GUNNISON SAGE GROUSE

CONSERVATION PLAN

CRAWFORD AREA - COLORADO

July 22, 1998

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Signature page

By signing, the following parties have agreed to implement the Crawford Area Gunnison Sage Grouse Conservation Plan to the best of their organization's ability.

John Barcus — July 31 - 1998

Black Canyon Audubon Society
John Barcus, Representative

7/31/98

Colorado Department of Natural Resources
Colorado Division of Wildlife
Jim Young, Area Wildlife Manager

7/31/98

Consolidated Woolgrowers Association
Joe Sperry, President

Darold Hawk — 10/23/98

Delta County Livestock Association
Darold Hawk, President

10-15-98

Delta County Commissioner
Ted Hayden

10/07/98

Montrose County Commissioner
Dave Gann

7/31/98

USDA, Natural Resource Conservation Service
Tom Jones, Soil Conservationist

7/31/98

USDI, Bureau of Land Management
Allan Belt, Area Manager, Uncompahgre Basin Resource Area

LeRoy W Carlson — 7-31-98

USDI, Fish and Wildlife Service
LeRoy Carlson, Colorado Field Supervisor — Date

Dave Robert — 7-31-98

USDI, National Park Service
Black Canyon of the Gunnison National Monument and
Curecanti National Recreation Area
Sheridan Steele, Superintendent — Date

Thomas L. Ware — 7-31-98

Members of the Public — Date

Hank LeValley

Janet Allen

Geraldine M. Ware

Mark LeValley

Kay L. Kontour, Div. of Parks

PREAMBLE

Sage grouse are restricted to sagebrush rangelands in western North America and occur nowhere else in the world. Their distribution and abundance have markedly decreased and the species has been extirpated from at least three states and one province, and their 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, the Gunnison sage grouse. This newly described species has a limited distribution (Map 1), a relatively small population size, and may become a candidate for federal listing as threatened or endangered. Five listing factors (Appendix D) are considered by the U.S. Fish and Wildlife Service (USFWS) in evaluating possible action under the Endangered Species Act.

Gunnison sage grouse are known to occur in 9 highly fragmented populations in scattered localities in southwest Colorado and southeast Utah. The largest area of contiguous distribution and, consequently, population size of this new species is in the Gunnison Basin. One of these populations is no longer viable (Sims Mesa, < 10 birds), another (Poncha Pass) is the result of a transplant, two others, Dove Creek and Monticello are undoubtedly linked (2 states), while one(Cimarron) is marginal (< 50 birds). The population at Glade Park/Pinion Mesa is estimated to be 75 - 100 birds. The Crawford population, while small (< 225 birds), has increased since 1994 and probably has a relationship with the larger population in the Gunnison Basin.

Conservation plans provide unique opportunities for partnerships involving resource agencies, private groups, and individual landowners to work jointly for more effective conservation of candidate species, and land management. Presently conservation plans are being developed for Gunnison sage grouse populations at Crawford (this plan), Dove Creek, Dry Creek Basin/Miramonte, Glade Park/Pinon Mesa, and Poncha Pass. The conservation plan for the Gunnison Basin is complete (1997) and is being implemented. The goal is to have conservation plans for each of the populations that are believed to be viable. Hunting is presently allowed under tight restrictions only in the Gunnison Basin with none of the other populations being hunted nor considered for future hunting opportunities.

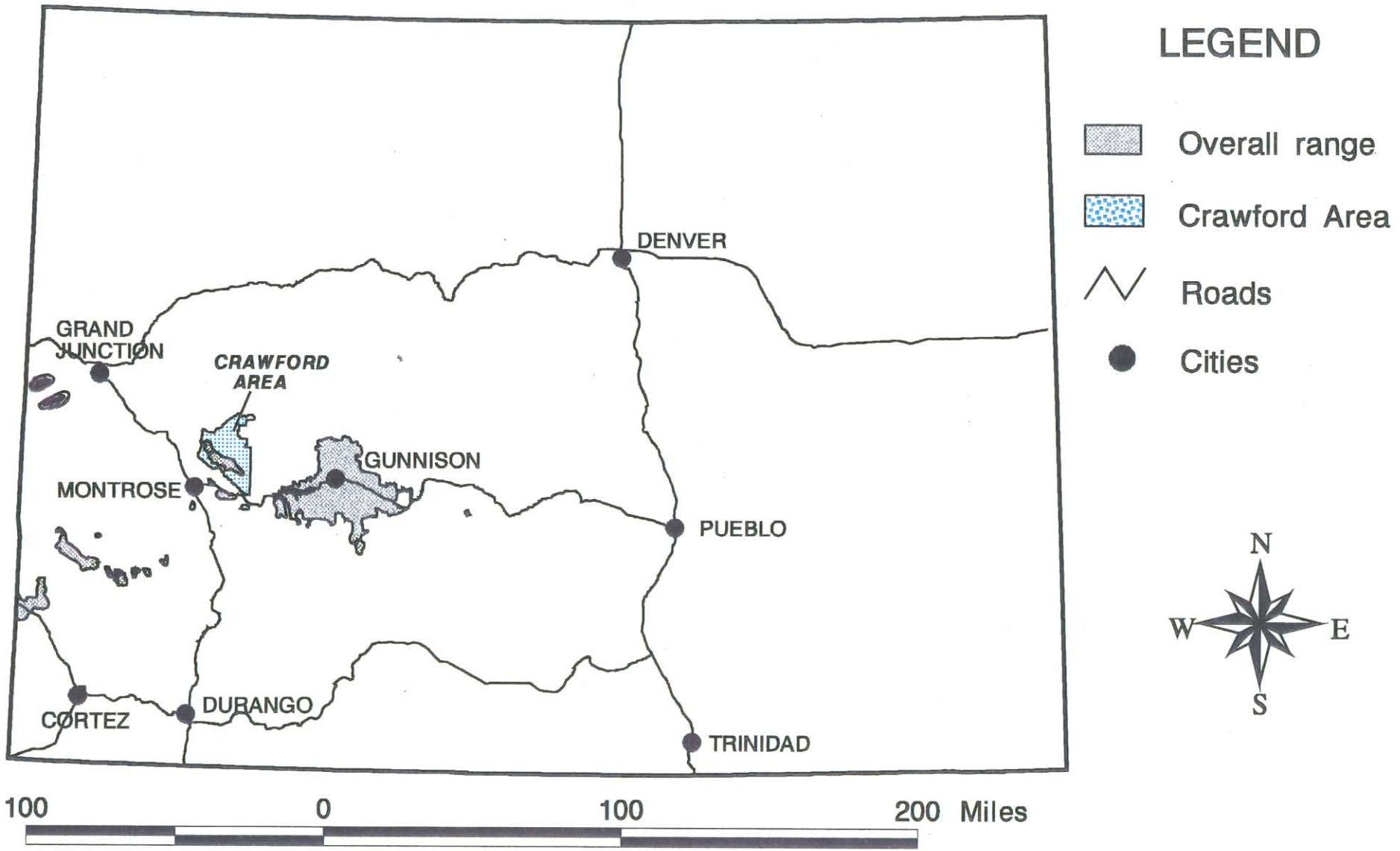
This Conservation Plan, for the Crawford population of Gunnison sage grouse, addresses the five USFWS listing factors, and describes and sets forth a strategy for long-term management of the Gunnison sage grouse in concert with other resource values and land uses at a landscape scale. It is the intent of the Crawford Sage Grouse Partnership to frequently communicate with other Gunnison Sage Grouse Work Groups to seek and exchange information as progress is made on implementing the Conservation Actions. Also, participation by private landowners in this Conservation Plan will be strictly on a volunteer basis.

TABLE OF CONTENTS

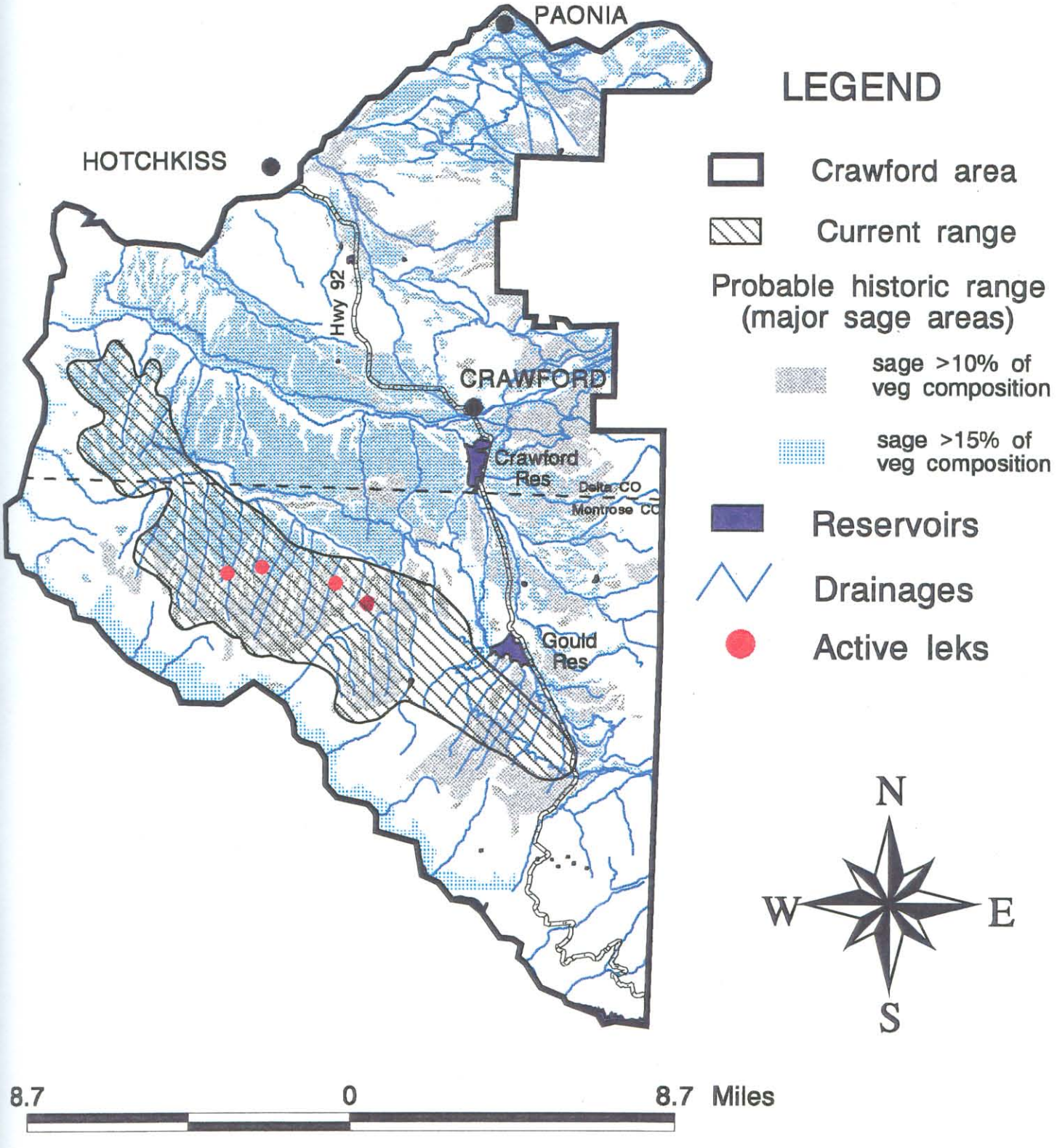
LIST OF FIGURES AND TABLES

APPENDICES

Map 1. Overall range of Gunnison sage grouse in Colorado.



Map 2. Crawford area Gunnison sage grouse current and probable historic range.



I. INTRODUCTION

The Gunnison sage grouse is endemic to the Crawford area. Although there is no quantified long term population information available, it is generally believed by the Division of Wildlife and long time residents of the area that sage grouse numbers have declined substantially.

In 1995, to address rising concerns about the long term status of sage grouse in the Crawford area the Colorado Division of Wildlife (CDOW), Bureau of Land Management (BLM), Uncompahgre Basin Resource Area, local landowners, and interested individuals and groups formed the Crawford sage grouse partnership (the Partnership).

The goal of this Partnership is to address concerns about the declining trend of sage grouse numbers, the long term security of this species, maintaining other resource values and uses in this area, and the state of health of the natural system.

Other important resource values and uses that occur in this area are: 1) it is a major wintering area for both elk and mule deer; 2) livestock grazing, both cattle and sheep is traditional; 3) and recreational use is fairly high due to its proximity to the Gunnison Gorge Recreation Area along the Gunnison River and the presence of the Black Canyon of the Gunnison National Monument.

II. THE PLAN AND ITS PURPOSE

This Conservation Plan establishes a process and puts in place a framework that will guide a coordinated management effort at a landscape scale directed at improving sage grouse habitat and reversing the long term trend of declining numbers, while continuing to optimize management for the other resources. Central to this process is citizen, community, and agency involvement in determining appropriate management activities designed to meet jointly developed goals and objectives.

The plan is designed to be dynamic and flexible, allowing new information and issues, as well as results from previous conservation efforts to be incorporated. It is also designed to answer questions and collect data necessary for future resource management decision making.

A. GUIDING PRINCIPLES

This process is designed to guide sage grouse and other resource management efforts, particularly developing goals, objectives, and the selection of conservation actions and the way in which they are implemented across jurisdictional/ownership boundaries. They are:

1. Promote public involvement in planning and decision making.

2. Maintain an atmosphere of cooperation and participation among land managers, private land owners, and other stakeholders.

3. Implement conservation actions in ways that meets the needs of sage grouse and other resources, and are least disruptive to, and encourages the development of a stable and diverse economic base in the North Fork (Crawford) area.

4. Respect individual views and values and implement conservation actions on a collaborative basis in ways that have broad community support.

5. Make every effort among partners to seek efficiency and integration of efforts, and to select conservation actions that also promote other land health or resource management objectives whenever possible, especially among agencies in the implementation of conservation actions.

III. SPECIES DESCRIPTION, DISTRIBUTION, AND POPULATION MONITORING

A. DESCRIPTION

Sage grouse are large (2.4-7.2 lbs) brown/gray chicken-like birds with conspicuous black (belly, underthroat) and white markings (breast of males, undertail converts). They are brown gray above barred with black, with rounded brown wings with some black barring. Males during the breeding season (Mar-May) have conspicuous neck plumes, white upper breast with yellow-green air sacs and 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 3.5 to 7.2 pounds, while females weigh from 2.4 to 4.0 pounds.

Gunnison sage grouse, in southwestern Colorado, differ from sage grouse found in northern Colorado in size (males are 3.5 to 5.0 lbs, vs. 5.5 to 7.2 lbs in northern Colorado; females are 2.4 to 3.1 lbs vs 3.3 to 4.0 lbs in northern Colorado), bill shape and size, and tail patterns (larger, more distinct white barring of tail feathers). Also, the difference in behavior and calls between the Gunnison and large-bodied sage grouse in Northern Colorado are striking.

B. DISTRIBUTION

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 3rd 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 having a markedly narrow (one) range of genetic haplotypes. The present distribution of the Gunnison sage grouse is south of the Colorado-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 (Map 1).

C. POPULATION MONITORING

Counts of male prairie grouse on leks provide managers with an estimate of minimum population size. Studies across western North America indicate there are about 2 females for each male in the spring population. Thus, if the number of males is known it is possible to calculate a minimum population size. It is important to recognize that a count will never represent all males in the population and that any calculated population estimate will be lower than the actual population size.

Area and District personnel of the CDOW were requested, starting in the 1950's, to document sage grouse presence and general trend within specific areas of western Colorado. Thus, locations of active leks and counts of males on leks were recorded. Generally, only accessible leks were counted and intensive searches for new or relocated leks were not made because of manpower and equipment priorities. Searches and counts were sporadic as firm procedures were not in place. Counts of male sage grouse on leks at Crawford were initiated in 1978 under existing protocols (3 counts/spring). These counts were constant from 1983 through 1993 and were intensified (4 counts spaced at 7-10 day intervals) in 1997.

IV. THE CRAWFORD AREA ENVIRONMENT

The Crawford area ranges in elevation from 5084 feet at the Gunnison River and North Fork confluence to 9020 feet near Cathedral Peak on the east side. It is semi-arid with a mean annual precipitation of 14 inches at Fruitland Mesa. Approximately 50% of the annual precipitation occurs as winter snowfall. Winters are mild with mean temperatures between 25 to 40 degrees F from January through March. The Crawford area is characterized by diverse topography which includes rolling uplands cut by steep, rocky drainages grading down to gently sloping adobe flats and hayfields. Saltbush and wheatgrass dominate the adobes, pinyon-juniper woodland covers the slopes and rocky canyons, while mountain big sagebrush and black sage are the dominant species on mid-elevation uplands. As elevation increases, mountain shrubs form an increasing percentage of the vegetation and sagebrush declines.

A. CRAWFORD AREA BOUNDARY

The Partnership considered possible boundaries for the Gunnison sage grouse population that historically and presently use the general area north of the Gunnison River in Montrose and Delta counties. Delineation of a boundary was based on known historic use sites and sage grouse observations, as well as the present potential of remaining sagebrush-dominated habitats. Substantial areas with rural dwellings and town sites as well as agricultural developments, especially orchards, are included within the boundary. While this was necessary to include all areas with potential for habitat development to benefit an expanded Gunnison sage grouse population, no inferences on future changes in present land uses are inferred by the boundary delineated. Participation in this plan on the part of landowners is strictly voluntary.

The Crawford Area boundary (Map 2) follows the Gunnison River on the west from its confluence with the North Fork, south and southeast to the Gunnison/Montrose County line and then north along the Gunnison County line to the 3rd Standard Parallel at the Gunnison National Forest Boundary and then west and north following the Gunnison National Forest Boundary to Minnesota Creek and then west along Minnesota Creek to the North Fork and southwest along the North Fork until it joins with the Gunnison River.

B. SAGE GROUSE POPULATION AND HABITAT STATUS/DISTRIBUTION

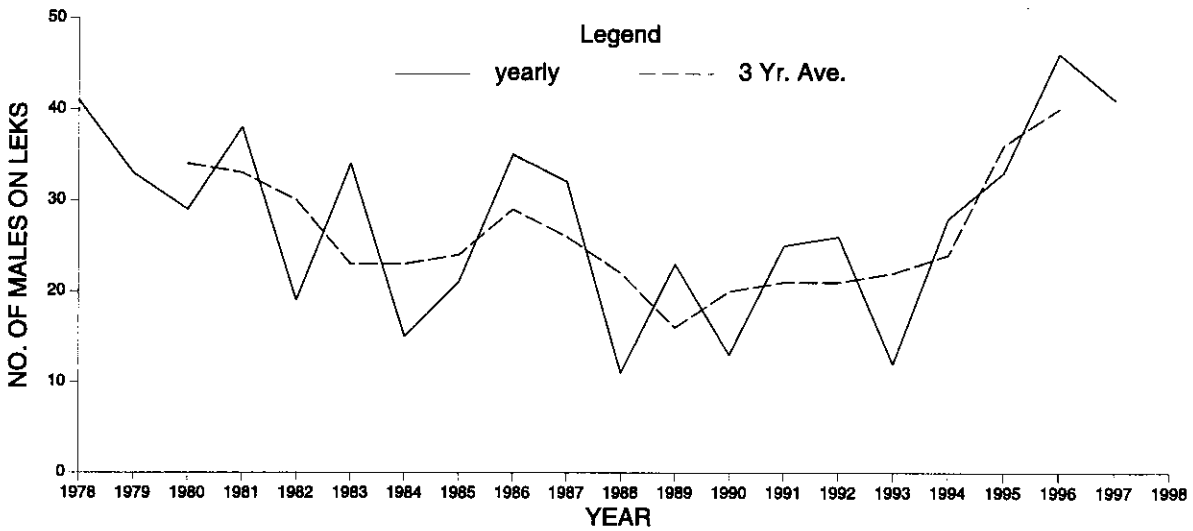
Population Status: Sage grouse lek counts have been conducted in the Crawford area since 1978. Figure 1 shows the Crawford area population trend based on these lek counts, 1978-97.

The present (1996-97) size of the breeding population of sage grouse in the Crawford Area is estimated between 129 and 228 birds based on 45 and 41 males counted on 3 active leks in 1996 and 1997, respectively (2-year average = 43 males). This range is based on knowledge that there are about 2 hens/males in the spring population (43 males+ 86 hens = 129). Thus, there were at least 129 sage grouse in the Crawford Area in 1996 and 1997. However, this estimate may be 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 may not be known. Given the terrain and early spring access in this area, it is probable that not all active lek areas were known and were counted in 1996 and 1997. If we assume that locations of 90% of all leks were known, there could be 1 unknown active lek (if 3 active leks = 90%, then 3÷0.90 = 3.3 active leks would constitute 100% of all active leks). To reach an upper estimate of population size, the 3.3 calculated active leks was rounded to 4.

Given a total of 43 males counted on 3 active known leks, there would be 57 males on 4 active leks (43÷3 = 14.3 males/active known lek x 4 assumed leks, 4x14.3 = 57.2 rounded to 57). Further, given that not all males associated with a lek are counted on one count day, it is reasonable to assume the actual number, based on data from radio-marked males, lies between 50 and 100%. Assuming this percentage to be 75, there would be 76 males (57 males [on 4 possible leks] ÷ 0.75 present during the

high count = 76). Thus, if there are 2 hens/male in the spring population, the upper estimate for the population would be 228 (76 males + 152 hens = 228).

FIGURE 1. CRAWFORD AREA SAGE GROUSE POPULATION TREND



There are problems with both lower and upper estimates as sex ratios may be closer to 1:1 in unhunted populations and all active lek sites may be known and counted. However, it is probable that the true population number lies within the range calculated.

The spring population size of sage grouse in the Crawford area has been higher in the recent past even though adequate count data are not available. In 1978-81, 1 to 2 leks were known to be active with 29 to 41 total males (14-31 males/lek). If the average number of males per lek was 20 and there were at least 4 active leks, there would have been at least 80 males and 160 hens for a total of 240 breeding birds. With a 75% correction factor for males not seen (80 ÷ 0.75 = 106.6 males[107] + 214 hens = 321, there should have been at least 321 birds in the spring population in 1978-81.

Habitat status: It is believed that the decline in the Crawford area sage grouse numbers reflects a larger decline in the health of the natural landscape in this area. Past management activities including fire suppression and selective livestock grazing appear to have created conditions suitable for establishment of young pinon and juniper trees which are slowly encroaching into sagebrush areas on the landscape, as well as creating decadent, dense shrub growth. Assessment of the potential natural disturbances in the area indicates that the plant communities and grouse evolved under a system of fairly frequent, low intensity fire and primarily dormant season grazing and browsing by native ungulates. This would have led to a highly patchy landscape with many different age groups of vegetation and high levels of herbaceous growth and groundcover. Sage grouse habitat objectives represent small steps back toward this more functional landscape pattern, and are compatible with a move toward greater landscape health, as well as existing management objectives such as those found in the BLM's Resource Management Plan (RMP).

Specific habitat problems identified by the Partnership are: 1) fragmentation of habitat components, i.e., too much distance between nesting and brooding areas, and wet areas; 2) invasion of pinyon and juniper into the sagebrush areas throughout most of the area; 3) not enough grass and forbs in the sagebrush understory; 4) low vegetative age class diversity throughout the area (a homogeneous old age stand exists); 5) low vegetative vigor; 6) poor vegetative conditions on leks (too much vegetation > 8" high) and, 7) a short supply of wet areas and water sites.

Population and Habitat Distribution: It is believed that historically Gunnison sage grouse occurred in all suitable sagebrush habitat in the Crawford area. Thus, based on the existing location of sagebrush, suitable soil types that may have supported sagebrush in the past, and the knowledge of present sage grouse use areas, the probable historic and present distribution of sage grouse is shown on Map 2.

Currently the primary sage grouse use area is along C-77 road west of Poison Spring Gulch to Green Mountain, and between the Black Canyon of the Gunnison River on the south and Red Canyon on the north. Elevation of this area ranges between 6560 - 8200 feet. All known, active leks are on BLM land within this area, spaced fairly evenly for about 7 miles west from the Black Canyon Road. All leks are located 1/4 mile of the road on the north side. Most of the sage grouse activity, strutting, breeding, nesting, and wintering occurs within the first four miles of this area west of the Black Canyon road. This strip is the largest contiguous sagebrush dominated site within the Crawford area.. Vegetation in this strip blends from sagebrush in the middle along C-77 road to invading pinyon and juniper on the north edge at lower elevations near Red Canyon, and to mountain shrubs on the south edge at higher elevations toward the Black Canyon.

Sage grouse use is also known to occur outside this area, as far east as Hwy. 92 south of Gould Reservoir to the southeast, and on Black Ridge to the northwest. Also, sage grouse sightings have been reported recently in other locations within the Crawford and North Fork Valley, however, there is no evidence of long-term occupation.

In 1945 the State Warden's report did not report sage grouse occurrence in the Crawford area, which may have been from the lack of knowledge. In 1961 Glenn Rogers, in his publication "Sage Grouse Investigations in Colorado," did not mention or include any data about leks in the Crawford area. However, he did recognize that sage grouse were present. He estimated there were less than 10 birds per square mile.

Lek counts were first conducted in this area in 1978, and have continued annually since. The number of leks has fluctuated between 3 and 7. The annual lek attendance remained at around 30 males until the mid-80's, then it declined through 1993 when 12 males were observed. In 1994, three new leks sites were developed by brush beating (mowing vegetation with a brush-hog). Lek attendance returned to 30+ males in 1997.

In the Crawford area there are currently four known active lek sites. These lek areas have been monitored by the CDOW for the past 15 years. Some have been monitored for as many as 20 years. During the last several years the population trend appears to be static, or slightly declining.

C. HABITAT REQUIREMENTS OF THE GUNNISON SAGE GROUSE IN THE CRAWFORD AREA

Habitat needs for sage grouse in the Crawford area relate to survival over winter (Nov-Mar), escape cover adjacent to lek sites (Mar-May), nesting cover (Apr-Jun), early brood-rearing habitat (May-Jun), late brood-rearing habitat (Jul-Aug), and fall habitat (Aug-Oct). Of these habitats, winter, nesting, and early brood rearing are most important with suitable escape cover near leks of near equal importance.

Winter Habitat: As documented by pellet surveys, sage grouse extensively use mountain big sagebrush in the current primary use area between Poison Spring Gulch and Green Mountain and black sagebrush interspersed with mountain big sagebrush on Black Ridge. Adequate winter habitat may be unavailable in some years in the current primary use area because of snow depth and the birds may move to lower areas. Winter

habitat generally does not appear to be limiting in the Crawford area. Foods eaten in winter appear to be black and mountain big sagebrush.

Lek Habitat: Suitable habitats for display superficially appear to be limited in the Crawford area. Known formerly active leks are no longer occupied, possibly because of pinyon/juniper invasion, or other changes in the structure of the sagebrush community. This appears to be related to quality of lek sites. Sites presently used for display are those that were brushbeat in 1994 and 1996, with taller (> 8 in.) sagebrush immediately adjacent (< 200 yds.) to the display sites. Presence of taller sagebrush (mountain big sagebrush) with a lack of taller coniferous shrubs/trees and other obstructions appears to be critical for continued use of these sites by displaying male sage grouse.

Nesting Habitat: Sage grouse hens (small sample sizes) in the Crawford area select sites for nesting with taller, more dense sagebrush(> 18 in., > 25% canopy cover) with scattered deciduous shrubs. These sites are frequently at slightly higher elevations (upper edge of the occupied habitat) where moisture allows greater and more robust grass and forb cover (> 25 and 8% respectively, > 6-8 in. total herbaceous height). Nests are typically at the base of taller (> 18 in.) sagebrush plants.

Early Brood Habitat: The description of this habitat at hatch is identical to nesting with hens moving their young chicks (< 5-10 days of age) into areas dominated by forbs and grasses with < 20% live sagebrush canopy cover. Hens select disturbed sites (burned, disked) in the sagebrush type that have abundant forbs and frequently moisture. Grasses and forbs dominate at all known use sites with a definite preference for live sagebrush escape cover (> 18 in. height).

Late Brood Habitat: Hens with older broods prefer moist sites near stockponds, upper drainages, and on north slopes depending upon elevation and site. Forbs and grasses dominate at preferred use sites with some live sagebrush and other deciduous shrubs (snowberry, serviceberry, Gambel oak). Shrub cover is important for escape while most foraging is on forbs.

Fall Habitat: Sage grouse of all ages and gender continue to use habitats identical to those used by broods in July and August until plants become dessicated (several successive killing frosts) or heavily grazed. Taller sagebrush (> 20 in.) with more canopy cover (> 20%) becomes more important. Use increases on north and west facing slopes and diets change gradually from a high proportion of forbs to a high proportion of sagebrush. During extensive snow cover, in late fall and early winter, use of black and mountain big sagebrush stands is extensive.

V. CONSERVATION STRATEGY

A. CRAWFORD AREA GOALS AND OBJECTIVES

To more clearly guide management efforts of the Partnership in securing the long term status of the Gunnison sage grouse, and meeting the needs of the other resources and involved groups and individuals, the following goals and objectives were developed.

Overall Goal: Maintain or increase sage grouse numbers and distribution in the Crawford area while maintaining current uses and a healthy landscape.

Sage Grouse Population Goal: Maintain a sage grouse population size in the Crawford area that is in balance with the carrying capacity of the habitat, striving for a desired minimum of 225 birds and an optimum of at least 480 birds; increase the minimum number of birds over time to at least 225 ± in 2001 (3 years), 350 ± in 2005 (7 years), and 480 ± total birds in 2010 (12 years).

The present (1996-97) size of the breeding population of Gunnison sage grouse in the Crawford area is between 129 and 228 birds based on 41-45 males counted on 3 active leks. Thus, the minimum goal desired, 225 birds, may be higher than the present estimated population.

To obtain the minimum spring population goal of 225 birds, it would be necessary to have at least 4 active leks with an average of 14 males/lek (present numbers) for a total male population of 56 that is counted (4 x 14). If this number represents 75% of the cocks in the population and all active lek areas are known and counted, the male population should be 75 (56 ÷ 0.75) with 150 hens for a total population of 225 sage grouse (75 males + 150 hens). An optimal population would translate to 160 males (120 ÷ 75%) and 320 hens for a spring population size of about 480 sage grouse. With proper habitat management, this goal should be achievable. Three-year averages of counts of males on leks will be used to assess population trend (1994-95-96, 1995-96-97, 1996-97-98, etc.). Further, as new information is obtained, changes in these goals may be necessary.

Sage Grouse Habitat Goal: Maintain on suitable sites across the Crawford landscape relative large, contiguous stands of sagebrush with a variety of vegetative conditions interspersed throughout, in the desired arrangement with good connectivity to provide the quantity and quality of sage grouse habitat to support at least the desired optimum population level by 2010.

Populations are basically products of the environment, or habitat in which they are found. Thus, habitat quality is an indicator of how well habitat meets the needs of sage grouse. Also, the health of the natural system in which populations exist, and its ability to function in a dynamic manner through time largely determines its capability for long-term sustainability. Time, space, a focus on the natural processes and their ability to function, and the relationship with surrounding communities are of primary importance and concern in achieving the habitat goal of this plan.

B. GENERAL CONSERVATION OBJECTIVES

Using these goals as a target, the Crawford Partnership identified three dominant themes or categories; habitat quality, habitat loss/fragmentation, and physical disturbance to the population, for which general conservation objectives were developed. Specific objectives were developed for habitat quality. These objectives were developed largely based on the issues and/or factors identified as in some way contributing to the static or declining population size of sage grouse or affecting the quantity or quality of sage grouse habitat in the Crawford area.

The purpose of these objectives is to guide the selection of conservation actions. These objectives are also useful to explain the overall thrust of the conservation strategy. These objectives are:

Habitat Quality: Maintain and/or improve the quality of sage grouse habitat,

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, the group of factors that affect habitat quality and/or fragmentation (discussed in the following section) are considered to be the most important to sage grouse recovery.

Specific Objectives: (Habitat Vegetation)

Leks:

Habitat Function: Used for display and mating, require good acoustics and visibility for display activity, and for predator detection.

Location: Within at least 300 yards to 1/2 mile of nesting habitat. Within 200 yards of escape

cover (large expanses of sagebrush). Typically in broad valleys or benches, broad ridges or mesas. At least 200 yards from trees or other potential raptor perches.

Size: 1-5 acres.

Shape: Irregular, but usually circular or short and linear.

Time of use: Mid March to early June.

Composition: Perennial grass cover > 20%.
Total sage cover < 10%.
Total forb cover > 10%.

Structure: No trees or deciduous shrubs > 3 feet tall.
Grass and forb height 5-10 inches.
Sage up to 15 inches.

Near Lek Areas:

Habitat Function: Provides escape cover for displaying males, visiting females, resting birds.

Location: Within 200 yards of lek.

Size: > 1 acre up to 40-60 acres.

Shape: Irregular, if linear, then > 200 yards in width, if patches, then > 200 yards in diameter.

Composition: Perennial grass cover > 20%.
Total shrub cover (sage + mountain shrubs) 20-30%.
Total forb cover > 10%.

Structure: Sagebrush and other shrubs > 15 inches tall.
No potential raptor perches.

Nesting/Early Brood Rearing Areas:

Habitat Function: Provides good hiding and nesting cover and high levels of insects and succulent forbs to meet brood rearing nutritional requirements.

Location: Within 3 miles of a lek.

Size: Overall nesting area > 10 acres made up of 1/4-1 acre patches of sage ranging from dense to sparse.

Shape: Need high level of interspersion within heavier sagebrush areas.

Time of use: April through July.

Composition: Patchy: **foraging areas:**
Total sage cover < 20%.
Total forb cover > 15%.
Total grass cover > 25%.
hiding areas:
Total sage cover > 25%.
Total forb cover > 10%.
Total grass cover > 20%.

Structure: Sagebrush > 18 inches tall.
Abundant standing herbaceous material.
Herbaceous average height > 8 inches.

Late Brood Rearing Areas:

Habitat Function: Provides moisture and high levels of succulent forbs and insects, hiding cover. Typically edges of hay meadows, riparian areas, ponds, seeps, drainage bottoms.

Location: Near stands of live sagebrush or other deciduous shrubs close enough for escape. Less than 1/2 mile from early brood rearing areas, often north slopes.

Size: > 100 yards, usually around 200 yards wide.

Shape: Irregular, frequently linear, high interspersion of stand and cover types.

Composition: Sagebrush < 20%.

Total shrub cover < 25%.
Perennial Grass cover > 25%.
Perennial forb cover > 15%.

Structure: herbaceous vegetation >10 inches tall.

Fall and Winter Habitat:

Habitat Function: Provides thermal and hiding cover, abundant supply of taller sagebrush (15-25 inches).

Location: Usually broad basins, ridges, and north to northwest facing slopes.

Size: Extensive stands of sage, usually in patches larger than 100-2200 acres.

Shape: Interspersion of shorter stands of sage (ridges) with taller stands (swales, valley bottoms).

Composition: Total sage cover > 20% (25-30% preferable).
Total Forb Cover > 10%.
Perennial grass cover > 15%.

Structure: Tall sage 15-25 inches.
Shorter sage > 10 inches.

Habitat loss/fragmentation: Reduce fragmentation by preventing, minimizing, and mitigating past, present and future loss of sage grouse habitat,

Description: Loss of sage grouse habitat refers to areas that once provided habitat, but no longer does because that habitat no longer exists or is not available. It should be thought of as a permanent loss in the area. 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.

Physical disturbance to the population: Identify and manage physical disturbances to reduce adverse effects to sage grouse.

Description: This refers to the physical disturbance to sage grouse, the birds themselves. Physical disturbance can result in sage grouse death or exert stress particularly if disturbance occurs during biologically critical periods or times. Narratives of these issues can be found in Appendix A. (Issue Descriptions)

C. ISSUES OR FACTORS THAT AFFECT SAGE GROUSE POPULATIONS AND THEIR HABITAT

The following list of issues and factors were identified by the Partnership that could in some way contribute to the decline of the Gunnison sage grouse or affect its habitat quantity or quality in the Crawford area. A description for each issue listed is presented in Appendix 1.

- Vegetative Habitat
  - poor habitat quality and quantity
  - lack of grasses and forbs
  - condition of winter habitat
- Land Treatments
  - effects of land treatments on winter habitat
  - poor management of land treatments
  - fire suppression
- Land Planning/Mitigation
  - fragmentation
  - changes in land uses

- Utilities
  - powerlines
  - roads
  - fence designs
  - pipeline
- Loss of Topsoil & Productivity
- Poor Nest and Brood Survival
- Timing, Intensity and Duration of Livestock/Big Game Grazing
- Drought
- Predators (Coyotes, ground squirrels, badgers, eagles and other raptors)
- Scientific Lek Harassment
- Conflicting Uses During Critical Biological Activity Periods
- Recognition of Private Landowners Rights
- Monitoring/Research
- Reservoirs
- National Park Service Conservation Easements
- Recreational Uses
- Hunting

VI. CONSERVATION ACTIONS AND IMPLEMENTATION

The backbone of the Crawford sage grouse Conservation Plan is its goals and objectives which together establish a framework for developing conservation actions. Conservation Actions are designed to be consistent with the plan's goals and also to meet one or more of the objectives. These actions also address issues that affect sage grouse, and/or their habitat. Due to the interrelationship of the habitat components, resource values, and issues, many actions may apply to more than one objective. However, to avoid duplication, these actions have been listed in table 2 (page 12) where the link is most direct. Any additional actions identified at a later date will be analyzed by the Partnership for the application and design to ensure the appropriateness and compliance with the goals and objectives set forth in this plan.

Plan implementation will be priority-based starting with those actions the Partnership believes to be most effective at accomplishing their goals. This group recognizes the need to be opportunistic in carrying 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.

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.

The adoption of these Conservation Actions will be the responsibility of the Partnership. Specific steps or tasks needed to carry out a conservation action will be developed as the implementation proceeds. Cost estimates, including those for monitoring and evaluation will be identified. Every effort to leverage money and resources will be made. Many actions, such as vegetation treatments are costly, and will be dependent upon seeking cooperative funding from many partners, and possibly outside sources, such as grants.

Because plan accomplishment will require a lengthy period to complete, it is important to track progress at meeting our goals. At least yearly, the Crawford Partnership will convene a meeting to examine accomplishments and keep the plan on track. As actions are completed they will become part of the yearly

progress report. Signatory parties to this Plan will provide reports of their accomplishments to BLM by January 15 of each year for inclusion in the Partnership's annual progress report. A consolidated report will then be prepared and disseminated to Partnership members prior to the yearly or spring planning meeting. The public will be invited to attend the annual meeting and copies of the progress report made 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 the goals in the plan.

Based on the data available the BLM and CDOW will schedule a public meeting each year, or as needed, to discuss progress and future planning, and to disseminate results of the previous year's efforts or to adjust the Conservation Plan as needed.

VII. 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 interested parties in the collection of data and in the subsequent evaluations based on these data will add to the credibility of monitoring results.

It is important that all monitoring information be easily accessed by those interested. Monitoring the response of the Gunnison sage grouse population to conservation actions will be measured by total number of active leks, and the total number of males counted. The number of active leks and total males will reflect winter 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. Three year averages of lek counts will be used to assess sage grouse population trend (1994,95,96; 1995,96, 97; 1996,97,98, etc.).

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.

It is the intent of the Partnership to frequently communicate with other Gunnison Sage Grouse Work Groups to seek and exchange information as progress is made on implementing the Conservation Actions. Also, participation by private landowners in this Conservation Plan will be strictly on a volunteer basis.

Table 1. Crawford area Gunnison sage grouse Conservation Actions (listed in no particular order & with examples of how to accomplish), and Implementation Schedule (when & who).

CONSERVATION ACTIONS		IMPLEMENTATION SCHEDULE	
Action	**Examples of How to Accomplish**	**When**	**Who**
A. Information & Education			
1. Provide to the public, landowners, and others information that describes sage grouse habitat needs and conditions, and identifies sage grouse population levels. Identify concerns and opportunities to improve conditions for sage grouse in this area.	a. Maps, newspaper articles, radio & TV spots, displays, etc. b. Public contacts (e.g., individuals, County Commissioners, local schools, Tri-River Conservency), meetings, field trips, & make available copies of Conservation Plan. **c. Videos (sage grouse & habitat, treatments, etc.) in Coop with other sage grouse groups.** d. Brochures (e.g., Living with sage grouse in your backyard - control of dogs, etc.). e. Coordination/communications with; the public, other sage grouse groups, HPP, Black Canyon Audubon, etc. f. Information sign at Black Canyon Road and C77 Road.	a. Ongoing opportunistically. b. Ongoing opportunistically. **c. 1998-99 (completed).** d. As planned and when funding is available . e. Ongoing opportunistically. f. 1999-2000.	a. The Partnership. b. The Partnership. c. DOW Lead, BLM, NRCS, Public. d. The Partnership. e. The Partnership. f. BLM/DOW/NRCS.
2. Work with interested parties, landowners and others to create a better understanding of sage grouse needs, including the value and importance of sage grouse and sage grouse habitat, and provide a basis for sharing of ideas and reaching agreement on ways to improve sage grouse habitat and increase populations.	a. Meetings with interested landowners, government/regulatory entities (e.g., Counties, and livestock Associations). b. Maintain a current mailing list of interested citizens, and State, Local, and Federal Agencies. c. Develop management plans, cooperative agreements, etc. d. Distribute information about importance of sage grouse; availability of incentive programs, Best Management Practices, effects of certain land uses on grouse. e. Coord. Management of sage grouse with other wildlife species and resource agencies. f. Continue to work with other groups, e.g., Habitat Partnership Program. g. Communicate with other sage grouse groups. h. provide monitoring information and training to landowners. i. Present programs at local schools.	a. Ongoing opportunistically. b. Ongoing. c. Ongoing opportunistically. d. Ongoing opportunistically . e. Ongoing opportunistically . f. Ongoing opportunistically . g. Ongoing, annually. h. Ongoing opportunistically. i. Ongoing opportunistically.	a. The Partnership. b. The Partnership. c. The Partnership. d. DOW, BLM, NRCS, FWS, landowners. e. The Partnership. f. The Partnership. g. The Partnership. h. The Partnership. i. The Partnership.

CONSERVATION ACTIONS		IMPLEMENTATION SCHEDULE	
Action	**Examples of How to Accomplish**	**When**	**Who**
B. Monitoring			
1. Identify and evaluate sage grouse habitat, limiting factors and activities that have the potential to impact sage grouse or their habitat. Identify and evaluate critical sage grouse habitats.	a. Habitat mapping and condition monitoring. b. Assess and track land-use changes, e.g., developments, roads, etc. c. On-site visits with landowners, Holistic Resource Mgmt. groups, Livestock and Wool growers groups to discuss and assess habitat conditions and monitoring needs. d. Joint-interagency/landowner evaluation, information sharing. e. Provide monitoring training to landowners. f. Big game impact data.	a. Ongoing, annually. b. Update 3-5 years. c. As needed/requested/ opportunistically. d. As needed/requested/ opportunistically. e. As needed/requested/ opportunistically. f. Ongoing, annually.	a. BLM, DOW, NRCS, landowners, Extension. b. BLM, DOW, NRCS, FWS, County. c. The Partnership. d. The Partnership. e. BLM, DOW, NRCS, Extension. f. DOW, BLM.
2. Continue to gather or initiate the collection of basic resource data to better understand and document conditions for sage grouse, including response to applied conservation measures.	a. Sage grouse population monitoring/census, e.g. lek counts. b. Design and carry out monitoring for applied measures, e.g., treatments. c. Continue to identify changes in the sage grouse populations size (use 3 yr. average of lek counts).	a. Annually, March-May. b. Annually, as needed. c. Annually.	a. DOW, others, Black Canyon Audubon. b. BLM, NRCS, Extension, landowners. c. DOW.
C. Avoiding or mitigating permanent loss of habitat			
1. Develop and encourage incentives for landowners to avoid or mitigate loss of sage grouse habitat.	a. Land exchanges. b. Conservation Easements with 3-Rivers Trust, Valley Land Conservency, CCA, RMEF, etc. c. Transferrable development rights. d. Payment for non use of sage grouse habitat. e. Application of specific land use practices that benefit grouse, e.g., water development, grazing plans. f. Develop recommendations for managing sagebrush community as a whole, considering all uses.	a. Ongoing opportunistically. b. Ongoing opportunistically. c. Ongoing opportunistically . d. Ongoing opportunistically . e. Ongoing opportunistically . f. Ongoing opportunistically .	a. BLM/Private landowners. b. Private landowners. c. The Partnership, Counties, landowners, developers. d. DOW, NRCS (WIP, EQUIP), FWS. e. DOW, HPP, BLM, NRCS, Pvt., Extension. f. DOW, HPP, BLM, NRCS, Pvt., FWS, Extension.

CONSERVATION ACTIONS		IMPLEMENTATION SCHEDULE	
Action	**Examples of How to Accomplish**	**When**	**Who**
2. Enhance existing and restore former sage grouse habitat to offset loss of habitat elsewhere.	a. Vegetation treatments, e.g., brush beat, burn, reclaim. seed. b. Mitigating effects of human population growth and development.	a. Ongoing opportunistically . b. Ongoing opportunistically .	a. BLM, DOW, NRCS, Extension, landowners. b. The Partnership, County Planners.
3. Prevent loss and fragmentation of habitat from construction of roads, utilities.	a. Relocate or modify new utility lines, roads, developments, etc. in key grouse habitat.	a. Ongoing opportunistically.	a. BLM, DOW, FWS, Counties, landowners.
D. Restoring or improving quality of grouse habitat and populations			
1. Enhance existing riparian areas, or create or enhance small wet areas to benefit sage grouse nesting and brood rearing habitat.	a. Design and implement livestock grazing management practices to benefit riparian areas. b. Modify or adapt pipelines/springs to create small wet areas. c. Enhance and protect existing natural wet areas.	a. Ongoing opportunistically . b. Ongoing opportunistically . c. Ongoing opportunistically.	a. BLM on Public lands, NRCS assist landowners on private lands. b. BLM on Public lands, NRCS assist landowners on private lands. c. BLM, FWS, landowners.
2. Eliminate or modify situations that cause predation.	a. Modify power lines and wood fence posts (to remove raptor perches) in critical sage grouse areas. b. Cut pinyon-juniper trees near leks and elsewhere within potential sage grouse habitat to remove raptor perches, and to maintain the sagebrush habitat. c. Sale of Christmas trees in key sage grouse areas.	a. Ongoing opportunistically . b. 1998, ongoing. c. 1998, ongoing.	a. DOW, BLM, Power Counties, pvt. landowners, FWS. b. BLM (contracts, Delta Honor Crew), landowners, NRCS,& DOW, & FWS (incentives to landowners). c. BLM, landowners.
3. Implement local guidelines and use Best Management Practices to guide land uses to increase sage grouse populations and improve sage grouse habitat quantity and quality.	a. Implement Livestock grazing practices that benefit sage grouse habitat quality, and avoid physical disturbance to grouse during critical times, i.e., breeding and nesting. b. Restore and rehabilitate riparian areas. c. Proper land treatment design and construction that reduce impacts to sage grouse (e.g., how and where to plan projects). d. Land development options. e. Construction standards (placement, timing, rehab.,techniques).	a. Ongoing opportunistically. b. Ongoing opportunistically. c. Ongoing opportunistically. d. Ongoing opportunistically. e. Ongoing opportunistically.	a. BLM-permittee's, NRCS/Ext.-landowners. b. BLM, FWS, landowners. c. The Partnership. d. The Partnership. e. The Partnership.

CONSERVATION ACTIONS		IMPLEMENTATION SCHEDULE	
Action	**Examples of How to Accomplish**	**When**	**Who**
4. Improve sage grouse habitat quality, and improve vegetation cover, especially forbs and grasses in sage grouse areas.	a. Develop and use sound grazing management practices. b. Plant and/or re-seed with a high proportion of forbs. c. Design vegetation treatments in sage grouse areas to be compatible with sage grouse needs. d. Improve ground cover in sage grouse areas. e. Manage big game population and habitat to minimize or avoid conflicts on grouse habitats, and to encourage moving them off grouse habitat, i.e., to the extent possible develop the highest quality big game habitat outside the sage grouse prime habitat. f. Integrate weed management with grouse needs. g. Vegetation treatments to improve vegetative age class diversity, improve the grass and forb component (may or may not need to seed), and reclaim any disturbed areas. h. Road closures, e.g., C-77 road at second cattle guard after 3rd season, and at Black Canyon road Dec. 15.	a. 1998, ongoing opportunistically. b. 1998, ongoing opportunistically. c. 1998, ongoing opportunistically. d. 1998, ongoing opportunistically. e. 1998, ongoing opportunistically. f. 1998, ongoing opportunistically. g. 1998, ongoing opportunistically. h. 1998, ongoing opportunistically.	a. BLM, Private. b. BLM, HPP, NRCS, DOW, FWS, Private. c. BLM, HPP, RMEF, NRCS, DOW, FWS, Private. d. BLM, HPP, RMEF, NRCS, DOW, FWS, Private. e. BLM, DOW, Private. f. BLM, County Weed Boards, Private. g. BLM, Private. h. BLM, Park Service, County Roads.
5. Increase opportunities for improving over-winter survival, escape cover near leks, nesting cover, and expanding the range or use areas of sage grouse, e.g. use of new lek sites and areas.	a. Improve quality of sagebrush dominated habitats by using grazing management and vegetation treatment, e.g., mechanical treatment, fertilization. b. Avoid treatment projects that remove large stands of sagebrush in critical areas. c. Attempt to expand existing sage grouse use areas/range by using calls to entice males during the breeding season to use new lek sites close to or adjacent to existing lek sites.	a. 1998, ongoing opportunistically. b. Ongoing opportunistically. c. 1999 (start).	a. BLM, HPP, DOW, NRCS, FWS. b. BLM, HPP, FWS, Private. c. DOW.
E. Reducing Physical Disturbance to Sage Grouse			
1. Mitigate or reduce conflicts with sage grouse during critical biological periods and on critical habitats.	a. Noise or physical disturbance ordinances or restrictions during critical periods near leks, e.g. manage on-road travel and OHV use in key grouse areas to avoid disturbance during critical times. b. Delay or modify construction start up dates or hours. c. Control or limit pets. d. Coordinate grazing management to avoid conflicts on leks.	a. 1998, ongoing opportunistically. b. 1998, ongoing opportunistically. c. 1998, ongoing opportunistically. d. 1998, ongoing opportunistically.	a. BLM, NPS, FWS, County. b. BLM, FWS, Counties, DOW. c. DOW, FWS, Counties. d. BLM, FWS, Private.

CONSERVATION ACTIONS		IMPLEMENTATION SCHEDULE	
Action	**Examples of How to Accomplish**	**When**	**Who**
F. Improving community support and participation			
1. Incorporate economic, social and cultural values into conservation practices.	a. Seek understanding, information sharing and maintaining communication. b. Adopt principle of voluntary compliance and participation. c. Involve landowners and local communities in all aspects of sage grouse conservation.	a. 1998, ongoing opportunistically. b. 1998, ongoing opportunistically. c. 1998, ongoing opportunistically.	a. The Partnership. b. The Partnership. c. The Partnership.
2. Maintain local control.	a. Maintain Sage Grouse Partnership (must include landowners, local residents) to serve as advisory body. b. Continually seek public input and involvement. c. Annual (or as needed) hold a Partnership meeting to discuss progress and future needs, and plan a yearly schedule of events and conservation action implementation.	a. 1998, ongoing opportunistically. b. 1998, ongoing opportunistically. c. 1998, ongoing opportunistically.	a. The Partnership. b. The Partnership. c. The Partnership.
3. Develop, improve, and encourage credibility and success.	a. Seek outside scientific review of projects. b. Involve college and/or universities. c. Adapt and change as we go. d. Annually the Partnership will prepare and disseminate to the members and others a progress report.	a. 1998, ongoing opportunistically. b. 1998, ongoing opportunistically. c. 1998, ongoing opportunistically. d. 1998, Annually.	a. The Partnership. b. The Partnership. c. The Partnership. d. The Partnership.

VIII. GLOSSARY

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.

Ecological Site - A kind of land which differs from other kinds of land, in it's potential natural community and physical site characteristics and thus differs also in its ability to produce vegetation and in its response to management.

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. The vegetation rating 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% similarity to the PNC and are called early seral, mid seral, late seral, and PNC, 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.

Integrated Weed Management - a strategy using a comprehensive, interdisciplinary approach to weed management. The purpose of integrated weed management (IWM) is to achieve healthy and productive natural and agricultural ecosystems through a balanced program. This program includes, but is not limited to, education, prevention measures, good stewardship and control methods.

Lek - An arena where male sage grouse display for the purpose of gaining breeding territories and attracting females. These arenas are usually open areas with short vegetation within sagebrush habitats, usually on broad ridges, benches, or valley floors where visibility and hearing acuity are excellent.

Lek Area - The geographic area that includes all closely allied lek sites within 1 mile. This geographic area is usually stable overtime.

Lek Count -The high count of males from all lek sites on the same day; which are taken at 7-10 day intervals between late March and mid May.

Lek Site - A particular site where sage grouse gather for display and mating in spring (Mar-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.

Potential Natural Plant Community (PNC) - The biotic community that would become established if all successional sequences were completed without interferences by man under the present environmental conditions. The potential natural plant community of an ecological site is the assumed end point of natural succession for that site in the absence of disturbances and physical site deterioration. 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.

Sagebrush - As referred to in this plan, includes the following species: **Basin Big** - *Artemisia tridentata;* **Mountain Big** - *Artemisia tridentata vaseyana;* **Wyoming Big** - *Artemisia tridentata wyomingensis;* and **Black** - *Artemisia nova.*

Strutting Ground - See Lek.

Uncommon - A term used by bird watchers, in reference to sightings or observations and 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.

APPENDIX A

Issue Descriptions

The following issues were brought forth by people involved in the Crawford Partnership. During the group meetings, individuals were able to explain why they felt the Gunnison sage grouse population, as a whole, was declining. The major reason for the decline in habitat quality and quantity is due to the lack of disturbance that improves herbaceous diversity. All reasons were to be treated equally and no limitations were placed on what could be an issue. Thus, a long and varied list of possible reasons for the Gunnison sage grouse decline was developed. The issues are listed in no particular order. The issues listed may not include all the issues discussed and some issues may be not resolved and are out of the scope of the plan.

Issues That Effect Sage Grouse Populations and Their Habitat

- **Vegetative Habitat:**

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

  Lack of grasses and forbs---The quality and quantity of residual herbaceous cover have important roles 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 chicks depend. The number and distribution of high quality nesting and early brood-rearing areas appear to be a limiting factor for sage grouse in the Crawford area.

  Condition of winter habitat---Winter habitat is most critical to Crawford 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.

- **Land Treatments**: Land treatments include such projects as: plowing and seeding, prescribed burning, herbicide, and chaining/cabling. The effects of land treatments on sage grouse populations can be either positive or negative, depending upon location, method, objective of the treatment, and follow-up management. Some historic land treatments conducted in the Crawford area have not benefited sage grouse. 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.

  Effects of land treatments on winter habitat---Some 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. 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.

Poor management of land treatments---A major problem resulting from historic land treatments in the Crawford area involves alteration of plant community structure in each of the sage grouse habitat types. The increases in alterations 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.

Fire suppression---Wildfires are natural with effects that vary depending upon size of burned areas and the intensity and severity of the fire. In the past, natural fires were not a problem because they 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.

- **Land Planning/Mitigation:**

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 or by different habitats and/or unsuitable terrain may be considered fragmented. As habitat becomes increasingly fragmented, fewer individual birds exist. 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.

Changes in land uses---Sage grouse require habitats dominated by sagebrush from October through April. During May through September they prefer habitats with abundant forbs (food) and grasses (cover plus habitat for insects used as food) with some live sagebrush or adjacent to live sagebrush which is used as escape cover. Removal of sagebrush cover to benefit livestock grazing and development of hay production areas have changed land uses (in some cases positively or negatively) in the Crawford Area.

- **Utilities:**

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 decrease 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.

Pipelines---Development of pipelines is becoming more common in sage grouse habitats. Pipeline development (construction) can be negative if not properly managed to avoid adverse effects to breeding (March-mid May), nesting (mid April-early July), and early brood rearing (mid May-mid July). However, reseeding of areas disturbed by pipelines with desirable forbs and taller grasses can be beneficial to sage grouse especially if the width of the area disturbed is minimal (<100

yards) and roads/trails used during construction are closed and reseeded after completion of the pipeline construction interval.

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.

Fence designs---Fences are necessary for livestock management. However, wood fence posts can provide perches for predators of sage grouse. Also, sage grouse have been observed flying into fence wires, especially near preferred use areas such as leks. Fence management that reduces potential perch sites (metal posts) and allows larger spacing between wires (2 or 3 vs. 4 or 5) could be less negative for sage grouse.

- **Loss of Topsoil & Productivity:** Soil is the primary factor determining the potential for vegetation production of 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 and increased soil compaction. The loss of topsoil reduces the vegetation production on many sites impacting critical nesting and brooding areas through reduced herbaceous plant production.

- **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 some sites in the Crawford area.

- **Timing, Intensity, and Duration of Livestock/Big Game Grazing:** Potentially timing and intensity of livestock/big game grazing may affect sage grouse nesting and brood rearing success. The peak of sage grouse hatch is the last week in May and the first week in June, depending on weather conditions. Concerns are that livestock/big game grazing would directly compete with sage grouse for food (forbs and insects) and nesting cover during this time, or would physically disturb the nests. Fall grazing would remove residual cover needed the following spring for nest and brood cover. Also, persistent early spring and summer grazing would reduced plant vigor of herbaceous species causing undesirable long-term changes in the vegetative composition.

In some areas existing grazing, timing and duration may be having a negative affect on nesting and early brood habitat quantity, especially near and around the water sites. Winter grazing by sheep on lek sites may be beneficial by keeping them free of thick shrubby vegetation, and stimulating grass and forb growth.

The distribution and potential overbrowsing by deer and elk on big game winter ranges have had significant effects on important forage shrubs and associated plant communities which may have influenced sage

grouse habitat quality. The large deer herds and resultant overbrowsing between 1940 and the mid 1970's is well documented. Overbrowsing of forage shrubs on the winter range by elk has generally occurred only during winters of heavy snowfall. In some areas shrub canopy and height has been reduced to less than what is desired, and may not be sustainable. Also, heavy winter and early spring grazing by elk has reduced cover, probably affecting nest and brood cover, and possibly influenced long-term vegetative composition too.

- **Drought:** 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 Crawford area, 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.

- **Predators (coyotes, ground squirrels, badgers, eagles, hawks):** 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 have shown that ground squirrels and badgers 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 sage grouse population. Eagles and hawks can be effective predators on sage grouse and some feel that eagle predation is increasing. A difficult issue faces the BLM in trying to manage for Bald eagles (Federally Threatened) and managing for the Gunnison sage grouse, in which they are trying to protect. The quality and quantity of grasses and forbs and other vegetation cover may influence the rates of predation. Predation is reduced when there is sufficient vegetation to conceal the nests. Predation of males on leks was documented to be a serious problem in the Crawford area in 1994. Removal of pinion and juniper trees and tall shrubs starting in 1994 in conjunction with brush beating existing and new lek sites was effective in reducing predation risk of sage grouse.

- **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.

- **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.

- **Recognition of Private Landowners Rights:** Most landowners are willing to work collectively toward a goal, as long as the recommendations or actions concerning sage grouse do not impact their efforts to make a living. However, most private landowners are environmentally concerned and appreciate wildlife and try not to negatively affect habitat useful to wildlife. These landowners do good things for the land without having to be forced by an endangered species.

- **Monitoring/Research:** Monitoring of sage grouse populations through use of counts of males on leks has been used to estimate trends in population size. This effort requires vehicle access via roads and trail

during the late March-mid May interval. Properly conducted, spring counts are not known to affect sage grouse. Research on sage grouse is periodically needed to learn more about specific requirements and responses to habitat treatments. The need for monitoring and periodic research will continue. Monitoring of vegetation in relation to grazing by domestic livestock and big game, specially in response to vegetation treatments, will continue on public lands.

- **Reservoirs:** Construction of Gould Reservoir is known to have inundated brood habitat and reduced total sage grouse habitat. However, as the result of the reservoir additional brood habitat was created on the south edge. Reservoirs that flood > 100 acres have been documented to have negative effects on sage grouse. Construction of smaller ponds/reservoirsirragation ditches may benefit sage grouse though creation of wet meadows sites and provision of open water.

- **National Park Service Conservation Easements:** The Secretary of the Interior is authorized to acquire lands or interests in land within the authorized boundaries of Black Canyon of the Gunnison National Monument. Conservation Easements are purchased from willing sellers as a perpetual and assignable right deeded to the United States of America, Department of the Interior, National Park Service. Black Canyon of the Gunnison National Monument has approximately 2,000 acres under Conservation Easements. The Terms and Conditions of a Conservation Easement impose restrictions, some of which are as follows:

  - the land shall be used and maintained as open grazing land only, and grazing of livestock may continue,

  - hunting, trapping or other means of taking wildlife is prohibited,

  - no pesticides shall be used, or other practices followed, which would significantly injure or destroy the relatively natural ecosystem,

  - the land shall not be used for any mining, quarrying, sand and gravel removal, industrial or commercial activity, nor can there be any change in the character, use of topography of the land which would alter the scenic character of the property, affect the scenic enjoyment of the property by the general public or cause permanent destruction of any significant conservation interest in the land, unless such change is previously approved in writing by the National Park Service,

  - commonly accepted operation and maintenance practices supporting livestock grazing may continue, including the maintenance of existing domestic, livestock or agricultural water conveyance systems, and the construction and maintenance of required fencing and stock ponds; plans for new fencing or stock ponds must be approved by the Secretary of the Interior or his authorized representative; water impoundments shall not exceed one acre in size and shall be located so as to minimize visual impact; fences shall be of standard four or five strand barbed wire or sheep wire only and shall in no case exceed four feet in height,

  - all regular and ordinary maintenance to all existing structures, buildings, ground and access roads may be done; replacement of existing structures with another of the same size and in the same location may be done; and repair, or rebuilding to no greater than former size, and existing buildings or structures which are damaged by fire , storm or other casualty is allowed;

  - selective cutting, trimming, destroying or removal of trees, grasses, brush, or shrubbery on scattered units, shall be permitted on the land, in accordance with sound range management practice provided that individual areas so cleared shall not exceed one-acre in size, nor be closer than 300 feet from other areas so cleared during a 10-year cutting interval; and the Secretary or authorized representative shall be notified in writing and provided with a clearing plan at least thirty days prior to initiation of such clearing.

- **Recreational Uses**: Sage grouse have been hunted and their mating rituals observed since prior to European settlement based on native American artifacts and ceremonies. Sage grouse are not presently hunted at Crawford and there is no organized watchable wildlife viewing for the species within the boundary of the area. Other recreational use of the area such as big game hunting, blue grouse hunting, and predator hunting are not thought to be negative although accidental take may occur. Use of all terrain vehicles has the potential to negatively impact sage grouse, especially in winter. However, much of the area is seasonally closed to all terrain vehicles, primarily to preclude disturbance of big game.

- **Hunting**: Sage grouse hunting in the Crawford area was closed prior to 1953 when the area was opened (2-day season, bag/possession limits of 2/2 for any grouse). The season remained open with limited take (2/2, 3/3. 2/4, 3/6) and short seasons (2-4 days) until 1973 when it was closed until 1989 when it reopened for 30 days with a bag and possession limit of 3/6. The season remained open through 1993 with bag/possession limits of 3/6 or 3/9 and season lengths of 30-45 days. The season was closed in 1994 and has been closed through 1997 as the population does not meet the standard (100 cocks counted in spring for 3 consecutive years) required to be open to hunting. Hunting of sage grouse in this area is not contemplated for the foreseeable future. No information on annual harvest is available for this population for any year. Table 1 shows the Crawford Area sage grouse hunting regulations, 1946-97.

Table 1. Crawford Area sage grouse hunting regulations, 1946-97.

Year	Length (Days)	Bag/ Possession Limits	Year	Length (Days)	Bag/ Possession Limits
1946-52	Season Closed		1965	2	2/2
1953	1	2/2	1966-67	2	2/4
1954-57	2	2/2	1968	3	2/4
1958	3	2/2	1969	4	3/6
1959	3	3/3	1970-72	3	2/4
1960	4	3/3	1973-88	Season Closed	
1961	3	3/3	1989-91	30	3/6
1962	3	2/4	1992	34	3/9
1963	3	3/6	1993	33	3/9
1964	3	2/4	1994-97	Season Closed	

Harvest management unit designations:
1953-57, Statewide or area specified by highways, drainages, etc.
1968-73, Unit 19
1974-86, Unit 64
1987-97, Units 53 and 63

APPENDIX B

List of Participants

The process of developing the Crawford Area - Gunnison sage grouse partnership and subsequently the Conservation Plan has been on-going since 1995. During this time the following people have been involved, making significant contributions of time and knowledge:

Mark LeValley, Rancher
Hank LeValley, Rancher
Larry Jensen, Rancher
Tom Ware, Landowner
Danny Todd, Rancher
Larry Allen, Rancher
Ross Allen, Rancher
Charlie Klaaseen, Rancher
Paul Obert, Natural Resource Conservation Service
Tom Jones, Natural Resource Conservation Service
John Barcus, Black Canyon Audubon
Myron Chase, National Park Service
Terry Ireland, US Fish and Wildlife Service
Amanda Clements, Bureau of Land Management
Jim Sazama, Bureau of Land Management
Bob Welch, Bureau of Land Management
Clait Braun, Colorado Division of Wildlife
Don Masden, Colorado Division of Wildlife
Doug Homan, Colorado Division of Wildlife

APPENDIX C

References and additional reading material

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APPENDIX D

Listing factors considered by the U.S. Fish and Wildlife Service in evaluating possible action under the Endangered Species Act.

Factor 1. Present or threatened destruction, modification, or curtailment of it's habitat or range.

The range of the Gunnison sage grouse in the Crawford Area has been greatly reduced in size and quality through habitat loss caused by plowing, spraying, road construction, and powerlines; habitat fragmentation caused by the same factors, and habitat degradation caused by the same factors as well as inappropriate livestock management. Total range reduction is estimated at greater than 50%.

This Conservation Plan will reduce destruction, modification, or curtailment of the Gunnison sage grouse's range through implementing the following management actions: Eliminating major land disturbances from housing development and industrial uses (other than farming and ranching); by reducing unnecessary roads; reducing or eliminating disturbed land by livestock operations; using mechanical means for habitat improvement; reducing unnecessary utility lines/ and improving vegetative habitat and soil conditions by reseeding with forbs, by using proper grazing and hay mowing management, by managing noxious weeds, by appropriate big game management, and by appropriate herbicide use.

Factor 2. Overutilizstion for commercial, recreational, scientific, or educational purposes.

No overuse of Gunnison sage grouse in the Crawford Area is apparent as hunting is not permitted, there is no commercial or recreational use, and scientific study (banding, radio marking) only affected 20-30 birds in 1995-96. Educational field trips may occur but are not likely to cause disturbance to the Gunnison sage grouse if proper viewing protocols are followed.

Factor 3. Disease or predation.

No disease/parasite problems have been identified in Gunnison sage grouse in the Crawford Area. Predation is a natural event and about 50% of the total population disappears (dies) each year. Major identified predators of adults include golden eagles, goshawks, bobcats, and coyotes. Most loss of potential productivity is through nest failure caused by ground predators such as ground squirrels, badgers, etc. Some accidental loss due to livestock management and road maintenance has been documented.

Factor 4. Authorities and existing regulatory mechanisms.

Members of the Crawford Gunnison Sage Grouse Partnership are committed to improving conditions for sage grouse in the Crawford Area. While landowner adoption of the proposed conservation actions is voluntary, the Conservation Plan was developed with the spirit of cooperation and there is broad support for the goals and objectives contained in the Conservation Plan. The Partnership believes existing regulatory mechanisms are adequate to achieve these goals and objectives.

The Colorado Division of Wildlife, a branch of the Colorado Department of Natural Resources, has responsibility for the management and conservation of wildlife resources as defined and directed by state laws. The Division also has enforcement authority for poaching and harassment.

The Boards of County Commissioners of Montrose and Delta Counties, Colorado have authority to regulate land use, land planning, and protection of the environment in these Counties. Montrose and Delta Counties have regulations to exercise such authorities including the review, approval or denial of proposed activities and uses of land.

The USDA Forest Service (USFS) has direction and authority for the maintenance of biological diversity on National Forests and for the protection and management of wildlife species and habitats as defined and directed by various Federal Laws and Regulations.

The USDA Natural Resources Conservation Service (NRCS) also has authority for conservation of the Gunnison sage grouse through various Federal Laws.

The USDI Bureau of Land Management (BLM) has authority for conservation of the Gunnison sage grouse and the management of natural resources and land uses on Public Lands through a number of Federal Laws and Regulations.

The USDI Fish and Wildlife Service (USFWS) has authority for conservation of the Gunnison sage grouse through the Endangered Species Act of 1973 and other Federal Laws.

Two other authorities for agencies working on Gunnison sage grouse conservation include a Memorandum of Understanding and a Memorandum of Agreement. In 1994, several federal agencies, including those listed here, signed a Memorandum of Understanding to establish a general framework for better cooperation and participation among these agencies in the management and conservation of species at risk, which are tending towards federal listing as threatened or endangered. In 1995, the state of Colorado and the U.S. Department of Interior entered into a Memorandum of Agreement which committed agencies in the Department of Interior and the state to collaborate and cooperate in management and conservation of declining populations of fish and wildlife and their habitat. This agreement has two important tasks: "The state and the Department agree to develop and implement programs to determine and monitor the status of species at risk;" and "The state and the Department will encourage partners and stake holders to take a leadership role in working with the state and the Department to develop and implement conservation actions through Conservation Agreements and Recovery Agreements. " A list of species for which the Department and the state would initially focus conservation actions on was written. This list specifically mentioned declining populations of sage grouse.

Factor 5. Other natural or manmade factors affecting its continued existence.

Natural factors affecting the continued existence of Gunnison sage grouse in the Crawford Area include natural fragmentation and severe weather conditions during the nesting and early brood periods. Fire suppression is a manmade threat leading to changes in habitat through invasion of pinyon-juniper and allowing sagebrush habitat types to become decadent. Other manmade factors that effect sage grouse include continuous noise that impairs the acoustical components of males on leks; disturbance from construction or other projects; harassment from pets; and disturbance, death, or habitat degradation from use of off-highway-vehicles (OHV's)

To address these threats, fire or other habitat management may be prescribed for areas in the Crawford Area population range to remove invasive trees and restore native plants and vitality to the sagebrush habitats used by sage grouse. Additionally, noise ordinances or restrictions during critical periods near leks may be enforced, construction start up dates may be delayed or modified, pets may be encouraged to be controlled or limited, and OHV use areas and other travel management in key sage grouse areas may be enforced.