MIDDLE PARK SAGE GROUSE CONSERVATION PLAN

I. PREAMBLE

Greater-sage grouse (*Centrocercus urophasianus*) are closely associated with sagebrush rangelands throughout western North America, and occur nowhere else in the world. Over the past 75 years, distribution and abundance of this species has markedly decreased throughout its historic range. Long-term viability of sage grouse populations is highly tenuous in at least 6 of the 11 states, and the 2 Canadian provinces, where they presently occur. Uncertainty and concern for the future of sage grouse has given rise to recent efforts to assess and ensure sage grouse viability throughout its range. Should sage grouse populations continue to decline, the bird will likely be listed as federally threatened or endangered under the Endangered Species Conservation Act of 1969. If so classified, involuntary restrictions could be placed on lands where sage grouse occur or would be expected to occur.

Greater-sage grouse are native to Middle Park, an intermountain basin in Grand and Summit counties, situated in north-central Colorado. The historic range of sage grouse in Middle Park has decreased over time; there is likewise concern that population numbers have correspondingly declined. Because of increased concerns about the status of sage grouse in Middle Park, a group of concerned citizens and agencies formed a working partnership in the spring of 1999, known as the Middle Park Sage Grouse Committee (hereafter referred to as MPSGC) . This group is committed to developing a conservation plan, and to undertaking actions to stabilize and maintain a healthy sage grouse population in Middle Park.

II. THE PLAN AND ITS PURPOSE

The Middle Park Sage Grouse Conservation Plan (Plan) provides information on the sage grouse population and its habitat in Middle Park, and addresses issues and concerns related to the possible decline of sage grouse populations in the area. The primary objective of the Plan is to maintain a healthy and viable sage grouse population in Middle Park, and to prevent any long term decline in sage grouse numbers. Both public and private lands have traditionally provided significant sage grouse habitat in Middle Park. This makes it important to protect and enhance the quality of exisiting rangelands, while preserving the historic agricultural character of the area.

Efforts to maintain a healthy sage grouse population in the Middle Park area will:

1. Identify and address major threats to the health of the sagebrush-grassland plant community which serves as the basis for a viable sage grouse population.

2. Prioritize areas in which to concentrate conservation efforts, identifying critical habitats in need of protection or enhancement, such as sage grouse winter range, nesting areas, and brood rearing habitat.
3. Identify tools to protect and improve sagebrush communities.
4. Improve sagebrush rangelands through treatments identified.
5. Measure the response of sage grouse and habitat to treatments.
6. Identify funding sources for projects and monitoring.
7. Seek provisions to secure habitat for sage grouse in land use planning.

III. GUIDING PRINCIPLES

The collaborative process used by MPSGC is intended to guide resource management efforts related to sage grouse through the development of goals, guidelines, and the selection of conservation actions that may cross jurisdictional boundaries and land ownership patterns. Participation in the plan by private landowners is strictly voluntary. The following principles have been adopted to guide this process:

1. Promote public involvement in planning and decision making.
2. Maintain an atmosphere of cooperation among land managers, private landowners, and other stakeholders where everyone feels free to actively participate.
3. Implement conservation actions that meet the needs of sage grouse, while promoting stability of the agricultural lifestyle in Middle Park.
4. Respect individual views and values.
5. Implement conservation actions on a collaborative basis that have broad community support.
6. Seek efficiency and integration of efforts among partners.
7. Select conservation actions that also meet other land or resource management objectives.

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IV. AREA DESCRIPTION

Sagebrush rangelands of the upper Colorado River drainage in north-central Colorado (Figure 1) are the focus of this Plan. Portions of Grand and Summit counties are included in this area, as is the extreme northeastern corner of Eagle County. Other than the area of the Colorado River downstream from Gore Canyon (Radium/Sheephorn), lands covered by this Plan lie within Middle Park, a high elevation intermountain basin. Middle Park has a more varied and interrupted terrain than other such basins in Colorado, resulting in smaller, more fragmented blocks of sagebrush rangeland (Figure 2).

The eastern portion of the planning area is centered around the town of Granby, and includes sagebrush rangelands between Red Dirt Hill (south), Cottonwood Pass (west), and Granby Reservoir (north). The middle portion of the planning area lies west of Hot Sulphur Springs. It includes lands north of the Colorado River, along the Corral Creek and Troublesome drainages, as well as lands south of the Colorado River, in the Little Muddy, Reeder Creek, Barger Gulch, and Williams Fork drainages. Western portions of the planning area include the sagebrush steppe that extends north from Kremmling to Muddy Pass, as well as sagebrush rangelands extending south, up the Blue River to Pioneer Creek (approx. five miles north of Silverthorne). Lastly, the area of focus continues to the west of Kremmling into the Radium area, extending into the lower Sheephorn, Cottonwood, Blacktail, and Trail Creek drainages.

Much of the sagebrush community described above occurs within the rain shadow of the Gore Range. Precipitation in the Kremmling area averages approximately 11 inches per year (Figure 3). Winters are long and low temperatures can exceed -40? F. Summers are cool and dry, with an average growing season of 50 days. The area surrounding Radium is slightly more temperate in climate and includes pinyon-juniper habitat and a remnant of pondersa pine.

Upper boundaries of the planning area were set by MPSGC at 9,400' elevation, based on known historic range and local observations of sage grouse. In many cases, boundaries may dip far below this elevation, depending on distribution of sagebrush-dominated habitats with potential to support sage grouse.

Areas in the Fraser Valley and in the area now occupied by Dillon Reservoir no longer meet the habitat requirements of sage grouse, due to impacts of human development and land conversion. Townsites and other areas of high density habitation have been included in the boundary for convenience sake, but without any intent of promoting additional land use restrictions within these areas.

Important resource uses that occur in the sagebrush-grasslands of Middle Park include: 1) critical wintering habitats for deer, elk, and antelope; 2) ranching and livestock grazing; 3) recreational use of public lands; 4) outlying residential areas; and 5) road and utility corridors. The MPSGC recognizes the need to provide for these uses while maintaining sage grouse populations.

V. SPECIES DESCRIPTION

Greater sage grouse (sage grouse) are large gallinaceous, chicken-like, birds. Their coloration is a brownish gray, barred with black on the backside, with a conspicuous black belly and underthroat. Their rounded brown wings have some black barring. During the breeding season (March-May) males exhibit conspicuous neck filoplumes, along with a white breast and 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 is most noticeable in winter and early spring. Undertail covert feathers are white-tipped. Males weigh from four to seven pounds while females weigh from three to four pounds.

VI. SPECIES DISTRIBUTION AND STATUS

General Distribution

Greater sage grouse occur in 11 states and two Canadian provinces. Their present range is from southwestern North Dakota and northwestern South Dakota into Montana, north into Saskatchewan and Alberta, west into Idaho, Washington, Oregon, and California, and south into Nevada, Wyoming, Utah, and Colorado. Distribution at the periphery of their range tends to be highly fragmented and discontinuous.

General Status

Sage grouse are classified as a resident game bird and are hunted in all states where they presently occur, except in Washington. Populations have been greatly reduced in size since settlement, largely through conversion of sagebrush rangelands, increased human populations, and associated developments. Sage grouse have been listed as threatened/endangered in Canada as of 1998, and state listed as endangered in Washington.

Distribution and Status in the Middle Park Area

Historically, sage grouse occurred along the Colorado River from Kremmling to Granby, as well as up the Muddy, Troublesome, Williams Fork, and Blue River (Figure 4). The main concentration of birds likely occupied the lower Muddy, Troublesome, Williams Fork, and Blue River drainages. First reference to sage grouse in Middle Park came from John C. Fremont, who reported sage grouse along the Blue River on June 20, 1844. From the fall of 1875 to the spring of 1887, 37 specimens were collected, mostly from the vicinity of Kremmling (Cooke, 1897). Thirteen sets of eggs were also collected from 1876 to 1884; most came from near the mouth of the Blue River. Grouse were reported breeding near Dillon, at 9000 feet in elevation.

Reference to sage grouse numbers and occurrence in Middle Park was largely anecdotal through the earlier part of the twentieth century. Forest Service records indicate an abundance of grouse in the area as late as 1920; however, no distinction is made as to species. Most often, ?mountain grouse? (blue grouse) and ?willow grouse (sharp-tailed grouse) were the point of reference. In the 1930's, sage grouse numbers had evidently decreased to the point that, as one of the first

actions of the newly-formed Wildlife Commission, the season on sage grouse was closed statewide in 1937. The Forest Ranger?s estimate of sage grouse in Middle Park in 1938, primarily based on anecdotal information and personal sightings, was 125 birds. By 1943, an estimate of 700 birds was given, suggesting some recovery of the bird population. Sage grouse numbers continued to recover to the point that a hunting season was re-established in 1953.

In 1964, Glenn Rogers characterized the sage grouse population in Grand County as being ?fair? with its heaviest concentration in the Muddy and Troublesome Creek drainages from the town of Kremmling north about 15 miles (Figure 5). He also noted a ?light? population existed on the lower Blue River (from Kremmling to ?above? Green Mountain Reservoir) and east to Rock Creek. Rogers likewise mentioned a ?few? sage grouse as being present in the Williams Fork drainage and along the Colorado River from Parshall to ?above? the town of Granby.

The majority of the present-day Middle Park sage grouse population occupy the sagebrush steppe north of Kremmling, along the Muddy Creek and Troublesome drainages (Figure 6). A fair concentration of birds also occurs south of the Colorado River between Junction Butte and the Williams Fork Reservoir. Lesser numbers can still be found along the Blue River and northwest of Parshall in the Rock Creek area. Lastly, a small, tenuous population of birds occurs in the sagebrush rangelands south and west of Granby.

Historically sage grouse likely moved between North Park and Middle Park using a sagebrush corridor either across Muddy Pass, Araphoe Pass, or between Bear and Diamond Mountains. Such interchange of birds probably provided for genetic interchange, and allowed for replenishment of populations over time. Connectivity to North Park remains a viable possibility with sagebrush rangeland still intact between Diamond and Grizzly Creek. A *direct* link between sage grouse populations in the Egeria/Toponas and Middle Park areas likely does not exist, given the forested character of Gore Pass. Birds may have crossed from the Egeria/Toponas area through Conger Mesa and into the Radium/Sheephorn area. (Rogers, 1964, reported a sage grouse above timberline on the Gore-Sheephorn Divide; while Hoffman and Cade found 3 birds above timberline on Elliott Ridge in August of 1982.) Presently, there is no known resident population of birds in the Radium/Sheephorn area.

VII. LIFE HISTORY

General

Sage grouse are restricted to the sagebrush steppe habitat type and adjacent riparian areas in western North America. They are specialized herbivores that have no grinding gizzard and consequently feed solely on the leaves and flowers of forbs, leaves of sagebrush, and insects. They do not eat grasses or seeds, and do not ingest grit. They are highly dependent upon sagebrush, both for food and cover, throughout the year (See Appendix B for Life Cycle Requirements relative to vegetational characteristics). This dependence peaks during the winter months when sagebrush leaves comprise 99% of the sage grouse diet.

Sage grouse are best recognized for the strutting display of males during the spring. From late March through mid-May, birds congregate in large numbers on display or strutting grounds commonly referred to as leks. Dominant males establish and defend small, central territories on the lek, while less dominant males establish more peripheral territories. Generally adult males will appear on the lek and begin displaying early in the season, whereas yearling males appear at the lek later in the breeding season, following peak hen attendance. The same strutting grounds are traditionally used from year to year, although there may be some minor shift in location to accommodate physical changes at the lek site. In years of high population numbers, satellite leks may temporarily appear, persist for several years, then fall into disuse as populations decline.

Males exhibit a strutting behavior which consists of a combination of steps, wing-brushing movements, and inflation and deflation of gular air sacs. Visibility, and likely acoustics, play a key role in attracting hens. Females are attracted to the displays and eventually breed, primarily with the dominant male. After breeding, females leave the strutting ground and establish a ground nest, most often under live sagebrush. Egg laying begins almost immediately thereafter, with an average of 8 eggs generally laid over a 10 day period. Fifty-five to sixty-eight percent of nests have been reported occurring within 2-3 miles of the lek. Adult hens show considerable fidelity to nesting areas, often returning to the same area over the years. Twenty-five to twenty-seven days are required for incubation. When disturbed on the nest, sage grouse hens frequently desert the nest. In some cases, hens will attempt to re-nest; clutch size is generally reduced. Nest predation is a common phenomenon affecting sage grouse nest success, making the presence of protective cover extremely important.

Once hatched, the hen may remain with the brood in the immediate area of the nest if brood-rearing habitat is available, or the hen may move the brood to moister areas where food is more abundant. Chicks feed on insects at this stage of development and progressively transition to forbs through the first 12 weeks of life. After 10-12 weeks the young become fairly independent of the hen. Gradually birds move away from the nesting and brood-rearing grounds, feeding on forbs and increasingly on sagebrush in the upland areas. Depending on weather conditions, they gradually move toward wintering grounds; immature females are the first to leave fall areas, and adult males are the last. Wintering areas usually occur in lower elevation sagebrush where reduced snow load allows better access to necessary food and cover.

Recent studies in southeastern Idaho distinguish between migratory and non-migratory populations of sage grouse, with the recommendation that this characteristic be identified for purposes of managing local grouse populations. The distinction between migratory and non-migratory rests on whether birds use widely separated and distinct habitats to meet different life cycle requirements (e.g. breeding, nesting, brood-rearing), or whether the same geographic area satisfies all needs. Migratory populations move at some point in their annual life cycle from one habitat to another, sometimes over relatively long distances. There can be several variations. For instance, wintering and breeding areas may be integrated, while summer range remains distinct. Or, all three areas may be clearly and visibly distinct and separate.

The sage grouse population on the east side of Middle Park, (that sub-group centered around Granby) shows signs of becoming non-migratory out of necessity, since massive land conversion is rapidly usurping existing rangeland. Sage grouse populations in all other parts of Middle Park show signs of being migratory in nature, although more seasonal movement information is needed to confirm this. Concerns for non-migratory populations will be more focused on a smaller area and may demand more stringent protection of a given habitat. Keeping movement corridors functional will be important for migratory populations.

Insufficient information exists at this time to determine the minimum area of suitable habitat needed to support a viable sage grouse population. Generally speaking, sage grouse, being a sagebrush obligate species, are considered to require landscape-sized habitat (a mosaic of large, unbroken tracts of sagebrush-dominated rangeland). Information gained documenting population trends and habitat use will better assist the process of estimating and modelling future habitat size.

Unlike other areas of Colorado, there has been little study of sage grouse in Middle Park. Counts have been regularly conducted on specific lek sites in Middle Park since the late 1950's. Leks, along with observed wintering areas have been mapped through the Colorado Division of Wildlife?s WRIS (Wildlife Resource Information Service) process. More recently (1999) a preliminary effort to systematically track and monitor birds with radio telemetry was undertaken. Information gained has begun to provide a clearer definition of areas used by sage grouse in Middle Park. Additional radio-tracking and mapping of important habitat types and vegetative changes over time will continue for at least the next several years. In Middle Park, requirements for winter, nesting, and early brood-rearing habitat presently appear to be in shortest supply. Escape cover near leks needs to be further evaluated, and may possibly be of equal concern.

VIII. ESTIMATING POPULATION PARAMETERS

Lek Counts

Studies of sage grouse across western North America indicate that, as a consequence of greater mortality rates of males, particularly adult males, there are approximately two females for each male in the spring population. Since nearly all mature cocks and most of the juvenile birds attend leks, counts of males on strutting grounds allow managers to estimate grouse population sizes, assuming the majority of lek sites are known. It is likely that some lek sites escape detection; it also has been documented that not all males appear on leks at any given time. Any calculated population size that is not adjusted to account for these factors will be lower than the actual population size.

In many cases, sage grouse populations appear to follow a systematic 8-10 year fluctuation of population highs. However, some would argue that such reported fluctuations have not been sufficiently documented as true cycles; moreover, they point out that the mechanism behind any possible population cycles has not been adequately explained.

Number of males on active leks may fluctuate from day to day, as well as between years. Year-to-year fluctuations in number of birds on leks may be primarily attributed to nesting success and chick survival. Day to day fluctuations are explained by weather, intrusion of predators, time of day relative to sunrise, and time of occurrence within the breeding cycle. Peak male counts generally occur toward the latter part of the breeding period when yearlings begin attending the lek. While birds show relatively high fidelity to a particular lek, there is some movement between leks, particularly with sage grouse hens and with yearling males. Adult males show highest fidelity to a lek site.

Lek sites are generally used from one year to the next, but some shift in location may occur. Even when leks do shift locations, the shift is generally not over any large distance. Outlying leks, or ?satellite? leks, appear to be used primarily during peak times in the population cycle. They show signs of less permanence than the primary leks. In some cases, leks may fall into disuse, only to become active at a later date.

History of Middle Park Sage Grouse Data

Earliest reports of sage grouse numbers in the Middle Park area (1920-1946) come from recently found records of local Forest Rangers. Grouse numbers were not based on any systematic assessment, but rather were developed from anecdotal information and occasional observation of birds. In 1947, a more systematic approach was undertaken by Colorado Game and Fish (predecessor of the CDOW), based on total number of males observed. Stiehm (Rogers, 1964) counted a total of 119 males on 7 leks. Leks were listed numerically as Kremmling #1-7, without further description. Counts continued through the 1950's in other parts of the State; however, there is no further record of counts in Middle Park until Rogers?report of 1959 information. Since 1959, counts have been recorded for most years, with varying degrees of consistency (Figure 7).

Several factors have resulted in inconsistencies in counts through the years. In some cases lack of adequate equipment or sufficient personnel have prevented counts from being conducted. On some occasions, persisting snow cover or impassable roads have prevented access to known sites. Weather conditions at the time of count greatly affect observability and count accuracy. Differences in observer effort and in counting procedures likewise may explain a degree of inconsistency. Both aerial counts and ground counts have been used at times to account for male lek attendance. Each type of count has its limitations. Surveys from airplanes (aerial counts) usually provide only momentary observations, but allow observers to quickly survey large areas of habitat that might otherwise be inaccessible. On the other hand, ground observations generally provide for multiple counts within the more extended time frame, and often are able to detect birds which may not be displaying at a particular moment. The amount of time spent searching for new leks has varied considerably throughout the years. In earlier years, data may have been recorded only for the better known leks, making it difficult to obtain an accurate picture of distribution and overall numbers. Variations in sage grouse populations themselves and factors affecting lek attendance (poor weather conditions, appearance of avian or terrestrial predators, etc.), as already noted, may further contribute to some of the differences and inconsistencies

associated with annual lek counts.

From 1989-1996, management philosophy emphasized ?lek surveys? rather than lek counts. Persons responsible for the surveys were directed to determine whether the lek was active or inactive, with less regard for the actual number of birds using the lek at any one particular time. At the time, research biologists thought that the number of active leks was as good or better a predictor of population health and stability than actual number of males counted. Moreover, it was felt wing barrel collections (i.e., harvest information) provided the best information on the dynamics of sage grouse populations. Although numbers of males were recorded for most lek visits during this period, counts were not necessarily replicated throughout the season, and survey effort is hard to assess. Effort devoted to obtaining accurate counts and time spent searching for new leks has increased substantially since 1997. The relationship between males counted in the spring and actual population size needs to be more fully clarified if possible.

Despite the numerous factors that can influence the precision of counts, the spring count of males still provides the best and most consistent information, regarding overall population size and trends, available on sage grouse in Middle Park. Information must be interpreted with caution, and may in some cases only provide a minimal assessment of the population.

Calculating Population Size Based on Male Lek Counts:
To maximize the usefulness of spring lek counts, certain guidelines are recommended for future consistency:

1) Leks should be visited between 30 minutes prior to sunrise and two hours after sunrise;
2) Ideally, at least three counts should be made of birds at 5-minute intervals during each visit;
3) Leks should be counted at least four times, at roughly 10-day intervals, during the breeding season.

If there are leks close enough (<? mile) for daily interchange, those counts should be considered together (i.e., use either the combined count on any one day, or the highest count on either site, whichever is larger).

If these guidelines are followed to obtain counts, and if reasonable effort goes into searching for undiscovered leks, then credible population estimates can be derived based on the following assumptions (Table 1):

- X When population numbers are high, number of known leks typically represents 90% of all active leks. This is largely due to the potential for unaccounted satellite leks. During population lows or following intensive searches, more than 90% of the active leks may be accounted for.
- X Seventy-five percent of all males are present on leks during the day of high count.
- X The total count of males, adjusted for incomplete lek detection and lek attendance,is assumed to represent 1/3 of the population.

As a general rule of thumb, fall populations are twice the size of the spring population. (The long term average of 1.677 chicks per hen works out to a fall population 2.12 times the spring population.)

Summary of Middle Park Lek Data

The long term data set for Middle Park does not identify any clear trend in sage grouse numbers. Some leks have disappeared, and others appear to be slowly declining. Counts on some leks have shown a resurgence in numbers over recent years; still other leks have gone through numerous peaks and valleys. In some cases, leks have been recently discovered; in other cases, an entire area that once had lek activity is now devoid of any known grouse use. Due to the problems with the consistency of data collection, it is difficult to draw any firm conclusion regarding the trend of sage grouse in Middle Park over the last 50 years. Overall lek attendance (both males and females) and the peak number of males on a lek do show some signs of a downward trend. On the other hand, the number of known, active leks has increased slightly. It is still felt that not all active leks are known in Middle Park. This may be due to a combination of factors, including a diverse topography making discovery and observation difficult, interspersion of private lands, and late persisting snows that make travel into some areas difficult if not impossible.

Looking at the last 13 years? worth of data for Middle Park, which is probably the most reliable data set available, it appears that the size of the breeding population has gone from a period of high numbers (1987-1992), to low numbers (1993-1996), and back to a higher population (1997-1999). This could suggest a possible 8-10 year cycle in the sage grouse population; however the inconsistencies of long term data as mentioned above do not allow for any inarguable conclusiveness. Additionally, it should be noted that during the lower population phase between 1993 and 1996, count effort was reduced, undoubtedly contributing to the reported drop in numbers. The intensive search effort of the past 2 years introduces an additional bias. Regardless, a substantial difference remains between high and low numbers reported in this period. A suggestion of high and low cycles carries through from preceding periods as well. In 1996 a low male count equated to a suggested population size of 462 birds; in 1989, a high male count suggested a breeding population of 1329 birds.

Delineation of Geographic Areas

Based on an assessment of historic and current lek activity, and on recent monitoring of grouse activity from April to October, the MPSGC found it useful to group leks according to geographical zones within the total planning area (Figure 8). The following geographic delineations are suggested: 1) Granby ; 2) Troublesome; 3) Williams Fork area; 4) Muddy Creek; and 5) Blue River. Although such delineations are conceptual in nature and are not meant to infer that movement of birds does not occur between areas, individual birds and flocks are much more likely to remain within their geographic zone. Recognition of these geographic zones should be helpful in assessing the general health of the population and in keeping efforts focused

on maintaining an overall distribution of the existing population.

IX. PROCESS FOR SETTING POPULATION GOALS

A two-step process was used to arrive at population goals for Middle Park. The first step was to determine whether male counts on leks in the spring provided the best parameter for assessing the status and health of the Middle Park sage grouse population. Other parameters were examined and evaluated. Then, population goals were set and expressed in terms of the parameters chosen. Goals were considered both from a general assessment of historic grouse populations and numbers, and from a compilation and evaluation of pertinent lek information based on field observation.

The MPSGC looked at the following as possible parameters for evaluating and setting sage grouse goals: total count of males on leks in the spring, average number of males per lek, assessment of population by subgroup/zone, use of primary/ ?indicator? leks, historic highs or lows of past counts, total number of active leks, translation of suitable habitat acreage to expected bird density, brood counts and juvenile/hen ratios, limits of acceptable change, and wing barrel information. Many of these options included several variations which were examined and considered as well. Assumptions, accuracy, practicality, and integration with other information were considered in determining the most desirable parameters.

The MPSGC concluded that the best information in determining and relating population goals was offered through continuation (and refinement) of springtime lek counts on males. At the same time, it was decided that setting population goals based on total number of males alone could be misleading. Total number of males may remain constant, due to an increase of birds in one area compensating for a loss of birds in another area. Such loss could be critical, yet go unnoticed if goals were totally dependent on overall male count in the spring. Therefore, MPSGC chose to recognize the 5 geographic areas listed above and to set population goals in relation to these as well.

Given the fluctuating nature of sage grouse populations in Middle Park, as represented by count data for male attendance at leks during the spring, the MPSGC chose to address minimum and optimum levels when setting population goals. The minimum level represents a level below which MPSGC would not like to see grouse numbers fall, while the optimum level represents a healthy sage grouse population based on past and current information. Given count inconsistencies, a three-year moving average was considered the best indicator for determining overall population status and short-term trends relative to these two levels. Neither level is meant to represent an arbitrary line at which point, and only at which point, action or relief from action is triggered. If population trends are downward, the MPSGC finds it important to identify causes and intensify efforts *before* reaching any minimum acceptable level. It likewise considers it important to pursue efforts in restoring and enhancing populations even if optimum levels are reached.

The reasonableness of these suggested goals was evaluated through an in-depth review of each individual lek and the local grouse population (sub-group) centered around that lek. Factors likely to impact those populations were evaluated, and the feasibility of actions that could offset or enhance populations in that area were examined. It is hoped that with added monitoring and increased understanding, the reasonableness of numbers given minimum and optimum levels can be more fully scrutinized, and if necessary the setting of minimum and optimum levels can be appropriately adjusted.

X. MIDDLE PARK POPULATION GOALS

Based on preliminary biological information, the following population goals were set for the Middle Park area:

- X **At an optimum level, efforts will be made to maintain a spring population of at least 1100 birds. Based on the assumptions given above, this population will be represented by an actual count of 250 males total across all leks.**
- X **At a minimum level, efforts will be made to keep spring populations from falling below 125 males counted across all leks, which equates to a total of 550+ birds in the breeding population.**
- X **In order that there be a balance of sage grouse throughout a broad segment of the sagebrush steppe in the area of focus, spring cock counts must show breeding activity in at least 4 of the 5 geographic areas defined.**
- X **These goals shall be revisited and re-evaluated by the MPSGC 3 years from date of signing. Subsequent information gained will be used to assess the reasonableness of such goals, and with consensus of the different interests represented within the MPSGC, goals may be modified or expanded. Thereafter, goals will be evaluated on a 5 year basis for similar purposes.**

Many biologists suggest that a population of 500 birds is necessary to remain viable for at least 25 years. The minimum acceptable level chosen for Middle Park (550 birds, breeding population) allows for maintenance of this population size. Over the past 42 years of total male counts, bird populations in Middle Park have appeared to fall below this benchmark 17 times. Hence, the minimum goal seems to offer a reasonable approach providing adequate challenge. The optimum goal takes into account the continued loss of rangelands to development and growth. Limited opportunities exist, primarily through conservation easements and small land exchanges, to increase or maintain the quantity of sagebrush rangeland in the future. While quantity of sagebrush habitats cannot be readily increased, quality of sagebrush habitats may compensate for at least a part of the future losses. However, even here, there is presently a very limited understanding as to how rangeland ?improvements? might help stabilize or increase sage grouse in the future. It is hoped that as we learn more about sage grouse in Middle Park, we will have a better understanding of population capabilities and realistic goals. At such time, goals may be adjusted accordingly.

XI. CONSERVATION STRATEGY

Having first defined population goals, management issues were identified (Appendix C) and management actions/options (Appendix D) were then developed to address such issues. It should be noted that the management options listed for identified issues may not cover all possible conservation actions, or that all options listed will be suitable at all sites. Listing management options serves as a preliminary step in addressing sage grouse needs and provides background for evaluating possible actions to be later identified in specific work plans. Issues and actions are categorized under 4 separate headings:

1) Habitat-Related Management; 2) Wildlife-Related Management; 3) Human Demographics and Growth-Related Issues; and 4) Planning and Outreach Issues. Each of these categories was subdivided accordingly, and general conservation actions were listed to better define objectives and tools for reaching the proposed population goals.

HABITAT-RELATED ISSUES

While sage grouse are highly dependent upon large expanses of the sagebrush steppe, a diverse mosaic of seral stages, age classes, and canopy cover of sagebrush is needed to meet grouse life requirements. An interspersion of forbs and grasses is equally important in providing the understory necessary for sage grouse (See Table 2 for a listing of Common Plant Species found in Middle Park). Of the various habitat characteristics associated with sage grouse needs, those relating to breeding, nesting/early-brood rearing, and wintering activities were deemed most important for initial focus, assessment, and action of MPSGC.

A desired future condition is given for each of these habitats (See Table 3, summarizing Desired Conditions), followed by a list of potential management practices. The desired future condition is based on guidelines provided by the Western States Sage Grouse and Columbian Sharp-tailed Grouse Technical Committee (the Technical Committee) and the Western Association of Fish and Wildlife Agencies (WAFWA), and derived from sage grouse research done throughout the western U.S. Percent canopy cover and vegetation height given represent best existing knowledge relative to sage grouse requirements at this time. Guidelines given have to be realistically coupled with land capability in the Middle Park area. Specific site conditions, including soils, aspect, and existing condition, may not allow for the attainment of desired future condition on all sites, even over an extended period of time. The Technical Committee itself states that the herbaceous requirements may not be possible in all habitats, and that local biologists and range ecologists will need to develop requirements (specifically height requirements) that are reasonable and defensible. As with desired future condition, not all management practices that are cited can be effectively applied to any given site. Listing of management practices is not intended to be all-inclusive, but is meant to serve as a foundation for continued discussion and creative problem-solving.

Breeding Habitat

Rationale: Without successful breeding, sage grouse populations decline over time. Breeding activity is centered around the lek site. Open areas with low or sparse vegetation are selected to enhance visibility of displaying males to hens, and to facilitate detection of approaching predators. Breeding activity generally occurs in Middle Park between March 15 and May 15, with highest female attendance at the lek in early-mid April, followed by a peak in male attendance in early May. Hens often visit more than one lek site; therefore, the distribution of breeding sites across the overall range may be important.

In Middle Park, there is considerable variation in the topographical location of lek sites. Some occur on ridges and gentle slopes; others are found on the edge of hay meadows and in bottomlands. For the most part, lek sites in Middle Park appear viable and within desired condition; however, a few sites need to be further evaluated as to successional condition of vegetation, the encroachment of shrubs, and the existence of physical obstructions such as fences.

Not only are the physical and vegetational characteristics of the immediate strutting ground important, but the off-site area surrounding the lek (within 300 yards of the lek site) is likewise considered extremely important to breeding success. Hens coming to the lek often utilize this area before proceeding onto the lek site itself, while males use it for feeding, roosting, and hiding cover. This area is optimally characterized by a healthy stand of big sagebrush, intermixed with adequate grass and forb cover to provide structural obstruction which lessens the chance of predation. While quite a bit is known about the nature and character of lek sites in Middle Park, off-site characteristics need to be more fully assessed as to structural diversity, canopy cover, and interspersion of grass and forbs.

Desired Condition: Management objectives are to maintain the open character of the immediate lek site, while ensuring sufficient structural diversity of sagebrush within 300 yards of display areas to provide adequate resting and escape cover. Such diversity in off-site areas is characterized by big sagebrush stands with 15%-25% canopy cover and a height greater than 16". Grasses and forbs, whether residual or new growth, ideally comprise 25% of the canopy cover with an average herbaceous height of 7". Greater than 15% canopy cover of grasses and >10% canopy cover of forbs (with diversity of forbs) is preferred.

Management Options: Members of the MPSGC identified the following as a partial list of management options to be considered for protecting/enhancing breeding habitat values on the immediate lek site itself: delay of grazing in breeding areas; removal of obstructions (fences, posts, wire, etc.); modification of nearby perch sites; minimization of wild ungulate disturbances through hazing and other methods; assessment of predation and appropriate response through predator control when necessary; halting/reversing pinyon-juniper encroachment within the immediate area; prevention of shrub establishment on leks through seeding of native shortgrass species; identification and enhancement of other possible lek sites in the area when present sites show no response or when re-establishment of historic sites is desirable. The following

constitute possible management actions off-site (within 300 yards of display areas): limit grazing during breeding periods; manage grazing to provide adequate residual grass and forb cover*;* discourage wild ungulate use that would be disruptive of grouse activity; judiciously apply vegetative treatment (fertilization, spraying, mowing, harrowing, brushbeating) to achieve desired cover, height, and mix; seed with grasses; manage the greater area surrounding the lek for successional and structural diversity that can be maintained over time; control noxious weeds. (Appendix D summarizes all management options for this and other issues.)

Nesting/Brood-Rearing Habitat

Rationale: Nesting and brood-rearing habitat have obvious importance in the maintenance and development of sage grouse populations. Relative to other gamebirds, sage grouse exhibit fairly low production, with an average clutch size of eight. Hens show considerable fidelity to nesting areas over time, and depend heavily on brood-rearing habitat where insects are readily available for the young. Forbs play an important nutritional role in pre-laying condition of hens. Higher levels of crude protein and phosphorous, and in some cases calcium, have been identified in various forb species used by the hen prior to and at the time of nesting. Successful nests are most often associated with big sagebrush-dominated plant communities with an understory of herbaceous species. This understory of grass and forbs provides horizontal and vertical structure thereby reducing susceptibility of nests to predation, while providing an important forage component for the nesting hen. Herbaceous cover may additionally discourage predation through scent barriers and physical obstruction that slows the approach of predators. Traditionally, the majority of nesting (50-60%) has been found to occur within 2-3 miles of lek sites. In Middle Park nesting begins in mid-April while incubation of re-nests continues into early June.

Once eggs have hatched, hens will keep their broods in the nesting area if succulent forage persists. If not, they will move to more mesic areas, usually along meadows and within riparian areas where an adequate insect base can be found to ensure optimal development of the chicks. Increasing diversity of understory results in greater insect diversity. Horizontal cover and habitat interspersion are considered two of the most important characteristics of sage grouse habitat in the summer. A moderate canopy of sagebrush provides adequate escape cover while allowing suitable moisture and sunlight for development of grasses and forbs. After an initial period when chick diets consist largely of insects (approx. 60% 1 week from hatch, declining to 5% by the 12th week), succulent forbs become predominant (75%) into the early fall. Gradually diets shift from forbs to total sagebrush consumption by late October. Juvenile/hen ratios >1.75 in the fall population are generally indicative of a stable or increasing population in Colorado.

Desired Condition: This Plan recommends structural characteristics in nesting areas that include: 15%-25% canopy cover of big sagebrush, between 14 and 31 inches in height; a herbaceous canopy greater than 15%, with a diversity of forbs; grass height (residual or new growth) >7". In areas of early-brood rearing, protection of living sagebrush within 300 yards of meadows is recommended with a 14-20% live canopy. This allows for a desirable mix of grass and forb species, and provides the necessary roosting and escape cover.

Management Options: Options set forth for protection and enhancement of nesting areas include the following: seeding and fertilization of nesting areas; grazing management (wild and domestic ungulates); assessment of predation types (coyote, rodent, avian) and impacts, and implementation of controls when predation rates are deemed high and control measures would be considered reasonably effective. Techniques proposed for improvement or maintenance of brood-rearing areas include: encouragement of natural forb growth through grazing management, fertilization, and vegetational treatment; interseeding of forbs (alfalfa, clover, sanfoin) when natural establishment is not favorable; promotion of healthy insect populations through limitation on use of insecticides, fostering of forbs which provide insect forage base; maintenance and management of free water; development, enhancement, and protection of wetland and riparian habitats; drought management; weed control.

Winter Habitat

Rationale: Overwinter survival plays a critical role in maintaining a viable sage grouse population. During winter, sage grouse are highly dependent upon big sagebrush, both for forage, and for hiding and thermal cover. *A.t. wyomingensis* is prevalent on Middle Park winter range, and has been found to provide higher protein with lower terpenes than *A.t.vaseyana*. Areas available to sage grouse during the winter are largely determined by snow depth. In North Park, only 50% of big sagebrush was found to provide suitable winter use areas because of snow depth, slope, and location; of this, only 7% of total area received significant use. Similar conditions prevail in Middle Park. Although they support less forage, mesas and ridgetops (<5 degrees slope) that tend to blow free of snow must be recognized for their importance. *A. t. wyomingensis* has been identified as constituting preferred feeding areas, although taller stands of *A.t.vaseyana* extending above the snow are also considered critical. There is no evidence that severe winter weather *directly* results in winter mortality of birds, provided there is adequate cover and forage.

Desired Condition: Important wintering areas should have >20% canopy cover of big sagebrush, with a 10-14" height above the snow, regardless of winter severity. Vegetation on windblown ridgetops needs to be maintained and protected.

Management Options: Members of the MPSGC identified the following as possible actions to protect and improve habitat in sage grouse wintering areas: fertilization or stimulation to increase sagebrush height and nutritive value; reduction of undesirable plant competition; summer grazing management to ensure plant height; travel management; elimination of avian perches; protection of open ridges and slopes; assessment of and response to excessive predation; ground-truthing aerial photos of winter sagebrush habitat with sage grouse use during severe winters.

GROWTH-RELATED ISSUES

Over the past twenty years, Grand County has seen significant changes in the demographics and growth of its population. While western Grand County remains largely rural in nature, the eastern part of the county has seen a major shift from production agriculture to commercial development. Many of the larger private holdings have been subdivided for housing or

commercial use. Population growth in the county during the period 1990-1994 increased at a rate of approximately 10%, and projections continue to point toward a 3-5% increase in population over the next 10 years. More recently, western parts of the county have begun experiencing a similar surge in growth and several large ranches have been converted to uses where production agriculture has become secondary in importance. In some cases, remaining ranches now provide the only sage grouse habitat in an area because of land conversions surrounding them.

With such growth come both impacts and benefits. Grand County recently completed a Strategic Growth Plan and a Master Plan to address issues of growth-related concern, to direct growth to specified areas, and to implement actions associated with definable growth strategies. The need and desire to maintain open space and wildlife habitat, and to protect the county?s rural and agricultural character, headed the list of community goals driving much of this process.

Increased growth and population densities invariably lead to a fragmentation and loss of habitat for wildlife species. Besides the immediate and obvious impacts of housing and the conversion of ranchlands to residential developments, there are also less obvious impacts associated with supporting infrastructure. Increased recreational demands are having a growing impact on public lands and habitat, and the behavior and viability of wildlife populations. Wildlife professionals are becoming more aware of the interrelatedness of these many impacts, and are beginning to recognize the overall cumulative effect they have on wildlife populations.

Issues relating to growth are categorized below under headings of land development and recreation.

Land Development Issues

Rationale: Sagebrush rangelands constitute approximately 13.6% of total acreage in Grand County. Irrigated haylands comprise another 2.3% of total acreage, and generally occur in bottomlands along the major drainages. The largest expanse of sagebrush occurs in the western half of Grand County in the Muddy Creek, Troublesome, Williams Fork, and Blue River drainages. A smaller, fairly fragmented block of sagebrush habitat occurs in the eastern end of the county, primarily south and west of Granby. Of 15 active leks reported in 1999, nine (60%) occur on private land; six occur on public lands. Of the six found on public lands, only two are situated more than one quarter mile from private holdings. Moreover, two sites presently on public land are likely to be exchanged and become privately owned. Growth and development issues are identified under headings of physical expansion, associated infrastructure, and exchange of public lands.

> **Expansion into and conversion of sage grouse habitat to development-related purposes -** Traditional sage grouse habitats in the eastern part of Grand County are being fragmented and lost to the rapid increase of dispersed housing and more concentrated commercial development. The majority of new housing development on the east end has occurred on large lots between 3 and 35 acres in size, and has taken place in the unincorporated areas. In the western part of the county several small subdivisions have

appeared in sagebrush rangelands, and are presently in various stages of development. Moreover, large tracts of private land dedicated to production agriculture are presently being sold to interests, both large and small, for whom production agriculture is secondary. The combined influences of increased activity, unimpeded movement of household pets, and direct impacts on the habitat itself (e.g. the establishment of horse pasture acreages, sagebrush conversion, road placement), radiate out beyond specific structures and improvements, further depleting the quantity and quality of sagebrush habitat.

Associated infrastructure - An increasingly large infrastructure is needed to support the growth and development occurring in the Middle Park area and throughout the region. Powerlines, fences, pipelines, roads, gravel pits, reservoirs, water diversions, formal and informal recreational areas (ballparks, golf courses, parking lots, campgrounds, trails) are all manifestations of such growth. In some cases, impacts are direct and obvious as in the loss of physical habitat. In other cases impacts are less obvious and less direct, with subtle changes in reduced habitat connectivity and increased fragmentation of overall grouse range. Noxious weeds are often introduced and spread through construction activity and compaction of soils. As with housing and subdivisions, zones of influence affecting wildlife presence often surround powerlines, roads, gravel pits, and other improvements.

Exchange of public lands - Efforts to dispense with less manageable and more isolated parcels of public land by government agencies (BLM, DOW, SLB, USFS) have recently increased throughout the State and region. Most often, efforts are directed at exchanging such parcels for lands that would provide a more contiguous and larger block of land that can offer additional resource/recreational advantage and permit more efficient management in terms of time and cost constraints.

In the process of disposing of isolated parcels of public land, there is the potential of reducing or losing altogether the only remaining islands of viable sage grouse habitat in the area. Not all land exchanges can or do protect sage grouse values, as sagebrush-grass rangelands are often considered of less priority or importance than other values. Nor do all land exchanges necessarily balance like values within the immediate Middle Park area. For example, lands that may provide highly-important security for birds on an existing lek may be exchanged for other lands in areas with low grouse potential. Net losses of real or potential grouse habitat have typically occurred with the exchange of lands in Middle Park for lands outside the area.

Desired Condition: MPSGC seeks to maintain the viable sagebrush rangelands that support local sage grouse populations. In order to do so, it will be necessary to provide input to county planners on growth and development on private lands so that wildlife values can be more fully recognized and understood. The larger blocks of public land that meet all the habitat requirements and life cycle needs of sage grouse need to be protected. Moreover, important travel corridors between Middle Park sub-groups, and between populations in Middle Park and

North Park, should be identified and preserved.
Management Options: Options addressing the above land-related issues include, among others, the use of conservation easements, fee title purchases/leases, land exchanges, transferable development rights, and payment for non-use to gain or protect important sage grouse habitat values. Further wildlife values through conservation easements or deed restrictions on public exchange parcels. Develop partnerships with private landowners and entities such as utility companies to achieve sage grouse stabilization and enhancement. Incorporate habitat issues in assessing and issuing right-of-way and special use permits on public lands. Monitor and aggressively address infestations of noxious weeds that limit the quality and condition of grouse habitat. Control and limit movement of pets and feral animals.

Work with County Planning and Zoning to identify and protect critical grouse habitat. Develop and disseminate information to property owners, developers, and land management personnel. Monitor and track land-use changes and infrastructure development (e.g.utilities expansion, road construction, development and design of recreational facilities). Ensure consideration of sage grouse needs and requirements into application of County goals for wildlife habitat and open space as written into County Master Plans. Mitigate adverse impacts such as noise, pets, time of activity, and intrusion into critical habitat. List critical habitats on public land that need to be protected by land management agencies.

Recreation Issues
Rationale: Public lands provide a valuable recreational asset not only to residents of Grand County, but to visitors from outside the county as well. The greatest potential for impacts of recreation on sage grouse are likely to occur on wintering and breeding areas. Both wintering and breeding activities place costly physiological demands on sage grouse and occur at times when recreational activity is concentrated because of snowpack in higher areas. Recreation issues have been listed under the headings of travel and viewing.

> **Travel Management -** Concerns exist about unrestricted motorized and non-motorized uses on sage grouse habitat in relation to soils, vegetation, location, and timing. OHV use with its resultant roads/trails is growing and expanding into sagebrush and riparian areas. Off-road travel can impact grouse populations directly through loss, damage, or abandonment of nests, or through injury to/displacement of birds. It can also have indirect effects, including erosion of soils, trampling of vegetation (with subsequent exposure to predators), and spread of noxious weeds. Winter travel has been shown to provide travel corridors for predators on compacted snow, making grouse and other prey species more vulnerable. Non-motorized activity likewise can have significant impacts depending on intensity, duration, and timing of use. Wildlife species are less tolerant of unpredictable disturbances resulting from recreational travel and activity, and less apt to habituate to such disturbances.
>
> **Wildlife Viewing -** There has been increasing interest over recent years in viewing spring-time grouse displays. In several parts of the State, wildlife agencies and commercial

groups have responded by identifying watchable wildlife sites and scheduling tours to observe this spring ritual. Protocols to manage human activities near select sage grouse leks were developed and implemented in North Park in the early 1980's. However, if protocols are not clearly understood and followed, birds may be adversely affected and abandon lek sites, either temporarily or permanently. In Middle Park, visitation of leks has been informal and unmonitored. While there is a general feeling that such activities are incidental and very limited, there is no consistent monitoring of such activity. In one case (Antelope Pass lek), there is sufficient public knowledge of and interest in the lek site to suggest that indiscriminate viewing may have contributed to a decline in lek attendance and instability.

Desired Condition: Relative to growth-related issues, this Plan seeks to develop and encourage responsible use and appreciation of public lands and resources. This includes providing non-invasive viewing opportunities as needed, and instilling values which recognize and appreciate the needs and requirements of sage grouse throughout their life cycle.

Management Options: Among conservation actions identified are the following: seasonal closure of critical areas; development of a viable and enforceable travel management plan with the designation of routes in areas of sensitive habitat and at critical times; trail and site design (including design and placement of camping sites, outhouses, etc.); monitoring vehicle traffic and viewer numbers during breeding season; designation of viewing sites as appropriate; dissemination of information regarding ethical and non-intrusive viewing.

WILDLIFE-RELATED ISSUES

Numerous wildlife-related issues surfaced while addressing the need to protect and enhance sage grouse populations in Middle Park. Foremost among these issues were 1) multiple species management; 2) T&E issues; 3) the role of predation and predation control in management ; 4) hunting impacts, real and perceived; and 5) the need to expand our knowledge base of sage grouse activity and habitat use in Middle Park.

Multiple Species Management

Rationale: There is a growing awareness that for any management to succeed, entire landscapes need to be addressed in a comprehensive and integrated manner which allows for a balance of needs and concerns. Too often management in the past has taken a single species approach, only to the detriment and loss of important resource values for other species, or for the ecosystem as a whole. A collaborative approach, which goes beyond single species management and recognizes the multiple demands and uses placed on the environment, has a greater possibility of achieving the desired results over the long term.

Sage grouse habitat and life requirements are met on both private and public lands in Middle Park. Much of this same habitat serves a host of other purposes, providing necessary forage for livestock, hay meadows for winter feed, and critical winter range for deer, elk, and pronghorn antelope. The ultimate goal of this plan is to restore and sustain the health, productivity, and

biological diversity of the sagebrush ecosystem in such a way that sage grouse, and the other wildlife and domestic species dependent on this system, receive sustainable benefit and have the means to prosper.

Desired Condition: A healthy and sustainable mosaic of sagebrush/grassland range characterized by a diversity of seral stages, age classes, and horizontal/vertical structure is necessary for a balanced animal community. A rich and diverse wildlife community in Middle Park sharing the range of important habitat values characteristic of sagebrush rangelands during one or more seasons may include elk, deer, pronghorn antelope; small mammal species including coyote, fox, badger, ground squirrel, white-tailed jackrabbit, weasel, and skunk, among others; and sagebrush obligate bird species including Brewer?s sparrow and sage thrasher.

Management Options: As means to the desired condition, the following options were listed: Map overall health and diversity of rangelands in Middle Park. Track sagebrush projects both on private and public lands. Encourage grazing practices that assist in attaining the habitat values needed for sage grouse; consider conservation easements, exchange of grazing values, map critical areas, times of use, and areas of potential conflict. Monitor utilization by wildlife, esp. on winter ranges; track interspecific competition; monitor population trends of associated bird species; monitor population trends/levels of rodents, canids, and mustelids when of concern. Assess areas of utilization overlap and potential conflict.

T&E Species (Threatened and Endangered)

Rationale: Federally listed T&E species are protected through the Endangered Species Act. Any actions affecting these species are regulated through the USFWS. State listed T&E species fall under the protection of Colorado wildlife statutes and regulations. Given the multiple species approach of this Plan, and given the desire to manage sagebrush rangelands in a way that is consistent with management of other species, there is the need to manage sage grouse in a way that would not be harmful toT&E species in the Middle Park area.

Desired Condition: Management for sage grouse will not lead to further endangerment of T&E plant and animal species, whether those are federally listed, or state listed. Moreover, species that are classified as sensitive or species of special concern, either by a federal or state agency, will likewise receive consideration in sage grouse management, given the best knowledge available. In Middle Park?s sagebrush/grass rangelands and upland shrub communities, the following wildlife species meet the above description and may possibly/likely occur: bald eagle, ferruginous hawk, peregrine falcon, merlin, Columbian sharp-tailed grouse, and western burrowing owl.

Additionally, special status species associated with wetland and irrigated systems include the tiger salamander and northern leopard frog. Of plant species associated with sage grouse habitats in Middle Park, Osterhout milkvetch (*Astragalus osterhoutii*) and Penland beardtongue (*Penstemon penlandii*) are federally endangered, while Harrington beardtongue (*Penstemon*

harringtonii) and Middle Park penstemon (*Penstemon cyathophorous*) are classified as special status species.

Management Options: In order to safeguard T&E species and species of special concern throughout sage grouse habitat, this Plan calls for continued monitoring of such species. It also advocates the design of sage grouse-related improvements in a way that is consonant with the life requirements and needs of these species.

Predation

Rationale: Native predators have played, and continue to play, an important role in natural ecosystems. As landscapes have become increasingly fragmented and values have emphasized single-species or single-resource management, certain predators have been eliminated from the system, while others, often non-native species, have expanded their range and become more prominent.

Relative to other bird species, sage grouse exhibit a moderate degree of natural annual mortality (40-60%), with adults and older juvenile sage grouse (>10 weeks of age) exhibiting fairly high survival rates. Higher mortality occurs with males than with females. Predation accounts for the greatest portion of overall mortality. Predators on sage grouse and on sage grouse nests include both avian and mammalian species - golden eagles, hawks, magpies, ravens, crows, coyotes, foxes, bobcats, skunks, badgers, weasels, and ground squirrels, as well as domestic and feral dogs and cats.

Much of the predation on male grouse occurs on strutting grounds, when males are particularly exposed and susceptible because of highly observable display behavior and minimal vegetative cover. Observations in Middle Park, both historical and current, confirm the significance of avian predators at this point in the life cycle; studies elsewhere report similar susceptibility of other grouse species at the time of displaying and when vegetative cover was least abundant.

Some studies indicate that the highest predation on sage grouse is at the egg stage, with rodents (primarily ground squirrels) and weasels capable of inflicting up to 50% loss to the current year?s nests and productivity. However, nesting success in species such as sage grouse is generally considered good provided it does not fall below 40%. Avian predators, including great horned owls, hawks, and eagles, along with mammalian predators, such as coyotes and foxes, account for most of the predation on birds after they leave the nest.

Although predators are generally the immediate cause in depressing sage grouse numbers and productivity, habitat condition plays a significant and perhaps more ultimate role in the sage grouse?s survival. Overstory and understory heterogeneity are essential to providing the escape and hiding cover necessary for a prey species to avoid detection and to find refuge. Sagebrush canopy lessens exposure to avian predators, while grass/forb interspersion reduces lateral observability which would make the bird susceptible to mammalian predators. red fox skunk

Fragmentation of habitat often favors predator species, allowing for travel corridors and ready access into sage grouse habitat. Smaller mammalian predators such as red fox and skunks often find a foothold in fragmented habitats, while domestic and feral animals are brought into closer proximity with the incursion of rural housing and development. Fragmentation likewise forces prey to increase home range size to meet life requirement needs, or to move through less desirable habitats where they become more exposed to predation and other sources of mortality.

In the past, extensive control programs have been undertaken to eradicate entire predator populations in an attempt to protect and manage for a single species. In more recent years, a more comprehensive understanding of the predator-prey systems, and the need for balance in such systems, has resulted in efforts to address long-term problems. While intensive predator control programs have shown some short-term effectiveness, few have been sufficient to keep predation in check over extended periods of time. The larger the area to which control is applied, the more costly such programs become. Moreover, control programs directed at one species often lead to an eruption of another species, whether predator or prey. Efforts to control coyote populations in the past frequently resulted in an increase in ground squirrel or jackrabbit populations, or allowed red foxes to increase and expand their territory to the detriment of bird species such as grouse. Direct control of avian predators is not an option since hawks and eagles are federally protected.

Desired Condition: It is important that a balanced approach be taken in addressing predation problems. This begins by looking at root problems which offset predator-prey imbalances and recognizing the fact that long-term problems cannot be adequately resolved through short-term solutions. When a particular form of predation weighs heavily on grouse production and survival, ways to restore the balance without creating further imbalances in the system need to be identified. Given the fact that habitat condition strongly influences susceptibility to predation, this Plan recognizes the need to improve understory of grass and forbs, live canopy and diversity of sagebrush.

Management Options: Among options identified are the following: more clearly ascertain the impacts of known/probable cause of grouse and nest predation, including coyote, ground squirrel, and corvid (crow/raven) predation, especially in areas where sage grouse populations seem most impacted; examine long-range effects associated with attempted control of predator populations; assess the time frame when problems may be occurring (e.g. the egg stage, brood stage, or adult stage) and determine whether the predation problem can be effectively reduced without shifting the loss to another life stage; retrofit/modify existing perch sites in areas of high sensitivity; experiment with species specific predator control in high-importance areas such as surrounding lek sites; support studies in other parts of the State that seek to define predator impacts on sage grouse; manage habitat to encourage diversity and heterogeneity.

Hunting

Rationale: Subsistence hunting of grouse pre-dates modern record keeping. On occasion, bird points from arrows used by Native Americans have been found on lek sites still in use today. In

the late 1800's, market hunting provided a ready supply of game birds, along with big game, for workers swarming into mining and railroad camps. With the first State legislative session of 1877, initial restrictions were placed on the take of sage grouse. However, these were so liberal that up to 25 birds could be taken in a day (50 birds in possession) until the turn of the century. Many settlers, seeking subsistence from the land, depended on sage, blue, and sharp-tailed grouse to add variety to their diets and help them through the winter. As mentioned earlier, the season on sage grouse was closed statewide in 1937. While there is the suggestion that the season in Middle Park was temporarily opened in the mid-1940's, consistent seasons on sage grouse did not being until 1953. In recent years, most sage grouse hunting has taken place on public lands rather than on private. Small game hunters through their recreational pursuit have traditionally funded management programs that have furthered an understanding of life cycles and behavior patterns of sage grouse. Dollars that support such programs come from license fees and the excise tax on firearms and ammunition.

Historically, bag limits in MP have ranged between 1 and 3 birds since 1975, while possession limits have ranged between 2 and 9 birds (Table 4). Season length and bag/possession limits have typically been adjusted in response to population trends. From 1995-1997 bag and possession limits were reduced to 1 and 2 birds respectively. This was based on spring lek counts of 103-127 males. In 1998 bag and possession limits were raised to 2 and 4 birds respectively, given a marked increase in males (223) counted on leks. Although season length (Figure 9) has been shown to have no impact on overall harvest, it was reduced to16 days in 1997, with most hunting of sage grouse expected to occur on weekends (4 of the 16 days available). The sage grouse season for 2000 has further been reduced to a seven day period. Current CDOW guidelines have set a breeding population of 500 birds as the minimum for a huntable population, below which point a closure would be imposed.

Wing barrels have provided important biological information. Wings collected from hunter harvest help determine productivity within the population, including percent of successfully nesting hens, number of chicks per hen, and adult survival from previous year. Although larger samples (number of wings collected) provide better quality information, even smaller sample sizes, when interpreted cautiously, may provide at least a general indication of population make-up and trend. Harvest data from wing samples can assist in measuring the success of management practices as well, providing a cost effective and realistic way of monitoring outcomes.

Wing barrel information coupled with field observations indicate that there has been a marked reduction in sage grouse hunter numbers since 1994 (Table 5). Even with the most liberal bag/possession limits of the past (3/9birds - 1985 to1994) and the more extended seasons (30-34 days - 1989 to 1994), number of birds harvested (Figure 10) fell far below the upper limit acceptable for harvest. (Harvest of no more than 10% of the fall population is recommended in proposed sage grouse guidelines.) A report on hunter/harvest surveys in North Park during the late 1970's and early 1980's indicated that season length did not affect total harvest, and accounted for only a slight and temporary increase in hunter numbers. Using check stations to

verify actual harvest, it was concluded that harvest was a function of total grouse population, not season length or bag/possession limit. Given a shift in hunter interest and season participation, coupled with highly restrictive bag and possession limits of recent years, it would be reasonable to suggest that harvest itself may no longer be an adequate predictor of bird populations.

Since 1998, Colorado has collaborated with the federal government in HIP (Harvest Information Program), a harvest survey program mandated for reporting small game participation and harvest. Considerable discrepancy exists in Middle Park between number of harvested birds accounted for through wing barrels and numbers reported through harvest surveys. Concerns exist that hunters reporting harvest of sage grouse in the Middle Park area through harvest surveys have either misidentified units in which they took birds, or have confused blue grouse and sage grouse. Another possibility is that extrapolation from a sampling of harvest reports to overall harvest numbers has been seriously misinterpreted. Number of hunters participating in the sage grouse season in Middle Park as reported through HIP appear also to conflict with field officer observations. A statewide small game survey conducted in the mid-1970's overestimated hunter numbers by 29%, and harvest by 85%. Although techniques have become more refined in sampling hunters, information gained through HIP, particularly in early stages of reporting, must still be tested. Recognizing the likelihood that some wings are not being placed in wing barrels as requested, it is still felt that wing barrel information in Middle Park is more accurately aligned with total hunter pressure and harvest than is HIP at this point in time.

For over a decade biologists have discussed whether hunting mortality on sage grouse is compensatory (replacive) or additive in nature; that is, whether one form of mortality (at the hands of the hunter) is not compensating for/replacing the other form of mortality that arises naturally (winter mortality or loss to a predator) and that is typical of bird and small mammal populations. Past investigations have concluded that most mortality through hunting is replacive; it does not add to the overall natural mortality expected of this species. A model recently presented by Johnson and Braun (1999) suggested that hunting, in some situations (density independent systems in poor quality habitat), could be additive at some harvest level. However, the study found only a weak inference and the authors concluded that most sage grouse populations appear capable of sustaining hunting if carefully managed.

Minimum viable population size for sage grouse is uncertain. Braun (1994) suggested that it likely lies between 200 and 500 birds. He suggests that populations having less than 100 males counted on leks in the springtime (equating to a likely breeding population of <500 birds) should not be hunted.

Desired Condition: It is desired that harvest be carefully monitored and that population size and trends be assessed so that design and approval of season structure, bag, and possession limits by the DOW is founded upon the most complete and objective information available.

Management Options: Among options identified are: Determine accuracy of harvest estimates. Monitor hunter numbers, and compare with information supplied through DWM field

observation and HIP feedback. Verify HIP information by Area-initiated phone survey. Monitor falconer pressure and harvest on sage grouse. Use emergency season closure when male counts on spring leks fall below 120 birds. Encourage area closure or establishment of zones (such as east of Byers Canyon) to protect population remnants when necessary. Provide input for consideration of season length, bag, and possession limits, based on spring male counts and local conditions. Examine and test harvest results as provided by wing barrel data and HIP. Use limited permits to better track hunter numbers. Initiate mandatory wing checks. Better determine poaching impact. Continue private land partnerships and efforts to limit hunting density in a way consistent with population size and trends.

Expansion of Knowledge Base

Rationale: While there has been considerable research and study of life cycle components and general habitat needs/characteristics for sage grouse, there has been very limited information specific to sage grouse populations in Middle Park. Counts of males on spring leks provides the most extensive information gathered to date. In the 1950's and 1960's, brood counts were conducted along defined routes, but information gained relative to time and energy spent was marginal and incomplete. Brood count information is not a good predictor of chicks per hen, or of percent juveniles to be expected in the fall population. Wing barrels have provided harvest-based information on age and sex structures and nesting dates over time, and continue to provide information of basic value. But because of low harvest and few wings over the past several years, such information has had, and will likely continue to have, limited value.

A more intensive monitoring program to determine lek locations and grouse movement was undertaken in the spring and summer of 1999. Information collected points to the importance of continuing to identify key nesting, brood-rearing, and wintering habitats so as to better formulate and focus management actions. While future monitoring and gathering of information serves an important purpose, it is by no means too early to begin working from the basis of our present understanding.

Desired condition: A knowledge base which provides an adequate understanding of sage grouse habitat requirements specific to Middle Park is key to proper management of this species. Most immediate concerns are to define important nesting and wintering areas, so that management decisions can be made in a responsible way.

Management Options: Identify dollars, utilize and assist with statewide input, set priorities, begin monitoring a greater segment of the hen population so as to answer questions regarding nesting and wintering. Use radio telemetry to track movement and habitat use. Systematically survey wintering areas. Assess production and recruitment when feasible. Provide field support to assist research. Utilize volunteers. Integrate information regarding habitat treatments, grazing history, allotment condition history, and recreational use. Assess weather data relative to sage grouse trends.

PLANNING AND OUTREACH ISSUES

The culmination of any planning process is not in the plan itself, but rather in a change stemming from the goals and directions to which the plan speaks. The ultimate goal of this Plan is to support and enhance a healthy population of sage grouse in a rangeland complex capable of meeting the needs of grouse. In order to do so, the values of both the habitat and the resource it supports must be effectively communicated and realized. There is a need to work closely with many entities and interests within the broader community ? with private landowners, public agencies, and county personnel. There is likewise the need to work closely with the general public ? with local sportsmen, recreationists, wildlife viewers, and users of our public lands. The following sections address the on-going need for support so this plan can achieve the purpose for which it is intended.

Outreach and Education

Rationale: In order to achieve the objectives of this plan there is a need to foster a balanced understanding of the importance and value of healthy sagebrush rangelands in the Middle Park area. Such appreciation and recognition is furthered through those opportunities which impart a fuller understanding of the complexity, make-up, and interrelatedness of this ecosystem and of the various species which it supports. Both formal and informal opportunities for exchange of information and insights are central to the effectiveness of this plan. Measured steps need to be taken to increase and communicate an understanding and awareness of sage grouse needs and their relationship to a healthy sagebrush ecosystem.

Management Options: Update county publications distributed to new landowners regarding the values of the sagebrush rangeland and conservation of sage grouse. Develop an educational brochure available to Chambers of Commerce, visitor bureaus, etc. with guidelines for viewing and use of sagebrush habitats (common sense and responsibility approach). Compile a list of best management practices (BMP?s) with preferred herbaceous species, desired mosaic, and timing of treatments for ranchers/landowners.

Funding Sources

Rationale: Specific conservation actions which address the issues and concerns identified are necessary for purposes of this Plan. Such actions necessitate adequate funding to support and implement them. In many cases, efforts to realize our goals will necessarily be opportunistic, relying on the availability of funds from diverse sources. At the same time, efforts should be made to target species-specific funding.

We believe that if the entities involved truly value the goals and objectives set forth, they will direct part of their attention, energy, and funding to address sage grouse needs. Fiscal responsibility necessitates that many of the projects developed and proposed will have to be coupled with broader management efforts (e.g. travel management, big game management, grazing management, allotment evaluations, etc.) Therefore, projects will address a cross-section of interests and concerns, and be aimed at a multiple-species, multiple-interest level. Resource

agencies [including the Colorado Division of Wildlife (CDOW), Bureau of Land Management (BLM), Natural Resource Conservation Service (NRCS), United States Forest Service (USFS), Colorado State Forest Service (CSFS), Colorado State Land Board (SLB), United States Fish and Wildlife Service (USFWS), and County Extension] need to partner with local and private interests to support such goals and to work toward their realization. Identify and apply for species-specific money to support sage grouse research and protection.

Management Options: For this Plan to be effective, MPSGC feels the need to: take advantage of existing dollars/programs that favor enhancement of one/more components of sage grouse habitat; encourage a multiple-species approach; recommend design of other-species management/research supportive of sage grouse; use volunteers when possible; and work with specialized classes in schools (e.g. Vocational-Agriculture) to assist in project implementation and monitoring.

Monitoring and Evaluation of Conservation Actions and Conservation Plan

Rationale: Whatever conservation action is undertaken, it can only be deemed incomplete and partially effective unless in its planning, there is also due consideration given to proper feedback, monitoring, and evaluation. In some cases, such assessment and feedback can be done informally; however, when conservation actions seek to specifically manipulate and improve the habitat, there is need for a more formal means of evaluation. Without such monitoring, past mistakes will be repeated, and we will fail to recognize other dimensions and opportunities that exist. Given the limitations of time and money, and the many variables involved (a fluctuating and dynamic grouse population, weather, vegetational response, etc.) monitoring of projects does not need to be on a statistically demanding level; yet at the same time, it needs to be sufficiently rigorous to reasonably assess the successfulness and effectiveness of such a conservation action.

Management Options: These include: taking an adaptive management approach, using monitoring and evaluation to determine success of implementation; ensuring that adequate measures of monitoring are part of all project design; and using photo plots to evaluate plant response over time.

Coordination

Rationale: Since numerous entities will be making decisions which impact the sagebrush rangelands, and given the fact that decisions and actions, even within the same agency or community, are often made in a vacuum and isolated from the whole, there exists the need to coordinate efforts and actions, at least on an annual basis. Such collaborative efforts need to have representation from the involved land management agencies, the NRCS, the DOW, County Extension, the ranching community, County Planning, local sportspersons, Weed Control Districts, and Water Districts, as well as the community at large.

Management Options: Options suggested for effective coordination include: Develop an annual

work plan and provide a written summary of accomplishments each winter. Host an annual public meeting to coordinate actions for the coming year, and to solicit specific needs and requests relative to goals and objectives set. Coordinate with other sage grouse groups, sharing and utilizing research information (e.g. Best Management Practices). Re-examine population goals as set forth, and with additional information subsequently gained, evaluate the reasonableness of such goals. (See Section X, MIDDLE PARK POPULATION GOALS).

Prioritization and Implementation

Rationale: Plan implementation will require considerable time to measure. Given the dynamic nature of sage grouse populations and their habitat, the changing social climate of Grand County, and the limited knowledge base from which to work, a certain degree of flexibility will need to be built into the process of moving toward goals and objectives of this Plan. Prioritization and implementation can only be suggested in general terms at this time. Given the opportunistic nature of this Plan?s approach, and given the fact that there is no specific guarantee of financial support to further this Plan?s objectives, the nature and timing of many of the conservation actions proposed will depend greatly on identification and realization of resources, and development of the knowledge base underlying this Plan.

Management Options: Some general statements can be made about the priorities and phases of implementation anticipated by this Plan. Priorities and actions are more readily identifiable in the early phases of Plan development and implementation. As the Plan moves into later phases, there will be a need to further assess direction and feasibility in light of information gained. Initial successes will bring confidence that sage grouse populations in Middle Park cannot only be protected but also enhanced, and that sufficient habitat exists to allow goals to be raised even higher.

MPSGC has identified two major phases for plan implementation, corresponding with short-term and long-term goals. These phases and associated actions will be further delineated in future work plans and annual reviews.

Phase I (Year 1-5) - *Note: If there actually is an 8-10 year cycle in sage grouse populations, as some would suggest, MPSGC would anticipate that Phase I of the Conservation Plan would occur at a time when grouse numbers are approaching their lower limits. Success of conservation actions could be confounded, or at least difficult to assess, if such a trend does truly exist. Regardless, MPSGC chooses not to ignore any downward trend solely on the basis that it may represent the lower end of a natural cycle.*

Monitor and map sage grouse movements and habitat use relative to life cycle requirements, particularly nesting, brood-rearing, and wintering. Continue to conduct lek counts as prescribed by best management practices. Evaluate habitat condition, including sagebrush canopy, and grass/forb understory. Assess vegetative composition and productivity. Compile and integrate data relative to rangeland condition, including grazing practices, recreational use (off-highway

use, hunting pressure, viewing), and past vegetative treatments. Design and disseminate information to the public regarding rangeland values. Provide best management practices to landowners, supporting and encouraging efforts to stabilize and enhance sage grouse populations. Contact local and regional planning departments to address concerns regarding loss and fragmentation of habitat. Identify areas where conservation easements would be most beneficial to stabilization and enhancement of sage grouse populations; pursue such agreements. Begin implementation of small-scale actions to address immediate problems relating to individual sub-groups. Enact travel management and seasonal closures to protect grouse populations as necessary. Protect remaining grouse habitats in the Granby area. Identify and leverage money and resources.

Phase II (Year 5-20+) - *Note: As with Phase I, if an 8-10 year cycle in sage grouse populations does in fact exist, MPSGC anticipates that the earlier part of Phase II (5-10 years from inception of the Conservation Plan) would mark a rebound in sage grouse populations, with a trend toward the upper limits of the population cycle. Population numbers will hopefully begin to indicate some effectiveness with habitat improvements and conservation actions. In years 11-20, MPSGC would anticipate seeing a less dramatic downward swing in numbers (given the implementation and continuation of specific conservation actions) followed by continued movement toward new highs in the sage grouse population. As stated before, MPSGC chooses not to ignore any downward trend solely on the basis that it may represent the lower end of a possible natural cycle.*

Continue and expand on activities of Phase I. Initiate large-scale actions and improvements on a landscape level. Develop viewing areas. Systematically monitor and assess long-term treatment results.

The Annual Work Plan

In order to realistically and effectively set forth conservation actions that have the greatest chance of benefiting sage grouse populations, MPSGC recognizes the need to build a framework of conservation actions from a firm foundation of information regarding sage grouse habitat and usage in the Middle Park area. As mentioned previously, there has been little study of Middle Park sage grouse until this past year (1999) when a DOW-sponsored project began tracking sage grouse movement and identifying specific habitats of use. Due to trapping bias (males are more susceptible to trapping around lek sites in spring) there was a sparsity of information as to female activity and areas of use. Efforts are now being enhanced through a two-year Coloardo State University research project that is tracking birds (with an emphasis on sage grouse hens), and mapping nesting, brood-rearing and eventually wintering habitats. Coupled with this are efforts to identify vegetative response to past sagebrush treatments and to relate such treatments to sage grouse use or avoidance.

Information regarding habitat condition itself, relative to sage grouse needs, has been largely speculative and fairly unrefined in times past. Concurrent efforts are being made to identify important habitats and to measure vegetational characteristics of such habitats. It is our hope that pursuit of these two primary directions will result in a clearer understanding of both the

problems and the possibilities that exist for sage grouse populations in Middle Park. These directions will hopefully serve as a strong foundation and knowledge base so that general conservation actions may be more specifically delineated and assigned to particular localities. Recognizing our ability to respond to some presently identifiable needs, long-term actions will be coupled with a proactive response that addresses immediate situations.

MPSGC chooses to provide an annual Work Plan which each year will be approved and incorporated into the Conservation Plan as an Addendum. This Work Plan will provide the needed, cohesive, and far-visioning directions necessary to making management decisions in a responsible way. The Work Plan for the Year 2000 (Addendum 1) serves as a template for future work plans. Work Plans will be formulated on an annual basis, with completion of each Work Plan draft by May 1 of the assigned year. A Project Report for separate Work Plans will be completed by March 1 of the following year so as to track fulfillment of responsibilities and status of past or current projects. An ad hoc working group consisting of representatives of the same entities and interests responsible for the formulation of this Plan will receive and accept both project reports and work plans at an open meeting and will have the ability to designate such reports and plans as addenda to this Conservation Plan.

Given the importance of putting words into action, MPSGC will also maintain an on-going Record of Conservation Action listing all on-site management practices performed by land managers for the benefit and enhancement of sage grouse habitat. This Record will include type of management practice, date of action, location, acres involved, land status (public/private), funding source (public/private/combination), and additional comments. Lastly, MPSGC will apply standards such as those set forth in the Draft Policy for Evaluation of Conservation Efforts so that management practices undertaken will provide the best opportunity for positive results and an adequate means to measure and assess these results.

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Over 30 landowners in Middle Park have signed a statement of support and cooperation as of the time of this printing. Rather than cite each landowner individually, we include reference to their concern and interest in maintaining and enhancing sage grouse populations in a special acknowledgement to the Middle Park Ranching Community. Listed along with this community are the organizations and agencies that have provided their support of this Plan:

Middle Park Ranching Community
Blue Valley Sportsmen
Bureau of Land Management
Colorado Division of Wildlife
Colorado River Water Conservation District
Colorado State Forest
CSU Cooperative Extension Service
Denver Water
Grand County Commissioners
Middle Park Habitat Partnership Program
Middle Park Land Trust
Middle Park Stockgrowers Association
Natural Resources Conservation Service
U.S. Fish and Wildlife Service
U.S. Forest Service, Sulphur Ranger District
U.S. Forest Service, Parks Ranger District
U.S. Forest Service, Dillon Ranger District

Appendix A: Glossary

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

Arena - See "Lek"

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

Canopy Cover - The horizontal percentage of ground covered by 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.

Lek Complex - A generally definable geographic area, usually representating a portion of a basin or drainage, where one or more leks, often transitory in nature, have occurred over time and where such leks are likely represented by the same birds in attendance. (Note: The classification/grouping of leks based on "complexes" is a mental construct used to more readily ascertain population trends. The mention of "complexes" occurs at least as early as Rogers' Sage Grouse Investigations in 1964. Leks within a complex generally represent the same group of birds. Therefore, if birds strut in one corner of a hay meadow one year, and in another corner the following year, it could generally be assumed that an active lek has not been "lost".)

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.

Display Ground - Another description for the arena, or the lek site, also referred to as the "strutting ground".

Geographic Zone - That area encompassing a part of the overall grouse population's habitat which appears to provide all basic habitat features and life requirements for a distinctive sub-population of birds. In Middle Park, the Blue River, Muddy Creek, Troublesome Creek, Williams Fork, and Granby areas have been delineated as "geographic zones". (Note: As with "complexes", geographic zones are mental constructs used for the sake of assessing overall population occurrence and stability. Such zones define a larger area than complexes and thereby may represent several complexes. For example, birds in the Muddy Creek Geographic Zone represent sage grouse occurring in Pinto Valley, Dunning/Paine, and Antelope/Mitchell complexes).

Lek - A communal display ground or arena where males congregate, display competitively, and have territories, which are visually connected. Females visit these display grounds for purposes of choosing mates and mating. A lek is not always defined by a specific location but by a collective behavior, although many leks exhibit "traditional" (year to year) use (Johnsgard, 1994).

Active Lek - A lek that evidences 3 or more strutting birds on a traditional display ground during a seasonal count. This should not be confused with incidental "sightings" of birds actively strutting in a non-traditional area on an irregular or solitary basis.

Historical Lek - A lek that has not been active for more than 5 years.

Primary Lek - Generally considered the core lek in an area. In years of higher male activity, satellite leks often appear in the general vicinity of these core leks.

Satellite Lek - Leks that appear during periods of increasing/ high population density, persist for one to several years, then disappear as populations decline.

Appendix B: Life Cycle Requirements/Associated Habitat Characteristics

Winter Habitat - Sage grouse eat the leaves of Wyoming and mountain big sagebrush almost exclusively and seek cover in sagebrush stands during this period. During severe winters, such as occurred during 1983-84, only a small portion of sagebrush plants may be available to sage grouse. Sage grouse must move to areas where sagebrush is tall enough to protrude above the snow, or to wind-blown areas where snow depths may not be as great. Sagebrush stands with greater than 20% canopy cover and more than 10 inches in height above snow are preferred in winter.

Lek Habitat - Sites used for mating displays occur in open areas on ridges, flats, valleys, and basins. Open areas, in and of themselves, do not appear to be limited anywhere in Middle Park. Suitable escape cover surrounding the open area is largely responsible for determining whether birds will adopt an area as a lek. Maintaining stands of taller sagebrush (more than 20 inch height) in the proximity of leks out to 1-2 miles appears critical to their continued use by displaying males.

Nesting Habitat - Sage hens select sites for nesting with taller, denser sagebrush (avg. ht.20 inches, 15-20% canopy cover). These conditions typically occur toward the upper elevations of the occupied habitat where slight increases in moisture also produce denser and more robust grass and forb cover (>15% cover, >7 inches in height). Nests are typically found at the base of taller sagebrush plants occurring in denser stands on north and northwest-facing slopes.

Early Brood-Rearing Habitat - Immediately upon hatching, chicks follow hens into moist areas, such as wet meadows and drainage channels, dominated by forbs and grasses and fringed by lighter stands of sagebrush. The moist areas provide an important forage base of insects for the chicks, while the adult birds utilize many of the forbs, with penstemon and lupine being particularly significant forbs. Native bunchgrass-forb communities provide the most desirable habitat at this stage. Usually 10%-20% sagebrush canopy (with less than 25% total shrub cover) provides adequate habitat at this stage of the life cycle.

Late Brood-Rearing Habitat - Older chicks increasingly transition away from insects to forbs during the 2 ? - 3 months following hatching. Late broods continue to seek moist areas during this time, often moving to upland sites where forbs remain green later into the season. Shrubs remain important for escape cover.

Fall Habitat - Hens and young continue using areas where they have spent July and August, and are joined by the males in fall. As forbs become desiccated after successive frosts, and hay fields are cut and baled, or grazed by livestock, the sage grouse diet gradually shifts back to the leaves of sagebrush. Birds move to denser stands of sagebrush, and use of north and west-facing slopes increases. Birds may linger in drainage channels and edges of hay fields until snow begins to accumulate in fall and early winter.

Appendix C: **Issues Identification**
Middle Park Sage Grouse Committee

-Condition of rangeland relative to sage grouse needs
- -Quality/quantity of sagebrush (incl age distribution, vigor, juxtaposition w/ other habitat components
- -Quality/quantity of forbs and grasses
- -Quality/quantity of vegetative understory
- -Quality/quantity of wet meadows
- -Quality/quantity of insects
- -Degraded water quality
- -Lack of desired condition for leks
- -Lack of high quality nesting/early brood-rearing habitat
- -Lack of high quality brood-rearing habitat
- -Lack of wintering habitat
- -Loss of topsoil

-Land management practices
- -Grazing management, incl drought yrs.
- -Fire management
- -Use of insecticides
- -Use of herbicides
- -Weed management and suppression of undesirable vegetative species (e.g. juniper)
- -Disruption of vegetative succession and **conversion of sagebrush rangelands**
- -Loss of topsoil/erosion

-Wildlife management practices
- -Single species/other species management
- -Protection of other T&E species
- -Predator/prey interactions, incl rodents
- -Limited knowledge base for establishing, monitoring, and working toward pop goals
  - -Improvement of data gathering on grouse pops, short-term and long-term
  - -Improved knowledge and mapping of significant habitats
- -Species? specific factors, incl. disease, genetic variability
- -Hunting impacts

-Growth impacts
- -Land development issues
  - -Change in rural demographics
  - -Subdivisions - loss of habitat
  - -Development-associated impediments - powerlines, roads, fencing, dogs, traffic, gravel pits, reservoirs, water diversions, habitat fragmentation and interruption of connectivity
  - - Land transfers/conversions (public to private)
- -Increased recreation
  - -Disturbance/destruction at lek sites and rearing areas
  - -Disturbance on critical wintering grounds
  - -Noise
  - -Viewing

Other issues: Planning and Outreach Activities
- -Annual coordination
- - Monitoring/evaluation
- -Outreach and education
- - Financial backing/priorities

Appendix D:

MANAGEMENT OPTIONS

Habitat-Related Issues

Objective: Manage the sagebrush steppe to provide a diverse array of seral stages, age classes, and canopy cover to meet sage grouse requirements. This mosaic will include a mix of forb and grass species important to sage grouse survival and development. (See Table 2 for Desired Future Condtion.)

Lek-Related

Action: Remove obstructions that physically impede or threaten sage grouse activity, such as fences, posts, wire, on and near the lek.
- When possible, re-align fences that interfere with lek activity
- Use laydown design or modified gates when fences cannot be re-aligned

Action: Prevent/restrict shrub encroachment on leks
- Seed desirable shortgrass spp. to offset encroachment of shrubs and undesirable herbaceous species (e.g. cheatgrass, crested wheatgrass...)
- Mechanically treat lek sites to remove shrubs and stimulate desirable grasses

Action: Improve sagebrush and herbaceous quality in the area immediately surrounding grouse leks so as to provide important escape and resting cover
-Assess habitat condition and apply appropriate treatment (incl. mechanical, fertilization, partial herbicide, etc.)
-Manage the greater area surrounding the lek for a successional and structural diversity that can be maintained over time

Action: Identify and enhance potential lek sites when re-establishment of historic sites is desirable; or when expansion of leks into unoccupied areas is deemed desirable
-Use grazing and vegetative treatments to improve condition and attractability of potential lek site

Nesting/Early Brood-rearing

Action: Stimulate forb growth and development in nesting/brood-rearing areas
-Interseed with alfalfa, clover, or sanfoin when unable to stimulate native forbs
-Remove undesirable species that compete with desired forbs/grasses
-Reduce sagebrush canopy in areas where sagebrush density restricts understory growth/diversity
-Protect important residual growth/understory during nesting/brood-rearing season

Action: Promote healthy insect populations
-Limit use of insecticides
-Foster forbs that provide good insect forage base

Action: Enhance and protect existing water sources
-Inventory existing wetlands and riparian areas available to sage grouse brood-rearing season

Appendix D: Management Options (cont?d.)

-Modify or adapt springs and create small wet areas to support herbaceous growth throughout the
-Restore and rehabilitate riparian areas and wet meadows
-Maintain and manage water quality

Late Brood-rearing
Action: Enhance and protect existing water sources
-Inventory existing seeps and springs in upland areas
-Create small wet areas to support herbaceous growth

Wintering
Action: Stimulate shrub growth and development of robust and accessible sagebrush stands on wintering areas
- Identify and preserve key areas
-Use grazing and vegetative treatments to promote stand development

All seasons
Action: Develop and use sound grazing management practices in coordination with allotment and ranch management plans
-Manage grazing to provide adequate residual grass and forb cover at key locations (e.g. off-site lek) and at key times (e.g. nesting/brood-rearing)
-Defer grazing in lek areas to minimize interference and removal of important residual cover
-Modify grazing at times of drought
-Manage salting in areas having high sage grouse values
-Consistently review and monitor the effectiveness of grazing systems for providing desired habitat condition
-Encourage programs (conservation easements, exchange of grazing values between private and public lands, etc.) to offset grazing impacts on critical sage grouse habitat or at critical times in the sage grouse life cycle

Action: Manage big game populations (deer, elk, antelope) to minimize conflicts and reduction in sage grouse habitat quality
-See Wildlife-Management Issues

Action: Limit travel at times and in places where direct and indirect interference w/ grouse compromise grouse populations
- Restrict travel in sage grouse wintering areas
- Re-route or temporarily close roads/trails that interfere with lek activities
- See Growth-Management Issues

Appendix D: Management Options (cont?d.)

Action: Control noxious weeds and undesirable plant species that limit the quality of sage grouse habitat
- See Growth-Management Issues

Wildlife-Related Issues

Objective: To protect and manage sage grouse in a landscape setting that supports other native species and provides significant habitat value.

Action: Minimize interspecific competition with other wildlife species, most notably antelope, deer, and elk
- Map critical areas, times of use, and areas of potential conflict
- Monitor shrub utilization by other wildlife species on grouse winter range
- Manage big game populations and habitat to minimize or avoid conflicts on sage grouse habitat
- Redistribute big game away from lek and nesting areas when and where practical and necessary

Action: Minimize the effectiveness of the various types of predation to which sage grouse are most susceptible, including avian and mammalian predation on birds, and nest predation by rodents.
-Investigate impact potential of power lines, utility poles, fencing
-Remove pinyon juniper near leks and other critical habitat
-Use vegetative treatments to increase understory and provide necessary escape cover
-Experiment with species-specific predator control in high-importance areas (e.g. breeding grounds)
-Examine grouse movements and assess degree of habitat fragmentation that prevents/jeopardizes bird movement from one habitat type to another
-Evaluate effectiveness of predator control in light of cost, alternative prey species, area of operation, long-term effects on ecyosystem balance.

Action: Monitor trends of other sagebrush obligate species relative to sage grouse populations
- Work with CBO in conducting points counts to evaluate possible landscape-scale impacts and to focus areas of concern

Action: Monitor for T&E species and species of special concern throughout sage grouse habitat.
-Map sage grouse habitats in relation to listed species
-Design grouse-related improvements in a way that is consistent with the life requirements and needs of these species.
-Offset impacts to sage grouse by T&E and special concern species through indirect means such as
modification of perch sites, interseeding of forbs and grasses, rejuvenation of sagebrush

Action: Design and monitor sage grouse harvest so it does not impact sage grouse population
- Recommend season length, bag, and possession limits, based on spring male counts and distribution

Appendix D: Management Options (cont?d.)

- Request emergency season closure when male count on spring leks falls below 110 birds
- Encourage area closure or establishment of zones (such as east of Byers Canyon) to protect population remnants when necessary
- Examine and test harvest results as provided by wing barrel data and HIP info
    +area-initiated phone surveys
    +mandatory wing check
    +limited permits
    +survey and contact of sage grouse hunters by volunteers
- Monitor falconer pressure and harvest on sage grouse
- Continue private land partnerships and efforts to limit hunting density in a way consistent with population size and trends
- Determine poaching impact

Action: Expand knowledge base so as to better manage grouse populations
- Begin monitoring a greater segment of the hen population so as to answer questions regarding nesting and wintering areas
- Systematically survey wintering areas
- Assess production and recruitment when feasible
- Examine historic and active lek sites in relation to widespread vegetative treatments
- Integrate information regarding habitat treatments, grazing history, allotment condition, weather data, recreational use, and sage grouse populations
- Monitor and evaluate vegetational treatments applied to rangeland
- Use photo plots to assess change through time
- Utilize long-term information and readings from established enclosures to assess habitat trends
- Utilize and assist w/ statewide input, set priorities..
- Provide field support to assist research
-Establish reference areas to visually set forth quality habitat conditions

Growth-Related Issues

Objective: To help direct growth and habitat so as to have minimal impact on sage grouse habitat; to curtail fragmentation and loss of key habitat components; to conserve key elements within sage grouse habitat

Action: Encourage and support land transactions that protect important sage grouse habitat values
- conservation easements
- fee title purchases/leases
- land exchanges
- transferrable development rights
- deed restrictions or conservation easements on public exchange parcels

Appendix D: Management Options (cont?d.)

Action: Provide incentives to landowners to support sage grouse habitat and activity
- Offer incentives such as payment for non-use, exchange of grazing values at critical times
- Encourage cluster and density credits for development in sage grouse areas

Action: Seek grouse-friendly partnerships with public and private landowners and entities to achieve species stabilization and enhancement
-Develop awareness of sage grouse issues with County Planning and Zoning so as to foster zoning regulations and ordinances that limit growth impacts and mitigate negative effects on sage grouse habitat
-Ensure consideration of sage grouse needs and requirements into County Master Plan goals of wildlife habitat and open space
-Stipulate permits in sage grouse areas so that noise, access, and timing of activity minimize any conflict with key grouse activity
-Monitor and track land-use changes and infrastructure development, incl. utilities expansion, road construction, and development and design of recreational facilities.
-Track sagebrush projects both on private and public land
-Mitigate adverse impacts such as containment of noise, pets, times of activity and intrusion into critical habitat through land use regulations
-Work with the County Weed District to monitor and aggressively address infestations of noxious weeds that limit the quality and condition of grouse habitat
-Work with the County Water District and other water districts to ensure adequate water supply in key brood-rearing habitat
-List critical habitats on public land that need to be protected by land management agencies.
-Include habitat issues in agency assessment and issuance of rights-of-way and special use permits on public lands

Action: Direct recreational use of lands away from critical areas at critical times
-Seek development of a viable and enforceable travel management plan to protect critical areas
    +Define and use designated routes in areas of sensitive habitat
    +Enact seasonal closures on critical areas
    +Restrict physical, mechanical, and audible disturbance around lek sites during display periods
-Input trail and recreational site design
-Monitor vehicle traffic and viewer numbers during breeding season
-Develop and disseminate information regarding ethical and non-intrusive viewing.

Action: Protect important travel corridors which allow movement between sub-groups and provide connectivity between Middle Park and North Park birds.

Planning and Outreach Issues

Objective: Provide information important to protecting sage grouse and rangeland values; direct funding and oversight of this Plan in a positive and collaborative way

Appendix D: Management Options (cont?d.)

Action: Work to create a better understanding of the value and importance of sage grouse and sage grouse habitat, and to provide a basis for sharing ideas and reaching agreement on ways to improve sage grouse habitat and populations
-Update county publications distributed to new landowners regarding the values of the sagebrush rangeland and conservation of sage grouse
-Provide regular input to the community regarding sage grouse values through newspaper articles, public meetings, etc.
-Develop an educational brochure available to Chambers of Commerce, visitor bureaus, etc. with guidelines for viewing and use of sagebrush habitats (common sense and responsibility approach).
-Compile a list of best management practices (BMP?s) with preferred herbaceous species, desired mosaic, nature/timing/and application of treatments, for ranchers/landowners
-Present programs at local schools to develop an understanding and appreciation of sagebrush rangelands
-Provide extension services to landowners, with training to monitor and assess habitat condition and trends

Action: Identify opportunities to further programs supportive of sage grouse habitat
-Take advantage of existing dollars/programs that favor enhancement of one/more components of grouse habitat.
-Minimize costs through encouragement of multiple-species approach, and design of other-species management/research supportive of sage grouse.
-Use volunteers when possible.
-Incorporate with specialized classes in schools (e.g. Voc-Ag) to assist in project implementation and monitoring.

Action: Take an adaptive management approach, using monitoring and evaluation to determine success of implementation.
-Ensure that adequate measures of monitoring are part of the project design and that projects have adequate dollars and personnel to follow through with monitoring
- Conduct field tours to assess project design and effectiveness

Action: Coordinate Plan development, dissemination, and evaluation
-Develop an annual work plan and provide a written summary of accomplishments
-Host an annual public meeting to coordinate actions for the coming year, and to solicit specific needs and requests relative to goals and objectives set
-Prioritize important sage grouse habitats relative to potential for exhibiting high recovery/enhancement response
-Coordinate with other sage grouse groups, sharing and utilizing information gained.
-Re-examine population goals as set forth, and with additional information subsequently gained, evaluate the reasonableness of such goals. (See Section X, MIDDLE PARK POPULATION GOALS).

Appendix E: Listing Factors

When evaluating possible listing of a species under the Endangered Species Act, the U.S. Fish and Wildlife Service considers the following five factors:

Factor A: Present or threatened destruction, modification, or curtailment of a species? habitat or range.

Historic range of sage grouse in the Middle Park area has decreased in size and quality over the past 50 years. Most reduction has occurred in peripheral areas such as Summit County (Dillon/Breckenridge areas), and the eastern part of Grand County (east of Hot Sulphur Springs). Glenn Rogers report of sage grouse in 1964 indicates that grouse populations had basically disappeared from all of Summit County south of Green Mountain. He does mention that a ?light?population (1-10 birds per square mile) was present on the lower Blue River from Kremmling south to Green Mountain Reservoir, and east of Kremmling in the Rock Creek drainage. He also mentions that a few sage grouse were present in the Williams Fork drainage south of Parshall and ?all along the Colorado River from Parshall to above the town of Granby?. However, the heaviest sage grouse concentration (10-30 birds per square mile) occurred in the Muddy and Troublesome Creek drainages from Kremmling north 15 miles. Rogers characterized this as a ?fair? population, indicating that while significant, it was not of the caliber of populations in Gunnison, Moffat, or Jackson counties. A map of historical sage grouse occurrence does not indicate any connective range between Grand and Jackson county populations; however, given the presence of sagebrush and the open, non-forested character of some lands in the area between Muddy Pass and Arapahoe Pass, movement of birds is possible.

Based on 1960 figures, Rogers? report also estimates the existence of 484 square miles of sagebrush in Grand County and additionally 44 square miles of complimentary range, consisting in irrigated riverbottom and dry- farm land. This compares with 254 square miles of sagebrush habitat indicated by GIS mapping (Grand County Matrix) in 1998. However, given the ability to more finitely delineate vegetation types, portions of an additional 300 square miles of upland grasses and shrub may account for some of the difference between 1960 and 1998 estimates. The 44 square miles of complimentary range cited by Rogers corresponds to 45 square miles of ?complimentary range? cited through GIS mapping in 1998. Neither set of figures can precisely account for ?useable? rangeland, although it must be recognized that housing and industrial development coupled with road and utility corridors would in fact decrease the amount of available range in 1998.

Quality of rangeland needs also to be considered in assessing modification and change over the past 50 years. A comparison of grazing carrying capacity between 1960 and 1999 would indicate that rangelands are carrying fewer AUM?s in recent years. Grazing of sheep has been all but eliminated on public lands occupied by sage grouse. Impacts of grazing were likely most severe in the earlier part of the 20th century, prior to the Taylor Grazing Act. However, some suggest that rangelands have still to recover from overstocking of ranges. More recent concerns question whether much of the sagebrush habitat has become decadent, and has restricted overall rangeland

production.

Appendix E: Listing Factors (cont?d.)

In the 1950's and 1960's, massive herbicidal or mechanical treatments coupled with re-seeding (generally crested wheatgrass) occurred in Grand County. Treatments were applied in 100 foot widths, and remnants are still visible today. Rogers concluded that such treatments negatively impacted grouse populations at the time, but that if seeding were successful such range could become good sage grouse habitat in 10-20 years (1965-1975). Subsequent knowledge has revealed limited gains because of crested wheatgrass seeding, and has shown that in many instances, disturbance of soils at the time of seeding has likely raised less productive soils to the surface.

Lastly, a comparison of grouse estimates from earliest records to present time may give some coarse indication of overall trend. Records from the District Forest Ranger in 1920 indicate a ?plentiful? population of ?mountain grouse? and ?willow grouse? (presumably blue grouse and sharp-tailed grouse), but make no mention of sage grouse. In 1926, few grouse were noted in the district. Approximately 125 sage grouse were estimated in the Kremmling area in 1938, with further mention of grouse in the Slate Creek (Summit County) area. In 1940, Forest Ranger reports indicate a poor sage grouse population pushed to near extinction in past hunting seasons.[1] District Forest Ranger records of 1943 estimate an increasing grouse population of 700 birds. In the 1950's and 1960's lek counts become the standard means of accounting for grouse populations. Applying suggested guidelines (p. 6) grouse estimates in the 1960's would range between a high of 947 birds and a low of 222 birds, compared to a 1990's estimate ranging between 1128 and 458 birds, high and low counts respectively.

This Conservation Plan will reduce destruction, modification, or curtailment of sage grouse habitat or range in the Middle Park area through the following actions: protection of existing high quality sage grouse habitat with conservation easements, exchange agreements, permit restrictions; formulation/continuation and implementation of sound grazing management; improvement of habitat quality through treatment and planting; proactive management of recreational use; minimization of predation effects; thorough monitoring of hunting impacts; appropriate big game management; and expansion/application of knowledge base.

[1] It is unclear as to which hunting seasons were alluded to, since general information indicates the sage grouse seasons were closed statewide in 1937. However, in the very early 1900's it was recommended that seasons either be closed or begin at a later date (an opening date of midseason during the hatching period being considered too early and decimating of chick numbers) and that bag and possession limits be reduced (limits had been >15 birds).

Appendix E: Listing Factors (cont'd.)

Factor B: Overutilization for commercial, recreational, scientific, or educational purposes.

No overutilization of the Middle Park sage grouse population appears to be occurring at this point. Harvest information presently indicates that there is minimal impact from hunting, and that such impact is not additive. Moreover, viewing of birds on leks during springtime is incidental and extremely limited in nature at this time. Past monitoring of birds has been non-invasive and limited to lek counts, until capture and radio-marking of 19 birds in 1999. Monitoring of birds will be increased in 2000-2002, so as to better identify nesting and brood-rearing habitat, but placement of radios has not proven harmful or disruptive of bird activity.

This Conservation Plan will prevent overutilization through: more comprehensive monitoring of harvest; input of critical information to DOW for purposes of assessing season structures and bag/possession limits; assessment of viewer impacts and application of protocols and physical limits when impacts are suggested; observation of acceptable scientific handling protocols.

Factor C: Disease or predation.

No disease/parasite problems are known to exist in Middle Park sage grouse populations. Predation is recognized as a natural event. At this time there is nothing to suggest that an inordinately high predation rate occurs on grouse populations in the area. However, degree, type, and timing of predation will be more clearly assessed in the future.

This Conservation Plan provides the following actions to limit the consequences and excessive loss of the grouse population to disease or predation: more active monitoring and radio-tracking of birds to assess habitats used, and to provide opportunity for further habitat assessment, loss of birds, and type of loss; more systematic accounting for observation of predators and behavioral reaction of sage grouse; more specified means for addressing predator problems in a balanced way.

Factor D: Authorities and existing regulatory mechanisms.

Members of the MPSGC are committed to improving conditions for sage grouse in the Middle Park area. The committee finds it important to build its Plan on a strong foundation of respect, information, and collaborative effort. There is broad support for the direction and goals of this Plan. Even before this Plan, numerous landowners acted on concern for sage grouse in their area by limiting access during sage grouse hunting seasons, and in some cases, by undertaking habitat improvements. MPSGC believes that existing regulatory measures are adequate to achieve the goals and objectives of this Plan, when set within a framework of collaboration.

The Colorado Division of Wildlife has responsibility for the management and conservation of wildlife resources as defined and directed by state law. The Division also has authority to enforce statutes and regulations governing the conservation of this species.

Appendix E: Listing Factors (cont?d.)

The Board of County Commissioners has authority to regulate land use, land planning, and protection of the environment. Both Grand and Summit counties have the ability to review, approve, and deny proposed activities and uses of the land.

The Bureau of Land Management and the United States Forest Service have direction and authority for the maintenance of biological diversity and for the protection and management of wildlife species and habitats on lands under their management.

The USDA Natural Resources Conservation Service has direction to conserve sage grouse through applicable federal law.

This Conservation Plan sets forth specific actions for the above authorities to work collaboratively with the broader community for the betterment of the sagebrush rangelands of the Middle Park area. It has established an unprecedented effort to address problems and concerns in a proactive, collaborative way.

Factor E: Other natural or human-caused factors affecting its continued existence.

Natural factors affecting sage grouse populations in the Middle Park area include climate, weather, topography, and soils. A certain degree of natural fragmentation occurs in the area which limits the ability to enhance sage grouse population and habitat. Human-caused factors include continued population growth and increased housing density, expansion of subdivisions into sage grouse habitats, and conversion of private lands from an agricultural base (see Growth-Related Issues). Coupled with the physical impacts of such development are the social tolerances related to growth and development, including fire suppression, infrastructure needs, and use of public lands.

This Conservation Plan seeks to develop and implement a strategy of outreach and education to appropriately direct human-induced limitations (e.g. ability to use fire management) and impacts to sage grouse habitat. When appropriate, activity constraints may be sought to protect critical habitat at specified times and in specified locations. This may include, but is not limited to, noise ordinances, timing of intrusive activity, pet control, and travel management in key sage grouse habitat.

Figure 1. Middle Park Conservation Plan Study Area.

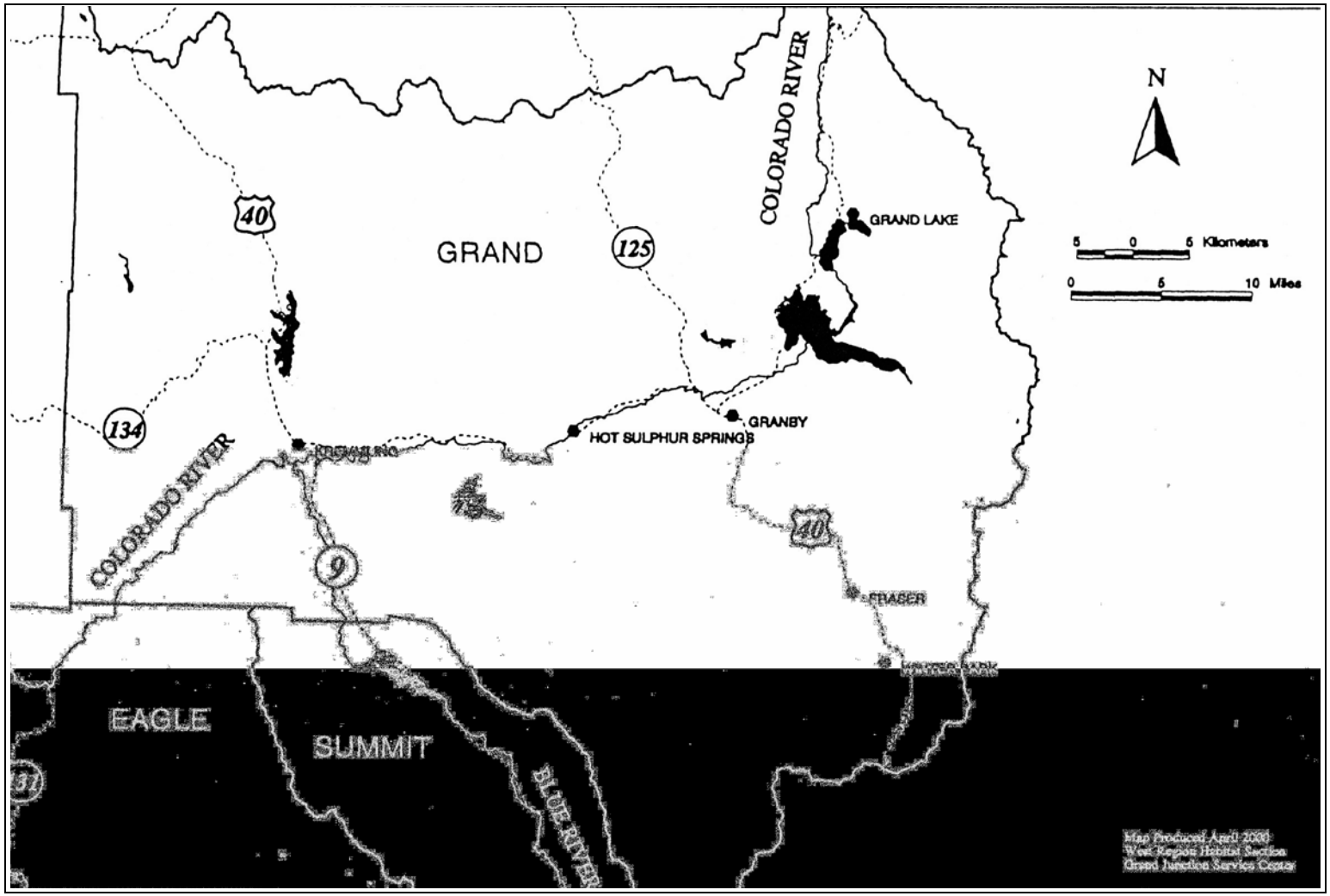


Figure 2. Sagebrush and Complementary Range.

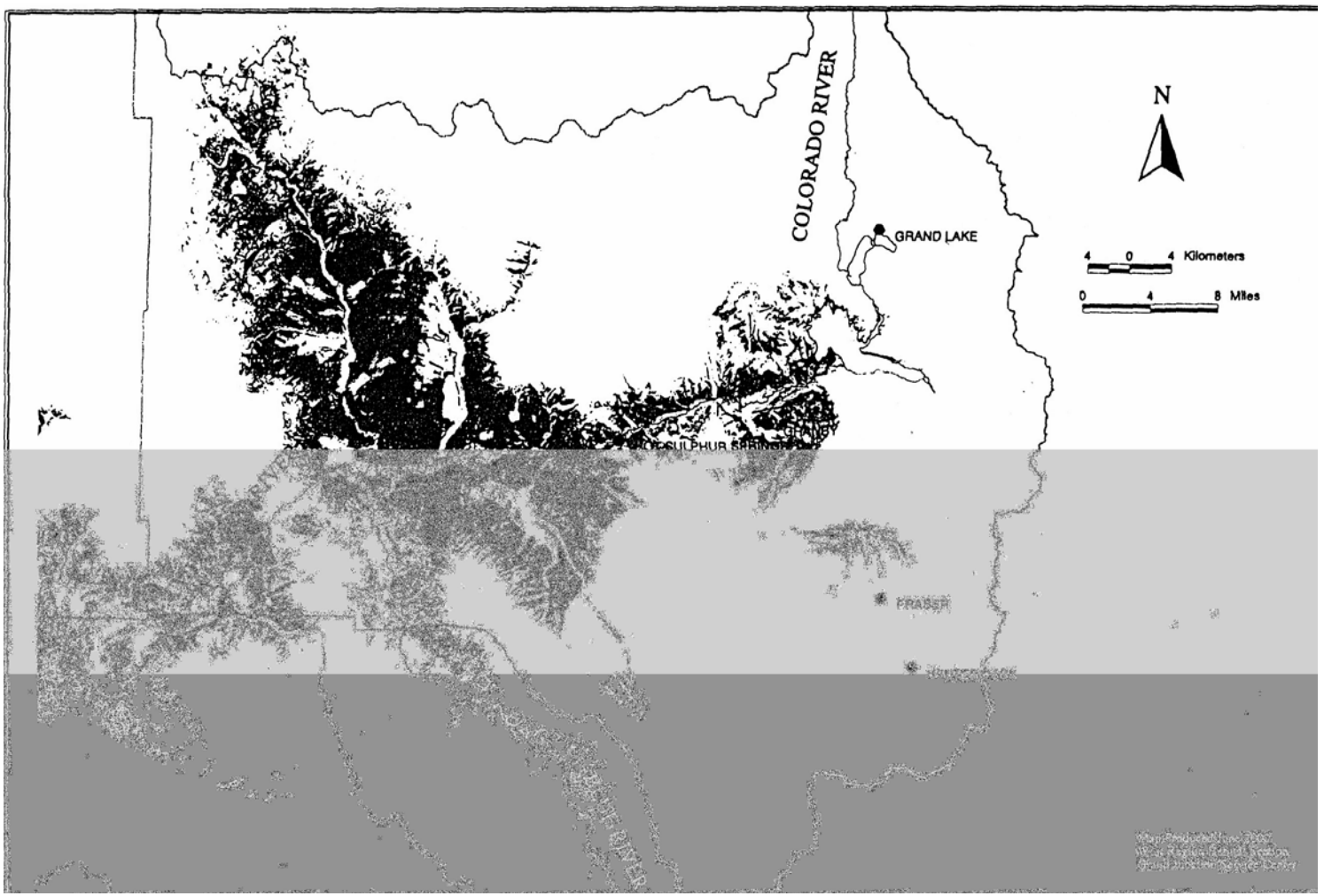


Figure 3. Annual and Spring Precipitation (Williams Fork Dam).

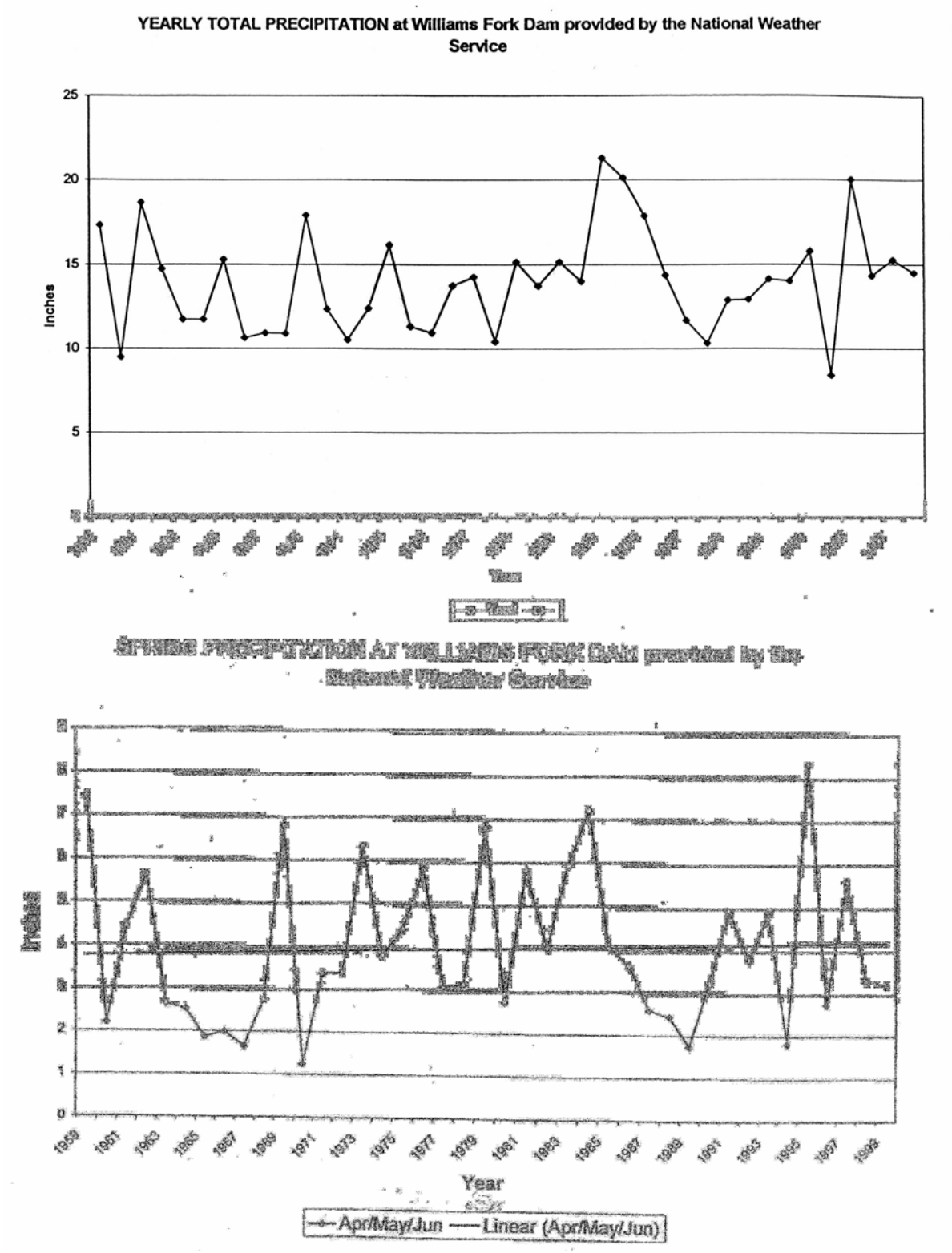
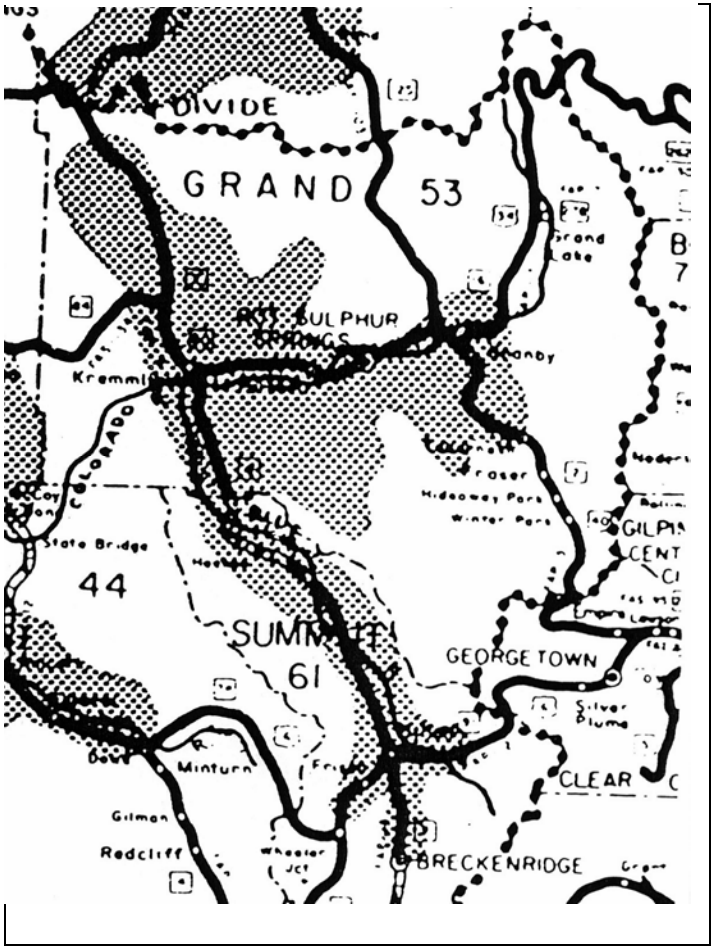


Figure 4. Historic (after Rogers, 1964) vs. Present (1999) Sage Grouse Range.



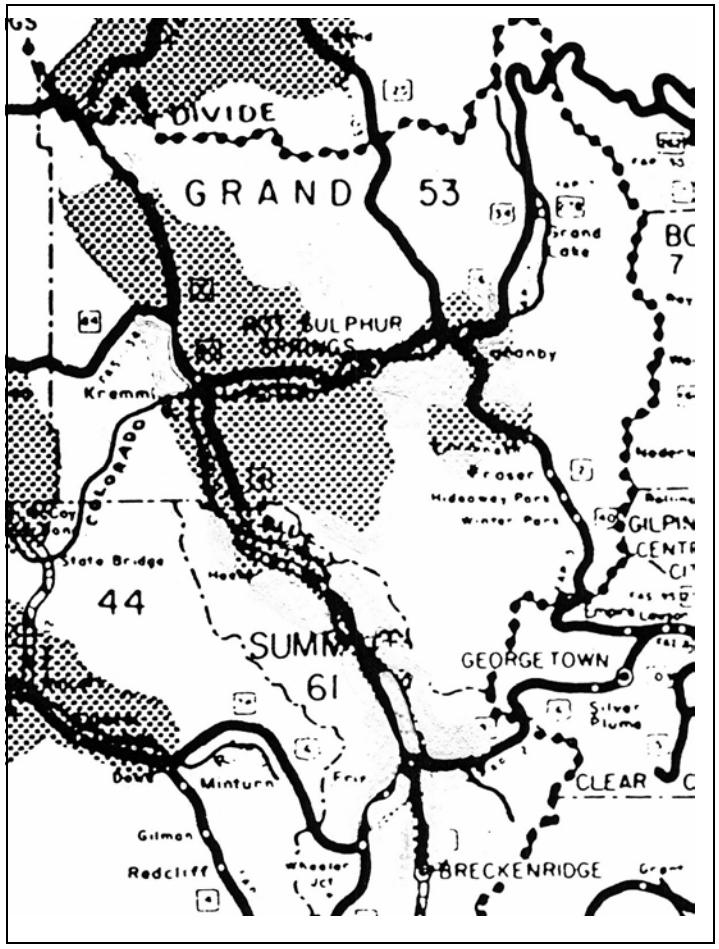
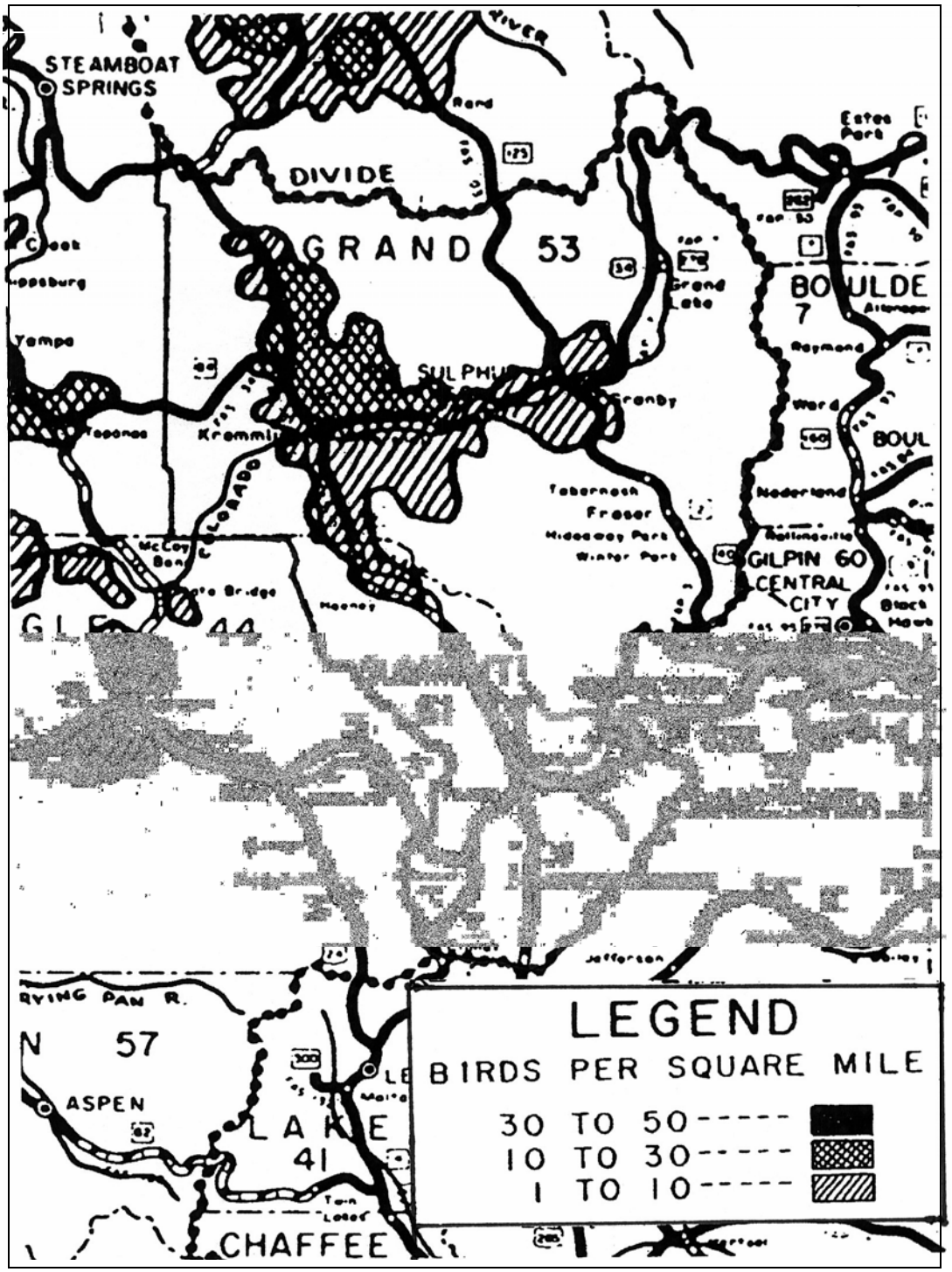


Figure 5. Sage Grouse Density (fall) in 1961 (after Rogers, 1964).



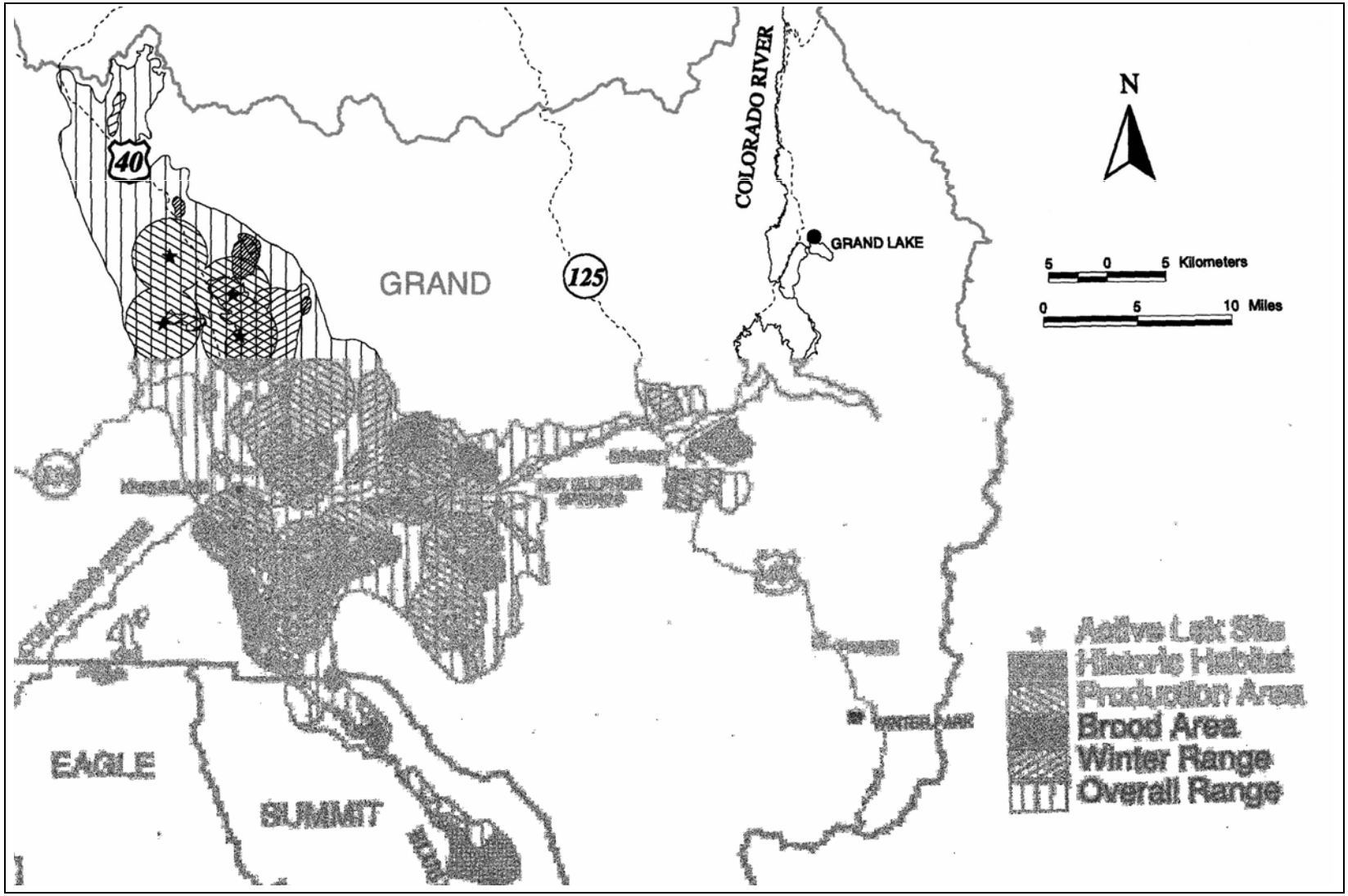

COLORADO RIVER
N
40
GRAND
125
GRAND LAKE
5 0 5 Kilometers
0 5 10 Miles
Active Lek Site
Historic Habitat
Production Area
Brood Area
Winter Range
Overall Range
EAGLE
SUMMIT

Figure 7. Lek Count Data, 1959-2000

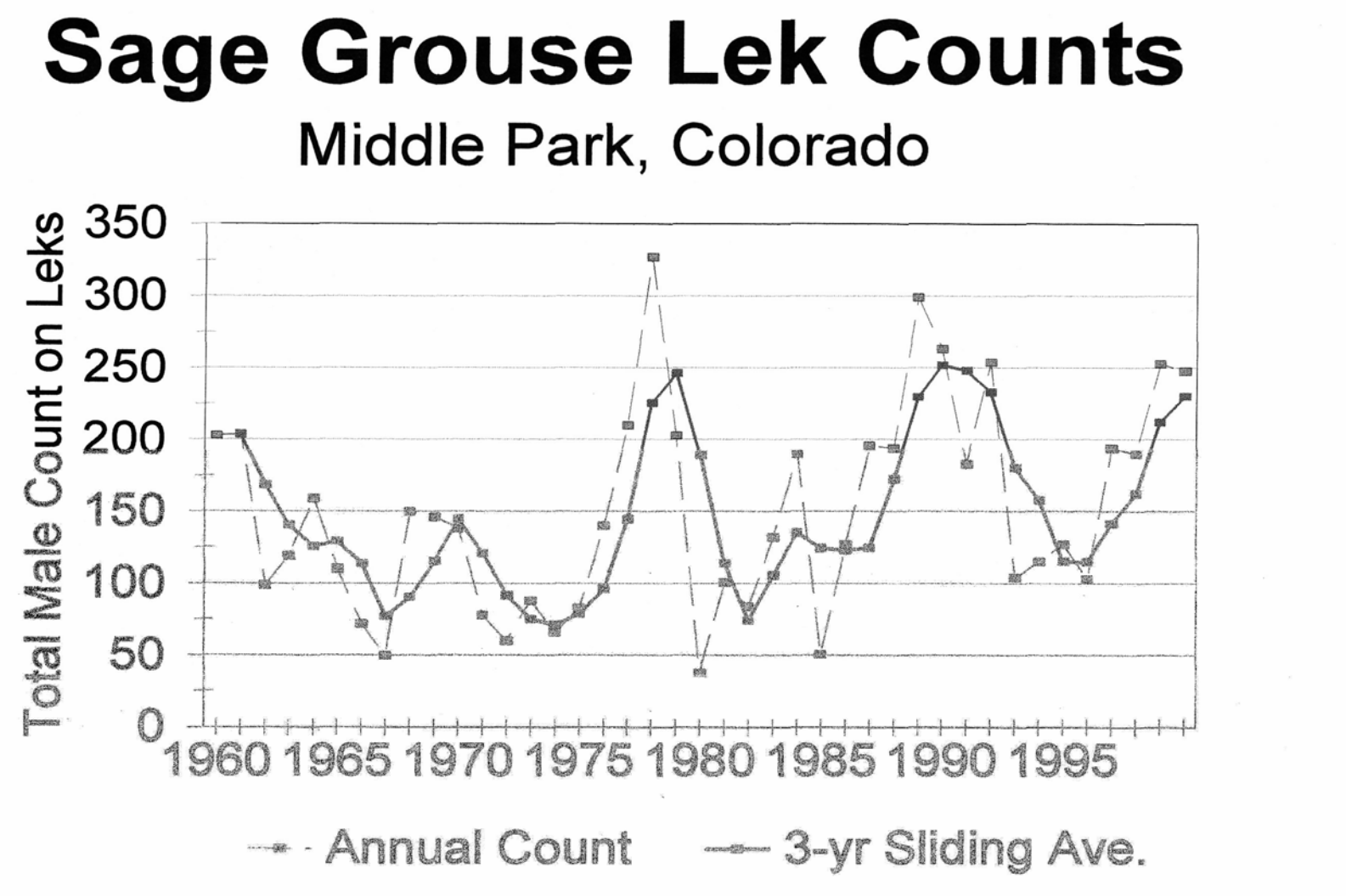


Figure 8. Delineation of Geographic Zones.

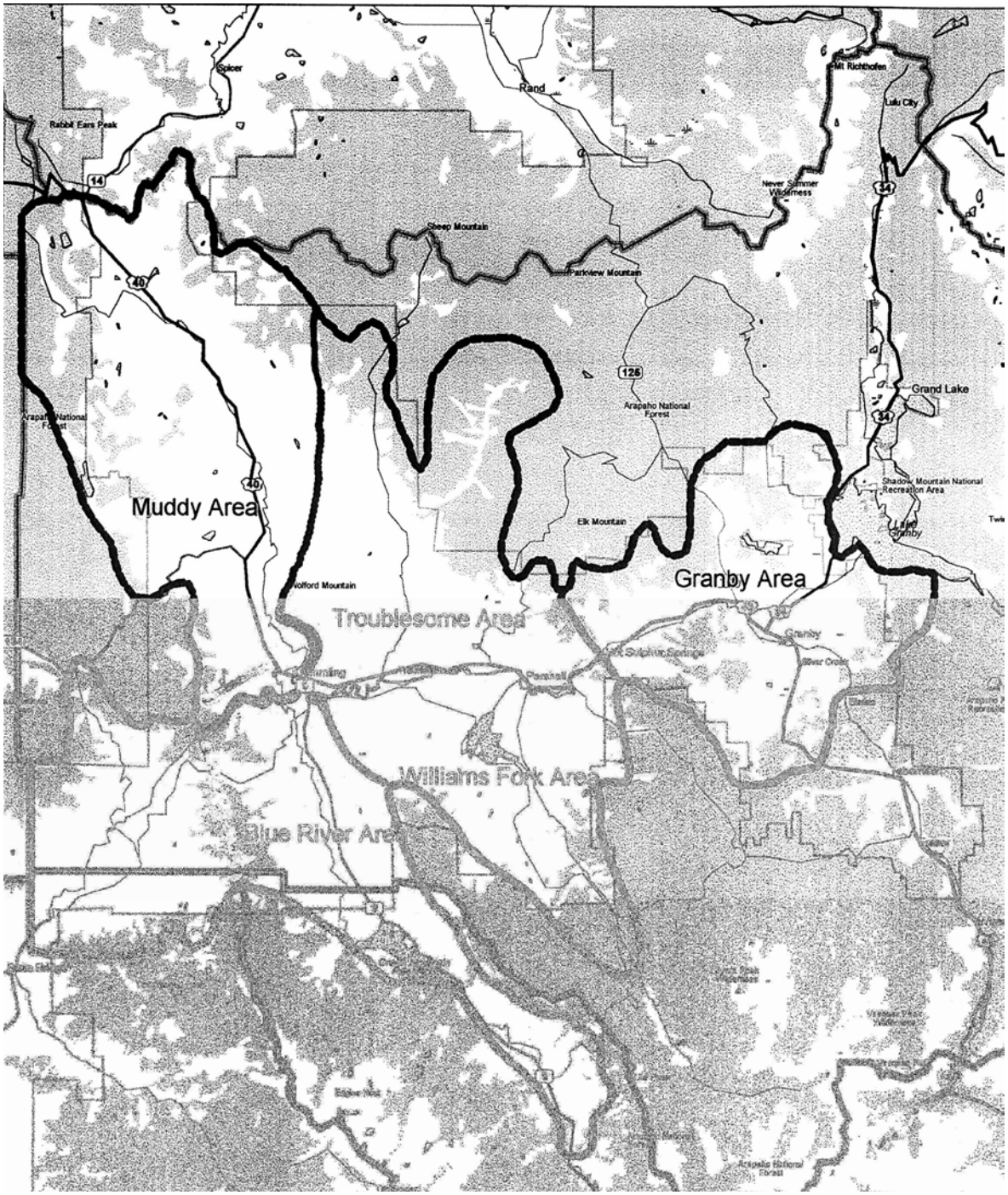


Figure 9. Season Length Relative to Lek Ct/Harvest Data.

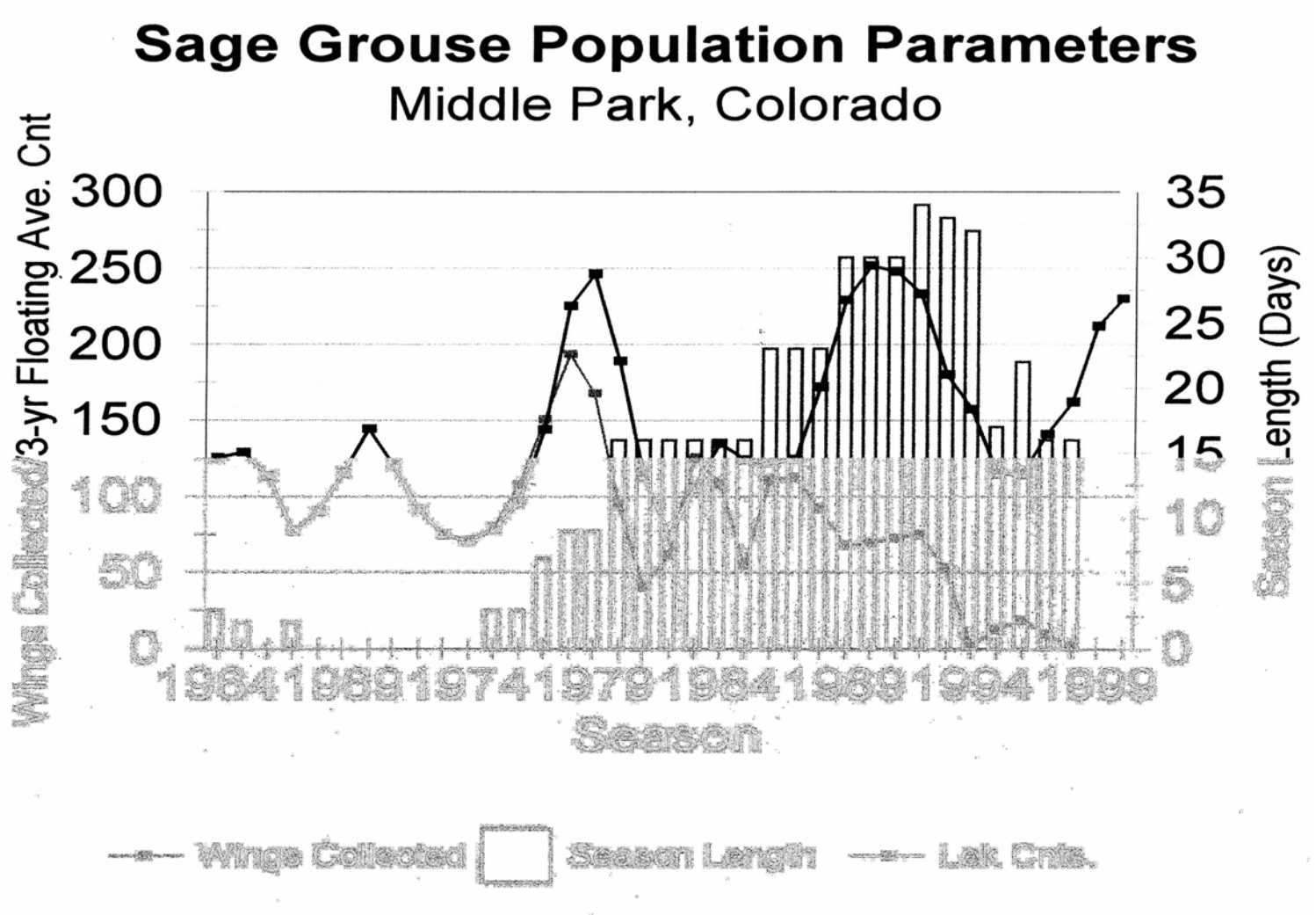


Figure 10. Number of Wings Collected from Wing Barrels.

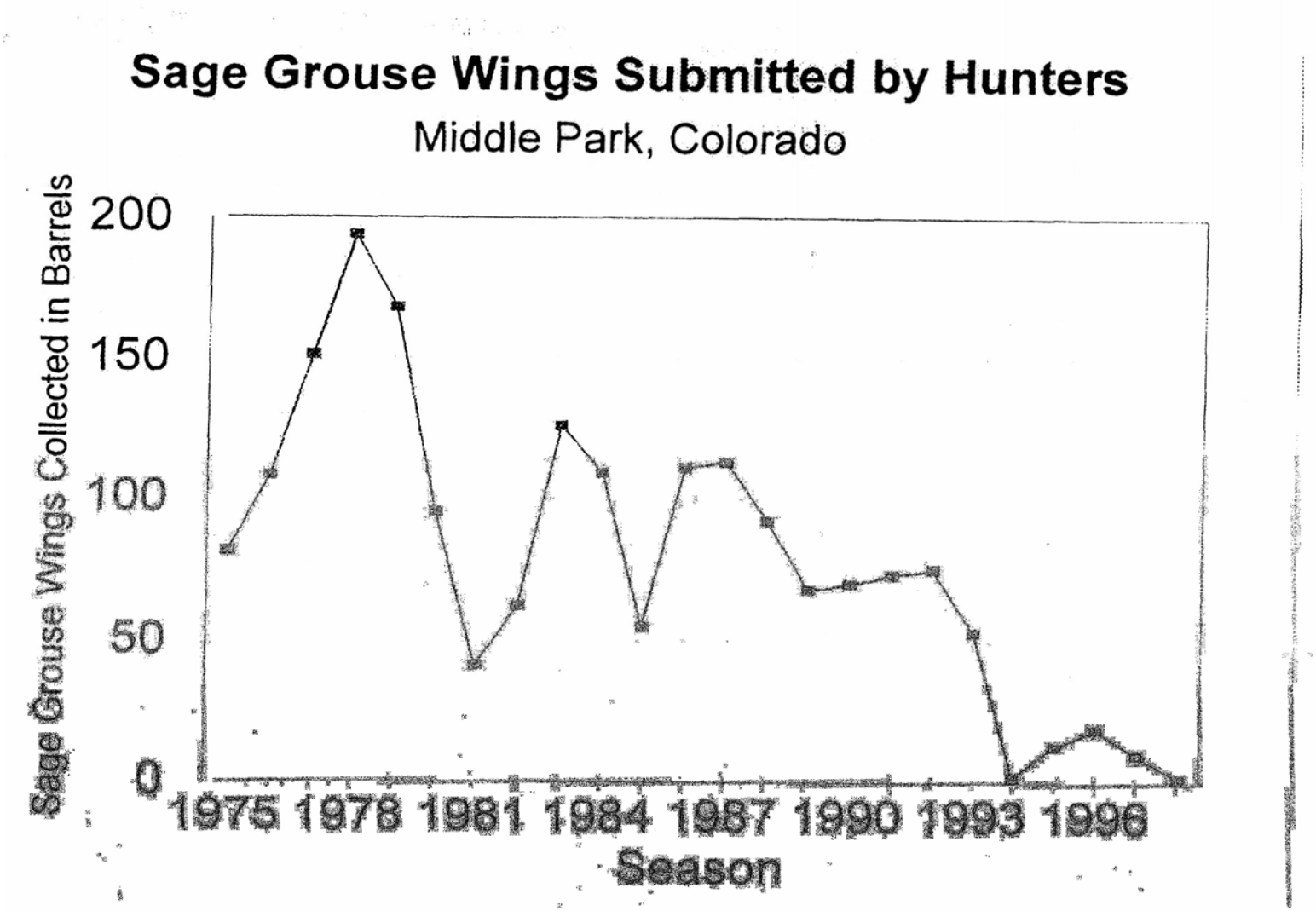


Table 1. Male Count/Total Population Conversion Chart.

N Males Counted	Estimated Population Size			
	Minimum[1]	Maximum[2]	75% Males[3]	Most Likely[4]
100	300	600	399	444
200	600	1200	801	888
300	900	1800	1200	1332
400	1200	2400	1599	1779
500	1500	3000	2001	2221
600	1800	3600	2400	2667
700	2100	4200	2799	3111
800	2400	4800	3201	3555
900	2700	5400	3600	3999
1000	3000	6000	3999	4443

[1]Assumes total males counted equals all (100%) males in population plus 2 hens per male; all leks known and counted
[2]Assumes total males counted equals one half (50%) of all males in population plus 2 hens per male; all leks known and counted
[3]Assumes total males counted equals 3/4 (75%) of all males in population plus 2 hens per male; all leks known and counted
[4] **Assumes total males counted equals 75% of all males in population plus 2 hens per male AND that 90% of all leks are known and counted (See Assumptions on p.7) .**

Table 2. Common Plant Species of Middle Park Rangelands.

GRASSES

Common Name	Latin Name
Western Wheatgrass	Agropyron smithii
Bluebunch Wheatgrass	Agropyron spicatum
Red-top	Agrostis gigantea
Blue Grama	Bouteloua gracilis
Sedge	Carex geyeri & filifolia
Inland Saltgrass	Distichlis spicata
Great Basin Wild Rye	Elymus canadensis
Giant Wild Rye	Elymus cinereus
Idaho Fescue	Festuca idahoensis
Thurber Fescue	Festuca thruberi
Sheep Fescue	Festuca ovina
Rush	Juncus spp
June Grass	Koeleria cristata
Mountain Muhly	Muhlenbergia montana
Indian Rice Grass	Oryzopsis hymenoides
Timothy	Phleum pratense
Mutton Grass	Poa fendleriana
Kentucky Bluegrass*	Poa pratensis
Sandberg Bluegrass	Poa secunda
Bottlebrush Squirreltail	Sitanion hystrix
Columbia Needlegrass	Stipa columbiana
Green Needlegrass	Stipa viridula
Needle and Threadgrass	Stipa comata

* Cheatgrass (Bromus tectorum) and Crested Wheatgrass (Agropyron cristatum) also occur but are non-native and considered undesirable. Kentucky bluegrass (Poa praetensis) is non-native.

FORBS

Common Name	Latin Name
Yarrow	Achillea lanulosa
False Dandelion	Agoseris spp.
Rock Primrose	Androsace septentrionalis
Pussytoes	Antennaria rosea
Fringed Sage	Artemisia frigida
Wiry Milk Vetch	Astragalus flexusus
Vetch	Astragalus spp.
Arrowleaf Balsamroot	Balsamorhiza sagittata
Sego Lily	Calochortus nuttallii
Harebell	Campanula rotundifolia
Paintbrush	Castilleja spp.
Spring Beauty	Claytonia lanceolata
Bastard Toadflax*	Comandra umbellata
LarkspurMountain Ball Cactus	Delphinium nuttalianum
Whiplash Erigeron	Pediocactus simpsonii
Winged Buckwheat	Erigeron flagellaris
Sulphur Flower	Eriogonum alatum
Bedstraw	Eriogonum umbellatum

Fremont Geranium	Galium boreale
Culryleaf Gumweed	Geranium fremontii
Goldenweed	Grindelia squarrosa
Golden Aster	Haplopappus spp.
Scarlet Gilia	Hetherotheca villosa
Iris	Ipsomopsis aggregata
Peavine	Iris missouriensis
Pepper-grass	Lathyris spp.
Salt-and-Pepper	Lepidium spp.
Lupine	Lomatium orientale
Oregon Grape	Lupinus argenteus
Bluebell	Mahonia repens
Yellow Sweet Clover	Mertensia viridis
Evening Primrose	Melilotus officinalis
Owl Clover	Oenetherea caespitosa
Colorado Loco	Orthocarpus luteus
Starvation Cactus	Oxytropis lambertii
Mat Penstemon	Opuntia polyacantha
Beardtongue	Penstemon caespitosis
Moss Phlox	Pentsemon spp.
Cinquefoil	Phlox hoodii
Pasque Flower	Potentilla spp.
Buttercup	Pulsatilla ludovicium
Stonecrop	Ranunculus spp.
Golden Ragwort	Sedum lanceolatum
Golden Ragwort	Senecio canus
Goldenrod	Senecio interrigimus
Globe Mallow	Solidago spp.
Wild Candytuft	Sphlaeralcea coccinea
Dandelion	Thlaspi montanum
Salsify	Taraxacum officionale
Golden Banner	Trapagon dubius
Clover	Thermopsis montana
Horsebrush	Trifolium spp
Yellow Violet	Tetradymia canescens
	Viola nuttallii

SHRUBS

Common Name	Latin Name
Serviceberry	Amelanchier alnifolia
Big Mountain Sage	Artemesia tridentata
Wyoming	A.t. wyomingensis
Mountain	A.t. vaseyana
Green Rabbitbrush	Chrysothamnus viscidiflorus
Rubber Rabbitbrush	Chyrsothamnus nauseosus
Winterfat	Eurotia lanata
Common JuniperPachistima	Juniperus communis
Shrubby Cinquefoil	Pachistima myrsinites
Chokecherry	Potentilla fruticosa
Bitterbrush	Prunus virginiana
Skunkbrush	Purshia tridentata
Currant	Rhus trilobatum
Rose	Ribes spp.
Greasewood	Rosa woodsii
Snowberry	Sarcobatus vermiculatus
	Symphoricarpos oreophylis

* Snakeweed (Gutierrezzia sarothrae) also occurs but is an undesirable species

Table 3. Desired Future Condition.

Desired Condition					
Site	Veg. Type	Height[+]	Canopy[+]	Area*	Comments
Breeding	Sagebrush	16"-32"	15-25%	>80	Display area needs to be relatively open and clear of shrub growth; area within 300' of display edge should have habitat characteristics noted. >15% perennial grass cover/10%forb rec.
	Forb/Grass	>7"	>25%		
Nesting	Sagebrush	14-31"	15-25%		High diversity of forbs, with good residual understory
	Forb/Grass	>7"	>15%		
Brood-rearing	Sagebrush	16"-32"	14-20%		Proximate to wet meadows with good insect populations
	Forb/Grass	variable	>15%	>40	
Wintering	Sagebrush	10-14"	20-30%		Height listed is for sagebrush above snow level
	Forb/Grass	NA	NA		

[+]Height and canopy recommendations are based on research relating most favorable conditions, and on general guidelines proposed by the Western States Sage Grouse and Columbian Sharp-tailed Grouse Technical Committee. Such recommendations may change with further study, and may be modified for specific on-site conditions in the Middle Park area given land capability and use.

[*]Area refers to percent of seasonal habitat needed with indicated conditions.

Table 4. History of Middle Park Hunting Regulations, 1975-1999.

Year	Season Length (days)	Limits	
		Bag	Possession
1975	3	2	2
1976	3	2	4
1977	7	3	6
1978-1979	9	3	6
1980-1983	16	3	6
1984	16	2	4
1985	16	3	6
1986-1988	23	3	6
1989-1991	30	3	6
1992	34	3	9
1993	33	3	9
1994	32	3	9
1995	17	1	2
1996	22	1	2
1997	16	1	2
1998-1999	16	2	4

Table 5. Summary of Wing Barrel Information, Middle Park, 1975-1999, Sage Grouse.

Area	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
Chimney Rk	8	1	19	5	6	9	13	20	-	23	11	6	5	7	7	2	0	2	2	0	0	5	1	0	0
Corral Creek	8	22	16	18	32	15	3	12	-	25	3	12	19	1	0	6	29	19	9	-	1	1	0	0	4
Gore Pass	-	6	14	38	0	2	0	0	-	-	18	4	16	6	0	1	6	0	1	0	2	0	0	0	0
Pinto Creek	42	13	22	2	16	33	6	10	-	12	8	53	28	13	6	27	9	7	9	2	8	5	0	0	2
Spring Creek	0	10	0	1	7	0	2	7	-	0	0	0	0	1	0	0	1	17	0	0	0	0	0	0	0
Troublesome	2	11	0	15	0	0	-	-	-	-	-	-	17	25	13	1	-	-	-	-	0	4	0	1	2
Trough Rd	-	-	0	13	1	3	4	13	-	1	0	1	3	6	6	0	5	0	2	0	0	0	0	0	0
Ute Pass	17	0	4	1	6	-	-	-	-	-	-	1	1	0	3	5	9	10	-	-	0	3	0	0	0
Williams Fk	17	11	4	37	48	18	11	0	-	26	8	33	2	14	24	8	14	17	2	-	1	1	6	1	0
Williams Pk	3	8	5	22	9	0	2	0	-	5	7	2	17	5	5	22	3	1	18	0	1	0			0
Total	97	82	84	152	125	80	41	62	NR	92	55	112	108	78	64	72	76	73	43	2	13	19	7	2	8

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Addendum 1A Middle Park Sage Grouse Conservation Plan - Annual Work Plan, Year 2000.

Annual Work Plan 1A – 2000, p. 1				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Habitat Related - Breeding Hab.	Modify fence at Kastle lek.	6/1/00	9/1/00	Pinto Valley Ranch w/ CDOW & BLM input/coordination
Habitat Related - Nesting/Brood.	See Knowledge Base			
Habitat Related - Winter Habitat	See Knowledge Base			
Growth-Related - Development	See Knowledge Base			
Growth-Related - Recreation	Evaluate need for travel mgt near impt grouse habitats	6/1/00	12/1/00 and on-going	CDOW/BLM Liewer/Arkins
Habitat-Related - General	Establish permanent trend transects for areas of concern	6/1/00	12/1/00 and on-going	BLM Waller/Taylor
Habitat-Related - General	Compare veg measuremts and occurrence on sample sites-utilization cages (protected vs unprotected)	6/1/00	12/1/00	BLM Waller
Wildlife-Related - Multiple Spp.	Coordinate veg mapping w/ HPP mapping efforts (10 intensive transects)	6/1/00	12/1/00	BLM Koblitz/Waller/Taylor
Wildlife-Related - T&E Spp.	Map all T&E occurrence relative to sage grouse habitat use	6/1/00	11/1/00	CDOW - wildlife BLM-plants
Wildlife-Related - Predation		6/1/00	On-going	CDOW
Wildlife-Related - Hunting	Examine discrepancies in hunter info provided thru wing barrel and HIP. More accurately determ hunter pressure on sage grouse. Request closure on hunting Granby area per CDOW protocol	9/5/00 3/1/00	3 year 7/1/00	CDOW Wagner CDOW Wagner

Annual Work Plan 1A - 2000, p. 2				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Wildlife-Related - Knowledge Base	Monitor/map nesting and brood-rearing habitat - vegetation measuremts.	6/1/00	3 year	F&W Coop Unit/BLM Alexander/Karl
	Determine wintering habitats and characteristics.	11/1/00	3 year	CDOW/BLM
	Research historical treatments of sgb and resultant effects on sage grouse pop.	3/1/00	3 year	Coop Unit/Alexander
	Develop database of areas most likely used for brood-rearing (wetland/riparian; seeps/springs)	6/1/00	6/1/01	BLM Paula/John
	Prepare a list of critical habitats where conservation easements would be most crucial and desirable	6/1/00	6/1/03	CDOW/BLM
Outreach and Education	Establish demo plots representing desired condition for various habitat requirements.	6/1/00	3 year	CDOW/BLM/LO
	Develop BMP?s for grazing mgt.	3/1/00	11/1/00 w/ on-going input	BLM/Permitees Cesar/Taylor
Funding Sources	Identify and pursue possible funding sources; project-share opportunities	3/1/00	On-going	CDOW/BLM/NRCS
Monitoring and Evaluation	Review and publish project progress - (Dec/Jan.)	12/1/00	3/1/01	CDOW Liewer
Coordination	Further reference scientific lit. and coord. w/ other statewide groups to avoid overlap and expedite info gathering/sharing.	3/1/00	On-going	MPSGC
	Establish BMP?s for veg treatments	3/1/00	3/1/01	CDOW-Apa
Prioritization/Implementation	Develop 2001 Work Plan.	3/1/01	5/15/01	MPSGC - Liewer

Addendum 1B - Middle Park Sage Grouse Conservation Plan - Plan Review, Year 2000. (Reviewed 2/12/01, Finalized 3/12/01)

Annual Work Plan Review 1B – 2000, p. 2				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Habitat Related - Breeding Hab.	Modify fence at Kastle lek.	6/1/00	9/1/00	Pinto Valley Ranch w/ CDOW & BLM input/coordination
Modification has begun; two sections of fence have been cut, Barbed wire gates will be put in after spring lek, and left open fall-spring. Need for modifying possible perch sites along fenceline will be assessed.				
Habitat Related - Nesting/Brood.	See Knowledge Base			
Habitat Related - Winter Habitat	See Knowledge Base			
Growth-Related - Development	See Knowledge Base			
Growth-Related - Recreation	Evaluate need for travel mgt near impt grouse habitats	6/1/00	12/1/00 and on-going	CDOW/BLM Liewer/Arkins
BLM (Arkins) requesting 3/15-5/15 closure on 1 mile of two-track adjoining Gravel Pit lek to minimize lek disturbance. Further travel mgt needs on-going.				
Habitat-Related - General	Establish permanent trend transects for areas of concern	6/1/00	12/1/00 and on-going	BLM Waller/Taylor
BLM (Waller) has est? d trend transects for Mitchell lek area; area west of Mitchell along Lewis? BLM; Antelope Pass lek area; and CR 26 - bottom just northeast of Antelope Reservoir.				
Habitat-Related - General	Compare veg measuremts and occurrence on sample sites-utilization cages (protected vs unprotected) Compare exclosures for 1999 HPP and Wolford Mtn projects	6/1/00 6/1/00	12/1/00 12/1/00	BLM Waller
Waller has compared and summarized; need further analysis. Differences between inside/outside of cages, but when averaged out, appear insignifcant.				
Wildlife-Related - Multiple Spp.	Coordinate veg mapping w/ HPP mapping efforts (10 intensive transects)	6/1/00	12/1/00	BLM Koblitz/Waller/Taylor
6 sites done, 3 on ammonite enclosure and 3 outside. Cesar still checking with Koblitz about other transects and specific location.				

Annual Work Plan Review 1B – 2000, p. 2				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Wildlife-Related - T&E Spp.	Map all T&E occurrence relative to sage grouse habitat use	6/1/00	11/1/00	CDOW - wildlife BLM-plants
BLM has locations on plant species, need to put onto GIS. CDOW has found no T&E species in existing sage grouse habitat. Species of special concern need to be identified.				
Wildlife-Related - Predation	Implement predator-control policy relative to sage grouse needs	6/1/00	On-going	CDOW
DOW has developed statewise predator control plan. Results from this will be used to assess desirability of applying specifically to sage grouse.				
Wildlife-Related - Hunting	Examine discrepancies in hunter info provided thru wing barrel and HIP. More accurately determ hunter pressure on sage grouse. Request closure on hunting Granby area per CDOW protocol	9/5/00 3/1/00	3 year 7/1/00	CDOW Wagner CDOW Wagner
Wagner has contacted Lyn Stevens to see what has happened to state? s phone survey of MP sage grouse hunters. Intensive field survey revealed 3 hunters on opening weekend. 6 wings harvested in all - 5 in Troublesome area; 1 in Pinto Valley area.				
Wildlife-Related - Knowledge Base	Monitor existing leks Monitor/map nesting and brood-rearing habitat - vegetation measuremts. Determine wintering habitats and characteristics. Research historical treatments of sgb and resultant effects on sage grouse pop. Develop database of areas most likely used for brood-rearing (wetland/riparian; seeps/springs) Prepare a list of critical habitats where conservation easements would be most crucial and desirable	3/15/00 6/1/00 11/1/00 3/1/00 6/1/00 6/1/00	Ongoing 3 year 3 year 3 year 6/1/01 6/1/03	CDOW F&W Coop Unit/BLM Alexander/Karl CDOW/BLM Coop Unit/Alexander BLM Paula/John CDOW/BLM

Work Plan Review 1B - 2000, p. 3				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
149 males total counted on leks spring, 2000. Waiting for final compilation of Alexander? s 2000 work collecting info on bird occurrence and hab use (nesting, brood-rearing, summer). Last locations in October. Alexander radioed X males using traps on leks. Wagner tracks winter use observations. Sherry Heuer will continue Alexander? s project. Alexander also began mapping previous habitat treatments. BLM has data points of seeps/springs, but need to compile (2001?). Dan Walsh, Sherry, and Amy Martin have been doing extensive trapping since February, and are recording location of radioed birds - good info on winter habitat.				
Outreach and Education	Establish demo plots representing desired condition for various habitat requirements. Develop BMP's for grazing mgt. **Complete SG Conservation Plan**	6/1/00 3/1/00 Spring, 2000	3 year 11/1/00 w/ on-going input Winter, 2000-2001	CDOW/BLM/LO BLM/Permitees Cesar/Taylor MPSGC
Plan finalized and approved January 2001. 31+ landowner signatures; 15+ agency signatures. BMP's just published in Wildlife Society Bulletin. These will be reviewed by local committee, and where needed, modified to meet Middle Park conditions (as suggested in Bulletin). Members of MPSGC will also attend sagebrush mgt workshop in April. BMP's will be further compiled and written up for landowners. Demo plots still being assessed based on research work. 90 acres dixie harrowed, using mosaic pattern. 30 acres re-seeded w/ alfalfa - demo and trial plots at Lone Buck, Kemp, and Byers Range. Control of minor juniper invasion using dixie harrow.				
Funding Sources	Identify and pursue possible funding sources; project-share opportunities	3/1/00	On-going	CDOW/BLM/NRCS
CDOW funding for Dan Walsh? s project to assess pop estimates using Braun? s suggestion of 2 hens for 1 male. Funding continued for Sherry? s project.				
Monitoring and Evaluation	Review and publish project progress - (Dec/Jan.)	12/1/00	3/1/01	CDOW Liewer
In process. Will likely want to move inception date from 12/1to 1/15 hereafter because of newly-revised big game season structures and time commitments for others involved.				
Coordination	Further reference scientific lit. and coord. w/ other statewide groups to avoid overlap and expedite info gathering/sharing. Establish BMP? s for veg treatments	3/1/00 3/1/00	On-going 3/1/01	MPSGC CDOW-Apa
Sgb mgt workshop early April with Tony Apa in Grd Jct. Statewide coordination of various grouse conservation groups. Walsh? s project has statewide impact and interest.				
Prioritization/Implemenetation	Develop 2001 Work Plan.	3/1/01	5/15/01	MPSGC - Liewer
March 12 meeting set to develop 2001 Work Plan.				

Addendum 2A -Middle Park Sage Grouse Conservation Plan - Annual Work Plan, Year 2001.

Annual Work Plan 2A – 2001, p. 1				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Habitat Related - Breeding Hab.	See Knowledge Base			
Habitat Related - Nesting/Brood.	Assist Blue Valley w/ establishment of wet areas adjoining previous spring dev.	3/15/01	12/2001	Taylor/Volt
Habitat Related - Winter Habitat	See Knowledge Base			
Growth-Related - Development	Assist Pratt in development of management plan	3/15/01	12/2001	Volt, NRCS
Growth-Related - Recreation	Input scoping and development of BLM travel mgt plan	3/1/01	2 year	Arkins/Liewer
Habitat-Related - General	Coordinate w/ BLM on veg-sat ground-truthing Coordinate and compare past veg mapping Read 1950's enclosures, compare w/ surrounding and thru time	3/1/01 3/1/01 Continued from 2000	2 year 12/1/01 12/1/01	BLM/Taylor BLM/Waller CDOW/NREL Manier
Habitat-Related - General	Coordinate future veg treatments/RCA deferrals Treat veg w/ dixie harrow - Deepe, Bruchez, Blue Valley Interseed clover into meadow edge Interseed old crested wheat trts	3/1/01 6/1/01 6/1/01 6/1/01	12/1/01 12/1/01 12/1/01 12/1/01	Crosby/Taylor Crosby NRCS/Volt Crosby
Wildlife-Related - Multiple Spp.	Coordinate w/ HPP on archaeological clearance of 200 acres	3/15/01	12/1/01	Cesar
Wildlife-Related - T&E Spp.	Identify and map location of all T&E spp, plant and animal	Continued from 2000	12/1/01	Cesar/Liewer

Annual Work Plan 2A - 2001, p. 2				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Wildlife-Related - Predation	Track and record predation	3/1/01	12/1/01	CDOW/Walsh/Hewer
Wildlife-Related - Hunting	Monitor hunting pressure/harvest both with wing barrel and hunter contacts in the field; compare w/ HIP	On-going from 2000	2/1/2002	CDOW Terr Bio/ Liewer
Wildlife-Related - Knowledge Base	Continue tracking grouse movement and habitat use to determine location of specific habitat (monitor/map)	Continued from 9/5/00	2 years	CDOW Walsh/Hewer
	Continue research and mapping of historical treatments	Continued from 3/1/00	2 years	Hewer
	Map wetland/riparian; springs and seeps	Continued from 6/1/00	10/1/01	Cesar/Paula
	Continue developing list of critical habitats where cons easements and leases most favorable and effective	Continued from 6/1/00	6/1/03	CDOW/BLM
	Refine existing database of lekcts	Continued from 6/1/00	9/1/01	Wagner
Outreach and Education	Distribute Conservation Plan and solicit further cooperation	3/1/01	6/1/01	Liewer
	Develop list of BMP?s and make available to landowners	4/1/01	12/1/01	Crosby/BLM(Taylor-Waller) /Permitees
	Establish demo plots	On-going from 2000	2 years	CDOW/BLM/LO
Funding Sources	Identify and pursue possible funding sources/project-share opportunities, incl. SCI, NWF, Quail, Grouse Inc.	Continued from 2000	On-going	BLM/CDOW/NRCS
Monitoring and Evaluation of Plan	Review and publish project progress (Jan-Mar)	1/15/02	3/15/02	MPSGC Liewer
Coordination	Coordinate w/ other statewide groups and share info gained	On-going	On-going	MPSGC
Prioritization/Implementation				

Addendum 2B -Middle Park Sage Grouse Conservation Plan - Annual Work Plan Review, Year 2001. Final Report - 1/31/02.

Wkpln01.wpd

Annual Work Plan Review 2B- 2001, p. 1

General Summary: Several noteworthy projects were begun during Year 2001. Most noteworthy of all was the radio-marking of 63 sage grouse during the winter of 2001, and the subsequent observation and tracking of birds throughout the year. Radioed birds were found on 13 of 14 known leks. One additional lek was found (likely a satellite lek)in the Williams Fork Geographic area. Dan Walsh coordinated an intensive survey of grouse leks in the spring so as to examine parameters relating to grouse attendance and observation on leks. He found the Bowden population estimator provided a more satisfactory population estimate than did traditional count methodology or the joint hypergeometric technique. Based on Bowden?s estimator, overall population estimates for sage grouse in Middle Park would indicate a population of 2108 birds, rather than the 1089 predicted using the traditional lek count methodology. This is largely due to 2001 data that found the hen:male ratio to be 2.73:1, rather than 2:1 as has been more generally assumed. Walsh?s work will provide further understanding and refinement of present count methodology used throughout the State of Colorado. Sherri Huwer, a CSU graduate student, coordinated much of the radio-tracking and vegetation analysis undertaken in 2001. She continued Don Alexander?s original efforts to assess effects of 20 year+ vegetation treatments in Middle Park. Her work will be summarized this spring. Initial indications are that most types of treatments have returned to pre-treatment composition when assessing shrub, forb, and grass components. Huwer is in the initial stage of setting forth a graduate research project that will examine chick development in low, medium, and high quality brood-rearing habitat in Middle Park. Information gathered from tracking of birds through 2001 will provide base information for setting forth the habitat quality types involved in her study. Karl Waller, BLM, has spent considerable time compiling the various databases that describe vegetation composition throughout the Middle Park sagebrush steppe. This information will provide a key element in delineating habitat characteristics throughout sage grouse range. Lastly, we have begun applying specific veg treatments (primarily the dixie harrow) so as to improve habitat quality in less desirable or decadent habitat.

Several individuals key to MPSGC and this plan have taken positions in other areas, incl. Erik Taylor, Chuck Wagner, and Pam Schnurr. Erik Taylor will be replaced by the new BLM range conservationist, Richard Johnson; Chuck Wagner has been replaced by Andy Holland; and we await further word on Pam Schnurr?s replacement and the possibility of further coordination on her veg sat efforts.

Management Issue	Project Description	Inception Date	Anticipated Completion	Responsible Party
Habitat Related - Breeding Hab.	See Knowledge Base			
Habitat Related - Nesting/Brood.	Assist Blue Valley w/ establishment of wet areas adjoining previous spring dev.	3/15/01	12/2001	Taylor/Volt
Not completed, but still interest in working with BVR; to be continued thru 2002 by Volt/Johnson.				
Habitat Related - Winter Habitat	See Knowledge Base			
Growth-Related - Development	Assist Pratt in development of management plan	3/15/01	12/2001	Volt, NRCS
Not completed. Much of Pratt?s 400 acre block has been subdivided. Volt will carry through w/ plans to contact Pratt in 2002.				

Annual Work Plan Review 2B - 2001, p. 2				
Growth-Related - Recreation	Input scoping and development of BLM travel mgt plan	3/1/01	2 year	Arkins/Liewer
Initial scoping of public comments/concerns. BLM completed road inventory in Lawson Ridge area. National Service Center is assisting with identifying travel routes in Wolford area with use of satellite data. BLM received approval for seasonal closure of two grouse-related areas, CR 22 Gravel Pit area and south Lawson Ridge. Horse Creek/Cow Creek areas adjoining Gravel Pit also have seasonal closures, but will likely have little effect on grouse pop. Three year time line on travel mgt plan. $50k received to inventory trails/roads. Anticipate further inventory and condition assessment of existing trails. Proposed direction is a designated route system (rather than existing route system). Main hang-up is cultural clearances for all roads/trails.				
Habitat-Related -General	Coordinate w/ BLM on veg-sat ground-truthing	3/1/01	2 year	BLM/Taylor
	Coordinate and compare past veg mapping	3/1/01	12/1/01	BLM/Waller
	Read 1950's enclosures, compare w/ surrounding and thru time	Continued from 2000	12/1/01	CDOW/NREL Manier
Initial efforts to collate a variety of veg analyses done over the past 30 years and to incorporate them into the ground-truthing efforts. Pam Schnurr, who was assisting this effort, has recently taken a different position and the project has been on hold since then. Received approval to test 30+ transects w/ satellite imagery, but need to get more points. Waller and Koblitz have done an additional 20+ Daubenmire transects this summer. Waller consolidating all veg info into master database. If DOW GIS help is available, this will provide the basis for veg-sat mapping in 2002. The 1950 enclosures have been read by Manier. Raw data has been provided and Manier is working on a write-up of time change and modified Whittaker results. Efforts to assess change in productivity were set back because of a dry summer, and a second year of data is being sought before final assessment.				
Habitat-Related - General	Coordinate future veg treatments/RCA deferrals	3/1/01	12/1/01	Crosby/Taylor
	Treat veg w/ dixie harrow - Deepe, Bruchez, Blue Valley	6/1/01	12/1/01	Crosby
	Interseed clover into meadow edge	6/1/01	12/1/01	NRCS/Volt
	Interseed old crested wheat trts	6/1/01	12/1/01	Crosby
Efforts were made to make the dixie harrow available with a protocol for use and treatment of an area. Despite interest, it was difficult for private landowners to find sufficient time to use the dixie harrow. On public lands, the primary drawback has been the need for cultural clearances. Two hundred acres of BLM had cultural surveys done. One hundred acres in Junction Butte area had too much significance to receive clearance, while 100 acres north of CR 26 received clearance and was dixie harrowed (one pass). Additionally, 35 acres of Kemp-Breeze were treated with a mix of one and two pass dixie harrowing, and 30 acres of crested wheat was interseeded with alfalfa. All dixie harrow treatments received an interseeding of clover, milkvetch, and western wheatgrass.				
Wildlife-Related - Multiple Spp.	Coordinate w/ HPP on archaeological clearance of 200 acres	3/15/01	12/1/01	Cesar
Completed, as noted above.				
Annual Work Plan Review 2B - 2001, p.3				

Wildlife-Related - T&E Spp.	Identify and map location of all T&E spp, plant and animal	Continued from 2000	12/1/01	Cesar/Liewer
BLM has map locations of Osterhout milkvetch, Penland beardtongue, Harrington beardtongue, and Middle Park penstemon, the only two listed veg species in the immediate sage grouse area. A 8x11 map will be added to the MP Sage Grouse Plan addenda noting these locations and referencing the more complete maps. T&E animal species and species of special concern are mapped by DOW. This map will also be incorporated into the Plan addenda.				
Wildlife-Related - Predation	Track and record predation	3/1/01	12/1/01	CDOW/Walsh/Huwer
Predation was recorded on radio-tracked birds. Adult males were most susceptible to predation on or near leks at the time of spring displays. The source of most predation came from golden eagles, with minor occurences of coyote predation. Adult hens and young were predated at the time of nesting and shortly thereafter. See summary of mortality information derived from radio-tracking.				
Wildlife-Related - Hunting	Monitor hunting pressure/harvest both with wing barrel and hunter contacts in the field; compare w/ HIP	On-going from 2000	2/1/2002	CDOW Terr Bio/ Liewer
Extensive monitoring of wing barrel harvest and estimates of harvest success based on a sample phone survey of hunters showed severe overestimates of both hunter # and grouse harvest based on phone surveys. Phone survey methods indicated 133 sage grouse were harvested, with 130 recreational days attributed to sage grouse hunting in Middle Park. Wing barrels showed only 6 sage grouse harvested, two of which likely came out of North Park. The primary reason for the wide discrepancy in results appeared to be a failure on the part of the surveyed party to adequately understand or note the difference between blue grouse and sage grouse. An overwhelming majority of falsely identified harvest claims indicated sage grouse were taken, when in fact blue grouse had been harvested. A secondary possibility is that the surveying party may not be clearly identifiying the bird being surveyed, or may not be familiar with habitat differences should the reporting party give only a general description of his/her harvest. Figures were reworked for Middle Park, and a possible harvest of approx. 30 birds was projected based on these numbers. Field personnel still find this projection higher than what was observed on the ground, but certainly a far better projection than that previously given. In an effort to correct the phone survey problem and to reduce projected overestimates of grouse harvest and hunter recreation days, the DOW sent brochures detailing species and habitat differences to hunters who thru HIP indicated intent to hunt blue grouse/sage grouse in the fall of 2001.				

Annual Work Plan Review 2B - 2001, p.4				
Wildlife-Related - Knowledge Base	Continue tracking grouse movement and habitat use to determine location of specific habitat (monitor/map)	Continued from 9/5/00	2 years	CDOW Walsh/Huwer
	Continue research and mapping of historical treatments	Continued from 3/1/00	2 years	Huwer
	Map wetland/riparian; springs and seeps	Continued from 6/1/00	10/1/01	Cesar/Belcher
	Continue developing list of critical habitats where cons easements and leases most favorable and effective	Continued from 6/1/00	6/1/03	CDOW/BLM
	Refine existing database of lek cts	Continued from 6/1/00	9/1/01	Wagner
Grouse location and habitat use was mapped through 2001. Huwer read veg plots based on location of birds. Tracking will continue for life of present radios, with particular interest given to wintering habitats. Historical treatment mapping has been completed. List of critical habitats being developed, with indications that wintering habitat is of primary concern due to development of such areas. Wagner has transferred to San Luis Valley; refinement of existing database is on hold.				
Outreach and Education	Distribute Conservation Plan and solicit further cooperation	3/1/01	6/1/01	Liewer
	Develop list of BMP?s and make available to landowners	4/1/01	12/1/01	Crosby/BLM(Taylor-Waller) /Permitees CDOW/BLM/LO
	Establish demo plots	On-going from 2000	2 years	
Conservation Plan distributed. Solicitation of further cooperation an on-going project. Development of BMP?s still in process and needing further refinement. Suggestion to summarize BMP?s on a statewide basis, to reduce duplication of effort. Demo plots still to be established. Cultural clearance one of the primary hold-up?s.				
Funding Sources	Identify and pursue possible funding sources/project-share opportunities, incl. SCI, NWF, Quail, Grouse Inc.	Continued from 2000	On-going	BLM/CDOW/NRCS
Remington indicates there is funding for smaller projects, but not for conservation easements/leases at this point. SCSP (Colorado Species Conservation Partnership) may provide future funding, two years out. Funding provided by DOW/CSU for Walsh/Huwer projects, incl temporaries/volunteers, housing and vehicles this past year. In-kind time/services provided by BLM (Waller/Taylor/Cesar/Arkins) and DOW (Apa/Remington/Schnurr/Strain/Liewer/Crosby). Dixie harrow funded thru Middle Park HPP.				
Monitoring and Evaluation of Plan	Review and publish project progress (Jan-Mar)	1/15/02	3/15/02	MPSGC Liewer

Annual Work Plan Review 2B - 2001, p.5				
Coordination	Coordinate w/ other statewide groups and share info gained	On-going	On-going	MPSGC
Cesar, Taylor, Waller, Crosby, and Liewer attended statewide session in Grand Junction April, 2001.				
Prioritization/Implementation				

Addendum 3A - Middle Park Sage Grouse Conservation Plan - Annual Work Plan, Year 2002. - Finalized, March 10, 2002

Annual Work Plan 3A - 2002, p. 1				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Habitat Related - Breeding Hab.	Open Harsha Gulch lek area w/ rollerchopping	6/1/01	3/15/02	Blue Valley Ranch
Habitat Related - Nesting/Brood.	Assist Blue Valley w/ establishment of wet areas adjoining previous spring dev.	Continued from 3/15/01	12/2002	Volt/Johnson
Habitat Related - Winter Habitat	See Knowledge Base	3/15/02 Map known wintering areas	12/15/02	Liewer
Growth-Related - Development	Assist Bumgarner subdivision LO?s in development of management plan	Continued from 3/15/01	12/2001	Volt/Crosby/Ritschard
Growth-Related - Recreation	Input scoping and development of BLM travel mgt plan	3/1/01 2 year - ongoing	Extend additional year 12/31/03	Arkins/Gale/Liewer
Habitat-Related - General	Coordinate w/ BLM on veg-sat ground-truthing Develop photo record of MP leks Begin sagebrush rejuvenation planning and project in Radium area, with EA write-up this year GIS lek locations and key wintering areas Track major land changes/development affecting potential/known SG hab	Continued from 3/1/01 3/1/02 1/1/02 1/1/02 3/1/02	12/15/02 12/15/02 EA completed 2002 Rejuvenation 3 year+ 12/30/02 On-going updates 12/30/02 and On-going	BLM/Johnson Waller Cesar/Thompson Cesar, Walsh MPSGC Liewer/Johnson

Annual Work Plan 3A - 2002, p. 2				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Habitat-Related - General	Coordinate future veg treatments/RCA deferrals Continue veg trt w/ dixie harrow; track and keep master list Interseed clover into meadow edge Interseed old crested wheat trts Modify Pinto Valley grazing plan for BLM, relative to range health and sage grouse needs	3/1/01 Begun 6/1/01 Continued from 6/1/01 6/1/01 3/15/02	12/1/02 - on-going On-going 12/15/02 12/1/01 12/31/02	Johnson/Crosby/Cesar Crosby/Cesar NRCS/Volt Crosby Johnson, Pinto Valley
Wildlife-Related - Multiple Spp.	Coordinate w/ HPP, BLM on archaeological clearances	3/15/01	12/1/01	Cesar/Arkins
Wildlife-Related - T&E Spp.	Maintain master list at BLM; Create usable location map	On-going from 2000 3/15/02	Maintain and update list on-going 12/15/02	Cesar/BLM Liewer
Wildlife-Related - Predation	Informal tracking of predatory problems w/ chick study Check into modifying above ground power poles on BLM	4/1/02 3/15/02	12/31/02 12/31/02	Huwer, CSU Cesar
Wildlife-Related - Hunting	Monitor hunting pressure/harvest success thru use of wing barrels	On-going from 2000	On-going	CDOW/Terr Biologist

Annual Work Plan 3A - 2002, p.3				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Wildlife-Related - Knowledge Base	Continue tracking grouse movement and habitat use to determine location of specific habitat (monitor/map)	Continued from 9/5/00	As long as radios last (Hopefully thru 2002)	CDOW
	Finalize mapping and report of historical treatments	Continued from 3/1/00	Extend thru 8/31/02	Huwer, Johnson, Cesar, Liewer, Crosby, Volt
	Map wetland/riparian; springs and seeps and develop master list	Continued from 6/1/00	10/1/02	Cesar/Belcher
	Continue developing list of critical habitats where cons easements and leases most favorable and effective; provide list to BLM, MPLandTrust, and other entities involved in sale/exchange of lands	Continued from 6/1/00	On-going	CDOW/BLM
	Refine and update original database of lek counts	Continued from 6/1/00	Extend to 9/1/02	Wagner/Holland/Liewer
	Examine growth rates and behavioral characteristics of broods on high, medium, and low quality brood rearing habitat	5/1/02	12/3/02	Huwer
	Re-assess counting protocol for spring leks; refine count parameters	Continued from 1/1/01	12/1/03	Walsh
	Centralize all pertinent SG info, MPSGC Plan and final documents	3/15/02	12/31/02	Liewer

Annual Work Plan 3A - 2002, p.4				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Outreach and Education	Refine list of BMP?s, print, and make available to landowners Establish demo plots Involve West Grand Voc-Ag in grouse related projects Enlist East Grand student to assist with tracking Granby birds	Continued from 3/1/01 On-going from 2000 1/1/02 1/1/02	2 year 12/03 Extend to 12/1/03 12/31/02 5/30/02	Statewide/MPSGC Crosby/Johnson/Cesar/Volt CDOW/BLM/NRCS Crosby/Huwer Claassen
Funding Sources	Identify and pursue possible funding sources/project-share opportunities, incl. SCI, NWF, Quail, Grouse Inc. Emphasize grouse needs for CDOW real estate section Investigate possibility of ag tax status for LO?s w/ T&E species/species of concern who defer grazing on their lands	Continued from 2000 1/1/02 3/15/02	On-going Prep for CSCP 12/30/01 12/31/02	BLM/CDOW/NRCS Crosby Ritschard/Liewer
Monitoring and Evaluation of Plan	Review and publish project progress (Jan-Mar) Formulate annual work plan for following year	1/15/03 3/15/02	3/15/03 5/15/02	MPSGC Liewer
Coordination	Coordinate w/ other statewide groups and share info gained	On-going	On-going	MPSGC
Prioritization/Implementation				

Addendum 3B - Middle Park Sage Grouse Conservation Plan - Annual Work Plan Review, Year 2002. - Finalized, January 2003

Lek Count Summary: High male count was down this past spring from the previous year (266 males vs. 313, but still up from 2000 [238] and 1999 [247]). Most of this can be attributed to the less intense surveys (107 total counts) being done following the highly intense (212 counts) survey of 2001. (Surveys since 2000 (2000, 125 total counts) have been more intense than those most recently preceding that date (99 total counts, 1999 and 1998), given additional assistance and use of temporary employees in making these counts.) Total hen count was 107 hens for 2002, vs. 212 for 2001, 125 for 2000, and 99 for both 1999 and 1998. A potential lek was newly-discovered in the area of Hill Creek in the spring of 2002; however, this lek will not be fully-recognized as permanent for at least 3 years, based upon continuance of use in this area. The 2001-2002 winter was fairly dry, with a period of early snow in the first week of December, followed by a long dry spell. Snows recurred in February and early March, but the spring turned exceptionally dry. Middle Park experienced a major drought, as did much of western Colorado through the summer of 2002. Some rains returned in September, but the fall was generally dry, with a period of snows occurring in late October, but then tapering off through the end of the calendar year. Results of annual work projects are given below.

Work Plan Review 3B - 2002, p. 1				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Habitat Related - Breeding Hab.	Open Harsha Gulch lek area w/ rollerchopping	6/1/01	3/15/02	Blue Valley Ranch
Habitat Related - Nesting/Brood.	Assist Blue Valley w/ establishment of wet areas adjoining previous spring dev.	Continued from 3/15/01	12/2002	Volt/Johnson
Habitat Related - Winter Habitat	See Knowledge Base	3/15/02 Map known wintering areas	12/15/02	Liewer
Growth-Related - Development	Assist Bumgarner subdivision LO?s in development of management plan	Continued from 3/15/01	12/2001	Volt/Crosby/Ritschard

Annual Work Plan Review, 3B- 2002, p. 2				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Growth-Related - Recreation	Input scoping and development of BLM travel mgt plan	3/1/01 2 year - ongoing	Extend additional year 12/31/03	Arkins/Gale/Liewer
Habitat-Related - General	Coordinate w/ BLM on veg-sat ground-truthing Develop photo record of MP leks Begin sagebrush rejuvenation planning and project in Radium area, with EA write-up this year GIS lek locations and key wintering areas Track major land changes/development affecting potential/known SG hab	Continued from 3/1/01 3/1/02 1/1/02 1/1/02 3/1/02	12/15/02 12/15/02 EA completed 2002 Rejuvenation 3 year+ 12/30/02 On-going updates 12/30/02 and On-going	BLM/Johnson Waller Cesar/Thompson Cesar, Walsh MPSGC Liewer/Johnson
Veg-sat ground truthing: Contacts made earlier this year w/ GIS division of DOW in Grd Jct. Seems as though veg-sat is on hold, due to turnover of personnel and other priorities. BLM continues to read transeects. Photo record of leks - compiled by Walsh, and now on CD-ROM. Also, lek photos and descriptions set forth by Walsh in *Greater Sage Grouse Leks, Middle Park, Colorado*. GIS lek locations: Wintering areas (12/15-3/15) mapped for 2001-2002. Also map of previous incidental observations during winters 1997-2001. Tracking land changes: Most sgb treatments in MP now compiled on maps, although some difficulty w/ possible duplication/notation of NRCS work. Will continue to map. Also beginning to map development areas in MP.				
Habitat-Related - General	Coordinate future veg treatments/RCA deferrals Continue veg trt w/ dixie harrow; track and keep master list Interseed clover into meadow edge Interseed old crested wheat trts Modify Pinto Valley grazing plan for BLM, relative to range health and sage grouse needs	3/1/01 Begun 6/1/01 Continued from 6/1/01 6/1/01 3/15/02	12/1/02 - on-going On-going 12/15/02 12/1/01 12/31/02	Johnson/Crosby/Cesar Crosby/Cesar NRCS/Volt Crosby Johnson, Pinto Valley
Coordination: Dixie harrow: Clover: Interseeding: PV grazing plan: BLM has modified grazing plan for PV, resulting in deferral. However, this is counter balanced by PV doing some brushbeating immediately adjacent to Kastle lek. Birds strutting more on hillside to north, but little cover to retreat to if signs of predators. Need to continue tracking.				
Wildlife-Related - Multiple Spp.	Coordinate w/ HPP, BLM on archaeological clearances	3/15/01	12/1/01	Cesar/Arkins
Archaeological clearance done on # acres in area of PV Ranch, in anticipation of some dixie harrow work. Need to map for future reference.				

Annual Work Plan Review, 3B- 2002, p. 3				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Wildlife-Related - T&E Spp.	Maintain master list at BLM; Create usable location map	On-going from 2000 3/15/02	Maintain and update list on-going 12/15/02	Cesar/BLM Liewer
Wildlife-Related - Predation	Informal tracking of predatory problems w/ chick study Check into modifying above ground power poles on BLM	4/1/02 3/15/02	12/31/02 12/31/02	Huwer, CSU Cesar
T&E list: No T&E wildlife species on same range as SG. T&E veg species included in Cons Plan is mapped and present at BLM. Chick study indicated 1 chick was confirmed predated, although no direct observation or clear determination of the predator was reported. Given the presence of an observer at the site, it is assumed that the kill was by a small mammal, possibly a weasal. Predation by a coyote/avian raptor was ruled out. The study also showed an additional # of 9 chicks disappeared during the field exposure. It is assumed that disappearance reflected mortality, but it is unclear whether this would have been from malnutrtion or from predation. Chick mortality was 75%. The suspected cause of death in the remaining chicks is suspected to be malnutrition. See Huwer for full report. Lek and nesting observations indicated 2 males were killed on the AP lek (likely avian predation); 1 male on Hill Creek lek (confirmed avian predation). Pole modification:				
Wildlife-Related - Hunting	Monitor hunting pressure/harvest success thru use of wing barrels	On-going from 2000	On-going	CDOW/Terr Biologist
Spring 2002 - Compared wing barrel results with phone harvest surveys for second straight year and found wide discrepancies. Wing barrels showed # wings, whereas initial phone survey reported 135 +/- 96 birds harvested, with 156 +/-47 hunters. Follow-up calls to all reported hunters surveyed revealed a 24% accuracy level when interpreting the data loosely, and an ~10% accuracy level when interpreting the data in phone survey reports more strictly. Reasons for discrepancy continue to suggest possible misunderstandings on part of hunters replying, confusion of SG/BG, wrongful entry of data by the surveyor, and fudging of data by surveyor. Lyn Stevens, who has oversight of HIP program, has subsequently modified the harvest phone survey for 2002, so that hunters are asked if they hunted in open sagebrush or in aspen/conifer. This should hopefully reduce some of the errors in reported harvest. Also, it became apparent that some hunters are very incidental in their approach to hunting sage grouse, e.g. some report they kept an eye open for sage grouse as they traveled to higher elevations to hunt blue grouse, or even big game during the archery season. Lyn intends to adapt the survey form to pick up on opportunistic vs. Active SG hunters. Even correcting for the above errors in the phone harvest survey, the refined report indicated more hunters (63 +/-31) and sage grouse harvested (25 +/-37) than is accounted for by the wing barrels. Given some reluctance/failure of hunters to place wings in the barrels, and given that field officer observation of hunters is likely very modestly understated, there continues to be some misalignment of data which may/may not be correctable. Fall 2002 - Monitored wing barrels (# wings received) and hunter participation (very light, with ~15 hunters projected by extrapolating from direct observation). Phone survey results to be compared in spring 2003. Survey questions now modified to correct some of the misunderstanding/misidentification of BG/SG reporting in Middle Park.				

Annual Work Plan Review 3B- 2002, p. 4				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Wildlife-Related - Knowledge Base	Continue tracking grouse movement and habitat use to determine location of specific habitat (monitor/map)	Continued from 9/5/00	As long as radios last (Hopefully thru 2002)	CDOW
	Finalize mapping and report of historical treatments	Continued from 3/1/00	Extend thru 8/31/02	Huwer, Johnson, Cesar, Liewer, Crosby, Volt
	Map wetland/riparian; springs and seeps and develop master list	Continued from 6/1/00	10/1/02	Cesar/Belcher
	Continue developing list of critical habitats where cons easements and leases most favorable and effective; provide list to BLM, MPLandTrust, and other entities involved in sale/exchange of lands	Continued from 6/1/00	On-going	CDOW/BLM
	Refine and update original database of lek counts	Continued from 6/1/00	Extend to 9/1/02	Wagner/Holland/Liewer
	Examine growth rates and behavioral characteristics of broods on high, medium, and low quality brood rearing habitat	5/1/02	12/3/02	Huwer
	Re-assess counting protocol for spring leks; refine count parameters	Continued from 1/1/01	12/1/03	
	Centralize all pertinent SG info, MPSGC Plan and final documents	3/15/02	12/31/02	Walsh Liewer

Annual Work Plan Review 3B- 2002, p. 5				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Tracking continued thru spring and summer, 2002. Fall and winter tracking was inconsistent and less intensive due to work loads in other areas. 14 radios possibly remain active although winter tracking thus far indicates far fewer have been found. Distribution of radio-tracked birds is presently being compared with 2001 observations. Appears to be general consistency in areas of use. Additional birds (summer), heretofore unknown in the area, found on S side Morris Mtn., controlled by Gallagher Ranch west of Hwy 40, and south of Hwy 134. Possible new lek located N of Hill Creek, Two Bar STL, on Peak allotment. Area will be monitored in 2003 and following to determine consistency of use, and whether this equates to a truly permanent lek site. Location makes it difficult to observe until after later snows melt. DOW Habitat section developing list of priority areas for conservation easements and leases. Oversight of Middle Park in mapping and notation of such areas by statewide habitat is being corrected. Met w/ TNC and other NW SG committee members to develop further prioritization needs relating to SG based on assessment of stress factors, scope of stress, and sources of stress. Also field day with TNC for on-site look at habitat types and factors infringing on SG habitat. Tour w/ Steve Monsen who will be creating BMP?s for statewide sagebrush habitat, incl consideration of grouse needs. Finalized mapping of trts: Most trts now mapped on TOPO and also BLM trts mapped w/ ARCVIEW. As mentioned above, some discrepancies as to exact location of some treatments, date of trt, and type of trt. Need to review w/ NRCS for fuller and more accurate detail. Wetlands/springs: Critical hab list: Fairly well developed and included in WRIS database and also in Habitat Prioritization list. Attempted cons easement on Grand River (w/ MPLT), in area of Morris Mtn where summer SG found, but unsuccessful in finalizing. Nordloh cons deal fell thru; BLM retains land in area of Gby lek, but wants to divest. Investigating possible PPR? deal. Update lek count list: Need count data from Holland. Huwer completed 1st year of study on growth and development of chicks in MP area, examining possible differences in chick development relative to high, medium, and low quality habitat. First year of study indicated no clear indication that ?quality? (as projected by sagebrush, forb characteristics) affected early development of chicks. (See accompanying report). Counting protocol - Walsh completed his write-up of the intensive lek study he did in 2001 and presented the results at the national sage grouse conference in Utah. Most basically, his study concluded that there is no clear way to accurately determine population size with a simple count of lek attendance at this point. His one year study showed a slightly higher ratio of female:male (2.7:1) in the population than is presently used with the Braun method of attributing 2 females for every male. His study also suggests that male attendance at the lek is more dynamic and less consistent than is often perceived; hence, many of the males that may attend at sometime during the breeding season are not accounted for in any single count. This realization would increase the overall population beyond what has been previously projected. However, until lek counts are calibrated to actual population parameters by estimating the detection probabilty , extrapolation of population numbers from lek counts remains crude and imprecise. Walsh?s recommendations for obtaining the most highly refined lek count data (p. 116) are labor intensive and often impractical from a field perspective. Walsh did conclude that optimal count dates for adult males and females occurred between April 3 and April 26, which dates include both peak female and male attendance. Using two different estimators, 16 leks were estimated as the total number of leks existing (both detected and undetected) in MP west of Byers Canyon. This corresponds to the number of leks actually observed in 2002, if the recently-discovered Hill Creek lek in fact shows signs of permanence in coming years. Using Bowden?s estimator, Walsh suggested a SG population for MP of 559 total males, and 1284 females (=1843 total birds), based on his one year of intensive survey. (Previous population estimates based on Braun?s theory of lek attendance and male:female ratios derived from such attendance showed a high population of 1329 birds in 1989, and a low population of 462 birds in 1996. MPSGC goals based on this form of estimation set an optimum level of 1100 birds with a minimally acceptable level of 550 birds in MP. Again, Walsh?s estimate is based on 1 year of study and needs to be viewed with caution, just as should other indicators of population.) See Walsh?s *Population Estimation Techniques for Greater Sage-Grouse* for full report. Centralization of documents: Fairly complete, but becoming quite large and in need of further organization. Would like to house documents at DOW, with back-up at BLM. Also, need to work on making the Plan electronically accessible.				

Annual Work Plan Review 3B – 2002, p. 6				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Outreach and Education	Refine list of BMP?s, print, and make available to landowners Establish demo plots Involve West Grand Voc-Ag in grouse related projects Enlist East Grand student to assist with tracking Granby birds	Continued from 3/1/01 On-going from 2000 1/1/02 1/1/02	2 year 12/03 Extend to 12/1/03 12/31/02 5/30/02	Statewide/MPSGC Crosby/Johnson/Cesar/Volt CDOW/BLM/NRCS Crosby/Huwer Claassen
Refinement of BMP list is being done on a statewide basis thru contractual work with Steve Monsen in collaboration of DOW work provided by Tony Apa . MPSGC, along with the DOW Habitat section, coordinated a field trip with Monsen, in order to familiarize him with on-site habitat types and conditions of Middle Park. BMP's are now being devised so as to address desired practices conducive to protection/enhancement of existing sage grouse populations. East Grand student assisted with some radio-tracking, but did not persist or provide the level of coverage hoped for.				
Funding Sources	Identify and pursue possible funding sources/project-share opportunities, incl. SCI, NWF, Quail, Grouse Inc. Emphasize grouse needs for CDOW real estate section Investigate possibility of ag tax status for LO?s w/ T&E species/species of concern who defer grazing on their lands	Continued from 2000 1/1/02 3/15/02	On-going Prep for CSCP 12/30/01 12/31/02	BLM/CDOW/NRCS Crosby Ritschard/Liewer
See Wildlife-Related, Knowledge Base section. Sage grouse management is now given a priority weight in assessing overall needs for habitat protection/procurement. Properties in MP have been ranked, based upon this refined rating system, and grouse considerations have been included in said ranking. MP HPP has given preliminary approval to an analysis and review of forage production in big game wintering and transition areas of Middle Park for the coming (2003) year. This information, while not based on any new veg readings, would be most helpful in collating past data collection in areas of soil productivity, habitat capability, and livestock/wildlife utilization. Given that the MPSG Plan is built around a belief that a healthy, integrated ecosystem is important to addressing SG needs, such information would be useful in further knowledge and specification of habitat capabilities, and would provide future direction for veg trts in wintering and transition areas.				
Monitoring and Evaluation of Plan	Review and publish project progress (Jan-Mar) Formulate annual work plan for following year	1/15/03 3/15/02	3/15/03 5/15/02	MPSGC Liewer
2002 Work Plan was formulated and finalized in March 2002; Plan is being reviewed and results will be distributed in early 2003 according to schedule.				

Annual Work Plan Review 3B – 2002, p. 7				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Coordination	Coordinate w/ other statewide groups and share info gained	On-going	On-going	MPSGC
Primary coordination for 2002 has been thru statewide development of BMP?s. Additional interaction at the TNC meeting in Glenwood Spgs, cataloguing stressors and evaluating overall types of conflict and stress on SG thruout NW CO. Also in 2002, discussion arose with State Land Board, whose State Trust Lands provide possible lek, confirmed nesting, and brood-rearing habitat in the Middle Park area (primarily Milk Creek and West Carter allotments). Beverly Rave, State Land Board District Manager, is being invited to be a signatory for the MPSG Plan.				
Prioritization/Implementation				
Most prioritization and implementation for 2002 continues to be in the area of Knowledge Base. 2003 will be the 3rd year for gathering information on bird movements and habitat use. It is anticipated that, beginning with 2003, there will be a transition from information gathering toward more actual field projects, particularly as BMP?s become available.				

Addendum 4A - Middle Park Sage Grouse Conservation Plan - Annual Work Plan, Year 2003. - Finalized, March 2003

Lek Count Summary: Weather: Weather continued dry through early winter (November, 2002 -January, 2003). Modest snowfall in early Febr leaving overall snowpack at approx 65-75% of normal. Heavier snowfall in late February has brought snowpack up to 85%.

Annual Work Plan 4A - 2003, p. 1				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Habitat Related - Breeding Hab.	Treat Sulphur Gulch per Monsen's recommendations with hopes of eventually restoring lek activity, weather permitting	3/1/03	Trt of 50 A this year, w/ spray and drilling; additional 50 A in 3 yrs following monitoring period - on-going	Crosby/Cesar/Volt
Habitat Related - Nesting/Brood.	Treatment of Sulphur Gulch to re-estab forbs and grasses - as above	3/1/03	As above	Crosby/Cesar/Volt
Habitat Related - Winter Habitat	Map wintering areas on GIS Fertilize wintering habitat in Red Mtn area, weather permitting	3/15/03 9/15	12/31/03 12/15/03	Liewer/Graham Cesar
Growth-Related - Development	Procure and make available written materials from RMEF, MPLT, and CCA that more specifically set forth benefits/drawbacks of cons easements. Provide potentially-interested landowners, esp. new property owners in MP w/ info on cons easements. Investigate further options for Granby area. Consider R-PP w/ BLM amg these options.	3/15/03 From fall, 2002	12/31/03 12/31/03	Liewer/Graham Claassen/Cesar

Annual Work Plan 4A - 2003, p. 2				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Growth-Related - Recreation	Input scoping and development of BLM travel mgt plan	From 3/1/01	Wolford travel plan anticipated in 2004; Lawson, Sulphur Gulch, Dice Hill in 2005; Middle Park/North Park in 2006	Rosene/Gale/Liewer
	Sign temporary road closure March 15- May 15 on Gravel Pit hill.	3/1/03	5/30/03	Arkins/Rosene
Habitat-Related - General	Continue to develop photo record of MP leks: 4 leks	3/1/03	12/31/03	Waller
	Enter MPHPP and BLM Daubenmire transects and modified line intercept pre-treatment transects on GIS and continue work on database	Cont'd from 2002	12/31/03	Waller
	Enter transects in usable database, incl canopy cover, spp comp, and fqcy, w/ transect summary	3/1/03	On-going	Waller
	Do EA (primarily bighorn project, but possible implications for re-establishment of sage grouse) on Radium trts and follow up w/ burns if weather permits	Continued from 2002 Anticipate 3+ year rejuvenation process	On-going	Cesar/Thompson
	Establish 2-3 more Daubenmire veg transects	5/1/03	12/31/03	Waller
	Put lek locations on GIS	3/1/03		
	Track major land changes/development affecting potential/known SG hab/GIS	On-going	On-going updates On-going	Holland Liewer/Graham

Annual Work Plan 4A - 2003, p. 3				
Additional Notes: Looking at treating 100 A total on Sulphur Gulch flats, in area of historic lek. Area had been sprayed and treated w/ interseeding of crested wheat, which has outcompeted many of the other forbs and grasses. Must do EA (Cesar). Anticipate treating with Round-Up (possibly contract spraying and drilling). Half to be done this spring if weather is conducive; monitor progress over next 2 years, then other half. Cultural clearance done. Red Mtn project - if weather is conducive, look at application of nitrogen on snow in late fall-early winter. Tie in with other fertilization projects of HPP, w/ possible MJK contract. GIS mapping - want to enter locations since removal of "selective availability". Holland to look at getting ARCVIEW.				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Habitat-Related - General	Check on veg/sat project status	Cont'd frm 2001	5/31/03	Liewer
	Coordinate future veg treatments/RCA deferrals (Linke, Yust, Lewis grazing permits)	On-going from 6/1/01	On-going	Johnson
	Continue veg trt w/ dixie harrow when feasible; track and keep master list; provide annually to MPSGC	On-going from 6/1/01	On-going	Crosby
	Purchase seeder, make available to LO's for interseeding clover alomg meadow edges. Also interseed w/ dixie harrow, mid-April application. Store at DOW.	Purchase by 4/15/03	12/31/03	Cesar/Volt/Crosby
	Track impacts of PV brushbeating on lek #'s - Kastle lek	3/1/03	5/15/07	Liewer
Additional notes: Veg/sat work put on hold last year and may well no longer have support w/ shift in changes of personnel and job responsibilities in DOW. If no additional support is forthcoming, this project will be dropped from work plan. BLM is presently anticipating a 40% voluntary reduction in grazing this year due to continued drought. BLM asked for and received full, voluntary cooperation last year when it requested 40% reduction and in fact received 41% reduction. Effort to encourage turning animals on at later date was only partially successful because of drought, water availability, and need for spring forage. Efforts to coordinate with HPP for purchase of seeder. Cesar will continue HPP contacts and approval by end of February so as to be ready for use this spring. NRCS to help with finding source for purchase of seed.				
Wildlife-Related - Multiple Spp.	Locate further areas for sgb trt/regen and coordinate w/ HPP, BLM on archaeological clearances	3/15/03	12/31/03	Cesar/Liewer/Crosby
Additional Notes: Examine area west of Fossil Ridge, north of Mitchell allotment. Possible burn. Also, Dead Badger area, Barger Gulch area, Yarmony Mtn.				

Annual Work Plan 4A- 2003, p. 4				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Wildlife-Related - T&E Spp.	Map northern spotted leopard frog as species of concern	3/15/03	12/31/03	Liewer/Crosby
Wildlife-Related - Predation				
Wildlife-Related - Hunting	Determine whether modification of phone survey questions aligns harvest and hunter results more closely to that observed in field and with wing barrel results. Seek earlier accounting for sage grouse wings in wing barrels	On-going from 2000 3/1/03	On-going 9/1/03	CDOW/Terr Biologist Holland/Liewer
Additional Notes: Because of CWD issues this past year, biologist and researchers have been delayed in "reading" grouse wings from wing barrel. No current information available from wing barrels of Sept. 2002.				

Annual Work Plan 4A- 2003, p. 5				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Wildlife-Related - Knowledge Base	Enter wetlands/springs on GIS, provided drought does not affect ability to map	3/1/03	12/31/03	Cesar/Belcher
	Prioritize and provide formal list of critical habs and locations of desired cons easements to BLM, MPLandTrust, and other entities involved in sale/exchange of lands.	Cont'd from 2002	12/31/03	Huwer, Johnson, Cesar, Liewer, Graham/Crosby
	Further investigate possibility of R&PP thru TNC w/ DOW maintaining on Nordloh	Cont'd from fall 2002	12/31/03	Claassen
	Continue to track lek counts on Master List - provide copy annually to MPSGC	On-going		Holland
	Support study of growth rates and behavioral characteristics of broods on high, medium, and low quality brood rearing habitat	Pending determination by research as to whether to transfer project to Moffat County for 2nd year of study	12/3/02	Huwer
	Centralize all pertinent SG info, MPSGC Plan and final documents	Continued from 2002	12/31/03	Liewer
	Put more intensive effort into checking area east of Cow Creek for winter and spring sage grouse activity	1/31/03	12/31/03	Holland
	Provide SLB w/ info regarding SG use of STL in Milk Creek/Carter areas; bring SLB on as signator and cooperator, recognizing STL as a separate classification of land ownership and responsibility, that reaches beyond traditional private/public definitions.	1/31/03	12/31/03	Liewer/Rave

Annual Work Plan 4A - 2003, p.6				
Additional Notes: Critical habitats have been noted and prioritized for TNC, but need still exists to disseminate this info more widely, particularly to the BLM itself (which continues to look at land exchanges), as well as to conservation/land trusts, etc. Huwer's project will likely be moved to Moffat County for second year of study. Hesitation on part of MPSGC to have additional eggs taken in area, and no active radios left, whereas no such problem in Moffat. Will continue to support and gain from this project. It is becoming more difficult to centralize the numerous reports and info gained through the committee's work plans and efforts. Want to likely have these on file both at BLM and DOW. Sage Grouse Census Records from 1959-1965 for the Middle Park Area were found in storage at State Ranch. Additional information was recorded on the Master Lek Ct form (esp. 1965 count data), and brood count routes were copied onto the SGLekWest-MP TOPO map. Three brood routes were traveled from mid-June-late July, viz. Kremmling North, Back Trbsome-Trbsome, and Rock Cr/Parshall Divide. Most notably, the Parshall Divide route, which begins at HSS, indicates more birds were likely using this area than currently exists. It should also be noted that the Williams Fork/Barger Gulch area did not have a brood count route. Bev Rave, District Ranger w/ SLB, has reviewed and recommended minor modification of current MPSGC Conservation Plan. It should be noted that State Trust Lands need to be viewed separately and outside the traditional definition of private or public lands. Such language will be incorporated in the amended Plan and will henceforth be included in future revisions or electronic forms of the Plan.				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Outreach and Education	Support completion of statewide BMP's and apply to Middle Park Establish demo plots; map and disseminate info to MPSGC	3/1/03 On-going from 2000	2 year 12/04 Extend to 12/1/03	Statewide/MPSGC Steve Monson Crosby/Johnson/Cesar/Volt CDOW/BLM/NRCS
Additional Notes: Had hoped to have Monson on line for this by now. Problems w/ contract process have delayed, but hopefully will be picked up this spring. Cesar suggests small, 1 A brushbeating on PV site where arch clearance done.				
Funding Sources	Identify and pursue possible funding sources/project-share opportunities, incl. SCI, NWF, Quail, Grouse Inc, EQUIP, WHIP.	Continued from 2000	On-going	BLM/CDOW/NRCS
Additional Notes: Volt indicates latter two can be done on either private or state				
Monitoring and Evaluation of Plan	Review and publish project progress (Jan-Mar) Formulate annual work plan for following year	1/15/04 3/15/03	3/15/04 5/15/03	MPSGC Liewer
Plan review completed in January 2004; Work Plan for 2004 completed – both Review and 2004 Work Plan sent to USFWS January 2004				

Annual Work Plan 4A - 2003, p. 7				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Coordination	Coordinate w/ other statewide groups and share info gained Contact those working on Gunnison project to assess future projects and trt potential	On-going 3/15/03	On-going 9/1/03	MPSGC Liewer
Prioritization/Implementation				

Addendum 4B - Middle Park Sage Grouse Conservation Plan – Annual Work Plan Review, Year 2003. – Final Report 1/29/04.

Lek Count Summary: Overall numbers (high male count) were slightly higher than 2002 – 287 vs 268. Part of this is explained by a significant increase in birds counted on Hill Creek and Mitchell, which offsets declines on other leks. Also, total count effort continues to decrease from the highly intensive effort at the time of Dan Walsh's research in 2001. We continue to do a yearly coordinated one-day count throughout the entire area, with 253 males (5/1/2003). Most notably: increase of males counted in Granby, rising from 10 to 18 birds (all-time high count). Mitchell Muddy Creek shows marked increase in birds counted. May possibly reflect a downward shift on neighboring Pinto Valley or Antelope Pass. Antelope Pass continues to show tenuous numbers, with few days of attendance. Back Troublesome down considerably. Second year of count on Hill Creek shows continued activity, with marked increase of birds counted (34 vs. 19 in 2002). One more year of positive counts, and we will assume Hill Creek represents a valid lek location and strutting ground. Pinto Valley Kastle down from 50 to 39, may be because of major brushbeating in area the year before. Taussig, Doucheff, and Eagle Pass numbers holding stable. Hilty down for 2nd year in row. Gravel Pit shows very few birds, inconsistency. **Weather**: Heavy snowfall and precip in late spring provided short-term recovery from severe drought conditions of previous year. Summer conditions were generally dry, with monsoonal flows of July delayed until mid-late August. Good moisture late August-early September, but moisture flow again cut off. Conditions dry from mid-September through time of report, mid-December. **Project Summary**: (See Summaries at end of each section for fuller detail.) Some of the anticipated field projects were postponed because of persisting drought conditions. Sulphur Gulch and Red Mtn projects to be carried into 2004. Multi-sagebrush-trts applied to Pinto Valley/Dunning Creek area. McQueary Creek identified as possible site for sagebrush project. Huwer's research project (chick development) moved to Moffat County for Year 2. Interseeding of clover on field edges was well-received by landowners, and hopefully will have some positive gains for sage grouse. Some of the transect work had to be set aside by Karl Waller because of health problems, but we're counting on Karl in 2004 and look forward to his full recovery.

Annual Work Plan Review 4B - 2003, p. 1				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Habitat Related - Breeding Hab.	Treat Sulphur Gulch per Monsen's recommendations with hopes of eventually restoring lek activity, weather permitting	3/1/03	Trt of 50 A this year, w/ spray and drilling; additional 50 A in 3 yrs following monitoring period – Carry-over due to drought	Crosby/Cesar/Volt
Habitat Related - Nesting/Brood.	Treatment of Sulphur Gulch to re-estab forbs and grasses - as above	3/1/03	As above	Crosby/Cesar/Volt
Habitat Related - Winter Habitat	Map wintering areas on GIS Fertilize wintering habitat in Red Mtn area, weather permitting	3/15/03 9/15	Completed Carry-over due to drought	Liewer/Graham Cesar

Annual Work Plan Review 4B - 2003, p. 2				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Growth-Related - Development	Procure and make available written materials from RMEF, MPLT, and CCA that more specifically set forth benefits/drawbacks of cons easements. Provide potentially-interested landowners, esp. new property owners in MP w/ info on cons easements.	3/15/03	Partially completed 12/31/03	Liewer/Graham
	Investigate further options for Granby area. Consider R&PP w/ BLM amg these options.	From fall, 2002	Further discussion needed 12/31/03	Claassen/Cesar
Summary: Treatment of Sulphur Gulch delayed because of 2002 drought. WRIS update in spring of 2003, but needs further revision w/ enhanced definitions. No fertilization because of previous year's drought. Some info collected on cons easements, with further info request to GCLC. Materials provided to several landowners, but this needs to be further organized and developed. Initial discussions on possibility of R&PP, Granby area. Value of land makes an R&PP less than desirable for BLM; however, there has been no interest in the property. Given increased lek count, BLM may have more interest in considering an R&PP, provided it can find someone to oversee/administer (e.g. DOW).				
Growth-Related - Recreation	Input scoping and development of BLM travel mgt plan	From 3/1/01	Scoping comments completed on Wolford travel plan	Rosene/Gale/Liewer
	Sign temporary road closure March 15- May 15 on Gravel Pit hill.	3/1/03	Completed	Arkins/Rosene

Annual Work Plan Review 4B - 2003, p. 3				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Habitat-Related - General	Continue to develop photo record of MP leks: 4 leks	3/1/03	Antelope and Mitchell completed	Waller
	Enter MPHPP and BLM Daubenmire transects and modified line intercept pre-treatment transects on GIS and continue work on database	Cont'd from 2002	Carry-over 12/31/03	Waller
	Enter transects in usable database, incl canopy cover, spp comp, and fqcy, w/ transect summary	3/1/03	On-going	Waller
	Do EA (primarily bighorn project, but possible implications for re-establishment of sage grouse) on Radium trts and follow up w/ burns if weather permits	Continued from 2002 Anticipate 3+ year rejuvenation process	Initial stage completed Spring burns anticipated	Cesar/Thompson
	Establish 2-3 more Daubenmire veg transects	5/1/03	Completed	Waller
	Put lek locations on GIS	3/1/03	Completed	Holland
	Track major land changes/development affecting potential/known SG hab/GIS	On-going	On-going	Liewer/Graham
Summary: Initial input into scoping of BLM travel management plan. Wolford travel plan still on line for 2004. Temporary road closure on Gravel Pit Hill is signed. All projects assigned to Karl Waller were put on hold because of Karl's health needs. Waller did do re-growth photos on Mitchell and Antelope lek sites; line-intercept on the Mitchell dixie harrow site; 2 more Daubenmire transects done. Bighorn trts in Radium area (with remote implications for sage grouse): Inspiration Point and Pumphouse burns set for spring. We did have a question as to sage grouse presence in the Sheephorn area (south of Radium), but earliest indications are that droppings found are not sage grouse. There has been some intensive survey of the Corduroy Creek and little Sheephorn Creek areas relative to a proposed land exchange. No further evidence of greater sage-grouse, once historically present. Lek locations have been put on GIS, thru WRIS, but latest version needs further editing.				

Annual Work Plan Review 4B - 2003, p. 4				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Habitat-Related - General	Check on veg/sat project status Coordinate future veg treatments/RCA deferrals (Linke, Yust, PV grazing permits) Continue veg trt w/ dixie harrow when feasible; track and keep master list; provide annually to MPSGC Purchase seeder, make available to LO's for interseeding clover alomg meadow edges. Also interseed w/ dixie harrow, mid-April application. Store at DOW. Track impacts of PV brushbeating on lek #'s - Kastle lek	Cont'd frm 2001 On-going from 6/1/01 On-going from 6/1/01 Purchase by 4/15/03 3/1/03	Pronounced "dead" On-going PVnow in 3 yr rest rotation Multi-trt project on PV completed Renewed interest in DH Completed ~900# clover seed given out 5/15/07 #'s down – 2nd year after	Liewer Johnson Crosby Cesar/Volt/Crosby Liewer
Summary: Veg/sat project officially ruled "dead". Scott Strain's position redefined. Veg trts: Pinto Valley on 3 year rest-roation. Present owner has little interest in running cattle on private. Deferred grazing has shown good growth and residual veg in Kastle draw area. Area that was brushbeaten next to lek and west of backroad is coming back, but as stated above, number of males attending lek is down. Two seeders purchased. Over 900# of clover given out to landowners. Success of project recommends continuation into future. Cody Neff treated approx. 240 A of sagebrush just N of Pinto Valley road this fall. Some difficulty in operating machinery given ground conditions. Lawson aerator as well as Dixie harrow being used for sagebrush rejuvenation, with broadcast seeding. Several other landowners now interested, incl. Bruchez, Hammer. Drawback is reluctance to defer grazing.				
Wildlife-Related - Multiple Spp.	Locate further areas for sgb trt/regen and coordinate w/ HPP, BLM on archaeological clearances	3/15/03	Carry-over	Cesar/Liewer/Crosby
Summary: Not completed. Still need to examine area west of Fossil Ridge, north of Mitchell allotment. Possible burn. Also, Dead Badger area, Barger Gulch area, Yarmony Mtn. Money available thru fuel reduction programs				

Annual Work Plan Review 4B - 2003, p. 5				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Wildlife-Related - T&E Spp.	Map northern spotted leopard frog as species of concern	3/15/03	Completed	Liewer/Crosby
Wildlife-Related - Predation				
Wildlife-Related - Hunting	Determine whether modification of phone survey questions aligns harvest and hunter results more closely to that observed in field and with wing barrel results. Seek earlier accounting for sage grouse wings in wing barrels	On-going from 2000 3/1/03	Completed Completed Counted and aged on 11/17/03	Liewer/Holland/Lyn Stevens Holland/Liewer
Summary: Northern spotted leopard frog distribution, species of special concern, mapped (TOPO aquaherp, based on 1994 amphibian surveys) so as to assess any impacts of sagebrush trt in/near wetland areas. The discrepancy between phone survey harvest reports and wing barrel counts for 2002 seemed to have been greatly reduced after modifying the phone survey questionnaire. Read wings from 2003 barrels w/ Rick Hoffman on November 17, 2003. A major increase in sage grouse wings this year, with 45 sage grouse wings total. However, 23 of these came from the Willow Creek barrel, which is assumed to represent birds taken in North Park. Seven of the remaining 22 wings came from Gore Pass (which are possibly drop-off's from other areas, i.e. Yampa Valley), William's Peak (6), Pinto Creek (5), and Beaver Creek (3) barrels. 9 of the 22 wings were collected on September 5, 2003 *before* the sage grouse season opened. (This suggests a need to possibly post season dates on the wing barrels if they are going to be put up prior to the sage grouse season. It also may indicate that many grouse hunters cannot discriminate very clearly between blue and sage grouse.) The sample included 9 yearling males, 1 yearling female, 4 adult females, and 8 juvenile females. Only 1 of the 5 adult and yearling hens show signs of successful nesting (Rick Hoffman report).				

Annual Work Plan Review 4B - 2003, p. 6				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Wildlife-Related - Knowledge Base	Enter wetlands/springs on GIS, provided drought does not affect ability to map	3/1/03	Carry-over (Near completion)	Cesar/Belcher
	Prioritize and provide formal list of critical habs and locations of desired cons easements to BLM, GCLC (MPLandTrust), and other entities involved in sale/exchange of lands.	Cont'd from 2002	Carry-over	Huwer, Johnson, Cesar, Liewer, Graham/Crosby
	Further investigate possibility of R&PP thru TNC w/ DOW maintaining on Nordloh	Cont'd from fall 2002	Carry-over based on increased male count	Claassen/Cesar
	Continue to track lek counts on Master List - provide copy annually to MPSGC	On-going	Completed/On-going	Holland
	Support study of growth rates and behavioral characteristics of broods on high, medium, and low quality brood rearing habitat	Pending determination by research as to whether to transfer project to Moffat County for 2nd year of study	Moved to Moffat County Research completed by Huwer	Huwer
	Centralize all pertinent SG info, MPSGC Plan and final documents	Continued from 2002	Completed	Liewer
	Put more intensive effort into checking area east of Cow Creek for winter and spring sage grouse activity	1/31/03	12/31/03	Holland
	Provide SLB w/ info regarding SG use of STL in Milk Creek/Carter areas; bring SLB on as signator and cooperator, recognizing STL as a separate classification of land ownership and responsibility, that reaches beyond traditional private/public definitions.	1/31/03	Info provided Completed May 6, 2003 Beverly Rave, District Manager SLB, signed off on MPSGPlan w/ the acceptance of amended text Text amended and approved by MPSGC 1/29/04	Liewer/Rave Liewer

Annual Work Plan 4B - 2003, p.7				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Summary: Wetland/springs being mapped and near completion. Lek counts entered into database and provided to MPSGC. Cow Creek (Green Mtn area) checked for winter/spring grouse activity (Holland/tech/Liewer), but no "hot spots" found. Greg Horstmann did report considerable sign found east of Spring Creek road. Need to carry over. SG info consolidated and SG Plan is electronically available. Master files will be kept by Terrestrial Biologist, Andy Holland, at State Ranch, DOW Area Office. All SG info, Plan, amendments, appendices, stored on CD's, made available to BLM/DOW offices (HSS). Veg data could likely use further organization and consolidatin. Also, need to centralize greater sage-grouse info statewide. Moffat project completed and Huwer is writing final thesis. Summer 2003 showed better chick development in high-forb areas, but did not show any difference in summer survival. Literature suggests survival would be greater for chicks w/ better growth. Remington to send copy of Huwer's results. Statewide G-SG Planning Committee anticipated for 2004-5, to come up with a Sage Grouse plan. Monsen's work slightly delayed, w/ Alma Winward's key to sgb types anticipated in late winter. Conservation Plan amended to include language referencing State Trust lands as unique from public and private lands, and showing authority of State Land Board to administer such lands for good of the public schools.				
Outreach and Education	Support completion of statewide BMP's and apply to Middle Park Establish demo plots; map and disseminate info to MPSGC	3/1/03 On-going from 2000	2 year 12/04 Awaiting BMP's Carry-over PV plots can be used	Statewide/MPSGC Steve Monsen Crosby/Johnson/Cesar/Volt CDOW/BLM/NRCS
Additional Notes: Monsen is under contract, and hopes are to begin writing BMP's by February 2004. Pinto Valley work being used to demonstrate some of the trts. DOW put together and distributed birding guide to West Grand County, featuring greater sage-grouse on cover and inside page.				
Funding Sources	Identify and pursue possible funding sources/project-share opportunities, incl. SCI, NWF, Quail, Grouse Inc, EQUIP, WHIP.	Continued from 2000	On-going Fuel trt $$$ available	BLM/CDOW/NRCS
Additional Notes: Bill Wyatt indicates fire $$$ best way to go at this time – lots of money available. Can do arch clearances by contract.				

Annual Work Plan Review 4B - 2003, p. 8				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Monitoring and Evaluation of Plan	Review and publish project progress (Jan-Mar) Formulate annual work plan for following year	1/15/04 3/15/03	Completed Completed	MPSGC Liewer
Coordination	Coordinate w/ other statewide groups and share info gained Contact those working on Gunnison project to assess future projects and trt potential	On-going 3/15/03	Request for info/rec'd Cesar made contacts	MPSGC Liewer/Cesar
Prioritization/Implementation				
Summary: No statewide meetings in 2003 in which MPSGC has been included. Cesar reported going to Telluride with Jerry Jack to look at Gunnison project. Indicates most of the projects are similar to those we have implemented, with the exception that there is money for Gunnison sage grouse, and cons easements may be more readily available given the status of the Gunnison sage grouse. Committee received copy of Idaho Station Bulletin 80 (October 2003) – Monitoring of Greater sage-grouse Habitats and Populations.				

Addendum 5A - Middle Park Sage Grouse Conservation Plan - Work Plan Final, Year 2004. – January 29, 2004

Lek Count Summary: **Weather**: Dry winter conditions persisting through January with minimal snow cover. **Project Summary:**

Annual Work Plan 5A - 2004, p. 1				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Habitat Related - Breeding Hab.	Carry-over Sulphur Gulch project to re-estab forbs and grasses and eliminate/reduce crested wheat w/ hopes of re-establishing breeding and nesting hab Blue Valley Ranch – 1-2 A burns adjacent to leks	3/1/03 3/1/04	Trt of 50 A this year, w/ spray and drilling; additional 50 A in 3 yrs following monitoring period – Follow up re-seeding in fall Carry-over due to drought 12/15/04	Crosby/Cesar/Volt Cesar – EA –Spring 2004 Volt-Evaluate herbicides and residuals, Spring 2004 Handyside/Crosby
Habitat Related - Nesting/Brood.	Sulphur Gulch	3/1/03	As above	Crosby/Cesar/Volt
Habitat Related - Winter Habitat	Carry-over of fertilization of wintering habitat in Red Mtn area, weather permitting Wolford Mtn fertilization	3/1/03 3/1/04	Carry-over due to drought 12/31/04 Summer '04	Cesar Cesar
Growth-Related - Development	Compile and make available written materials from RMEF, MPLT, and CCA that more specifically set forth benefits/drawbacks of cons easements. Provide potentially-interested landowners, esp. new property owners in MP w/ info on cons easements. Investigate further options for Granby area. Consider R&PP w/ BLM amg these options.	3/15/03 From fall, 2002	Continuation On-going Continuation 12/31/04	Crosby/Liewer Cesar/Oldham

Annual Work Plan 5A - 2004, p. 2				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Growth-Related - Recreation	Continued input into BLM travel mgt plan relative to sage grouse needs	From 3/1/01	Wolford travel plan anticipated in 2004; Lawson, Sulphur Gulch, Dice Hill in 2005; Middle Park/North Park in 2006	Rosene/Gale/Liewer Cesar to verify dates
Habitat-Related - General	Continue to develop photo record of MP leks: 2 leks (PV/RC), perm transects w/ utza cages pre/post grazing	3/1/04	Photo 4 leks: 12/31/04	Waller
	Enter MPHPP and BLM Daubenmire transects and modified line intercept pre-treatment transects on GIS and continue work on database	Cont'd from 2002	Continuation 12/31/04	Waller
	Enter transects in usable database, incl canopy cover, spp comp, and fqcy, w/ transect summary	3/1/03	On-going	Waller
	Do EA (primarily bighorn project, but possible implications for re-establishment of sage grouse) on Radium trts and follow up w/ burns if weather permits, PJ reduction in area once having SG presence	Continued from 2002 Anticipate 3+ year rejuvenation process	2nd year Spring burns, 2004	Cesar/Thompson
	Establish 2-3 more Daubenmire veg transects	5/1/04	12/31/04	Waller
	Copy WRIS/GIS maps of SG activity onto BLM GIS	3/15/04	12/15/04	Liewer/Cesar
	Track major land changes/development affecting potential/known SG hab/GIS	On-going	On-going	Liewer/Cesar
	Resolve issues w/ mapping active/inactive leks; lek cplx	3/1/04	12/31/04	Holland/Liewer

Annual Work Plan 5A - 2004, p. 3				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Habitat-Related - General	Coordinate future veg treatments/RCA deferrals (grazing permits)	On-going from 6/1/01	Only 1 permit for 2004 (east side of county)	Johnson
	Continue veg trt w/ dixie harrow when feasible; track and keep master list; provide annually to MPSGC -	On-going from 6/1/01	On-going	Crosby/Volt
	Make seeder available to LO's; approx 1 ton of clover for interseeding alomg meadow edges.	Follow-up from 2003	12/31/04	Cesar/Volt/Crosby
	Treat 240-300 A w/ dixie harrow (Bruchez/Hammer/others).	3/15/04	12/31/04	Crosby/Volt
	Track impacts of PV brushbeating on lek #'s - Kastle lek	3/1/03	5/15/07 3rd year	Liewer
	Do post trt msmts on GRR and PV for future reference	3/15/04	12/15/04	Waller/Liewer
Bruchez – Brush-beating/ Dixie harrow? Any additional work – Cody Neff				
Wildlife-Related - Multiple Spp.	Locate further areas for sgb trt/regen and coordinate w/ HPP, BLM on archaeological clearances	3/15/03	Carry-over 12/31/04	Cesar/Liewer/Crosby
	Survey Cow Creek for SG activity; compile 5 year list of areas to survey in subseq yrs	Continuation of Cow Creek	12/15/04	Holland
	Examine McQueary Gulch project – fuel trt – for SG benefits	3/1/04	12/31/07 3 year project	Waller/Wyatt/Johnson/Cesar/ Crosby
Additional Notes: Project is continuation of 3/15/03. Still need to examine area west of Fossil Ridge, north of Mitchell allotment. Possible burn. Also, Dead Badger area, Barger Gulch area, Yarmony Mtn. Bill and Karl in beginning stages of possible fuel trt in McQueary Gulch area. Good grouse sign in area. EA development this spring; cultural clearance by contract; funding from fire $$$, req by May 1.				

Annual Work Plan 5A - 2004, p. 4				
Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Wildlife-Related - Predation				
Wildlife-Related - Hunting	Determine whether modification of phone survey questions continues to align harvest and hunter results to that observed in field with wing barrel results. Adjust wing barrel location and signage to reduce pre-season take and lack of clarity in area of take	On-going from 2000 3/1/04	On-going (Last year for follow-up if necessary) 9/12/04 Hicks to move wing barrel on Willow Creek Pass to location further into North Park	CDOW/Terr Biologist Hicks Holland/Liewer
Wildlife-Related - Knowledge Base	Finalize mapping of wetlands/springs on GIS Refine WRIS mapping, and examine questions relating to lek complexes, geographic areas, inactive leks, connectivity and fragmentation, etc. Incorporate new WRIS definitions (occupied, unknown-vacant, poten suitable) Prioritize and provide formal list of critical habs and locations of desired cons easements to BLM, GCLC (MPLandTrust), and other entities involved in sale/exchange of lands. Maintain master list of lek cts, organize acc to geo areas, and make available to MPSGC	3/1/03 3/1/04 Cont'd from 2002 On-going	Continuation 12/31/04 12/31/04 Continuation 12/31/04 12/31/04	Cesar/Belcher Liewer/Crosby/Holland/ Cowardin Crosby/ Johnson/ Cesar/ Liewer Holland/Liewer

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Management Issue	**Project Description**	**Inception Date**	**Anticipated Completion**	**Responsible Party**
Outreach and Education	Support completion of statewide BMP's and apply to Middle Park	3/1/03	2 year 12/04	Apa/Statewide/MPSGC Steve Monsen
	Establish demo plots; list, map and disseminate info to LO's	On-going from 2000	On-going	Cesar/Crosby/Johnson/ Volt CDOW/BLM/NRCS
	Review and evaluate implications of National SG Strategy-BLM	3/1/04	12/31/04 (On hold until states do theirs)	Cesar
Funding Sources	Identify and pursue possible funding sources/project-share opportunities, incl. SCI, NWF, Quail, Grouse Inc, EQUIP, WHIP, Partners for Wildlife.	Continued from 2000	On-going	BLM/CDOW/NRCS
Monitoring and Evaluation of Plan	Review and publish project progress (Jan-Mar)	1/15/04	3/15/04	MPSGC
	Formulate annual work plan for following year	1/15/04	5/15/04	Liewer
Coordination	Coordinate w/ other statewide groups and share info gained	On-going	On-going	MPSGC
	Support development of statewide conservation plan	3/1/04	2 year	Liewer/Cesar
Prioritization/Implementation				
Sage grouse tour given to Friends of Wolford upon request, to improve understanding of lekking behavior, lek characteristics relative to travel management inpt by FOW. Information provided for Western Association of Governor's regards sage grouse projects in Middle Park upon request from Pam. Incl Pam on mailing list.				

Notes: Pam Schnurr has money for shrub-steppe grants. Apa anticipates BMP's completed this year, but will need to be reduced for local consumption; statewide meeting of reps for greater sage-grouse this summer/early fall to share ideas, and begin work to be included in statewide conservation plan. Bob Timberman, Partners for Wildlife, has $$$ esp for riparian work, willing to assist and be org cooperator