause some hens not to be mated.

Figure 2.



Nesting/Early Brood-rearing Habitat

Location: The priority area is within a two mile radius of leks, it is also recognized that sagebrush-dominated plant communities beyond the two mile radius are also used by nesting hens.

Description/Desired Future Condition: This habitat is characterized by big sagebrush- dominated plant communities. Nesting can begin in mid April and continue into July (some hens renest if the first nest is lost). The area in proximity to the nest is used by hens with broods up to several weeks after hatching.

The desired future condition of nesting/early brood-rearing habitat is big sagebrush- dominated plant communities below 9200' elevation. Within two miles of leks in big sagebrush-dominated plant communities, desired future conditions are: big sagebrush, 20% canopy cover, minimum, with an average height of 16 inches, (canopy cover of big sagebrush can be up to 40% if the minimum canopy cover for grasses and forbs is met); grass 30% canopy cover, minimum; forbs (not including phlox) 10% canopy cover, minimum. Grass leaf height (not including blue grama) on 50% of these areas (previous years residue or current green growth) averages 6 inches during the period of April 15 to July 1. (See Appendix D. Data Used in Developing the Desired Future Condition for Nesting/Early Brood-rearing and Winter Habitat).

Fragmentation/Permanent Loss of Habitat Objective

Fragmentation and/or permanent loss of nesting/early brood-rearing habitat within two miles of a lek that meets or exceeds the desired future condition or has the capability to meet the desired future condition would be discouraged and would not occur without adequate mitigation which meets the goal of this plan.

Physical Disturbance Objective

Physical disturbance by human activities or by predators to sage grouse in nesting/early brood-

rearing areas between April 15 and July 1 would not exceed the level where nest survival or brood survival is below that necessary to increase to, or maintain the population at the level which meets the goal of this plan.

Habitat Quality Objective

The desired future condition would be reached on 75% of **each** nesting/brood-rearing area (the area within a 2 mile radius of a lek) within 5 years.

Rationale: Female sage grouse require high quality habitat in proximity of leks to ensure nest and brood survival. Poor nest and brood survival has been related to predation due to habitat quality and is believed to be an important factor in the decline of the population. Excessive disturbance to birds can cause hens to abandon nests or increase the mortality to hens or broods.

Brood-rearing Habitat

Location: The priority areas of this habitat are riparian areas and meadows within a two mile radius of leks. Riparian areas and meadows beyond the two mile radius of leks are also used by hens with broods. A detailed map showing sage grouse brood-rearing habitat is available at the Bureau of Land Management office in Gunnison, Colorado.

Description/Desired Future Condition: This habitat is riparian plant communities associated with intermittent and perennial streams, springs, seeps and meadows that are within upland vegetation communities or along the edge of agricultural hay meadows (meadow areas within 35-50 feet, occasionally up to 165 feet from the edge of adjacent sagebrush communities). These areas are used by hens with broods from early June through the summer and into fall.

The desired future condition for brood-rearing habitat is: riparian areas within two miles of leks are in mid seral ecological status or higher (as determined by existing NRCS vegetative

classification or by the cooperative vegetation classification sponsored by the Habitat Partnership Program, U.S.D.A. Forest Service and Bureau of Land Management that is underway for the Gunnison Basin).

The stubble height of herbaceous vegetation is a minimum of 4 inches between June 15 and July 31 on 75% of the areas within 3 years. At all other times, the height of herbaceous vegetation is in a condition that sustains these productive areas to meet the needs of the landowners.

Fragmentation/Permanent Loss of Habitat Objective

Existing surface disturbances that fragment or result in the permanent loss of this habitat would be modified, reduced or mitigated. New surface disturbing activities resulting in permanent loss and/or fragmentation of brood-rearing habitat within two miles of a lek would be discouraged and would not occur without adequate mitigation which meets the goal of this plan.

Physical Disturbance Objective

Physical disturbance by human activities or by predators to sage grouse in brooding habitat between June 15 and July 31 would not exceed the level where hen or brood survival is below that necessary to increase to, and maintain the population at the level to meet the goal of this plan.

Habitat Quality Objective

This desired habitat condition would be reached on 60% of the areas within 5 years.

Rationale: Hens with broods require a habitat that provides high quality food for growth of chicks and cover to ensure survival. Riparian areas in mid seral ecological status or higher produce a diversity of food and cover plants for sage grouse. Broods are susceptible to predation during their first few months; a habitat that provides hiding and escape cover as well as quality food enhances the survival of chicks. This ecological status will also

provide resources for other uses such as livestock grazing and other wildlife needs.

Winter Habitat

Location: Sage grouse winter habitat and critical winter habitat within the Gunnison Basin are displayed in Figure 3. A more detailed map showing winter habitat is available at the Bureau of Land Management office in Gunnison, Colorado.

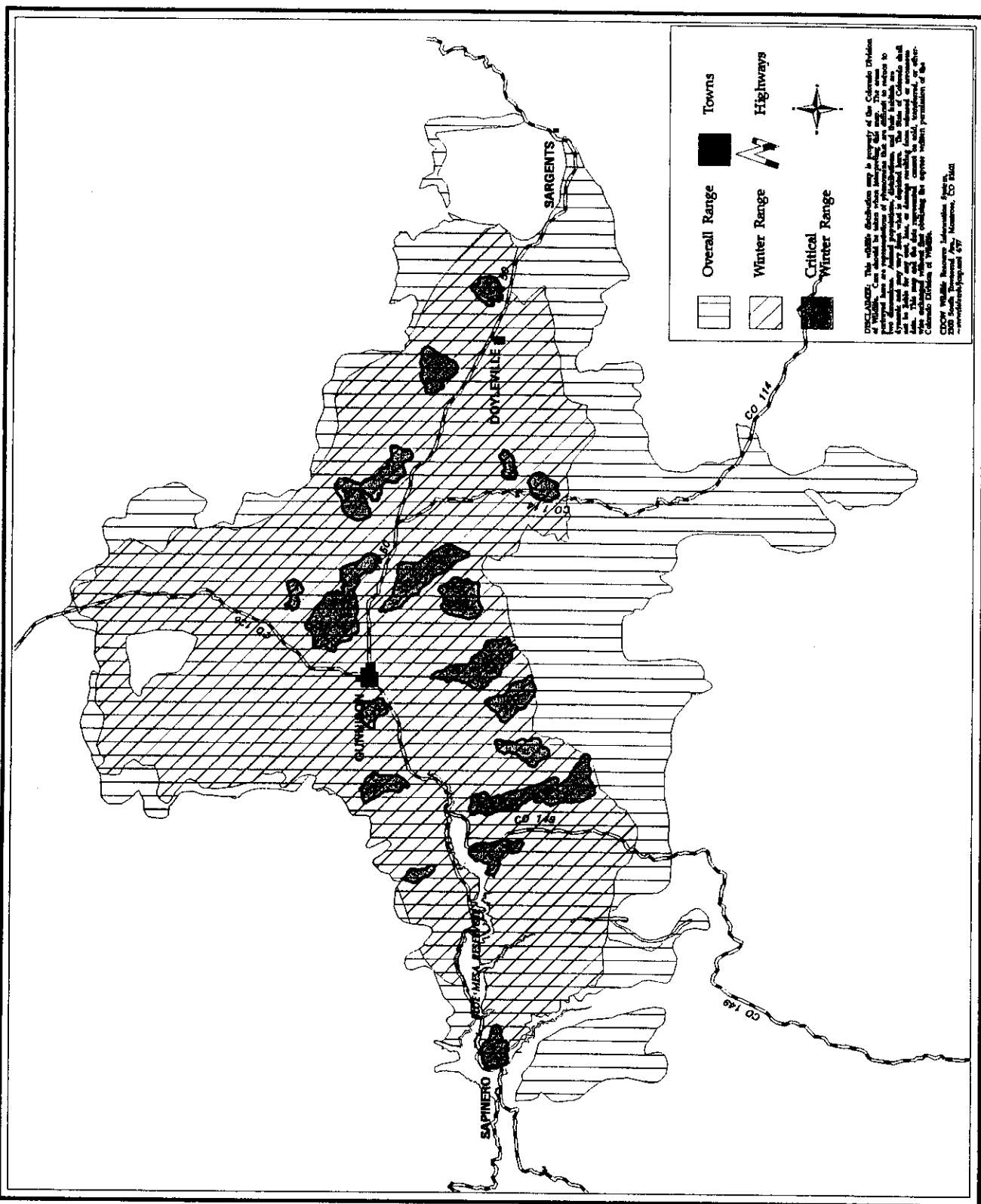
Description/Desired Future Condition: The areas available to sage grouse during the winter are largely determined by snow depth. Important areas during winters of deep snow are drainages because of tall, vigorous big sagebrush growth that is consistently available even during severe winters, southerly or westerly aspects (136°-315°) on slopes greater than 5°. Other areas used during the winter are mesa and ridge tops (5° or less slope) and flat, low sites (5° or less slope).

The desired future condition for winter habitat is: big sagebrush on slopes with southerly or westerly aspects has a canopy cover of 15% minimum and an average height of 12 inches; big sagebrush in drainages has a canopy cover of 30% minimum with an average height of 20 inches. Low, flat terrain used by sage grouse during the winter has a big sagebrush canopy cover of 25% minimum with an average height of 16 inches. Scattered throughout the winter habitat are small areas that are important feeding areas where big sagebrush has greater canopy cover and height. In these areas on south and west aspects, big sagebrush has a canopy cover of 30-40% with an average height of 16"; big sagebrush in drainages and on low, flat terrain has a canopy cover of 30-40%. (See Appendix D. Data Used in Developing the Desired Future Condition for Nesting/Early Brood-rearing and Winter Habitat).

Fragmentation/Permanent loss of Habitat Objective

Fragmentation and/or permanent loss of critical winter habitat would not occur. Permanent loss of other identified winter habitat that meets or

Figure 3.



exceeds the desired future condition or has the capability to meet the desired future condition would be discouraged and would not occur without adequate mitigation which meets the goal of this plan. Existing areas of disturbed surface that fragments this habitat would be modified, reduced or mitigated.

Physical Disturbance Objective

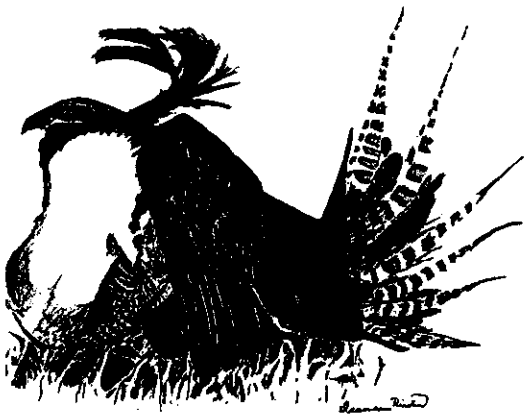
Physical disturbance by human activities to sage grouse on the critical winter habitat would not occur. Physical disturbance to sage grouse on critical winter habitat, other than by human activities, will be minimized. On other identified winter habitat physical disturbance to sage grouse will be minimized and not exceed the level

necessary to increase to, or maintain the population at the level to meet the goal of this plan.

Habitat Quality

The desired habitat condition would be met on 75% of the identified winter habitat within 5 years.

Rationale: The lowest population level during the year is generally just prior to breeding and is largely determined by winter survival. Maintaining sufficient winter habitat that is widely dispersed and that provides the food and cover requirements to enhance survival of sage grouse during all winter conditions is paramount to meeting the goal of this plan.



CONSERVATION ACTIONS

Introduction

The backbone of the Gunnison Sage Grouse Conservation Plan is its goal and objectives which together establish a framework for developing conservation actions. Conservation actions are designed to be consistent with the plan's goal and also to meet one or more objectives. These actions also address issues that affect sage grouse, and/or their habitat. Due to the interrelationship of the habitat components, resources values, and issues, many actions may apply to more than one objective. Any additional actions identified at a later date will be analyzed for their application and design to ensure their appropriateness and compliance with the goals and objectives set forth in this plan.

Discussion and analysis of the factors believed to be responsible for the decline of the Gunnison sage grouse led to the development of several hundred conservation actions. The following is a summary of the types of actions that would occur to meet specific habitat objectives and deal with human activities and land uses that affect sage grouse and their habitat. A detailed listing of these conservation actions is in Appendix E.

1. Information, Education and Coordination. A more coordinated approach to inform the public about the importance of sage grouse habitat and

methods to improve their habitat is needed. Collectively, information and education activities are considered to be highly effective in improving sage grouse conditions in the Basin as it is believed that increasing the understanding of sage grouse needs will lead to a cooperative and coordinated effort to improve conditions. Best Management Practices will be developed to cover a variety of topics such as riparian area restoration, water development in riparian areas, road location and maintenance, and livestock grazing.

2. Research and Monitoring. Efforts to increase what is known about Gunnison sage grouse need to continue. Research to identify impacts to sage grouse and methods of habitat improvement are needed. Research topics could include: how predators affect sage grouse populations; the manipulation of vegetation communities by herbicides, fire, or mechanical methods; the effects of hunting on sage grouse, and how to better manage other land uses in sage grouse habitat such as livestock grazing, big game herd management, and recreation. Existing monitoring of sage grouse and their habitat needs to continue and in some cases intensified.

3. Mapping and Inventory. Maps are tools that allow for the identification, display, and analysis of important sage grouse information and provide a foundation for future activities. Sage grouse information needs to be developed and shared by all resource management agencies and made available to the public. All sage grouse habitat and related information will be identified and mapped, at a high level of accuracy, on a Geographic Information System. This should increase the understanding of sage grouse, their habitat needs and identify future improvement projects and activities. In some cases, inventory of important sage grouse habitat needs to occur before mapping.

4. Permanent Loss of Habitat. Those habitats most important to sage grouse such as critical winter habitat need protection. The public will be informed about the potential of habitat loss

through land uses which include development and the destruction of vegetation. Future land use proposals also need to be evaluated. Information about conservation incentives and easements to help protect habitat from permanent loss needs to be made available to the public.

5. Habitat Quality. Restoration or improvement of the habitat quality would be accomplished in a variety of ways. Habitat could be improved by vegetation treatments and by improved management of livestock grazing, and big game grazing and browsing, as well as through construction of structural improvements such as water sources, erosion control or stream channel and riparian restoration structures and practices. The modification of existing structural impacts such as roads and powerlines that degrade or fragment habitat will be implemented. Restoration and improvement of sage grouse habitat could be accomplished in part, using cooperative funding from a variety of sources.

6. Physical Disturbance. Disturbance that negatively impacts sage grouse will be identified and managed. This includes predator management, predator habitat management, recreation use in sage grouse habitat, construction or surface disturbing activities, or other uses that could conflict with sage grouse during critical biological periods.

IMPLEMENTATION

Introduction

Plan implementation will be priority-based starting with those actions the Gunnison Sage Grouse Working Group believes to be most effective at accomplishing objectives. Because over 200 conservation actions (Appendix E) are proposed, completing all aspects of the Gunnison Sage Grouse Conservation Plan will occur over the next 15 years in five phases.

The Gunnison Sage Grouse Working Group recognizes the need to be opportunistic and carry out specific conservation actions as situations

present themselves. For example, a particular conservation action might be implemented sooner than scheduled, if funding became available, or a group or individual came forward to help with completing a task.

While the accomplishment of the conservation plan requires five distinct phases to spread the workload, it is important to recognize the need for flexibility. Some actions will be completed when opportunities arise or the need becomes evident even though they were scheduled for completion in another phase.

Some actions have already begun or are ongoing. Other actions would need to be done continually throughout the plan. These are normally a matter of policy or require small changes in the way resources are managed and land use activities take place. Sometimes a land use has to be proposed or initiated by a third party before the conservation action can be applied. For example, a request for utility line right-of-way, a proposal to stage a recreation event, or a proposal for a housing development. Many of the conservation actions can be incorporated into authorizations or permits at the time of issuance by a regulatory entity. These continually implemented actions appear last in Appendix F, and span all phases of implementation.

The formation of small technical committees or groups is required to complete some actions. At this time, two such groups are needed for the development of Best Management Practices and carrying out the Information and Education component. It may be necessary for these groups to interact with each another to assure consistency in the information that is developed and presented.

The adoption of these Conservation Actions will be the responsibility of each entity in the Gunnison Sage Grouse Working Group. For example, each resource agency or entity will look at the actions that fall into its area of concern and develop ways to address these actions. The Gunnison Sage Grouse Working Group felt that it

was better to leave this up to each agency or entity rather than presenting a formalized way of adopting these actions. Reaching the goal of this plan will involve the **voluntary cooperation** of private landowners, which is why the Information and Education component is high priority. Each citizen in the Gunnison Basin can have a positive role in reversing the decline in the sage grouse population.

Specific steps or tasks needed to carry out a conservation action will be developed as the implementation proceeds (Appendix F). Cost estimates, including those for monitoring and evaluation will be identified. Normally this will occur before the beginning of each phase or yearly as needed, to develop budgets. Every effort to leverage money and resources will be made. Many actions, such as vegetation treatments are costly, and will be dependent on seeking cooperative funding from many partners, and possibly outside sources, such as grants. Therefore, the implementation period represents a best guess. In actuality, completion of all proposed conservation actions could take longer than suggested.

Because plan accomplishment will require a lengthy period to complete, it is important to track progress at meeting objectives. At least yearly, the Gunnison Sage Grouse Working Group will convene a meeting to examine accomplishments and keep the plan on track. As actions are completed, they will be shown in Appendix G and become part of the yearly progress report. The public will be invited to attend the annual meeting and copies of the progress report will be available to those interested.

An important part of the yearly progress report and meeting will be to discuss and document any exceptions or deviations to planned accomplishments. Inadequate funding may preclude the completion of an action in a given period. In this instance, an adjustment to the implementation sequence would be needed. What is important, is to show continual progress at accomplishing plan objectives.

It is important to maintain flexibility and the dynamic nature of the conservation plan. The effects of many conservation actions will take time to become evident. For example, a vegetation improvement project might occur one year, but it may take several years for an actual increase in cover, and the establishment of desirable species to result. Vegetation management through improved livestock grazing may be in place, but a drought could negate or reduce the positive effects of these actions. Monitoring results and evaluating whether planned actions are helping achieve objectives are critical components of this conservation plan. It is important to consider each individual action and the cumulative effects of all efforts to improve conditions for sage grouse in the Gunnison Basin.

There is overlap between conservation actions because implementing one action or task may help or further the accomplishment of another conservation action. As time goes on, the need for other conservation actions may be recognized and the plan should be modified to incorporate these new actions as appropriate.

The process or mechanism to accomplish implementation of the Gunnison Sage Grouse Conservation Plan is generally to rely on each Gunnison Sage Grouse Working Group member or entity to implement to the best of their ability actions for which they have responsibility for, or an interest in seeing completed. To accomplish the yearly progress tracking and evaluation, the BLM will act as coordinator and each Working Group member or entity will have responsibility for reporting to BLM progress on implementation (Appendix G). Based on the data available, the BLM will schedule a public meeting each year to discuss and distribute results of the previous year's efforts and to plan or adjust future conservation actions.

Implementation Phases

Each Phase of Implementation is described below. Specific Conservation Actions in each phase are shown in Appendix F.

Phase I, starting in 1997

These conservation actions are thought to be among the most effective at reaching plan objectives. Implementation begins in 1997 and should be completed by the end of 1999. Included are actions relating to Mapping and Inventory and those relating to Information, Education, and Coordination. The Gunnison Sage Grouse Working Group believes it is important to establish a good foundation of information. This information will be useful in developing specific projects later and additional support is possible as more people become aware of sage grouse needs.

Also included in the first phase, are those actions that each entity or Working Group member believes to be the most important to begin work on. Some examples are: creating incentives for private landowners and developers to enhance existing riparian areas; managing the growth of the human population in the Gunnison Basin to not cause further damage to the Gunnison sage grouse; developing and implementing Best Management Practices to increase sage grouse populations and improve sage grouse habitat.

Phase II, starting in 2000

These conservation actions are among the most effective at achieving plan objectives. Implementation of these actions begins in the year 2000 and should be completed by the end of 2002. Examples include; restoring and rehabilitating riparian areas, updating existing allotment management plans to address sage grouse needs, managing livestock and wildlife use to meet sage grouse objectives, and closing areas of sage grouse use to OHVs, motorcycles, and mountain bikes during the "mud season".

Phase III, starting in 2003

Implementation of these actions begins in 2003 and should be completed by the end of 2005. Examples include; preventing development of recreation facilities on the south side of Blue Mesa

Reservoir to mitigate loss and fragmentation of sage grouse habitat, developing incentives to prevent the loss of sage grouse habitat, modifying powerlines in sage grouse habitat to make them unsuitable for raptor perching, and developing standards for future roads to minimize impacts to sage grouse and their habitat.

Phase IV, starting in 2006

Implementation of these actions begins in 2006 and should be completed by the end of 2008. Examples include; mitigating negative effects of existing utility corridors in riparian areas, evaluating effectiveness of herbicide use in sage grouse habitat, initiating research to develop a better understanding of predators and prey interactions, developing a protocol for recreational bird watching to prevent impacts to sage grouse, selectively brushbeating sagebrush stands to change the age class structure and improve habitat quality.

Phase V, starting in 2009

Implementation of these actions begins in 2009 and should be completed by the end of 2011. Examples include: deterring poaching of sage grouse by increasing law enforcement, and recommending increased penalties, providing incentives to improve the quality and quantity of sage grouse habitat, managing travel on State lands to minimize impact to sage grouse and their habitat.

MONITORING AND EVALUATION

Monitoring data will be gathered and used to evaluate progress in meeting the goal and objectives of this plan. Monitoring will be coordinated to insure that data collected will provide the needed information to assess the on-the-ground management actions and to measure progress in resolving resource problems and conflicts. This coordination will include appropriate consultation and cooperation with rangeland users, general public, landowners, academia,

private organizations, and local, State, and Federal agencies. Direct involvement by users and other interested parties in the collection of data and in the subsequent evaluations based on these data will add to the credibility of monitoring results.

Meticulous documentation of data collection procedures and methodologies is necessary to insure that monitoring results can be comparable over time. All documentation related to monitoring the actions and objectives of this plan will be maintained by individuals, groups or agencies with the primary responsibility for data collection. It is important that all monitoring information can be easily accessed by those interested in reviewing the data. Monitoring the response of the Gunnison sage grouse population to conservation actions will be measured by total number of active leks, total number of males counted by zone/entire Basin, and the production index of chicks/hens in

early September. The latter will reflect nest success and chick survival while number of active leks and total males will reflect overwinter survival as well as chick production in the previous year. Changes in habitat quality which result from the implementation of planned actions will be monitored using techniques applicable to the specific project or action. As a minimum, vegetation monitoring will include measurements for attributes identified in the objectives of this plan; plant heights and canopy cover.

Evaluation of all available pertinent data will be scheduled after the completion of each Implementation Phase (Appendix F). However, evaluations may be conducted anytime during the implementation of this plan. The goal of evaluation is to determine whether progress is occurring, and if progress is not occurring, to identify adjustments.

V. GLOSSARY

Acoustic Component - That portion of sage grouse displays and behavior that emits audible sounds. These sounds include those caused by vocal (cackles, growls, clucks, etc.), feathers (wing swishes, wing flapping), and release or intake of air (air sac intake and release).

Big Sagebrush - As referred to in this plan, includes the following species of sagebrush: *Artemisia tridentata* - big sagebrush; *Artemisia tridentata* ssp. *vaseyana* - mountain big sagebrush; and *Artemisia tridentata* ssp. *wyomingensis* - Wyoming big sagebrush.

Canopy Cover - The percentage of ground covered by a vertical projection of the outermost perimeter of the natural spread of foliage of plants. Small openings within the canopy are included.

Carrying Capacity - The ability of the land to produce a renewable resource (plant or animal) on a sustained basis without impairment of the productivity of the land or productivity of other desired resources.

Continuous Noise Source - Sounds emitted by oil/gas wells, pumps, road traffic, penned livestock (cattle/sheep) or other sources that affect the hearing of sage grouse of audible sounds made by other sage grouse.

Desired Future Condition - A statement that describes a specific plant community, habitat type or ecological status for an area that will be achieved within a specified period of time. The plant community that is desired must be consistent with the site's capability to produce the desired resource attributes through natural succession, management intervention, or a combination of both.

Ecological Site - A kind of land with a specific potential natural community (PNC) and specific physical site characteristics, differing from other

kinds of land in its ability to produce vegetation and to respond to management. Ecological sites are defined and described with soil, species composition, and production emphasis.

Ecological Status - The present state of vegetation and soil protection of an ecological site in relation to the potential natural community (PNC) for the site. Ecological status is independent of use. It is an expression of the relative degree to which the kinds, proportions and amounts of plants in a community resemble that of the potential natural community. The four ecological status classes correspond to 0-25, 26-50, 51-75, or 76-100 percent similarity to the potential natural community and are called *early seral*, *mid seral*, *late seral*, and *potential natural community*, respectively. Soil status is a measure of present vegetation and litter cover relative to the amount of cover needed on the site to prevent accelerated erosion.

Effective Population Size - The number of animals that actually breed or enable dominant individuals to breed (mate) successfully. This number is theorized to be 500 but more recent theory suggests it should be 5,000. Field observations suggest the number could be as low as 100 for a brief period (1-5 years).

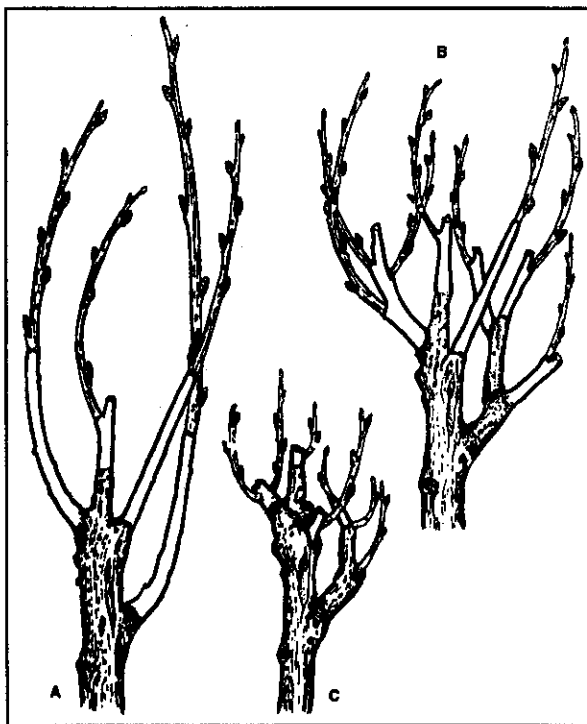
Genetic Haplotype - A specific marker found in tissue or blood that can be used to identify the species or subspecies of an animal through specialized laboratory procedures.

Gunnison Sage Grouse Working Group - The Gunnison Sage Grouse Working Group originated in 1995 when the Gunnison Resource Area, Bureau of Land Management (BLM) invited all interested groups and individuals to an organized meeting to discuss the current and potential future status of the Gunnison sage grouse. More than 65 people with widely diverse perspectives attended the meeting. Within a month, participants representing the Black Canyon Audubon Society, BLM, Colorado Division of Wildlife, Gunnison County Weed Commission,

Gunnison County Planning Commission, Gunnison County Stockgrowers, High Country Citizens' Alliance, Natural Resources Conservation Service, U.S. Fish and Wildlife Service, U.S. Forest Service, U.S. Park Service and several individuals from the general public formed a core group (15-25 individuals) that began working on strategies intended to increase sage grouse populations in the Gunnison Basin. The goal of the group was to create a conservation plan that would establish a process and put into place a framework that would guide management efforts directed at improving sage grouse populations and reverse long-term decline of the Gunnison sage grouse. The group was chartered as a subgroup of BLM's Southwest Resource Advisory Committee.

Hedging - (1) the appearance of browse plants (shrubs and trees) that have been browsed so as to appear artificially clipped; or (2) consistent browsing of terminal buds of browse species that results in excessive lateral branching and a reduction in upward and outward growth. The diagram below shows three degrees of hedging: A = Zero to Light; B = Moderate; C = Severe.

Degrees of Hedging



Lek Count - The high count of male sage grouse of 4 counts taken at 7-10 day intervals between late March and mid-May on all lek sites within a lek area taken on the same day.

Lek Site - A particular site where sage grouse gather for display and mating in spring (March-May). The actual site used can vary daily, seasonally, and yearly.

Noxious Weeds - Non-native plant species which have been introduced into an environment with few, if any, natural biological controls, thus giving them a distinct competitive advantage in dominating and crowding out native plant species. They have the ability to dominate plant communities to the extent plant diversity and ecosystem integrity are threatened. Noxious weeds are aggressive, spread rapidly, possess a unique ability to reproduce profusely, and resist control.

Off-Highway Vehicle (OHV) - This term replaces "off-road vehicle (ORV)", and means any motorized vehicle capable of or designed for travel on or immediately over land, water, or other natural terrain (i.e., travel off of paved roads). Off-highway vehicles include jeeps, 4-wheel drive vehicles, motorcycles, All Terrain Vehicles (ATV's), and snowmobiles.

Potential Natural Community (PNC) - The biotic community that would become established if all successional sequences were completed without interferences by humans under the present environmental conditions. It is the plant community that is best adapted to a unique combination of environmental factors and that is in dynamic equilibrium with the environment. Natural disturbances, such as drought, wild fires, grazing by native fauna, and insects are inherent in the development of any natural plant communities.

Proper Use - (1) a degree of utilization of current year's growth which, if continued, will achieve objectives and maintain or improve the long-term productivity of the site; or (2) the percentage of a plant that is used when the land as a whole is properly managed.

Responsible Party - As used in Appendix F and G. Denotes the entity(s) that has the ability to carry out work necessary to accomplish a conservation action. Realizing some tasks or actions may be more effectively accomplished by one entity than another, the listing in Appendix F shows parties that wanted to be involved in the implementation of the actions listed. No priority is implied where two or more entities are listed for a single action, although it is recognized that one

or more of the entities may have primary responsibility or authority for implementation.

Strutting Ground - see Lek.

Uncommon - A term used by bird watchers, in reference to sightings or observations which may be defined as seeing sage grouse or recent sign 20% of the time in the field in suitable habitat, for example one in five days.

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VII. LIST OF PARTICIPANTS AND ACRONYMS

Several persons have been involved in the process which has resulted in the Gunnison Sage Grouse Conservation Plan. The following is a list of those individuals that have contributed several hours over the past two and one-half years towards this effort.

Pam Bode, US Forest Service
Clait Braun, Colorado Division of Wildlife
Joe Capodice, Bureau of Land Management
Deric Clemons, Natural Resource Conservation Service
Cliff Coghill, Colorado Division of Wildlife
Lynn Cudlip, Curecanti National Recreation Area
Adena Green, Gunnison County Weed Commission
Buddy Green, Bureau of Land Management
Art Hayes, Bureau of Land Management
Sandy Hayes, Bureau of Land Management
Tom Henry, Colorado Division of Wildlife
Stan Irby, Gunnison County Stockgrowers
Terry Ireland, US Fish and Wildlife Service
Paul Jones, Colorado Division of Wildlife
Dave Kauffman, Bureau of Land Management
Mac McGraw, Member of the Public
Ron Meyer, Black Canyon Audubon Society
Marty Miller, US Fish and Wildlife Service
Sue Navy, High Country Citizens' Alliance
Jim Olterman, Colorado Division of Wildlife
Greg Peterson, Gunnison County Stockgrowers
Wendy Reinmuth, US Forest Service
John Scott, Natural Resource Conservation Service
Sandy Shea, Member of the Public
Barry Tollefson, Bureau of Land Management
Ray VanTuyl, Rancher
Steve Westbay, Gunnison County Board of Commissioner
Jessica Young, Researcher

The following is a list of acronyms or abbreviations that have been used in this plan:

AMP - Allotment Management Plan
AUM - Animal Unit Month
BLM - Bureau of Land Management
BMP's - Best Management Practices
COE - Corp of Engineers
CRMP - Coordinated Resource Management Plan
DAU - Data Analysis Unit
DOE - Department of Energy
DOW or CDOW - Colorado Division of Wildlife
FS or USFS- United States Forest Service
HCCA - High Country Citizens Alliance
I/E - Information and Education
K - Symbol for Potassium
MOU - Memorandum of Understanding
N - Symbol for Nitrogen
NPS - National Park Service
NRCS - Natural Resource Conservation Service
OHV - Off-Highway Vehicle
P - Symbol for Phosphorus
PNC - Potential Natural Community
RUS - Rural Utility Service
UMTRA - Uranium Mill Tailing Remedial Action
USDA - United States Department of Agriculture
USFWS - United States Fish and Wildlife Service
WAPA - Western Area Power Administration
WSC - Western State College

APPENDICES

- Appendix A: Sage Grouse Count Data in the Gunnison Basin
- Appendix B: Detailed Description and Methodology for Developing Conservation Plan Goal
- Appendix C: Issue Description
- Appendix D: Data Used in Developing the Desired Future Condition for Nesting/Early Brood-rearing and Winter Habitat
- Appendix E: Conservation Actions
- Appendix F: Implementation Plan
- Appendix G: Accomplishments

Appendix A

Sage Grouse Count Data in the Gunnison Basin.

The data are presented by specific zones with individual leks (grouped when possible) identified. The zones are:

Doyleville

All areas east of Colorado Highway 114 and east of the Quartz Creek Road on both sides of U.S. 50.

Gold Basin

All areas east of Colorado 149 and west of Colorado 114 south of U.S. 50.

Lost Canyon

All areas east of Colorado 135 and west of the Quartz Creek Road north of U.S. 50.

Ohio Creek

All areas west of Colorado 135 and north of U.S. 50.

Sapinero

All areas west of Colorado 149 and south of U.S. 50.

Sage Grouse lek counts conducted in the Gunnison Basin from 1953 through 1994 have been sporadic and inconsistent. However, these lek counts have provided managers with an estimate of minimum population size. The general trend in the sage grouse population in the Gunnison Basin is down, decreasing from about 100 males per lek area in 1953-54 to 22-26 males per lek area in 1994-95. This is a decrease of about 75% during the 43-year period. Decreases were not uniform across the Gunnison Basin and were highest in the Ohio Creek area. However, because of the nature of lek counts, access, priorities, equipment, and personnel changes, no specific leks can be identified as more important than others. Only broad differences can be identified among regions and no statistical analyses are appropriate.

Systematic lek counts were initiated in 1995, 1996, and 1997. The Colorado Division of Wildlife is committed to completing multiple counts of representative leks in the future. Such counts are important to enable managers to detect long term changes in populations. Annual fluctuations in lek counts are to be expected due to weather and other factors. Three-year averages will be useful in determining population trend.

Appendix A
Sage Grouse Count Data in the Gunnison Basin

Doyleville Zone: Counts of Male Sage Grouse on Leks, Gunnison Basin, Colorado, 1953-97.

	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76
Houston Gulch																								
Needle Creek	62	61	17	nc	3	8	88	30	nc	nc	17	nc	7	20	72	84	60	34	43	0	nc	14	nc	
Razor Creek	26	13	34	nc	18	43	90	24	41	32	21	58	116	54	28	20	97	43	36	35	nc	nc	nc	
South Parlin			85	nc	71	0	52	33	nc	128	67	164	74	68	68	76	114	91	64	0	17	nc	nc	
Waunita																								
Woods Gulch	8	11	nc	nc	18	0	2	0	nc	nc	2	2	3	8	0	1	2	0	0	0	0	2	nc	
Subtotal	96	85	136	-	110	51	232	87	41	160	107	224	200	150	168	181	273	168	143	35	17	16	-	
Ave/Lek Area	32	28	45	-	27	25	58	29	-	80	27	75	50	37	56	45	68	56	48	-	-	8	1	

	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	
Houston Gulch									19	nc	nc	nc	3	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Needle Creek	8	0	27	2	36	27	18	14	9	9	11	13	32	26	12	14	12	11	11	13	15	10	
Razor Creek	19	43	109	27	43	48	39	nc	19	12	57	31	0	55	21	14	13	11	7	10	22	36	
Razor Creek Divide																					30	29	
Razor Dome																					22	22	
South Parlin	31	50	66	38	43	72	47	88	66	94	63	63	75	78	69	45	39	32	32	51	54	69	
Waunita									19	nc	nc	15	23	14	28	43	40	nc	24	44	52	64	
Woods Gulch	14	13	15	1	7	10	15	8	5	2	4	nc	nc	5	5	2	7	nc	12	12	8	5	
Subtotal	72	106	217	68	129	157	119	110	137	117	135	122	133	178	135	118	111	54	86	130	203	235	
Ave/Lek Area	18	35	54	17	32	39	30	37	23	29	34	30	33	36	27	24	22	18	17	26	29	34	

Gold Basin Zone: Counts of Male Sage Grouse on Leks, Gunnison Basin, Colorado, 1953-97.

	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Chance Gulch					33	nc	7	65	21	nc	83	66	92	74	63	193	311	35	182	177	126	38	nc
Gold Basin	4	0	nc	nc	67	3	19	4	nc	7	3	5	2	0	0	0	0	23	0	1	nc	0	nc
Long Gulch																							
McCabe Lane																							
Six Mile																							
Sugar Creek																							
W Mtn.																							
Subtotal	4	-	-	-	100	3	26	69	21	7	86	71	94	74	63	193	311	58	182	178	126	38	-
Ave/Lek Area	-	-	-	-	50	-	13	34	-	-	43	35	47	-	-	-	-	29	-	89	-	-	-

	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
Chance Gulch	31	10	39	17	15	28	21	38	4	53	36	45	49	55	60	60	100	69	43	70	38	40
Gold Basin	11	0	16	0	0	nc	0	nc	7	nc	nc	nc	4	nc	nc	nc	nc	nc	nc	nc	0	0
Long Gulch																			14	18	0	0
McCabe Lane								5	nc	0	nc	14	10	16	9	10	nc	nc	nc	2	0	0
Six Mile							7	10	nc	nc	3	46	17	nc	20	nc	9	nc	15	18	25	17
Sugar Creek										5											5	6
W Mtn.																	6	nc	nc	nc	nc	nc
Subtotal	42	10	55	17	15	28	28	53	11	58	39	105	80	71	89	70	115	69	72	10	68	63
Ave/Lek Area	21	-	27	-	-	-	14	18	5	29	19	35	20	35	30	35	38	-	24	27	23	21

nc=not counted

Lost Canyon Zone: Counts of Male Sage Grouse on Leks, Gunnison Basin, Colorado, 1953-97.

	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Lost Canyon																							
North Parlin											3	3	0	0	12	6	8	0	1	0	8	nc	nc
Signal Peak																							
Subtotal											3	3	-	-	12	6	8	-	1	-	8	-	-
Ave/Lek Area											-	-	-	-	-	-	-	-	-	-	-	-	-

	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	
Lost Canyon																							
North Parlin	0	nc	13	nc	nc	nc	nc	nc	nc	nc	nc	14	10	12	17	18	17	nc	nc	2	13	11	
Sewell Gulch/ Hippie Knob																						18	10
Signal Peak /Tomichi Village									22	3	4	nc	3	nc	nc	nc	nc	nc	nc	nc	1	1	
Subtotal	-	-	13	-	-	-	-	27	3	16	-	14	13	12	17	18	17	-	-	2	32	22	
Ave/Lek Area	-	-	-	-	-	-	-	9	-	8	-	-	6	-	10	-	-	-	-	2	11	7	

nc = not counted

Ohio Creek Zone: Counts of Male Sage Grouse on Leks, Gunnison Basin, Colorado, 1953-97.

	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	
Allen Lane																							35	nc
Almont																								
Antelope					25	6	15	17	47	90	9	28	23	9	0	3	15	0	0	2	3	nc	nc	
Iola					28	17	3	0	nc	12	5	99	6	0										
					85	258	199	240	187	314	84	157	111	169	96	110	189	166	114	88	nc	51	nc	
Ohio Creek	517	301	nc	nc																				
Subtotal	517	301	-	-	138	281	217	257	234	416	98	284	140	178	96	113	204	166	114	90	3	86	-	
Ave/Lek Area	-	-	-	-	46	94	72	128	117	139	33	95	47	89	-	56	102	-	-	45	-	43	-	

	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	
Allen Lane	70	23	66	28	46	16	27	51	37	33	43	60	74	nc	43	nc	52	22	27	22	37	29	
Almont															3	nc	nc	nc	nc	4	17	21	
Antelope	0	34	51	29	0	63	52	62	53	46	75	55	107	nc	76	nc	58	52	55	47	51	46	
Eagle Ridge																						53	55
Hartman Gulch																							22
Iola/Stevens Creek																						7	15
Miller																						15	18
Ohio Creek	129	19	232	108	11	53	38	82	83	111	23	46	31	nc	44	nc	29	nc	5	65	28	36	
Subtotal	199	25	349	165	15	132	117	19	173	190	141	16	212	-	163	-	13	74	87	13	20	242	
		4			8		5				1					9				4	8		
Ave/Lek Area	99	85	116	55	79	44	39	65	58	63	47	54	71	-	54	-	46	37	29	45	30	30	

Sapinero Zone: Counts of Male Sage Grouse on Leks, Gunnison Basin, Colorado, 1953-97.

	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	
Blue/Pine Creek Mesa																								
Kezar Basin					7	0	0	0	nc	nc	2	7	0	0	9	3	0	30	35	nc	nc	nc	nc	nc
Sapinero Mesa							11	nc	nc	nc	42	28	34	43	30	34	66	64	64	nc	74	60	nc	
Willow (Iola)																								
Subtotal					7	-	11	-	-	-	44	35	34	43	39	37	66	94	99	-	74	60	-	
Ave/Lek Area					-	-	-	-	-	-	22	17	-	-	19	18	-	47	49	-	-	-	-	

	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
Blue/Pine Creek Mesa		16	12	3	0	2	nc	nc	nc	nc	nc	nc	nc	16	9	nc	2	nc	nc	27	8	22
Kezar Basin	3	nc	nc	nc	nc	nc	nc	nc	40	12	nc	nc	nc	nc	nc	nc	nc	nc	nc	11	13	16
Sapinero Mesa	107	79	60	54	68	60	nc	nc	17	41	49	nc	nc	nc	nc	nc	55	nc	nc	33+	55	45
Willow (Iola)	8	7	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Subtotal	118	102	72	57	68	62	-	-	57	53	49	-	-	16	9	-	57	-	-	71	76	83
Ave/Lek Area	39	34	36	28	-	31	-	-	28	26	-	-	-	-	-	-	28	-	-	24	25	28

nc = not counted

Summary of Totals: Counts of Male Sage Grouse on Lekks for the Doyleville Zone, Gold Basin Zone, Lost Canyon Zone, Ohio Creek Zone, and Sapinero Zone ,1953-97.

	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74
Total	617	386	136	-	355	335	486	413	296	583	338	617	468	445	378	530	862	486	539	303	228	200
Ave/Lek Area	123	96	45	-	32	56	49	59	74	97	28	56	47	56	47	53	96	61	67	61	46	33
No. of Lek Areas Counted	5	4	3	-	8	6	10	7	4	6	12	11	10	8	8	10	9	8	8	5	5	6

	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
Total	-	431	472	706	307	370	379	264	385	381	434	364	402	438	277	416	206	439	197	245	449	587	645
Ave/Lek Area	-	39	47	59	31	46	38	29	32	27	31	36	37	34	31	30	26	31	33	22	26	29	27
No. of Lek Areas Counted	-	11	10	12	10	8	10	9	12	14	14	10	11	13	9	14	8	14	6	11	17	20	24

Source: CDOW, 1997.

Appendix B

Detailed Description and Methodology for Developing Conservation Plan Goal

Population Goal

Developing the population goal based on carrying capacity of the habitat would be ideal. However, carrying capacity is a dynamic concept changing as seasons progress and environmental conditions change. Carrying capacity can be increased or decreased depending upon land management treatments. If a population goal can be agreed upon, then land management treatments can be implemented to attain the population goal. However, not all land units are equal in carrying capacity. Thus, densities (grouse/unit of area) will not be uniform in time or space. There appear to be no reasons why the 1969 population level cannot be achieved given our present knowledge of habitat conditions and amount of potential sage grouse habitat within the Gunnison Basin that can be improved. Population levels will annually fluctuate based on environmental conditions.

The present (1995) size of the breeding population of sage grouse in the Gunnison Basin is between 1,347 and 2,217 birds based on 449 males counted on 17 active lek areas. This range is based on knowledge that there are about 2 hens/male in the spring population (449 males + 898 hens = 1,347). Thus, there were at least 1,347 sage grouse in the Gunnison Basin in April 1995. However, this estimate is conservative as it has been repeatedly demonstrated that not all males are on leks at one time to be counted and, also, that locations of all active leks are not known. Given the terrain and early spring access in the Gunnison Basin, it is probable that no more than 80% of all active lek areas were located in spring 1995. Further, it is reasonable to assume based on studies in the Gunnison area and elsewhere in Colorado that the 449 males counted in spring 1995 represents somewhere between 50 and 100% of all males associated with the lek areas that were counted. A value of 75% is a defensible estimate given our present knowledge. Thus, if 17 = 80% of the active lek areas, then 100% of the lek areas probably present in the Gunnison Basin = 21 ($17 \div 0.80$). If 449 = 75% of the cocks associated with the known active lek areas, then 100% of the cocks on the 17 leks = 599 ($449 \div 0.75$). Males/lek for the 17 known active lek areas = 35.2 ($599 \div 17$) and total males for all 21 lek areas that should be present = 739 (21×35.2). Thus, with 739 males and 2 hens/male, the actual spring population size is about 2,217 birds (739 males + 1,478 females). This is a reasonable and defensible estimate.

The spring population of sage grouse in the Gunnison Basin has been much higher within the last 30 years. Given the 1969 count of 862 males on 9 lek areas, it is reasonable to conclude that the sage grouse population in the Gunnison Basin in

spring 1969 was in excess of 5,000 birds ($25 \text{ leks} \times 50 \text{ males/lek} = 1,250 \div 75\% = 1,667 \text{ males} + 3,334 \text{ hens} = 5,001 \text{ birds}$). Historically, the spring population size may have been twice the number of birds that had to have been present in spring 1969.

A reasonable minimum spring population goal would be to have at least 25 known active lek areas well distributed throughout the Gunnison Basin. These lek areas should average 26 males (1995 data) for a total counted male population of 650 birds (26×25). If this number (650) represents 75% of the cocks in the population and all active lek areas are known and counted, the male population should equal 867 birds with 1,734 hens for a total population of 2,601 sage grouse. This is certainly achievable. A reasonable optimum spring population goal would be to have 30 active lek areas each with 30 males counted. Thus, 900 males (30×30) would be counted in spring and all active lek areas would be known. This would translate to 1,200 males ($900 \div 75\%$) and 2,400 hens for a spring population size of about 3,600 sage grouse. This number has clearly been achieved in the last 30 years in the Gunnison Basin.

Appendix C

Issue Description

The following issues were brought forth by people involved in the sage grouse working group. During the early group meetings, individuals were able to explain why they felt the Gunnison sage grouse population was declining. All reasons were to be treated equally and no limitations were placed on what could be an issue. Thus was developed a long and varied list of possible reasons for the Gunnison sage grouse decline.

As the group continued to meet, questions arose from individuals who were not as involved in the issue development process, as to what was actually meant by some of the issues on this list. To answer these questions, the minutes of the meetings where the specific issues were discussed were reviewed. The minutes review helped clarify the actual concerns of the individuals who brought forth a specific issue. The issue descriptions on the following pages are the results of those efforts.

However, **the description that is given for each issue is not necessarily the consensus of the Gunnison Sage Grouse Working Group.** It is merely the belief of the individual, or individuals, who voiced their concern during the initial stages of this process. These issues will be further discussed, evaluated and debated as this effort continues.

1) Sage Grouse Habitat Quality

Issues or factors that affect habitat quality:

a. Poor habitat quality and quantity

The major factors that drive sage grouse populations are quality and extent of habitat. No other bird is so habitat specific to one particular plant type (sagebrush) in meeting its annual life requirements. Size of habitat is important because sage grouse move seasonally between suitable habitat types. Sage grouse require several distinct habitat types during different times of the year, which can be divided as following:

1. Winter
2. Nesting and early brood-rearing (uplands)
3. Late summer (riparian)
4. Escape and hiding habitat (needed yearlong)
5. Lek (breeding areas)

The key to sage grouse management is habitat, but in many locations of the valley key components of the sagebrush ecosystem are either insufficient or have been altered. Over the years, many factors have had a role in affecting sage grouse habitat, including human developments, roads, improper grazing/browsing by elk and deer and domestic livestock, agricultural practices, and practices by land management agencies. These factors have resulted in increased soil erosion and compaction and changes in plant community composition, all of which have contributed to decreases in the Gunnison sage grouse population.

Sage grouse are unable to adjust their life processes to fit a pattern of land use that eliminates or adversely disturbs large tracts of sagebrush.

b. Lack of grasses and forbs

The quality and quantity of residual herbaceous cover have an important role in sage grouse production and survival. Residual herbaceous vegetation (grasses and forbs) in sagebrush areas which provide adequate cover, both horizontal and vertical, is necessary to hide nests and nesting hens, and broods, as well as provide habitat for insects upon which birds depend. However, recent studies have shown that grasses and forbs are under-represented in a large portion of the Gunnison Basin sagebrush ecosystem. The number and distribution of high quality nesting and early brood-rearing areas appear to be a limiting factor for sage grouse in the Gunnison Basin.

c. Condition of winter habitat

Winter habitat is most critical to Gunnison Basin sage grouse because, without sufficient areas of exposed sagebrush, they cannot survive the winter to reproduce in spring. Although sage grouse are widely distributed in winter, suitable winter feeding sites do not constitute a large proportion of the available land area. Despite improvements made to other habitat types, sage grouse will not survive unless their wintering areas are protected from fragmentation or factors that destroy or degrade them.

d. Loss of top soil and degradation of soil quality

Soil is the primary factor determining the potential for vegetation production on a given site. With reduction of the herbaceous understory cover in sagebrush ecosystems, soils have become more vulnerable to wind and water erosion. Accelerated soil erosion has altered soil characteristics and quality by decreasing soil fertility due to loss of plant cover, reduction of organic matter and moisture retention of rainfall, and increased soil compaction. The loss of topsoil in the 'A' Horizon has reduced the vegetation production on many sites throughout the basin impacting critical nesting and brooding areas.

e. Effects of land treatments on winter ranges

Land treatments which attempt to remove sagebrush to increase livestock and/or big game forage in sage grouse wintering areas, can have a detrimental impact on sage grouse. As snow begins to accumulate, sage grouse winter use areas become limited and are restricted to areas that support taller, dense sagebrush stands such as south facing drainages. Removal of sagebrush at those sites would force sage grouse to use other terrains where sagebrush forage could be buried by snow. This would reduce survival due to greater exposure to winter weather, predators and starvation. As a result, treatment of sagebrush in critical areas has a disproportionate detrimental effect on winter habitat availability.

f. Poor management of land treatments

Two major problems have resulted from land treatments in the Gunnison Basin: 1) alteration of plant community structure in each of the sage grouse habitat types; and 2) with many of these treatments came an increase in Animal Unit Months allocated for livestock grazing. The increases in grazing allocations combined with a lack of subsequent management needed to maintain the health of plants, resulted in treated areas often being overgrazed and reinvaded with sagebrush with little herbaceous understory, especially forbs and native grasses.

g. Land treatments

Land treatments include such projects as plowing and seeding, prescribed burning, herbicide, contour plowing, chaining/cabling, and flood irrigation. The effects of land treatments on sage grouse populations can be either positive or negative, depending on location, method, objective of the treatment and follow-up management. Past land treatments conducted in the Gunnison Basin have not benefited sage grouse. Since the 1950s, more than 100,000 acres of sagebrush habitat have been treated in the Gunnison Basin. Effects of poorly designed treatments on sage grouse include reduction of brood carrying capacity of an area, loss of escape cover around leks making birds more vulnerable to predators, elimination of nesting habitat, and loss of winter habitat.

h. Lack of land treatment

Within the sagebrush habitat, there are many areas in the Basin where vegetative components other than sagebrush are needed for sage grouse survival and production. As sagebrush densities increase, about 30% canopy cover competition from big sagebrush may depress production of herbaceous understory species.

i. Poor nest and brood survival

Poor nest and brood survival has been attributed to the lack of herbaceous understory within the sagebrush community. This lack of herbaceous cover in sagebrush stands also negatively affects the survival of young sage grouse and nests. Since grouse initiate nesting prior to spring herbaceous vegetation growth, it is important that sufficient herbaceous residue remains from previous years. Such residual cover is lacking in several areas of the basin.

j. Fragmentation

Habitat fragmentation occurs when areas of suitable habitat are fragmented and divided into smaller areas due to such processes as physical destruction or degradation. Any patch of habitat isolated from similar habitat by different or unsuitable terrain may be considered fragmented. Several studies of avian species have found a relationship between size and shape of habitat and number of species and individuals supported. As habitat becomes increasingly fragmented, fewer individuals exist. One explanation for this negative relationship may be that domestic species such as cats, dogs and cattle present in the areas which cause the fragmentation may cause increased competition with and predation of native species. Sage grouse are especially sensitive to fragmentation because of their fidelity to lek, nest, winter, and brood-rearing sites. Even when their habitat is absent or degraded, they will continue to attempt to use these areas and will subsequently be exposed to higher mortality risks further reducing their population size.

k. Weeds

Noxious weeds have not historically affected sage grouse in the Gunnison Basin; however, these undesirable plants could easily have a large effect in the future if uncontrolled. Weeds along roads can spread to surrounding uplands and/or riparian areas and replace native vegetation critical for nesting and brood-rearing habitat. Invasion by state-listed species such as diffuse, spotted, and Russian knapweed, and other plants, are of major concern in the Basin. The most immediate concern in terms of undesirable plants encroaching into sage grouse habitat is the spread of cheatgrass throughout the Basin over the last eight years. This invasion is evident primarily along roads but has the potential to spread to the uplands. Cheatgrass invasions in other states have increased fire frequency to a point that many sagebrush stands have been eradicated.

Sage grouse do not eat noxious weeds and, if chemical control is used to control weeds, it may harm native forbs used by grouse. The effectiveness of the treatments and the effect on sage grouse depends on such things as the herbicide used (many are selective), timing of treatment, and the site.

l. Degradation of riparian areas

Riparian areas are those areas that exhibit vegetation with physical characteristics reflective of permanent surface or subsurface water influence. Lands along, adjacent to, or contiguous with perennial and intermittently flowing streams, springs, and reservoirs with stable water levels are typical riparian areas. As upland areas begin to dry, female sage grouse move their young to nearby riparian areas. At these sites, the young can continue to obtain insects and succulent forbs needed during the early part of their life cycle. Therefore, riparian areas must be in good condition and maintain adequate cover during sage grouse brood-rearing in the summer. Some riparian areas in the Gunnison Basin are improperly grazed reducing the quality of habitat for young birds. Some riparian areas are heavily infested with undesirable plants such as Canada thistle, Scotch thistle, and stinging nettle. There has also been a shift in the plant community of these areas to plant species more tolerant of heavy grazing. Gully formation in riparian areas associated with intermittent streams can also lead to loss of surface moisture and vegetation.

m. Fire suppression

Wild fires are natural with effects that vary depending on size of burned areas and the intensity and severity of the fire. In the past, natural fires were not a problem because they often burned relatively small areas and burned areas did not have large numbers of confined grazing animals using them afterwards. For the past several decades, public land management agency policy was to suppress all natural fires. Controlling and preventing fires may have resulted in degraded habitat conditions for sage grouse.

n. Timing, intensity and duration of livestock grazing

There is a concern that existing livestock turn-out dates on BLM and USFS lands are too early and that they conflict with sage grouse nesting and brood-rearing. Turn-out date on the majority of sage grouse areas is May 15th. The duration of grazing on BLM lands is generally 32 days (May 15 to June 15) in the spring, then onto the Forest allotments during the summer and crossing back over BLM in the fall. Mid-May to mid-June is critical to local ranchers because they have to remove livestock from their hay meadows in preparation for producing hay. The peak of the sage grouse hatch is the last week in May to the first week in June, depending upon snowfall. Concerns are that livestock are competing with sage grouse for food and cover during the spring grazing period and fall crossing. During the spring grazing period, livestock remove grasses which provide cover for nests and habitat for insects needed by young grouse. Grazing also impacts forbs, an important grouse food. During the fall crossing period, livestock are removing residue that could be available in the following spring for nest and brood cover.

The existing intensity of use combined with existing timing and duration is having a negative impact on the quality and quantity of nesting and brood-rearing habitats in some

areas, particularly riparian areas. Riparian areas are heavily grazed and use on uplands does not allow the understory to recover to its full potential in some locations. Some allotments are grazed season-long (May-November) which does not allow for adequate recovery from grazing which is essential for plant health and maintenance. Season-long use does not allow for adequate regrowth (residue) needed for the following year's nesting. Topography and water availability also play key roles in the distribution of grazing and resulting levels of use.

o. Changes in livestock genetics

Genetically improved livestock has resulted in larger animals grazing public lands today than when livestock grazing was first introduced to the area. Many of the existing AUM allocations on public lands were determined in the mid-1950's based on how much an 850-1000 pound cow and her calf consume each month. Cows not including their calves being turned out on public land (May-June) today weigh as much as 1350 pounds. Although the actual number of cattle has declined significantly over the years, the livestock industry generally produces larger cattle which may offset lower numbers. Another consideration is that some operators calve earlier so these young animals begin forage consumption sooner and are larger while on public lands.

The working group considered this issue in relation to sage grouse and felt that bigger livestock was once a trend that ranchers were following, but now, it seems there is a gradual trend back to a smaller animal. The market was not paying more for a larger animal and these animals need to be fed more in the winter. Ranchers seem to be looking for an efficient cow that will raise a good calf. There is not an effective way to research this issue and tie it to a specific sage grouse management action. The Gunnison Sage Grouse Working Group contends the key is managing timing, intensity, and duration of grazing realizing variation in animal size.

p. Historic overgrazing

From the late 1880's until after World War II, large numbers of sheep, cattle and horses were common on the ranges around Gunnison. Deer herds were at an all time high. Historic overgrazing probably has had a great effect on today's sage grouse nesting and brood-rearing habitat. The long-term health of the ecosystem may have been altered, possibly irreversibly, affecting the current carrying capacity of rangelands.

Historic overgrazing is a thing of the past and the potential of some sites were affected. The Gunnison Sage Grouse Working Group feels emphasis should be placed on existing and future management of livestock grazing to address the needs of the Gunnison sage grouse.

q. Increased numbers of deer and elk

The distribution and overbrowsing by deer and elk on the big game winter range has had significant effects on important forage shrubs, primarily serviceberry, mountain mahogany, chokecherry, skunkbush and bitterbrush and associated plant communities. The large deer herds and resultant overbrowsing between 1940 and the mid 1970's are well documented. The elk herd has increased and has been above the Basin herd goal of 9,000 for much of the last 15 years. While overbrowsing of forage shrubs on the winter range by elk has generally occurred only during winters of heavy snowfall, it has been at a frequency and intensity that has not allowed for regrowth and recovery of these shrubs. In many areas, shrubs are currently much smaller in canopy and height than what is desired and sustainable. The impact to the associated herbaceous communities is contraction in size as the snow-catching effect of the taller shrubs is diminished.

The impact to sage grouse includes not only a reduction in areas that have nesting cover but also reduction in areas with herbaceous species that provide food and cover for broods. Although sage grouse generally nest underneath sagebrush, they can nest under shrub species impacted by big game.

r. Pollution

More and more people moving into the Gunnison Basin has resulted in increased air and water pollution. A concern exists that insecticide spraying reduces the food base for grouse. Massive insect control programs have been known to reduce brood size of sage grouse in Wyoming.

s. Herbicides

Herbicides, used to control weeds, sagebrush, etc., pollute the water, air, and affect ground organisms and, in the past, have altered large areas of sage grouse habitat. Improper use increases the potential for impacts. Herbicide use extends from weed and/or brush control efforts on public, private and agricultural lands to basic lawn care around residences.

t. Acid precipitation

Acid precipitation occurs when nitrogen and sulfur oxides are released into the air. Emissions from vehicles are the most common source of nitrogen oxides and emissions from industrial plants are primarily responsible for sulfur oxides. Both oxides are transformed in the atmosphere into dilute solutions of sulfuric and nitric acids which return to the earth as a form of acid precipitation.

u. Global warming

Certain types of gases such as carbon dioxide, methane, and chlorofluorocarbons are accumulating at a rapid rate in the global atmosphere due to human activities. Global warming may occur because these gases retain reflected heat from the earth's surface and prevent the heat from escaping into the atmosphere. Overall global warming may cause changes in precipitation patterns and rising sea levels.

v. Loss of the ozone layer

Thinning of the ozone layer increases UV rays which could affect photosynthesis of plants, thickness of eggshells, and insect production. Increased development requires additional power which in turn requires more coal-fired plants resulting in stress on the ozone and the environment. Loss of the ozone layer causes increase to UV light which may influence the production of herbaceous vegetation in sage grouse areas.

Note:

Acid Rain, Global Warming, and Loss of Ozone layer are factors that have been the subject of extensive worldwide research and media coverage in recent years. It is possible that they, independently or combined, may indeed have a role in the decrease in the sage grouse population. To date, however, there are no studies to show what effects they may have on sage grouse habitat or sage grouse health and reproduction.

The Gunnison Sage Grouse Working Group finds that these environmental aberrations are a global problem, and controlling them is outside the scope of this group.

w. Drought

Climate in the valley for the past several years appears to have had an effect on sage grouse brood-rearing and nesting habitat. Sage grouse production is indirectly affected by drought. While sage grouse are not limited by water in most cases, they are limited by the vegetative growth and insects lost during drought conditions. In the Gunnison Basin, both nesting success of females and brood survival decline severely during years with low soil moisture as calculated by the Palmer Drought Index. This effect is probably compounded if land management practices remain unchanged during years with low soil moisture. However, drought does not appear to impact lek attendance of males.

2) Sage Grouse Habitat Loss/Fragmentation

Issues that affect sage grouse habitat loss/fragmentation:

a. Reduction in the Number of Riparian Areas

Historically there were more riparian areas throughout the Gunnison Basin; however, due to improper management, many riparian areas have degraded or have been lost. The number of riparian areas in the Basin is directly affected by the amount of water these areas contain. Gully formation, which is common, causes loss of surface water and lowers water tables. As a result, there is a reduction or elimination of riparian vegetation and encroachment of the upland species typically found in drier sites.

There are other riparian areas in the uplands where small springs are intermixed with the sagebrush communities. Development of these sites, (ponds, pipelines and collection systems) has resulted in riparian loss which also displaces sage grouse because grouse sometimes abandon pond type developments especially those in flat areas. Most spring developments were not planned with sage grouse needs in mind.

b. Blue Mesa Reservoir/DOE

Projects such as the development of Blue Mesa Reservoir and the Uranium Mill Tailings Remedial Action Project (UMTRA) resulted in both habitat fragmentation and loss. Blue Mesa Reservoir inundated excellent winter and brood habitat and destroyed one of the largest leks in the Basin. Since the reservoir has been completed, related recreational and residential development is further fragmenting sage grouse habitat.

The large haul roads, soil borrow sites, and the storage cell associated with the UMTRA project caused loss of habitat and fragmentation in one of the largest breeding areas in the Basin. Male attendance in the nearby lek area decreased approximately 30 percent after one year of operation and has remained low. Productivity of females has also decreased.

c. County land use planning

Historically, Gunnison County land use review did not take into account the affect of development actions on sage grouse and related habitat. The Gunnison County Land Use Resolution, the primary County planning regulations, do not mandate review specifically for sage grouse and, as a consequence, habitat has been degraded. Additionally, 35-acre tracts which are exempt from County subdivision review by State statute have generated ill-conceived development and land use profiles without sorely needed design review. Cumulatively, County Land Use Design Guidelines are not

adequate at this point to integrate wildlife management needs as they pertain to sage grouse habitat, and Colorado State statute (SB-35) has been a technique to disregard County land use regulations.

d. Subdivisions

With the increase in population in the Gunnison Basin, subdivision development is one of the greatest potential threats to sage grouse habitat. Those developments in the riparian and sagebrush areas outside of the city limits are especially critical. Subdividing large ranches into smaller residential developments decreases sage grouse habitat and creates habitat fragmentation. This type of development may also introduce unwanted plant species. Increased dog and cat predation and increased recreation activity in the surrounding areas may impact grouse. Roads and powerlines associated with subdivisions increase human activity and disturbance where there was none before, making it more difficult for grouse to find locations that are roadless.

Lack of consideration of the needs of sage grouse in the planning and development of subdivisions is affecting sage grouse habitat in several locations around the Gunnison Basin.

e. Mining

Mining operations often use large amounts of chemicals during processing which pollute ground and surface water. Modern mines are often large in scale, have the potential to impact large tracts of land, and also have the potential to increase the need for subdivisions, roads, etc. Past placer mining operations have reduced brood-rearing habitat in riparian areas and still have not been repaired.

f. Increased human population

The increase of people in the area may be a major factor contributing to the decline of grouse. More and more sagebrush and riparian areas are being subdivided to accommodate increased population. Each year, more people are using public lands, resulting in new roads and disturbances in areas once secure for sage grouse. Activities that promote the Gunnison area also create problems by encouraging people to move to the Basin.

g. Powerlines

The effects of powerlines on sage grouse are severe. Powerlines have been documented to serve as predator perches in Utah and Colorado with subsequent loss of all leks visible to raptors (primarily golden eagles) from perches on powerline poles. Further, counts of sage grouse pellets near powerlines decrease as distance to powerlines increase up to one-half mile. Thus, a strip about one-half mile on each side of powerlines is generally

avoided by sage grouse. These observations are supported by measurement of distances to powerlines of radio-marked sage grouse throughout sage grouse habitats in Colorado. Clearly, sage grouse avoid powerlines when possible.

h. Roads

Roads can be classified as primary, secondary, and as trails. Primary roads are those that are classified as state and federal highways. These roads are generally high speed and are paved. Secondary roads generally have county designations although some BLM and USFS roads can fit in this category. Some of these roads may be paved but most are generally gravel or dirt. These roads have moderate to low speed ratings. Trails generally are unsurfaced, lack formal designation, and have low speed ratings. Sage grouse prefer to walk to reach useable habitats throughout the year except when snow cover increases their conspicuousness. Sage grouse that walk across primary and secondary roads are at great risk of death from moving vehicles. The end result of all primary roads and many secondary roads is reduction in the size of the sage grouse population as those birds adjacent to the road are killed by road traffic. Because young sage grouse learn from older sage grouse, populations that traditionally used areas prior to road establishment or improvement become smaller over time as the older (and young) birds become fewer in number due to road disturbance (and death). Thus, traditional movements are often eliminated. Trails have less impact, depending upon vehicle speed.

3) Physical Disturbance to Populations

Issues that can cause disturbance to sage grouse

a. Hunting

Sage grouse hunting is a traditional recreational activity with subsistence hunting of the species occurring at all times of the year predating modern history. Sage grouse hunting in modern times date to 1953 when the season was reopened after many years of closure. There is concern that sage grouse hunting negatively affects sage grouse populations by removal of individual grouse and physical disturbance of grouse populations. There is also concern about the potential loss of population data obtained from sage grouse wing collections from hunters if sage grouse seasons are closed.

b. Poaching

Poaching is the intentional harvest of sage grouse outside of established seasons or it can include intentional harvest of more than the established bag/possession limit during hunting seasons. Intentional harvest of sage grouse outside of established seasons has occurred in all months in Colorado but most commonly occurs during big game seasons (October-November) and in winter when flocks of sage grouse may be more visible. It

has also been documented in the spring during the display period. No particular age or sex class is more susceptible than another to poaching.

c. Predators (coyotes, ground squirrels, weasels, skunks, badgers, eagles)

Losses of sage grouse nests and young to predation are often high and can, in some locations, be the most significant factor in determining annual recruitment to the population. Studies in the Basin have shown that ground squirrels and weasels can destroy up to 50% of the current year's nest and egg production. There is also a concern over coyote populations, which appear to be increasing and the effects they may have on the sage grouse population. Golden eagles can be effective predators of sage grouse and some feel that eagle predation is increasing. Predation by domestic cats and dogs may also be increasing as more subdivisions and people move into sagebrush areas.

The quality and quantity of the grasses and forbs and other vegetation cover may influence the effects of predation. Predation is reduced when there is sufficient vegetation to conceal the nests. Some individuals feel that the decline of predator control which coincided with the end of the sheep grazing era in the Basin has resulted in the increased predation on sage grouse and jack rabbits. Other individuals felt that predator control is not acceptable as a long term solution. The consequences of predator control to other species is not known.

d. Protection of other species

Over the years several laws have been enacted to protect many predator species of wildlife including those that prey on sage grouse. Existing laws and newly enacted laws recently passed in Colorado concerning coyotes and furbearers may increase their populations resulting in higher sage grouse predation.

e. Bird Watchers (i.e., Effects of Wildlife Viewers)

Male sage grouse display to attract females for the purpose of mating. These displays have attracted the attention of humans dating at least to the early 1800's. Several ceremonial dances of Native Americans historically living on the western plains incorporate rituals performed by prairie grouse. Modern civilization allows substantial leisure time which has resulted in an explosion of recreation activities. Bird watching is not recent in origin but interest in this activity has greatly increased. Wildlife agencies and commercial groups have responded by identifying watchable wildlife sites and constructing facilities and encouraging tours to observe wildlife, especially birds. Thus, organized tours exist for a number of species including sage grouse. In Colorado, protocols to manage human activities near selected sage grouse leks were developed and implemented in North Park in the early 1980's. However, if protocols are not clearly understood and followed, recruitment of yearling male sage grouse to leks may be adversely affected resulting in declining numbers of males on leks over a period of years.

Adult males may also be affected by improper action of wildlife viewers and may abandon lek sites. There is a concern that the South Parlin watchable wildlife site may disturb strutting sage grouse if people who visit the site do not follow the protocols.

f. Scientific Lek Harassment (i.e., Physical Disturbance Resulting From Scientific Studies).

Research on sage grouse frequently requires capture and marking (bands, radios) of individual grouse. Capture of grouse is usually most easily accomplished when birds are concentrated on or near leks for the purpose of display and mating. Methods used range from spotlighting to locate grouse that are then captured using long-handled nets to walk-in traps placed on or near leks. Repeated disturbance of sage grouse on leks has been demonstrated to make individuals more wary and flush more readily. Yearling males may change leks following marking but the available data suggest that this age/gender class commonly investigates a series of leks in their first year of life. Studies of radio-marked male and female sage grouse demonstrate strong attachment to the lek of capture despite repeated trapping activities.

g. Conflicting Uses During Critical Biological Activity Periods

The critical biological activity periods for sage grouse are during winter, breeding, nesting, and early brood-rearing (December-mid July). Conflicting uses during this period are those that physically prevent sage grouse from using preferred habitats. These uses range from human disturbance (including pets), motorized vehicles, to herding of livestock and heavy grazing/browsing by deer and elk and by domestic livestock.

h. Motorcycle/OHV use

Concerns exist about unrestricted motorized and non-motorized uses on sage grouse habitat, soils, vegetation, location and timing. Most of the concerns center around motorized activities rather than hikers, horses or mountain bikers. OHV's and the roads they create are increasing and expanding into more and more sagebrush and riparian areas. Motorized vehicles tend to travel in valley bottoms which may have a direct effect on grouse, since these areas are one of the most important feeding areas for young birds. Vehicles travel along riparian areas and create roads and trails which increases erosion. This can result in loss of riparian areas by soil down-cutting and lowering of the water table and disturbing birds when they come to feed in these areas. Roads and trails become corridors for predators which may make grouse more vulnerable. Organized motorized and mountain bike events which appear to be increasing have not taken into account the effects they may have on sage grouse.

Appendix D

Data Used In Developing the Desired Future Condition for Nesting/Early Brood Rearing and Winter Habitat

Nesting/Early Brood-rearing Habitat					
	Big Sagebrush		Grass		Forbs
	Canopy Cover	Height	Canopy Cover ^{5/}	Height	Canopy Cover ^{5/}
Minimum Habitat Requirements for Nesting Areas ^{1/}	20-30%	15-20"	15-20%	4-8"	5-15%
Minimum Habitat Requirements for Brood-rearing Areas ^{1/}	10-15%	15-20"	15-25%	4-8"	5-15%
Desired Future Condition	20% minimum	16" avg.	30% minimum	6" avg.^{6/}	10% minimum
Average PNC ^{2/}	27%	14"	55%	6.3" ^{6/}	12% ^{7/}
Avg. in Nesting Areas ^{3/}	26%	16"	9.5%	-----	3.7% ^{7/}
Avg. at Nest Sites ^{3/}	-----	21.8"	-----	-----	-----
Avg. Existing Conditions ^{4/}	30%	17.7"	28%	5.4" ^{6/}	4% ^{8/}

^{1/}Source: Braun, C.E. 1994. Personal Communication. Minimum Habitat Requirements for Sage Grouse Nesting and Brood-rearing Areas.

Minimums are recommended based on research conducted in the Gunnison Basin and other areas in Colorado by C.E. Braun, J. W. Hupp and J. R. Young.

^{2/}Source: Habitat Partnership Program, USDA Forest Service & Bureau of Land Management. 1993 to present. Ecological Classification and Inventory of Vegetation for the Gunnison Basin.

Data for Avg. PNC (Potential Natural Community) reflect numeric values for two of the more extensive and common sagebrush sites, specifically, Big sagebrush/muttongrass-pine woods needlegrass and Wyoming big sagebrush/Indian ricegrass plant communities.

The measurements of height values for sagebrush may be lower than sagebrush heights stated in the objective because the data used to arrive at the PNC height includes both Big sagebrush and Wyoming big sagebrush, the latter typically of shorter stature often occurring on drier sites.

^{3/}Source: Young, J.R. 1994. The Influences of Sexual Selection on Phenotypic and Genetic Divergence Among Sage Grouse Populations. (Available at the Bureau of Land Management, Gunnison Resource Area Office). pp. 31-63.

Data for 'Avg. in Nesting Areas' and 'Avg. at Nest Sites' was collected over a three-year period from 1991 to 1993 in the Gunnison Basin.

The values in Appendix D represent an **average** for the data collected. This means that measurements for canopy cover could be greater or less than the average. For example, for Big sagebrush the range of values collected for canopy cover was 11.6 - 42.7%, the range of canopy cover values for grasses was 1.0-37.1% and the range of canopy cover values for forbs was 1-13.4%.

^{4/}Source: BLM, Gunnison Resource Area. 1994. Monitoring Tebuthiuron Treatments In Big Sagebrush Communities.

Data for Avg. Existing Conditions was collected in 1994. The values listed were determined by analyzing data from 55 transects in Big sagebrush sites at each of the six established tebuthiuron treatment sites in the Gunnison Basin.

The values in Appendix D represent an **average** for the data collected. This means that measurements for canopy cover could be greater or less than the average. For example, for Big sagebrush the range of values collected for canopy cover was 17-56%, the range of canopy cover values for grasses was 7-63% and the range of canopy cover values for forbs was 1.0-15% (exclusive of phlox). The data collected shows that for 58% of the samples, canopy cover for grasses was less than 30%; for 93% of the samples, canopy cover for forbs (exclusive of phlox) was less than 10%.

^{5/}Numeric values for establishing Minimum Habitat Requirements, Averages in Nesting Areas and Averages at Nest Sites were collected by measuring the plant intercepts along and established transects. Intercepts for grasses and forbs were recorded if plants could be seen, when viewed from above, as intercepting the transect baseline. No intercepts were recorded for grasses and/or forbs if they occurred under sagebrush plants even though their canopies intercepted the baseline. This sampling procedure resulted in lower values for grasses and forbs when compared to values for Avg. PNC and Avg. Existing Conditions where canopy cover was recorded for **all** plants regardless of their position in the plant community. Values stated for the objective measure canopy cover for **all** plants.

^{6/}Average leaf height for a plant. Seedheads are not included.

^{7/}This canopy cover value includes **all** forb species.

^{8/}This canopy cover value does not include phlox. Exclusion of phlox from the existing canopy cover value for forbs gives a clearer comparison with values listed for the objective which do not include phlox as part of the minimum canopy value.

Winter Habitat		
	Big Sagebrush	
Objective:	Canopy Cover	Height
South & West Aspects	15% minimum	12" avg.
Drainages	30% minimum	20" avg.
Low, Flat Areas	25% minimum	16" avg.
Feeding Sites: ^{9/}		
South & West Aspects	33.6% avg.	16.2" avg.
Drainages	37.6% avg.	21.3" avg.
Low, Flat Areas	35.9% avg.	17.3" avg.
Random Sites: ^{9/}		
South & West Aspects	15.9% avg.	11.3" avg.
Drainages	32.0% avg.	20.8" avg.
Low, Flat Areas	28.5% avg.	17.0" avg.

Source: Hupp, J.W. 1987. Sage Grouse Distribution and Habitats in the Gunnison Basin, Colorado: Recommendation for Maintenance. Unpublished Report. (available at the Bureau of Land Management, Gunnison Resource Area Office, 216 N. Colorado St., Gunnison, Colorado).

Canopy cover and height of sagebrush for "Feeding Sites" represent data that was collected in areas where sage grouse tracks were observed and/or flock sightings were made during the winter.

Canopy cover and height values for "Random Sites" represent data that was collected at several randomly located sites throughout the Gunnison Basin.

These data show that sage grouse select areas where sagebrush has greater canopy cover and height.

Appendix E

Conservation Actions

Conservation Actions Relating to Information, Education, and Coordination

Enhance existing riparian areas to benefit sage grouse production and chick survival by providing information for Environmental Assessments on impacts from future utility corridors to riparian areas, through development of construction standards, reclamation guidelines and guidelines on the use of herbicides.

Mitigate loss and fragmentation of sage grouse habitat from the construction of Blue Mesa reservoir by working with NPS to redesign recreation facilities on the north side of the reservoir.

Provide sage grouse habitat maps and recommendations on revisions to the Gunnison County Land Use Resolution (Part 2: Design Guidelines).

Solicit the Board of County Commissioners to approve proposed changes to Land Use Resolution (Part 2: Design Guidelines) regarding sage grouse habitat needs. For example, encouraging conservation easements, mitigation on non-critical habitat areas, and preventing loss of critical habitat.

Improve County/Agency interaction by requesting agencies to designate a sage grouse contact person to interface with County planning.

Encourage the State Legislature to delegate the authority to regulate all subdivisions which occur in sage grouse habitat regardless of size to local authorities by circulating petitions to initiate State Legislature actions.

Encourage the State Legislature to delegate the authority to regulate all subdivisions which occur in sage grouse habitat regardless of size to local authorities by asking the State Legislature to create more stringent development restrictions for land in remote, undeveloped areas.

Encourage the State Legislature to delegate the authority to regulate all subdivisions which occur in sage grouse habitat regardless of size to local authorities by sending letters of support to other groups or organizations that support local land use control regarding the effects of 35 acre developments on sage grouse.

Encourage the County to offer incentives to developers who protect and enhance sage grouse habitat.

Develop a list of incentive programs presently offered that could be used to prevent the loss of sage grouse habitat.

Encourage clustering, density credits, development right transfers, land exchanges, etc. to prevent the loss of sage grouse habitat.

Provide maps to public land agencies, agencies involved with wildfire response, Colorado Division of Wildlife, Gunnison County, interest groups and landowners.

Identify and prioritize sage grouse habitats to be improved (types and locations) based on their ability to respond and importance in meeting the plan objectives.

<p>Prevent negative research impacts and maximize positive effects by managing scientific studies of sage grouse; screening research proposals; educating researchers about sage grouse and their habitats; reviewing capture techniques, methods and number of birds needed for study; and maximizing information gathered within studies.</p>
<p>Prevent negative research impacts and maximize positive effects by coordinating all research and monitoring projects involving sage grouse and their habitat with interested and affected parties, including landowners. This will provide consistency in data collection procedures, methodologies, analysis and evaluation.</p>
<p>Prevent negative research impacts and maximize positive effects by encouraging a small-scale experimental approach to land treatments in sage grouse habitat.</p>
<p>Use research data to modify existing management as it relates to sage grouse and their habitat (BMPs, drought indicators, predator impacts, key soil nutrients, etc.).</p>
<p>Improve management of large and small mining operations occurring in sage grouse habitat by providing input to the State regarding appropriate bonds for small operations.</p>
<p>Support 1872 Mining Law revisions to provide more local control to reduce potential impacts to sage grouse habitat.</p>
<p>Discourage and prohibit future large scale projects (eg. DOE's UMTRA project) which occur in critical sage grouse habitat and aggressively seek mitigation for those projects that cannot be deterred.</p>
<p>Manage existing and new utility lines to remove impacts to sage grouse by compiling recommendations for overhead utility line modification, or construction of new utility lines in all sage grouse habitat (leks, nesting, brood-rearing, winter). Provide these recommendations to land management agencies and others that permit or design powerlines.</p>
<p>Manage motorized and mechanized travel to minimize impacts to sage grouse and their habitat by posting signs to describe access restrictions in sage grouse habitat.</p>
<p>Plan or permit organized events to avoid impacting sage grouse habitat.</p>
<p>Manage motorized and mechanized travel to minimize impacts to sage grouse and their habitat by increasing enforcement of existing OHV regulations, including OHV registration.</p>
<p>Manage motorized and mechanized travel to minimize impacts to sage grouse and their habitat by developing standards for future roads to give to BLM, FS, County, Private, etc.</p>
<p>CDOW will manage motorized and mechanized travel on State Lands in conjunction with lessees to minimize impacts to sage grouse and their habitat.</p>
<p>Design and manage future land treatments to improve or at least not degrade sage grouse habitat by establishing the desired future condition prior to administering any land treatment.</p>

Conservation Actions Relating to Information, Education, and Coordination

Develop and distribute information about the value/importance of sage grouse and sage grouse habitat through the use of videos, information brochures, press releases, presentations, signs, field trips, open houses, etc. Provide materials on the:

- use of conservation easements,
- availability of State, Federal and Non-government incentive programs,
- importance of restoration/rehabilitation of sage grouse habitat,
- use and impacts of roads,
- importance of BMPs in the proper management of resources,
- impacts of water developments,
- Gunnison Sage Grouse and their habitat requirements,
- key points of the Conservation Plan,
- effects of large scale projects,
- impacts of population growth in the Basin,
- effects of land treatments
- detrimental effects of large scale wildfires,
- sage grouse hunting seasons,
- current and future research needs and findings,
- unique status of sage grouse,
- potential effects of domestic pets,
- most effective way of distributing informational materials,
- impacts of Off Highway vehicles,
- effects of noxious weeds,
- benefits of proper livestock grazing,
- influence of big game populations and winter range carrying capacity,
- effects of drought.

Recommend to the State Legislature increased penalties for poaching sage grouse.

Advocate no use of poison (too many non-specific species affected) to control predators in areas where they affect sage grouse in the Gunnison Basin.

Eliminate or modify things that facilitate predation by ensuring that sage grouse management is a priority consideration in management plans (both present and future) for all other protected species. Plans should consider effects to sage grouse populations before introductions of other protected species - ie., wolf, and provide mitigation to sage grouse.

Coordinate the management of other protected species with habitat requirements of sage grouse, identify and coordinate opportunities with agencies, private landowners and non-government organizations to improve habitat.

Manage motorized and mechanized travel to minimize impacts to sage grouse and their habitat by participating and giving recommendations to FS/BLM travel management planning group.

Improve sage grouse habitat by using integrated weed management practices to manage noxious weeds.

Manage noxious weed species by discouraging land uses that promote weed growth and propagation in sage grouse habitat.

Manage noxious weed species by developing weed management mitigating measures for ground disturbing projects in sage grouse habitat.

Acquire additional funding for noxious weed management where invasions affect the quality of sage grouse habitat.

Outline the gaps in the grazing regulations and land use plans and make suggestions to appropriate agencies to adequately address sage grouse objectives.

Update existing USFS and BLM Allotment Management Plans (AMPs) to address sage grouse objectives and incorporate these objectives into any future AMPs.

Manage big game habitat to meet sage grouse objectives by encouraging the enhancement of key big game winter ranges within sage grouse habitat. Consider vegetation treatments, easements, etc. to reduce impacts to big game on sage grouse and their habitat.

Conservation Actions Relating to Research and Monitoring

Continue to gather or initiate the collection of data for evaluating the effectiveness of all herbicide treatments on sage grouse habitat objectives and potential environmental effects.

Continue to gather or initiate the collection of data for pre-treatment monitoring and experimental controls for land treatments.

Continue to gather or initiate the collection of data for evaluating chemical test plots over sufficient time to accurately determine effects of chemical treatment.

Continue to gather or initiate the collection of data for determining drought conditions using standardized precipitation index and Palmer Drought Index.

Continue to gather or initiate the collection of data for determining the effects of the UMTRA project on sage grouse lek and brooding areas.

Continue to gather or initiate the collection of data for evaluating and recording the response of vegetation and sage grouse response to treated areas.

Gather or initiate the collection of data for continued improvement of modeling techniques for estimating big game populations using data such as herd counts, forage utilization, growing conditions (Palmer Drought Index or standardized precipitation index) to determine desired herd size by DAU & necessary harvest or other management needs.

Initiate research to find ways to raise money for open space and to mitigate impacts to sage grouse from growth (eg. lodging tax legislation, development fees, transferable development rights, grants).

Initiate research to find methods, other than gathering hunting data, to determine annual sage grouse survival and reproduction.

Initiate research to project the impacts of doubling the human population on sage grouse numbers and habitat in Gunnison Basin. Seek assistance from the Environmental Science Department at WSC.

Initiate research to investigate alternative treatments that minimize surface disturbance such as, selective seeding, fertilization, etc., to improve sage grouse habitat.

Initiate research to include test plots for land treatments with and without grazing by domestic livestock and wildlife within sage grouse habitats.

Initiate research to determine what elements are missing from soils (N,P,K, etc.) within sage grouse habitat.

Initiate research to determine whether fragmented sage grouse habitats can be effectively rehabilitated and improved.

Initiate research to determine the effects of spraying insecticide for mosquitos in sage grouse habitat.

Initiate research projects to develop a form to solicit information on sage grouse observations from visitors (recreational birdwatchers).

Initiate research to develop a better understanding of predator/prey interactions (coyotes vs. ground squirrels, raptors vs. sage grouse, crows/magpies vs. sage grouse young and/or eggs) and design a study to look at the relationship between predation and habitat quality as it relates to sage grouse and their habitat.

Initiate research to monitor predator populations, the percentage of sage grouse in predator diets (coyotes and eagles), and determine the percentage of sage grouse egg predators (ground squirrels, weasels, etc.) in large predator diets.

Initiate research to determine what types of predator control are most effective for sage grouse predators.

Determine procedures for providing comments (related to de-watering riparian areas and altering riparian habitat in sage grouse habitat) on augmentation plans, etc., submitted to the Division of Water Resources.

Initiate research to determine magnesium chloride impacts on roads in sage grouse habitat.

Initiate research to determine ideal road density in sage grouse habitat.

Initiate research to determine whether big game constitute a physical disturbance to sage grouse and/or impact their habitat.

Prevent negative research impacts and maximize positive effects by evaluating past results of land treatments specific to the Gunnison Basin prior to implementing future land treatments.

Evaluate fragmentation and identify techniques to reduce fragmentation in sage grouse habitat.

Prevent recreational bird watching from impacting sage grouse by determining if lek visitation is impacting sage grouse.

Manage existing land treatments with regard for sage grouse needs and plan objectives by evaluating treatments as they relate to sage grouse and determining appropriate management.

Review grazing regulations and land use plans to determine how and if existing management prescriptions, guidance, and/or standard operating procedures address sage grouse objectives.

Conservation Actions relating to Mapping and Inventory

Identify and map current nesting, brood-rearing, lek and winter sage grouse habitat.

Identify and map historical nesting, brood-rearing, lek and winter sage grouse habitat.

Identify and map high priority or critical nesting, brood-rearing, lek and winter sage grouse habitat.

Identify and map high priority or critical riparian areas in sage grouse habitat.

Identify and map potential impacts from roads to sage grouse or their habitat.

Identify and map potential impacts from utility line corridors, including powerlines to sage grouse or their habitat.

Identify and map potential impacts from noxious weeds to sage grouse or their habitat.

Identify and map potential impacts to sage grouse or their habitat resulting from livestock grazing management/range improvement conflicts.

Identify and map potential impacts to sage grouse or their habitat resulting from overlap with big game habitats.

Identify and map potential impacts from existing land treatments to sage grouse or their habitat.

Identify and map proposed land treatments that have the potential to impact sage grouse or their habitat.

Identify and map heavily fragmented areas that impact sage grouse or their habitat.

Identify and map mosquito spraying areas in nesting/early brood-rearing sage grouse habitat.

Periodically review and update maps so they can be used to determine if activities are occurring in important sage grouse areas during critical biological periods.

Manage existing overhead utility lines to remove impacts to sage grouse by identifying sections that negatively affect sage grouse currently within important sage grouse habitat.

Manage motorized and mechanized travel to minimize impacts to sage grouse and their habitat by identifying and mapping areas of (travel) use, including roads open to OHVs, which may impact sage grouse habitat.

<p>Enhance existing riparian areas to benefit sage grouse production and chick survival by creating incentives for private landowners and developers so that riparian areas remain undeveloped, eg. encourage the State and County to develop tax use classifications.</p>
<p>Enhance existing riparian areas to benefit sage grouse production and chick survival by restoring and rehabilitating riparian areas impacted or lost from water development, recreationists (trail use, camping, angling, etc.), powerlines, utility corridors, and/or roads through use of BMPs and other practices to benefit sage grouse survival.</p>
<p>Enhance existing riparian areas to benefit sage grouse production and chick survival by mitigating negative effects in riparian areas of existing utility corridors eg., enhance other riparian areas or sage grouse habitat, seed roads, etc.</p>
<p>Prevent habitat loss and fragmentation of sage grouse habitat by avoiding construction of reservoirs larger than 160 acres.</p>
<p>Mitigate loss and fragmentation of sage grouse habitat resulting from the construction of Blue Mesa reservoir by preventing recreational facilities on the south side of the reservoir.</p>
<p>Mitigate loss and fragmentation of sage grouse habitat resulting from the construction of Blue Mesa reservoir by purchasing private in-holdings north and south of the reservoir.</p>
<p>Mitigate loss and fragmentation of sage grouse habitat resulting from the construction of Blue Mesa reservoir by zoning the area around the reservoir to prevent subdivisions.</p>
<p>Preserve sage grouse critical winter habitat - no net loss.</p>

Conservation Actions to Restore or Improve Habitat Quality

Enhance existing riparian areas to benefit sage grouse production and chick survival by maintaining and protecting buffers along riparian areas and around hay meadows and grazed pastures; maintain fences between hay meadows/pastures and riparian areas.

Create, enhance, protect riparian areas, especially small ephemeral wet areas within nesting habitat for early brood-rearing sites, to benefit sage grouse production and chick survival (eg. north and south of Blue Mesa).

Mitigate loss and fragmentation of sage grouse habitat resulting from the construction of Blue Mesa reservoir by enhancing winter use sites north of the reservoir through powerline removal and recreation management.

Require adequate bonds to ensure clean operation and adequate reclamation of large and small mining operations in sage grouse habitats.

Improve management of large and small mining operations occurring in sage grouse habitat by ensuring adequate mitigation measures are in mining plans for operations over 5 acres.

Ensure the current UMTRA mitigation plan is fully implemented.

Manage growth of the human population in Gunnison Basin so as not to cause further damage to sage grouse or their habitat.

Manage existing and new overhead utility lines to remove impacts to sage grouse by making them unsuitable for raptor perching in sage grouse habitat.

Manage existing and new utility lines to remove impacts to sage grouse by using underground cable systems, where feasible, in sage grouse habitat.

Locate new powerlines away from important sage grouse habitat to minimize their impacts to sage grouse.

Concentrate utilities in existing corridors rather than creating new ones when impacts to sage grouse and habitat could be minimized by these actions.

Avoid actions which would result in fragmentation of important sage grouse habitat when locating new powerlines.

Locate new powerlines and access roads away from riparian areas if impacts to sage grouse are evident. Where water crossings are unavoidable, design crossings to prevent riparian damage.

Remove and realign roads where necessary in important sage grouse use areas, specifically in riparian areas, to reduce habitat loss, fragmentation, and enhance habitat quality.

Manage roads in sage grouse habitat to reduce habitat loss, fragmentation, and enhance habitat quality decreased hiding cover and corridors for predators).

Revegetate roads that are removed or permanently closed with plant species beneficial to sage grouse.

Reseed disturbed areas under powerlines with forbs and grasses desirable to sage grouse.

Close and revegetate travel ways in sage grouse habitats that are not officially designated roads.

Suppress wildfires occurring in sage grouse habitat (specific areas will be identified on a map).

<p>Eliminate or modify things that facilitate predation on sage grouse by removing/modifying predator perch sites, this includes both natural and man-made (consider those that are in close proximity to leks).</p>
<p>Develop Best Management Practices (BMP's) to increase sage grouse populations and improve sage grouse habitat in the Gunnison Basin. BMP's would incorporate critical biological periods. Best Management Practices would include guidelines for:</p> <ul style="list-style-type: none"> - restoring and rehabilitating riparian areas, - grazing management, - management of land treatments, - road maintenance (including those associated with powerlines), - insecticide and herbicide use.
<p>Manage motorized and mechanized travel to minimize impacts to sage grouse and their habitat by changing existing travel management to prevent off road travel within sage grouse habitat.</p>
<p>Manage motorized and mechanized travel to minimize impacts to sage grouse and their habitat by allowing no new primary or secondary roads in sage grouse habitat.</p>
<p>Manage motorized and mechanized travel to minimize impacts to sage grouse and their habitat by allowing no upgrading of 2-track roads in sage grouse habitat.</p>
<p>Manage motorized and mechanized travel to minimize impacts to sage grouse and their habitat by using BMPs for road maintenance.</p>
<p>Manage motorized and mechanized travel to minimize impacts to sage grouse and their habitat by minimizing powerline access, road density, size, and use within sage grouse habitat.</p>
<p>Manage motorized and mechanized travel to minimize impacts to sage grouse and their habitat by determining appropriate design and maintenance levels for existing roads.</p>
<p>Improve sage grouse habitat quality and quantity by planting/reseeding with a high proportion of forbs.</p>
<p>Selectively brush beat stands of sagebrush to lower age classes to create an age mosaic to improve the quality and quantity of sage grouse habitat.</p>
<p>Improve the quality and quantity of sage grouse habitat by increasing residual herbaceous cover and height remaining in the spring.</p>
<p>Improve the quality and quantity of sage grouse habitat by providing incentives to improve and retain herbaceous residual cover.</p>
<p>Improve the quality and quantity of sage grouse habitat by enforcing USFS/BLM allotment plans and regulations and by revising and implementing DOW DAU plans.</p>
<p>Improve the quality and quantity of sage grouse habitat by managing impacts from other small mammals through increasing herbaceous cover and height.</p>
<p>Rehabilitate sage grouse winter habitat to improve its condition. Consider small treatment areas of <30 ac. on a 5-10 yr. rotation.</p>

Conservation Actions to Restore or Improve Habitat Quality

Remove or modify predator perches which occur in sage grouse winter habitat.

Stop or reduce "accelerated" erosion (sheet, rill, gully) in high priority sage grouse habitat by increasing vegetation cover as per habitat objectives in plan and to level needed to reduce erosion rates (tie to NRCS/BLM standards).

Reduce "accelerated" erosion (sheet, rill, gully) by implementing herbivore management and land treatments to increase vegetation cover in sage grouse habitat.

Rehabilitate roads and/or close in sage grouse habitat to reduce erosion (consider seasonal closures if meets objective).

Improve soil quality and aid retention of top soil to assure productive sage grouse habitat is available by implementing measures to increase vegetation cover as per habitat objectives in the plan.

Improve soil quality and aid retention of top soil to assure productive sage grouse habitat is available by increasing organic matter (plant productivity) in the soil nutrient cycle.

Improve the soil quality and aid retention of top soil to assure productive sage grouse habitat is available by increasing the amount of plant residue on the soil surface and through the use of residue enhancements (eg. chopping, plowing, etc.) to increase plant residues in "problem areas".

Improve soil quality and aid retention of top soil to assure productive sage grouse habitat is available by reseeding disturbed or "problem" areas as required and if feasible.

Use BMPs to design and manage future land treatments to improve or at least not degrade sage grouse habitat.

Use fire as a management tool by creating prescription(s) for fire application that will improve or at least not degrade sage grouse habitat.

Prohibit land treatments known to be negative for sage grouse.

Enhance nest success and early brood survival by improving habitat to minimize impacts that affect sage grouse during these critical biological periods.

Use Best Management Practices to promote growth of desirable plant species and manage noxious weed species that affect the quality of sage grouse habitat.

Enforce grazing regulations and land use plans to help achieve sage grouse objectives; ensure consistency of all policies, MOUs, monitoring and data collection by all parties.

Implement livestock grazing management practices to solve problems with season, frequency, intensity, and/or duration to meet Gunnison sage grouse plan objectives.

Adjust livestock management during drought to promote grass and forb and soil health within sage grouse habitat.

Manage livestock use on public and private lands to prevent loss and enhance the restoration of sage grouse habitat by using land treatments as a tool to facilitate livestock management and developing incentives to achieve sage grouse objectives, especially on private land.

<p>Manage livestock use on public and private lands to prevent loss and enhance the restoration of sage grouse habitat by incorporating sage grouse winter habitat objectives into management plans for livestock and adjust management when not compatible.</p>
<p>Manage big game habitat by managing big game herds so their grazing/browsing use does not result in less suitable sage grouse habitat. For example, manage for proper use levels by big game on shrubs and grass considering watershed and livestock needs and allow no more than moderate hedging on forage shrubs.</p>
<p>Manage big game habitat to meet sage grouse objectives by regulating big game herd size in areas of sage grouse habitat to allow plant recovery where vegetation communities within sage grouse habitat have been impacted.</p>
<p>Manage big game habitat to meet sage grouse objectives by adjusting big game management during drought to promote grass and forb and soil health within sage grouse habitat.</p>
<p>Manage big game habitat to meet sage grouse objectives by incorporating sage grouse winter habitat objectives into management plans for big game and adjust management when not compatible.</p>
<p>Manage big game use in land treatments to meet sage grouse objectives.</p>
<p>Manage big game habitat to meet sage grouse objectives by enforcing the existing Data Analysis Unit (DAU) Plan on public lands.</p>
<p>To minimize impacts on sage grouse, meet or exceed all applicable water, air, and noise standards throughout sage grouse habitat.</p>
<p>Herbicide use will be critically evaluated and use or selection will be limited to situations where habitat cannot be improved by other methods.</p>
<p>When herbicides are used to improve sage grouse habitat, use minimum rates to achieve sage grouse habitat improvement, limit treatment areas to the smallest size needed to achieve sage grouse habitat objectives, and allow no large scale application of herbicides (ex. no more than 100 acres per 1000 acres in a 5 year period).</p>
<p>Minimize the impact of insecticide use on sage grouse habitat.</p>
<p>Use alternate methods of mosquito control where feasible to minimize the impacts to sage grouse and their habitat.</p>

Conservation Actions to Reduce Physical Disturbance of Sage Grouse

Minimize data collection which negatively impacts sage grouse populations.

If appropriate, prevent negative research impacts and maximize positive effects by rotating leks that are studied.

Remove unused overhead utility lines that impact sage grouse.

Manage existing and new powerlines to remove impacts to sage grouse by setting line maintenance schedules to avoid disturbances during critical periods of use.

Reduce speed limits on secondary roads and highways within high use sage grouse areas.

Lessen the physical impacts motorcycles, mountain bikes, and OHVs have on sage grouse and their habitat.

Hunting of sage grouse would be managed so as not to negatively impact sage grouse populations.

Hunting would occur in 1997 only if more than 400 males are counted in the spring of 1997.

An initial 3 year moving average would be calculated using the spring counts (males counted) from 1995, 1996, and 1997.

Hunting would occur in 1998 only if the 3 year moving average from 1996, 1997, & 1998 was 5% higher than the initial 3 year average.

The 3 year moving averages calculated in 1999 and 2000 would also have to increase by 5% for hunting to occur in those years as well.

The entire hunting issue/action would be evaluated in the year 2001 to decide if hunting would continue.

If hunting did not occur in 1997 because less than 400 males were counted or stopped in subsequent years because a 5% increase in the 3 year moving average was not attained, hunting would not occur again until a minimum of 500 males was counted in the spring.

No hunting would occur if CDOW does not complete spring lek counts.

When hunting occurred the following would apply:

1. The bag and possession limit would be 2 and 4 respectively.
2. Hunting would begin on the second Saturday in September and run for 16 days.
3. A sage grouse permit system by zone would be developed.
4. Hunter surveys by mail, phone or other methods would be used in conjunction with wing barrel counts.

Adjust the hunting season if grouse are negatively impacted by drought.

Deter poaching of sage grouse by making the bag and possession limits the same.

Deter poaching of sage grouse by increasing law enforcement patrols.

Predator control, in areas where sage grouse are affected, should be site and species specific.

Prevent recreational bird watching from impacting sage grouse by selecting lek(s) appropriate for visitation.
Prevent recreational bird watching from impacting sage grouse by developing a protocol for lek visitation; time of arrival, departure; stay in vehicle; no pets, no food outside vehicle.
Prevent recreational bird watching from impacting sage grouse by giving citations to individuals disturbing sage grouse.
Mitigate conflicts by considering timing and intensity of uses during the critical biological periods, December through July, for sage grouse (eg. cattle trailing, hunting, OHV use, birdwatching).
Mimimize or eliminate uses which affect sage grouse by modifying existing management plans and including in new management plans, criteria that considers uses during critical biological periods, December through July (plans include: RUS, WAPA, Gun Club, AMPs, CRMPs, and others).
Regulate use of motorcycles, mountain bikes and OHVs to minimize impacts to sage grouse and their habitats.
Manage motorized and mechanized travel by closing areas of sage grouse use to OHVs, motorcycles, and mountain bikes seasonally (mud season) to minimize impacts to sage grouse and their habitat.
Consider permanent closure, or use of designated routes for motorized and mechanized travel in sage grouse use areas when impacts to sage grouse or their habitat are affected by these uses.
Manage or exclude motorized or mechanized winter travel to minimize impacts to sage grouse and their critical winter habitat.
Manage motorized and mechanized travel by imposing seasonal use restrictions and using designated routes to minimize impact to sage grouse and their habitat.
Manage motorized and mechanized travel to minimize impacts to sage grouse and their habitat by giving citations for harassing wildlife.
Manage recreational use within sage grouse habitat during drought to reduce impacts to sage grouse (eg. use of campfires and physical disturbance).
Improve the condition of sage grouse winter habitat by managing and controlling detrimental uses in these areas throughout the year.
Avoid disturbance which impairs the "acoustic component" of the breeding display by managing continuous noise sources within 1 mile of known lek sites, March 20th-May 15th from 4:30 a.m. to 8:00 a.m.

IMPLEMENTATION PLAN

Implementation of Conservation Actions - Phase I				
Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
Enhance existing riparian areas to benefit sage grouse production and chick survival by creating incentives for private landowners and developers so that riparian areas remain undeveloped, eg. encourage the State and County to develop tax use classifications.	COUNTY			
	NRCS			
	DOW			
	STOCKGROWERS			
	USFWS			
	HCCA			
	COUNTY			
Solicit the Board of County Commissioners to approve proposed changes to Land Use Resolution (Part 2: Design Guidelines) regarding sage grouse habitat needs. For example, encouraging conservation easements, mitigation on non-critical habitat areas, and preventing loss of critical habitat.	GROUPSE GROUP			
	DOW			
	HCCA			
Identify and map current nesting, brood-rearing, lek and winter sage grouse habitat.	BLM			
	FS			
	DOW			
	STOCKGROWERS			
	BLM			
Identify and map historical nesting, brood-rearing, lek and winter sage grouse habitat.	FS			
	DOW			
	STOCKGROWERS			
	BLM			

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
Identify and map high priority or critical nesting, brood-rearing, lek and winter sage grouse habitat.	BLM			
	FS			
	DOW			
	STOCKGROWERS			
Identify and map high priority or critical riparian areas in sage grouse habitat.	BLM			
	FS			
	DOW			
	STOCKGROWERS			
Identify and map potential impacts from roads to sage grouse or their habitat.	BLM			
	FS			
	DOW			
Identify and map potential impacts from utility line corridors, including powerlines to sage grouse or their habitat.	BLM			
	FS			
	DOW			
Identify and map potential impacts from noxious weeds to sage grouse or their habitat.	DOW			
	COUNTY WEEDS			
	BLM			
Identify and map potential impacts to sage grouse or their habitat resulting from livestock grazing management/range improvement conflicts.	FS			
	BLM			
	STOCKGROWERS			

Implementation of Conservation Actions - Phase I

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments	
Identify and map potential impacts to sage grouse or their habitat resulting from overlap with big game habitats.	DOW				
	STOCKGROWERS				
Identify and map potential impacts from existing land treatments to sage grouse or their habitat.	BLM				
	FS				
	NRCS				
	STOCKGROWERS				
Identify and map proposed land treatments that have the potential to impact sage grouse or their habitat.	BLM				
	FS				
	NRCS				
	STOCKGROWERS				
Identify and map heavily fragmented areas that impact sage grouse or their habitat.	BLM				
	FS				
	DOW				
Identify and map mosquito spraying areas in nesting/early brood-rearing sage grouse habitat.	DOW				
	COUNTY				
Provide maps to public land agencies, agencies involved with wildfire response, Colorado Division of Wildlife, Gunnison County, interest groups and landowners.	BLM				
	NRCS				
	FS				
	NPS				
	COUNTY				
	DOW				

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
Identify and prioritize sage grouse habitats to be improved (types and locations) based on their ability to respond and importance in meeting the plan objectives.	DOW			
	FS			
	BLM			
	NRCS			
Periodically review and update maps so they can be used to determine if activities are occurring in important sage grouse areas during critical biological periods.	BLM			
	NRCS			
	FS			
	NPS			
	COUNTY			
	DOW			
	STOCKGROWERS			
	GROUSE GROUP			
	COUNTY			
	HCCA			
GROUSE GROUP				
Develop and distribute information about the value/importance of sage grouse and sustainable use/maintenance of sagebrush habitats through the use of videos, information brochures, press releases, presentations, signs, field trips, open houses, etc:	I/E SUBGROUP			
	I/E SUBGROUP			
- On the use of conservation easements and their financial advantages. Focus distribution on private landowners.				

Implementation of Conservation Actions - Phase I

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
<ul style="list-style-type: none"> - On the availability of State, Federal and Non-government incentive programs to protect and improve riparian habitats. Focus distribution to private landowners. 	I/E SUBGROUP			
<ul style="list-style-type: none"> - On the importance of restoration/rehabilitation of sage grouse habitat (winter, leks, brood-rearing and nesting). Focus distribution to landowners and users. 	I/E SUBGROUP			
<ul style="list-style-type: none"> - On the use/impacts of roads to sage grouse (includes physical disturbance) and their habitats. Focus distribution to all users. 	I/E SUBGROUP			
<ul style="list-style-type: none"> - On the importance and implementation of BMPs, and their importance in proper management of natural resources. Focus distribution to all users and landowners. 	I/E SUBGROUP			
<ul style="list-style-type: none"> - On the impacts of water developments to sage grouse habitat (include pursuing avenues other than through augmentation plans). Target Colorado Division of Water Resources. 	I/E SUBGROUP			
<ul style="list-style-type: none"> - About Gunnison Sage Grouse and their habitat requirements and the effects of disturbance during critical biological periods. Focus on NPS, County Commission (Gunnison, Saguache, Hinsdale), homeowners, realtors, developers, mining operators, Army COE, recreational groups, private landowners, pesticide applicators. 	I/E SUBGROUP			
<ul style="list-style-type: none"> - A program which summarizes the key points of the Sage Grouse Conservation Plan. Focus presentation for County, County Commissioners. 	I/E SUBGROUP			
<ul style="list-style-type: none"> - Develop an Executive Summary and make copies of the Sage Grouse plan and the Summary available. 	I/E SUBGROUP			

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
<ul style="list-style-type: none"> - On effects of large scale projects in critical sage grouse habitat. Focus distribution to public. 	I/E SUBGROUP			
<ul style="list-style-type: none"> - On impacts of population growth in the Basin as they relate to sage grouse habitat (i.e., "smart growth"). Focus distribution to developers, County, Chamber of Commerce and public. 	I/E SUBGROUP			
<ul style="list-style-type: none"> - On the effects of land treatments on sage grouse habitat; information should importance of maintaining sage brush along riparian zones, negative effects of large scale land treatments and importance of maintaining fringe areas. Focus distribution to public, including all landowners. 	I/E SUBGROUP			
<ul style="list-style-type: none"> - On the detrimental (negative) effects of large scale wildfires in sage grouse habitat. Focus distribution to public, including all landowners. 	I/E SUBGROUP			
<ul style="list-style-type: none"> - On sage grouse hunting season with regulations being published annually. 	I/E SUBGROUP DOW			
<ul style="list-style-type: none"> - On current and future research needs and findings related to sage grouse, including how data collected from wings provides information on nest success, brood survival, and how this data will be used in the management and recovery of the species. 	I/E SUBGROUP DOW			
<ul style="list-style-type: none"> - On the unique status of sage grouse; enlisting hunter cooperation: use of signs to list penalties and, big game season impacts. Focus on sage grouse and big game hunters. 	I/E SUBGROUP DOW			
<ul style="list-style-type: none"> - On potential effects of domestic pets on sage grouse, especially during critical biological periods. Focus on all users and landowners. 	I/E SUBGROUP			

Implementation of Conservation Actions - Phase I

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
<ul style="list-style-type: none"> - Determine where educational material, protocol, site directions will be made available to the public. Focus on recreational bird watchers. 	I/E SUBGROUP			
<ul style="list-style-type: none"> - On impacts of Off Highway vehicles, motorcycle, mountain bike offsite and secondary effects of races on sage grouse and their habitat. Focus on event organizers. 	I/E SUBGROUP BLM FS			
<ul style="list-style-type: none"> - On effects of noxious weeds to sage grouse habitats. 	COUNTY WEEDS			
<ul style="list-style-type: none"> - On the benefits of proper livestock grazing, Allotment Management Plans, and grazing regulations on public land. Focus on permittees and the public. 	I/E SUBGROUP			
<ul style="list-style-type: none"> - On the importance of managing the season, frequency, intensity, and duration of livestock grazing. Focus on permittees and the public. 	I/E SUBGROUP			
<ul style="list-style-type: none"> - On big game populations and winter range carrying capacity and their influence on sage grouse habitat. Focus on public, CDOW and BLM, and other landowners. 	I/E SUBGROUP			
<ul style="list-style-type: none"> - On the effects of drought and sage grouse habitat. Focus on public. 	I/E SUBGROUP			
<ul style="list-style-type: none"> - Develop Best Management Practices (BMP's) to increase sage grouse populations and improve sage grouse habitat in the Gunnison Basin. BMP's would incorporate critical biological periods. Best Management Practices would include guidelines for: 	BMP SUBGROUPS			
<ul style="list-style-type: none"> •Restoring and rehabilitating riparian areas. 	BMP SUBGROUP			

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
<ul style="list-style-type: none"> Grazing management. BMP's would contain: <ul style="list-style-type: none"> a list of livestock grazing management practices that affect season, frequency, intensity, and duration of grazing in order to meet Gunnison sage grouse objectives; for example encourage use of linear pastures <80 acres, improving herding and rest-rotation, increasing size of allotments, etc. 	BMP SUBGROUP			
<ul style="list-style-type: none"> Management of land treatments. BMP's would: <ul style="list-style-type: none"> -discontinue and discourage large land treatments (spraying, chaining, burning, furrowing) in sage grouse habitat. For example prevent large fires > 160 ac. per section in sage grouse ranges, both natural and prescribed. -describe the configuration of future treatments; should be linear (long and narrow). -prevent loss of sagebrush structure in critical sage grouse winter range (height and canopy cover). -consider timing of treatments based on sage grouse needs. 	BMP SUBGROUP			
<ul style="list-style-type: none"> Road maintenance. This would include guidance for all roads including those associated with powerlines. 	BMP SUBGROUP			
<ul style="list-style-type: none"> Insecticide and herbicide use. <p>Improve the quality and quantity of sage grouse habitat by increasing residual herbaceous cover and height remaining in the spring.</p>	BMP SUBGROUP BLM FS NRCS STOCKGROWERS DOW			

Implementation of Conservation Actions - Phase 1

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
<p>Improve soil quality and aid retention of top soil to assure productive sage grouse habitat is available by implementing measures to increase vegetation cover as per habitat objectives in the plan.</p>	BLM			
	DOW			
	FS			
	NRCS			
	STOCKGROWERS			
	<p>Enhance nest success and early brood survival by improving habitat to minimize impacts that affect sage grouse during these critical biological periods.</p>	BLM		
FS				
NRCS				
STOCKGROWERS				
DOW				
<p>Outline the gaps in the grazing regulations and land use plans and make suggestions to appropriate agencies in to adequately address sage grouse objectives.</p>		SUBGROUP		
	USFWS			
	STOCKGROWERS			
	<p>Implement livestock grazing management practices to solve problems with season, frequency, intensity, and/or duration of grazing to meet Gunnison sage grouse plan objectives.</p>	BLM		
FS				
STOCKGROWERS				
NRCS				
<p>Manage existing overhead utility lines to remove impacts to sage grouse by identifying sections that negatively affect sage grouse currently within important sage grouse habitat.</p>	DOW			

Implementation of Conservation Actions - Phase

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
Manage motorized and mechanized travel to minimize impacts to sage grouse and their habitat by identifying and mapping areas of (travel) use, including roads open to OHVs, which may impact sage grouse habitat.	BLM			
	FS			
	DOW			

Implementation of Conservation Actions - Phase II

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
Enhance existing riparian to benefit sage grouse production and chick survival by restoring and rehabilitating riparian areas impacted or lost from water development, recreationists (trail use, camping, angling, etc.), powerlines, utility corridors, and/or roads through use of BMPs and other practices to benefit sage grouse survival.	BLM			
	FS			
	NRCS			
	NPS			
Create, enhance, protect riparian areas, especially small ephemeral wet areas within nesting habitat for early brood-rearing sites, to benefit sage grouse production and chick survival (eg. north and south of Blue Mesa).	BLM			
	NPS			
	NRCS			
	FS			
Encourage the County to offer incentives to developers who protect and enhance sage grouse habitat.	GROUSE GROUP			
	HCCA			
	DOW			
Encourage clustering, density credits, development right transfers, land exchanges, etc. to prevent the loss of sage grouse habitat.	COUNTY			
	HCCA			
Continue to gather or initiate the collection of data for evaluating and recording the response of vegetation and sage grouse response to treated areas.	DOW			
	BLM			
	FS			
Initiate research to find ways to raise money for open space and to mitigate impacts to sage grouse from growth (eg. lodging tax legislation, development fees, transferable development rights, grants).	SUBGROUP			
	HCCA			

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
Initiate research to investigate alternative treatments that minimize surface disturbance such as, selective seeding, fertilization, etc., to improve sage grouse habitat.	BLM			
	DOW			
	NRCS			
	FS			
Initiate research to determine whether fragmented sage grouse habitats can be effectively rehabilitated and improved.	BLM			
	DOW			
	FS			
	NPS			
Remove and realign roads where necessary in important sage grouse use areas, specifically in riparian areas, to reduce habitat loss, fragmentation, and enhance habitat quality.	BLM			
	FS			
Eliminate or modify things that facilitate predation on sage grouse by removing/modifying predator perch sites, this includes both natural and man-made (consider those that are in close proximity to leks).	BLM			
	FS			
	DOW			
	COUNTY			
Manage motorized and mechanized travel by closing areas of sage grouse use to OHVs, motorcycles, and mountain bikes seasonally (mud season) to minimize impacts to sage grouse and their habitat.	BLM			
	FS			
	NPS			
	COUNTY			

Implementation of Conservation Actions - Phase III

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
Manage or exclude motorized or mechanized winter travel to minimize impacts to sage grouse and their critical winter habitat.	BLM			
	FS			
	NPS			
Improve the quality and quantity of sage grouse habitat by managing impacts from other small mammals through increasing herbaceous cover and height.	BLM			
	FS			
	NRCS			
	STOCKGROWERS			
	DOW			
Stop or reduce "accelerated" erosion (sheet, rill, gully) in high priority sage grouse habitat by increasing vegetation cover as per habitat objectives in plan and to level needed to reduce erosion rates (tie to NRCS/BLM standards).	BLM			
	DOW			
	FS			
	NRCS			
	STOCKGROWERS			
Reduce "accelerated" erosion (sheet, rill, gully) by implementing herbivore management and land treatments to increase vegetation cover in sage grouse habitat.	BLM			
	DOW			
	FS			
	NRCS			
	STOCKGROWERS			

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
Use BMPs to design and manage future land treatments to improve or at least not degrade sage grouse habitat.	DOW			
	FS			
	BLM			
	NRCS			
	STOCKGROWERS			
Use fire as a management tool by creating prescription(s) for fire application that will improve or at least not degrade sage grouse habitat.	BLM			
	FS			
	NRCS			
	DOW			
Review grazing regulations and land use plans to determine how and if existing management prescriptions, guidance, and/or standard operating procedures address sage grouse objectives.	BLM			
	FS			
	USFWS			
	DOW			
Update existing USFS and BLM Allotment Management Plans (AMPs) to address sage grouse objectives and incorporate these objectives into any future AMPs.	BLM			
	FS			
	USFWS			
	STOCKGROWERS			
Manage livestock use on public and private lands to prevent loss and enhance the restoration of sage grouse habitat by using land treatments as a tool to facilitate livestock management and developing incentives to achieve sage grouse objectives, especially on private land.	SUBGROUP			

Implementation of Conservation Actions - Phase I

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
<p>Manage big game habitat to meet sage grouse objectives by managing big game herds so their grazing/browsing use does not result in less suitable sage grouse habitat. For example, manage for proper use levels by big game on shrubs and grass considering watershed and livestock needs and allow no more than moderate hedging on forage shrubs.</p>	DOW			
	BLM			
	FS			
<p>Manage big game habitat to meet sage grouse objectives by regulating big game herd size in areas of sage grouse habitat to allow plant recovery where vegetation communities within sage grouse habitat have been impacted.</p>	DOW			
	DOW			
	BLM			
	FS			
	NRCS			
	NPS			

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
Prevent habitat loss and fragmentation of sage grouse habitat by avoiding construction of reservoirs larger than 160 acres.	DOW USFWS			
Mitigate loss and fragmentation of sage grouse habitat resulting from the construction of Blue Mesa reservoir by preventing recreational facilities on the south side of the reservoir.	NPS COUNTY USFWS			
Mitigate loss and fragmentation of sage grouse habitat resulting from the construction of Blue Mesa reservoir by enhancing winter use sites north of the reservoir through powerline removal and recreation management.	BLM NPS DOW USFWS			
Mitigate loss and fragmentation of sage grouse habitat resulting from the construction of Blue Mesa reservoir by purchasing private in-holdings north and south of the reservoir.	BLM COUNTY DOW USFWS			
Mitigate loss and fragmentation of sage grouse habitat resulting from the construction of Blue Mesa reservoir by zoning the area around the reservoir to prevent subdivisions.	COUNTY			
Improve County/Agency interaction by requesting agencies to designate a sage grouse contact person to interface with County planning.	GROUSE GROUP			

Implementation of Conservation Actions - Phase III

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
Encourage the State Legislature to delegate the authority to regulate all subdivisions which occur in sage grouse habitat regardless of size to local authorities by circulating petitions to initiate State Legislature actions.	HCCA			
Encourage the State Legislature to delegate the authority to regulate all subdivisions which occur in sage grouse habitat regardless of size to local authorities by asking the State Legislature to create more stringent development restrictions for land in remote, undeveloped areas.	GROUSE GROUP			
Develop a list of incentive programs presently offered that could be used to prevent the loss of sage grouse habitat.	HCCA			
Develop a list of incentive programs presently offered that could be used to prevent the loss of sage grouse habitat.	NRCS			
	COUNTY			
	DOW			
Initiate research to project the impacts of doubling the human population on sage grouse numbers and habitat in Gunnison Basin. Seek assistance from the Environmental Science Department at WSC.	GROUSE GROUP			
Initiate research to include test plots for land treatments with and without grazing by domestic livestock and wildlife within sage grouse habitats.	WSC			
	HCCA			
	BLM			
	FS			
	DOW			
	NRCS			
Initiate research to determine whether big game constitute a physical disturbance to sage grouse and/or impact their habitat.	DOW			
	BLM			
	FS			
	NPS			

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
Prevent negative research impacts and maximize positive effects by evaluating past results of land treatments specific to the Gunnison Basin prior to implementing future land treatments.	BLM			
	NRCS			
	DOW			
	FS			
Use research data to modify existing management as it relates to sage grouse and their habitat (BMPs, drought indicators, predator impacts, key soil nutrients, etc.).	BLM			
	DOW			
	FS			
	NRCS			
Manage existing and new overhead utility lines to remove impacts to sage grouse by making them unsuitable for raptor perching in sage grouse habitat.	NPS			
	SUBGROUP			
Manage existing and new utility lines to remove impacts to sage grouse by using underground cable systems, where feasible in sage grouse habitat.	USFWS			
	USFWS			
	BLM			
	COUNTY			
Remove unused overhead utility lines that impact sage grouse.	FS			
	SUBGROUP			
	USFWS			

Implementation of Conservation Actions - Phase III

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments	
<p>Manage existing and new utility lines to remove impacts to sage grouse by compiling recommendations for overhead utility line modification, or construction of new utility lines in all sage grouse habitat (leks, nesting, brood-rearing, winter). Provide these recommendations to land management agencies and others that permit or design powerlines.</p>	SUBGROUP				
	USFWS				
<p>Revegetate roads that are removed or permanently closed with plant species beneficial to sage grouse.</p>	BLM				
	FS				
<p>Manage motorized and mechanized travel to minimize impacts to sage grouse and their habitat by participating and giving recommendations to FS/BLM travel management planning group.</p>	BLM				
	FS				
	NPS				
	COUNTY				
	HCCA				
	GROUSE GROUP				
	<p>Manage motorized and mechanized travel to minimize impacts to sage grouse and their habitat by changing existing travel management to prevent off road travel within sage grouse habitat.</p>	BLM			
FS					
NPS					
COUNTY					
<p>Regulate use of motorcycles, mountain bikes and OHVs to minimize impacts to sage grouse and their habitats.</p>	BLM				
	FS				
	NPS				
	COUNTY				

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
Consider permanent closure of motorized and mechanized travel in sage grouse use areas when impacts to sage grouse or their habitat are affected by these uses.	BLM			
	FS			
	NPS			
Manage motorized and mechanized travel by imposing seasonal use restrictions and using designated routes to minimize impact to sage grouse and their habitat.	BLM			
	FS			
	NPS			
Manage motorized and mechanized travel to minimize impacts to sage grouse and their habitat by developing standards for future roads to give to BLM, FS, County, Private, etc.	SUBGROUP			
Manage motorized and mechanized travel to minimize impacts to sage grouse and their habitat by using BMPs for road maintenance.	BLM			
	FS			
Improve sage grouse habitat quality and quantity by planting/reseeding with a high proportion of forbs.	BLM			
	FS			
	NRCS			
Improve soil quality and aid retention of top soil to assure productive sage grouse habitat is available by increasing organic matter (plant productivity) in the soil nutrient cycle.	BLM			
	DOW			
	FS			
	NRCS			
	STOCKGROWERS			

Implementation of Conservation Actions - Phase II

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
Improve soil quality and aid retention of top soil to assure productive sage grouse habitat is available by reseeding disturbed or "problem" areas as required and if feasible.	BLM			
	FS			
	NRCS			
Manage big game habitat to meet sage grouse objectives by adjusting big game management during drought to promote grass and forb and soil health within sage grouse habitat.	DOW			
	BLM			
	FS			
Manage big game use in land treatments to meet sage grouse objectives.	DOW			
	BLM			
	FS			

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
Enhance existing riparian areas to benefit sage grouse production and chick survival by providing information for Environmental Assessments on impacts from future utility corridors to riparian areas, through development of construction standards, reclamation guidelines and guidelines on the use of herbicides.	BLM			
	FS			
	COUNTY WEEDS			
	NPS			
Enhance existing riparian areas to benefit sage grouse production and chick survival by mitigating negative effects in riparian areas of existing utility corridors eg., enhance other riparian areas or sage grouse habitat, seed roads, etc.	BLM			
	FS			
	NRCS			
	USFWS			
Mitigate loss and fragmentation of sage grouse habitat from the construction of Blue Mesa reservoir by working with NPS to redesign recreation facilities on the north side of the reservoir.	DOW			
	USFWS			
Encourage the State Legislature to delegate the authority to regulate all subdivisions which occur in sage grouse habitat, regardless of size, to local authorities by sending letters of support to other groups or organizations that support local land use control regarding the effects of 35 acre developments on sage grouse.	HCCA			
	GROUSE GROUP			
Continue to gather or initiate the collection of data for evaluating the effectiveness of all herbicide treatments on sage grouse habitat objectives and potential environmental effects.	BLM			
	DOW			
	NRCS			

Implementation of Conservation Actions - Phase IV

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
Continue to gather or initiate the collection of data for pre-treatment monitoring and experimental controls for land treatments.	BLM DOW NRCS			
Initiate research to find methods, other than gathering hunting data, to determine annual sage grouse survival and reproduction.	DOW			
Initiate research to determine what elements are missing from soils (N,P,K, etc.) within sage grouse habitat.	BLM FS DOW NRCS			
Initiate research to determine the effects of spraying insecticide for mosquitos in sage grouse habitat.	DOW			
Initiate research to develop a better understanding of predator/prey interactions (coyotes vs. ground squirrels, raptors vs. sage grouse, crows/magpies vs. sage grouse young and/or eggs) and design a study to look at the relationship between predation and habitat quality as it relates to sage grouse and their habitat.	DOW BLM FS STOCKGROWERS			
Initiate research to monitor predator populations, the percentage of sage grouse in predators diets (coyotes and eagles), and determine the percentage of sage grouse egg predator (ground squirrels, weasels, etc.) in large predator diets.	DOW STOCKGROWERS			
Initiate research to determine what types of predator control are most effective for sage grouse predators.	DOW			

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
Determine procedures for providing comments (related to de-watering riparian areas and altering riparian habitat in sage grouse habitat) on augmentation plans, etc. submitted to the Division of Water Resources.	SUBGROUP			
Initiate research to determine ideal road density in sage grouse habitat.	BLM			
Evaluate fragmentation and identify techniques to reduce fragmentation in sage grouse habitat.	DOW			
	BLM			
	DOW			
	FS			
	NRCS			
Manage roads in sage grouse habitat to reduce habitat loss, fragmentation, and enhance habitat quality (decreased hiding cover and corridors for predators).	NPS			
	BLM			
	FS			
Reduce speed limits on secondary roads and highways within high use sage grouse areas.	COUNTY			
Close and revegetate travel ways in sage grouse habitats that are not officially designated roads.	BLM			
	FS			
Lessen the physical impacts motorcycles, mountain bikes, and OHVs have on sage grouse and their habitat.	BLM			
	FS			

Implementation of Conservation Actions - Phase IV

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
Coordinate the management of other protected species with habitat requirements of sage grouse, identify and coordinate opportunities with agencies, private landowners and non-government organizations to improve habitat.	BLM			
	FS			
	NRCS			
	NPS			
	DOW			
	USFWS			
	STOCKGROWERS			
	Prevent recreational bird watching from impacting sage grouse by developing a protocol for lek visitation; time of arrival, departure; stay in vehicle; no pets, no food outside vehicle.	DOW		
Manage motorized and mechanized travel to minimize impacts to sage grouse and their habitat by increasing enforcement of existing OHV regulations, including OHV registration.	BLM			
	FS			
	NPS			
	DOW			
Manage motorized and mechanized travel to minimize impacts to sage grouse and their habitat by minimizing powerline access, road density, size, and use within sage grouse habitat.	FS			
	BLM			
Manage motorized and mechanized travel to minimize impacts to sage grouse and their habitat by determining appropriate design and maintenance levels for existing roads.	FS			
	BLM			

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
Manage recreational use within sage grouse habitat during drought to reduce impacts to sage grouse (eg. use of campfires and physical disturbance).	BLM FS NPS			
Selectively brush beat stands of sagebrush to lower age classes to create an age mosaic to improve the quality and quantity of sage grouse habitat.	BLM FS NRCS			
Rehabilitate sage grouse winter habitat to improve its condition. Consider small treatment areas of <30 ac. on a 5-10 yr. rotation.	BLM FS			
Remove or modify predator perches which occur in sage grouse winter habitat.	BLM FS DOW STOCKGROWERS			
Rehabilitate roads and/or close in sage grouse habitat to reduce erosion (consider seasonal closures if meets objective).	BLM FS			
Improve the soil quality and aid retention of top soil to assure productive sage grouse habitat is available by increasing the amount of plant residue on the soil surface and through the use of residue enhancements (eg. chopping, plowing, etc.) to increase plant residues in "problem areas".	BLM DOW FS NRCS STOCKGROWERS			

Implementation of Conservation Actions - Phase IV

Conservation Actions	Responsible Party	Task Description	Cos/ Estimate (by task)	Comments
Manage existing land treatments with regard for sage grouse needs and plan objectives by evaluating treatments as they relate to sage grouse and determining appropriate management.	BLM			
	FS			
	NRCS			
	DOW			
Use Best Management Practices to promote growth of desirable plant species and manage noxious weed species that affect the quality of sage grouse habitat.	BLM			
	FS			
	DOW			
	NRCS			
	STOCKGROWERS			
	COUNTY WEEDS			
Manage noxious weed species by developing weed management mitigating measures for ground disturbing projects in sage grouse habitat.	SUBGROUP			
	COUNTY WEEDS			
Manage livestock use on public and private lands to prevent loss and enhance the restoration of sage grouse habitat by incorporating sage grouse winter habitat objectives into management plans for livestock and adjust management when not compatible.	BLM			
	FS			
	NRCS			
Manage big game habitat to meet sage grouse objectives by incorporating sage grouse winter habitat objectives into management plans for big game and adjust management when not compatible.	DOW			
	BLM			
	FS			

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments	
To minimize impacts on sage grouse, meet or exceed all applicable water, air, and noise standards throughout sage grouse habitat.	DOW				
	BLM				
	FS				
	STOCKGROWERS				
	NRCS				
	NPS				
	COUNTY				
	USFWS				
	FS				
	BLM				
Herbicide use will be critically evaluated and use or selection will be limited to situations where habitat cannot be improved by other methods.	NRCS				
	DOW				
	COUNTY				
	COUNTY				
	Minimize the impact of insecticide use on sage grouse habitat.	COUNTY			
		COUNTY			
	Use alternate methods of mosquito control where feasible to minimize the impacts to sage grouse and their habitat.	COUNTY			
		COUNTY			

Implementation of Conservation Actions - Phase V

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
Initiate research projects to develop a form to solicit information on sage grouse observations from visitors (recreational birdwatchers).	BLM			
Initiate research to determine magnesium chloride impacts on roads in sage grouse habitat.	DOW			
Support 1872 Mining Law revisions to provide more local control to reduce potential impacts to sage grouse habitat.	DOW			
Support 1872 Mining Law revisions to provide more local control to reduce potential impacts to sage grouse habitat.	HCCA			
Recommend to the State Legislature increased penalties for poaching sage grouse.	DOW			
Deter poaching of sage grouse by making the bag and possession limits the same.	DOW			
Deter poaching of sage grouse by increasing law enforcement patrols.	DOW			
Advocate no use of poison (too many non-specific species affected) to control predators in areas where they affect sage grouse in the Gunnison Basin.	GROUSE GROUP			
Prevent recreational bird watching from impacting sage grouse by determining if lek visitation is impacting sage grouse.	DOW			
Manage motorized and mechanized travel to minimize impacts to sage grouse and their habitat by posting signs to describe access restrictions in sage grouse habitat.	BLM			
	FS			
	NPS			
DOW will manage motorized and mechanized travel on State Lands in conjunction with lessees to minimize impacts to sage grouse and their habitat.	DOW			

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
Improve the quality and quantity of sage grouse habitat by providing incentives to improve and retain herbaceous residual cover.	NRCS			

Conservation Actions for Continual Implementation

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
Enhance existing riparian areas to benefit sage grouse production and chick survival by maintaining and protecting buffers along riparian areas and around hay meadows and grazed pastures; maintain fences between hay meadows/pastures and riparian areas.	BLM			
	FS			
	NRCS			
	DOW			
	STOCKGROWERS			
	USFWS			
	DOW			
Provide sage grouse habitat maps and recommendations on revisions to the Gunnison County Land Use Resolution (Part 2: Design Guidelines).	GROUSE GROUP			
	COUNTY			
	BLM			
	NRCS			
	DOW			
Continue to gather or initiate the collection of data for evaluating chemical test plots over sufficient time to accurately determine effects of chemical treatment.	HCCA			
	BLM			
	FS			
	DOW			
	NRCS			
Continue to gather or initiate the collection of data for determining drought conditions using standardized precipitation index and Palmer Drought Index.	DOW			
	BLM			
Continue to gather or initiate the collection of data for determining the effects of the UMTRA project on sage grouse lek and brooding areas.				

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments	
Gather or initiate the collection of data for continued improvement of modeling techniques for estimating big game populations using data such as herd counts, forage utilization, growing conditions (Palmer Drought Index or standardized precipitation index) to determine desired herd size by DAU & necessary harvest or other mgt. needs.	DOW				
	BLM				
	FS				
Minimize data collection which negatively impacts sage grouse populations.	DOW				
Prevent negative research impacts and maximize positive effects by managing scientific studies of sage grouse; screening research proposals; educating researchers about sage grouse and their habitats; reviewing capture techniques, methods and number of birds needed for study; and maximizing information gathered within studies.	DOW				
If appropriate, prevent negative research impacts and maximize positive effects by rotating leks that are studied.	DOW				
Prevent negative research impacts and maximize positive effects by coordinating all research and monitoring projects involving sage grouse and their habitat with interested and affected parties, including landowners. This will provide consistency in data collection procedures, methodologies, analysis and evaluation.	DOW				
Prevent negative research impacts and maximize positive effects by encouraging a small-scale experimental approach to land treatments in sage grouse habitat.	BLM				
	DOW				
	NRCS				
	FS				

Conservation Actions for Continual Implementation

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
Require adequate bonds to ensure clean operation and adequate reclamation of large and small mining operations in sage grouse habitats.	BLM			
	FS			
	COUNTY			
Improve management of large and small mining operations occurring in sage grouse habitat by ensuring adequate mitigation measures are in mining plans for operations over 5 acres.	BLM			
	FS			
	COUNTY			
Improve management of large and small mining operations occurring in sage grouse habitat by providing input to the State regarding appropriate bonds for small operations.	BLM			
	FS			
	GROUSE GROUP			
	HCCA			
Ensure the current UMTRA mitigation plan is fully implemented.	BLM			
	DOW			
	USFWS			
	FS			
	BLM			
	COUNTY			

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
Locate new powerlines away from important sage grouse habitat to minimize their impacts to sage grouse.	USFWS			
	FS			
	BLM			
	COUNTY			
Concentrate utilities in existing corridors rather than creating new ones when impacts to sage grouse and habitat could be minimized by these actions.	USFWS			
	FS			
	BLM			
	COUNTY			
Avoid actions which would result in fragmentation of important sage grouse habitat when locating new powerlines.	USFWS			
	FS			
	BLM			
	COUNTY			
Locate new powerlines and access roads away from riparian areas if impacts to sage grouse are evident. Where water crossings are unavoidable, design crossings to prevent riparian damage.	USFWS			
	FS			
	BLM			
	COUNTY			
Reseed disturbed areas under powerlines with forbs and grasses desirable to sage grouse.	BLM			
	FS			
Suppress wildfires occurring in sage grouse habitat (specific areas will be identified on a map).	BLM			
	FS			
	COUNTY			

Conservation Actions for Continual Implementation

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
Hunting would occur in 1997 only if more than 400 males are counted in the spring of 1997.	DOW			
An initial 3 year moving average would be calculated using the spring counts (males counted) from 1995, 1996, and 1997.	DOW			
Hunting would occur in 1998 only if the 3 year moving average from 1996, 1997, & 1998 was 5% higher than the initial 3 year average.	DOW			
The 3 year moving averages calculated in 1999 and 2000 would also have to increase by 5% for hunting to occur in those years as well.	DOW			
The entire hunting issue/action would be evaluated in the year 2001 to decide if hunting would continue.	DOW			
If hunting did not occur in 1997 because less than 400 males were counted or stopped in subsequent years because a 5% increase in the 3 year moving average was not attained, hunting would not occur again until a minimum of 500 males was counted in the spring.	DOW			
No hunting would occur if CDOW does not complete spring lek counts.	DOW			

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
<p>When hunting occurred the following would apply:</p> <ol style="list-style-type: none"> 1.The bag and possession limit would be 2 and 4 respectively. 2.Hunting would begin on the second Saturday in September and run for 16 days. 3.A sage grouse permit system by zone would be developed. 4.Hunter surveys by mail, phone or other methods would be used in conjunction with wing barrel counts. 	DOW			
Adjust the hunting season if sage grouse are negatively impacted by drought.	DOW			
Predator control, in areas where sage grouse are affected, should be site and species specific.	BLM			
	DOW			
	FS			
	STOCKGROWERS			
Eliminate or modify things that facilitate predation by ensuring that sage grouse management is a priority consideration in management plans (both present and future) for all other protected species. Plans should consider effects to sage grouse populations before introductions of other protected species - ie., wolf, and provide mitigation to sage grouse.	BLM			
	FS			
	NRCS			
	NPS			
	DOW			
Prevent recreational bird watching from impacting sage grouse by selecting lek(s) appropriate for visitation.	DOW			
Prevent recreational bird watching from impacting sage grouse by giving citations to individuals disturbing sage grouse.	DOW			

Conservation Actions for Continual Implementation

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
Mitigate conflicts by considering timing and intensity of uses during the critical biological periods, December through July, for sage grouse (eg. cattle trailing, hunting, OHV use, birdwatching).	BLM			
	DOW			
	FS			
	STOCKGROWERS			
	COUNTY			
	USFWS			
Minimize or eliminate uses which affect sage grouse by modifying existing management plans and including in new management plans, criteria that considers uses during critical biological periods, December through July (plans include: RUS, WAPA, Gun Club, AMPs, CRMPS, and others).	BLM			
	FS			
	NPS			
	COUNTY			
Manage motorized and mechanized travel to minimize impacts to sage grouse and their habitat by allowing no new primary or secondary roads in sage grouse habitat.	BLM			
	FS			
	NPS			
	COUNTY			
Manage motorized and mechanized travel to minimize impacts to sage grouse and their habitat by allowing no upgrading of 2-track roads in sage grouse habitat.	BLM			
	FS			
	NPS			
Plan or permit organized events to avoid impacting sage grouse habitat.	BLM			
	FS			
	NPS			

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
Manage motorized and mechanized travel to minimize impacts to sage grouse and their habitat by giving citations for harassing wildlife.	DOW			
Improve the quality and quantity of sage grouse habitat by enforcing USFS/BLM allotment plans and regulations and by revising and implementing DOW DAU plans.	BLM FS DOW			
Improve the condition of sage grouse winter habitat by managing and controlling detrimental uses in these areas throughout the year.	BLM FS NPS DOW			
Preserve sage grouse critical winter habitat - no net loss.	BLM FS COUNTY DOW STOCKGROWERS			
Design and manage future land treatments to improve or at least not degrade sage grouse habitat by establishing the desired future condition prior to administering any land treatment.	BLM FS NRCS STOCKGROWERS DOW			
Prohibit land treatments known to be negative for sage grouse.	GROUSE GROUP			

Conservation Actions for Continual Implementation

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments	
Improve sage grouse habitat by using integrated weed management practices to manage noxious weeds.	COUNTY WEEDS				
	BLM				
	STOCKGROWERS				
	FS				
	NPS				
	NRCS				
	Manage noxious weed species by discouraging land uses that promote weed growth and propagation in sage grouse habitat.	COUNTY			
NRCS					
COUNTY WEEDS					
Acquire additional funding for noxious weed management where invasions affect the quality of sage grouse habitat.		BLM			
	FS				
	NRCS				
	COUNTY				
	COUNTY WEEDS				
	Enforce grazing regulations and land use plans to help achieve sage grouse objectives; ensure consistency of all policies, MOUs, monitoring and data collection by all parties.	BLM			
		FS			
Adjust livestock management during drought to promote grass and forb and soil health within sage grouse habitat.	BLM				
	FS				
	STOCKGROWERS				

Conservation Actions for Contingent Implementation

Conservation Actions	Responsible Party	Task Description	Cost/ Estimate (by task)	Comments
Manage big game habitat to meet sage grouse objectives by enforcing the existing Data Analysis Unit (DAU) plan on public lands.	BLM			
	FS			
	DOW			
	STOCKGROWERS			
Avoid disturbance which impairs the "acoustic component" of the breeding display by managing continuous noise sources within 1 mile of known lek sites, March 20th-May 15th from 4:30 a.m. to 8:00 a.m.	BLM			
	FS			
	COUNTY			
	STOCKGROWERS			
	NPS			
	USFWS			
When herbicides are used to improve sage grouse habitat, use minimum rates to achieve sage grouse habitat improvement, limit treatment areas to the smallest size needed to achieve sage grouse habitat objectives, and allow no large scale application of herbicides (ex. no more than 100 acres per 1000 acres in a 5 year period).	BLM			
	NRCS			
	FS			
	DOW			

Note: The actual format of Appendix F might change slightly as implementation of the Sage Grouse Plan proceeds.

