

III. CONSERVATION STRATEGIES FOR THE PPR PLAN

Strategy Overview

The working group identified the following issues/threats for the PPR population. The following section provides an elaboration of the issue or threat as it applies to the local population of GrSG, then lists conservation strategies that were developed through negotiation and consensus by the working group.

- A. Data Availability
- B. Habitat Change
- C. Grazing
- D. Predation
- E. Energy Industry and Mineral Development
- F. Recreation
- G. Water Project Development and Water Management

A. Data Availability

1) Issues Related to Data Availability

Problem Definition: lack of consistent historic information on population numbers, seasonal habitat use & movements, lack of coordination within and between agencies.

The issues intended to be resolved by the following actions are described previously in Section II. E. 4) Local Conservation Plan, and revolve around the lack of a consistent long-term data set of lek counts. The intent is to continue lek counts at least the level of effort begun in 2005.

2) Conservation Actions Relating to Data Availability

Goal:	Objectives:	Actions:	Who:	When:
Improved knowledge based on data to better inform wildlife manger(s), landowner(s) and public on decisions impacting Sage-grouse in this area.	1. Establish a consistent, coordinated lek count effort for Greater Sage-Grouse throughout the conservation Plan area.	1a. Continue helicopter counts begun in 2005	CDOW	Ongoing

Goal:	Objectives:	Actions:	Who:	When:
		1b. Check each lek at least 3 times, 7-10 days apart, late March through mid-May	CDOW & other stakeholders assisting with counts	Annually
		1c. Begin count ½ hour before sunrise (in air, at first lek); end no later than 2 hours after sunrise.	CDOW	Ongoing
		1d. Continue fixed-wing aircraft counts annually to maintain a data set.	CDOW	Ongoing
		1e. Investigate development of a detectability index between the two methodologies.	CDOW	Ongoing
		1f. Review count methodology used by other state wildlife agencies, and develop written helicopter survey protocol for counts in this area.	CDOW share with Work Group stakeholders	Feb. 15, 2009
		1g. Report current count data to Work Group in June of each year with comparison to previous years.	CDOW	At annual June Work Group meeting
		1h. Report data on three year “running average.” (2005-2007, 2006-2008, 2007-2009, etc.)	CDOW report to the Work Group	At annual June Work Group meeting
		1i. Pursue funding to ensure the continuation of helicopter counts in the future	CDOW & Work Group stakeholders	Annually
	2. Establish a Geographic Information System GIS for Greater Sage-	2a. Establish who is responsible for handling updating various types of data in system	CDOW, BLM, Natural Resources Conservation Service	January 2009

Goal:	Objectives:	Actions:	Who:	When:
	<p>Grouse information that can be shared and used relatively easily by members of the Work Group. Information would include soils, vegetation, various grouse information, rainfall/snow cover data, past and future land treatments, etc.</p>	<p>2b. Determine who will “house” and maintain the system. Establish agreements if necessary.</p> <p>3a. Investigate the possibility of CDOW or another agency using a software program such as “BIOTA” to compile, manage, and analyze grouse information, or perhaps set up an internet-based system similar to the CDOW’s Amphibian and Reptile Atlas, or the Cornell Laboratory of Ornithology’s “E-Bird” system.</p>	<p>(NRCS), CO Oil & Gas Commission (COGCC), Energy Companies, Landowners, etc.</p> <p>CDOW & stakeholders in Work Group</p> <p>CDOW</p>	<p>January 2009</p> <p>January 2009</p>

B. Habitat Change

1) Issues Related to Habitat Change

The Work Group identified goals, objectives, and conservation actions for the issue of habitat change to move toward the desired quantity of and quality of sage-grouse habitat in areas appropriate for sagebrush-grassland plant communities. The goal is to improve or sustain the quantity and quality of habitats to benefit both sage-grouse and livestock.

Habitat changes differ in the lower, central portions of Piceance Creek area as compared to the Parachute and Roan area, due to the differing elevations and associated plant communities. In the lower elevation areas of Piceance Creek, sagebrush areas on relatively narrow ridge tops are likely diminishing in size and total area due to encroachment of pinyon and juniper woodlands into sage areas currently or formerly used by Greater Sage-Grouse. On the south side of the area, in Parachute and Roan Creeks, the sage-covered ridgetops are wider and higher in elevation. Adjacent vegetation types are aspen forest and serviceberry shrublands. Sage-grouse are using areas where serviceberry is a greater component of the shrubs; the extent to which this type of area is preferred by the grouse over sagebrush-dominant areas is open to question, as is the question of whether serviceberry is stable or increasing in the southern areas.

“Habitat” and the vegetation types that comprise it change constantly in response to short-term influences such as annual precipitation and long-term influences such as gradual ecological succession (aging and eventual replacement of a plant community). In addition, events such as drought, storms, fire (or lack thereof), flooding, landslides, and human management activities may have long-term influences as well. Although we do not have detailed information and mapping on specific changes, some of the following events are known to have happened over the last 100-120 years:

- Changes from one vegetation type to another; in particular, changes from sagebrush-grassland communities to mixed sage-grass/pinyon-juniper woodland types in the Piceance Creek watershed. Sagebrush-grass communities across the conservation Plan area may differ in terms of their long term stability. The lower elevation ridgetops on the Piceance side likely tend toward pinyon-juniper woodland over time in the absence of disturbance such as fire. On the higher ridgetops on the Roan and Parachute sides, sagebrush-grass vegetation probably tends to maintain itself over the long-term; these sites may be too dry for aspen, and too wet, high, or cold for pinion and juniper. Encroachment of serviceberry may be a factor here, however.
- The abandonment or change of hay meadows to native range.
- The loss of wet meadow riparian areas due to stream-channel down-cutting and water diversions.
- Changes in age, structure, and density of sagebrush.
- Changes in the understory (grasses and forbs) in sagebrush communities.
- The invasion of noxious weeds.
- Changes in climatic conditions.

Characterizing specific areas as good, poor, or mediocre in terms of sage-grouse habitat is a site-specific exercise and will need to be completed in the field. Some areas with poor understory vegetation or poor sagebrush growth may be a result of naturally poor site conditions and, thus, are not likely to respond to habitat manipulation. On the other hand, some areas may be productive sites that have been preferred by wild and/or domestic livestock resulting in modified plant communities. Some of these potentially productive sites may benefit from active vegetation management. All conservation actions listed below are voluntary. However, the hope is that landowners and land managers will take action to improve or sustain the quantity and quality of sage-grouse habitat in the conservation Plan area. Appendix A lists some possible funding sources to cost-share with landowners on habitat improvement projects

2) Conservation Actions Relating to Habitat Change

Goal:	Objectives:	Actions:	Who:	When:
Develop vegetation resource goals that provide the desired quantity and quality sage-grouse habitat on a landscape level that benefits both livestock and sage-grouse.	1. Define healthy vegetative communities for the local environment and develop management practices to achieve healthy rangeland & sage-grouse habitat.	1a. Develop a list of best management practices that will help achieve the vegetative community goals for sage-grouse habitat. The list will be adaptive to allow for practices, as new information becomes available.	CDOW, BLM, NRCS, Landowner & user groups	2006 or upon Plan completion.
		1b. Inventory and develop mapping database (GIS). Include specific information on soils (where possible), sage-grouse habitat and, historical habitat treatments, etc.	CDOW, BLM, NRCS	Beginning 2006
		1c. Educate and encourage landowners and land managers to use the best management practices for vegetative communities and sage-grouse habitat.	Landowners, Colorado State University (CSU) Extension, NRCS, CDOW, BLM	Ongoing

Goal:	Objectives:	Actions:	Who:	When:
		1d. Provide expert assistance on management recommendations to willing landowners and land managers. If acceptable to landowner, provide opportunity for Work Group to participate in site visit.	CSU Extension, NRCS, CDOW, Partners for Wildlife	Ongoing
		1e. Monitor effectiveness of best management practices as they are applied. Provide updates and results of best management practices to Work Group.	CDOW, BLM, NRCS	Ongoing
	2. Develop goals for healthy habitat for the different seasonal needs of sage-grouse. Use local knowledge and available research to define the seasonal needs and habitat requirements. Take appropriate voluntary actions to improve sage-grouse habitats.	2a. Improve areas of poor quality nesting habitat by actions such as the following (pending inventory results); i. Seed area with grasses and forbs, go heavy on forbs if brood-rearing occurs in the area. Light disking & interseed, or drill seed	CDOW, BLM, NRCS, Landowners, & users	Ongoing
		ii. If sage is too dense, consider thinning by roller-chopping, light disking, Dixie Harrow, Lawson Aerator or other methods. Apply best management practices on a case by case basis. Use Connelly et al. (2000) guidelines as reference-page 19.	CDOW, BLM, NRCS, Landowners & users	Ongoing
		iii. Encourage multi-species plantings of grasses and forbs.	CDOW, BLM, NRCS, Landowners & users	Ongoing
		iv. Retain residual cover through fall and winter into nesting season.	CDOW, BLM, NRCS, Landowners	Ongoing

Goal:	Objectives:	Actions:	Who:	When:
		2b. Improve brood-rearing habitats by actions such as the following (pending inventory results).	& users CDOW, BLM, NRCS, Landowners & users	Ongoing
		i. Restore riparian systems.	CDOW, BLM, NRCS, Landowners & users	Ongoing
		ii. Raise water table – raise channel bottom from deeply incised gullies.	CDOW, BLM, NRCS, Landowners & users	Ongoing
		iii. Restore old ponds/Construct new ponds in areas lacking water, while minimizing potential for promoting mosquito breeding habitat at elevations below 8,000 feet.	CDOW, BLM, NRCS, Landowners & users	Ongoing
		iv. Preserve irrigated hay meadows.	CDOW, BLM, NRCS, Landowners & users	Ongoing
		2c. Improve Lek Areas by actions such as the following (pending inventory results).	CDOW, BLM, NRCS, Landowners & users	Ongoing
		i. Mechanically treat historic lek areas where sagebrush density has increased.	CDOW, BLM, NRCS, Landowners & users	Ongoing
		ii. Clear new lek sites.	CDOW, BLM, NRCS, Landowners & users	Ongoing

Goal:	Objectives:	Actions:	Who:	When:
		2d. Improve Winter Habitat by actions such as the following (pending inventory results).	CDOW, BLM, NRCS, Landowners & users	Ongoing
		i. Manage for vigorous stands of sagebrush in known critical winter range (based on current knowledge, telemetry study may provide more detailed information).	CDOW, BLM, NRCS, Landowners & users	Ongoing
		2e. Identify and map key seasonal habitat areas.	CDOW, BLM, NRCS, Work Group, landowners & users	Initial data in Fall 2006 then annually
	3. Manage for interconnected vegetative communities that minimize habitat loss.	3a. Plan proposed treatments in context of past treatments and other proposals on adjacent ownerships to maintain continuity of healthy vegetative communities.	Landowners & users, BLM, CDOW, NRCS	Ongoing
	4. Determine limiting habitat conditions within the landscape. <i>If any of the following are found to be limiting, the recommended actions are suggested:</i>			
	4a. Lack of suitable quantity or quality of vegetative cover resulting from past events or actions (e.g., drought, diseases,	i. Carefully consider further reduction in sagebrush acreage in key seasonal habitat areas (would not necessarily preclude thinning or other treatments if appropriate)	Landowners & users, BLM, CDOW, NRCS	Ongoing

Goal:	Objectives:	Actions:	Who:	When:
	<p>spraying, brush beating, intentional burning, or wildfire, excessive herbivore (any animal that eats plants) etc.)</p>	<p>ii. Restore Sagebrush –allow re-establishment over time if underway.</p> <p>iii. Manage for interconnection of sagebrush stands – some degree of interspersion of sage with grass areas is desirable, as is interspersion of sagebrush stands of different ages.</p> <p>iv. Allow for adequate sagebrush management to meet sage-grouse habitat requirements.</p>	<p>Landowners & users, BLM</p> <p>Landowners & users, BLM, CDOW, NRCS</p> <p>Landowners & users, BLM</p>	<p>Ongoing</p> <p>Ongoing</p> <p>Ongoing</p>
<p>4b. Large expanses of old dense sagebrush with little understory.</p>		<p>i. Consider thinning by roller-chopping, light disking, Dixie Harrow, Lawson Aerator, mowing, herbicide applications or other methods.</p>	<p>Landowners & users, BLM, CDOW, NRCS</p>	<p>Ongoing</p>
		<p>ii. Consider treatments of varying patch sizes and shapes to create a mosaic of open areas interspersed with sagebrush.</p>	<p>Landowners & users, BLM, CDOW, NRCS</p>	<p>Ongoing</p>
		<p>iii. When planning sagebrush treatments, treat older more dense sagebrush while allowing sagebrush regeneration in other areas. (Sagebrush treatments in winter range areas may not be appropriate.)</p>	<p>Landowners & users, BLM, CDOW, NRCS</p>	<p>Ongoing</p>
	<p>4c. Sagebrush is giving way to another vegetation type (e.g. pinyon-juniper (P-J), serviceberry and noxious or</p>	<p>i. Mechanically remove vegetation while retaining the sagebrush community: a. Chainsaw vegetation if widely scattered or rough terrain (draws) b. Roller-chop vegetation–</p>	<p>Landowners & users, BLM, CDOW, NRCS</p>	<p>Ongoing</p>

Goal:	Objectives:	Actions:	Who:	When:
	invasive weeds).	<p>destroys/mulches, some larger sage, thins sage, can seed simultaneously</p> <p>c. Hydro-Axe vegetation– mulches more finely than roller-chopping</p> <p>d. May require continuous management every 10-15 yrs, unless seedling/saplings shorter than sage are hand cut</p> <p>ii. Prescribed Burning</p> <p>a. Probably solves P-J problem longer term, but sage does not resprout and will not recover for 15-20 years or more.</p> <p>b. Burns should be planned for small areas to allow for continued dominance of sagebrush in landscape. For example, small burns up draws may help restore some riparian vegetation and water table while retaining sagebrush on uplands.</p> <p>iii. Herbicide Treatment</p> <p>iv. Consider and mitigate the potential for undesirable species invasion when planning and implementing habitat treatments.</p>	<p>Landowners & users, BLM, CDOW, NRCS</p> <p>Landowners & users, BLM, CDOW, NRCS, CSU Extension, County Weed Supervisor</p> <p>Landowners & users, BLM, CDOW, NRCS, CSU Extension, County Weed Supervisor</p>	<p>Ongoing</p> <p>Ongoing</p> <p>Ongoing</p>

Goal:	Objectives:	Actions:	Who:	When:
		v. Encourage landowners to seek assistance from county weed supervisor and extension when treating noxious weeds.	Landowners & users, BLM, CDOW, NRCS, , CSU Extension, County Weed Supervisor	Ongoing

C. Grazing

1) Issues Related to Grazing

Grazing animals are part of the landscape. Some grazers are wild and some are domestic. The animals can have positive or negative effects on the landscape, depending on land use objectives. In considering grazing and sage-grouse, the effects of wild and domestic grazers cannot easily be separated, so the Work Group is addressing both in this section.

The Work Group does not believe that any one factor, including grazing, is the sole reason for sage-grouse decline in the area. There is a lack of credible scientific evidence that directly links grazing (wild or domestic) with declines in sage-grouse numbers (Crawford et al. 2004). Having said that, the Work Group does not desire to see this species disappear from the area and will work with the CDOW and other interested parties to make sure that grazing practices are compatible with sage-grouse to the extent possible.

Domestic and wild ungulate grazing are dominant land uses on public and private lands in Rio Blanco & Garfield counties. Sound grazing management promotes the use of forage resources, while having a neutral or positive effect on plant vigor. The Work Group recognizes that drought is a critical factor in grazing management as it relates to pounds of available forage for both domestic and wild ungulates. Proper livestock grazing and wildlife management can maintain and perhaps enhance desirable plant communities by preventing the invasion of noxious weeds, improving the palatability of vegetation, and promoting residual cover. Proper grazing can also increase plant diversity and improve riparian areas. Improper grazing has the potential to reduce the availability of food and cover for sage-grouse by affecting the composition and structure of grasses, forbs, and shrubs. It is important to consider sage-grouse habitat needs when evaluating big game population objectives and livestock stocking rates.

Currently, the primary grazers in the conservation Plan area are deer, elk, cattle, wild horses and domestic sheep. (For purposes of this discussion, “grazing” includes browsing unless otherwise specified.) Over the last 50 years, numbers of deer, cattle, and sheep have declined or remained stable in varying proportions, while elk numbers have increased and wild horse numbers have fluctuated and are above BLM objectives.

The CDOW manages deer and elk populations toward objectives set in herd management plans, also known as Data Analysis Unit Plans (DAU Plans). The purpose of a herd management plan is to provide objectives for managing a big game species in a specific geographic area that includes the species’ seasonal movements. These objectives are based on sound wildlife management principles, as well as the desires of landowners, residents, land management agencies and other interested publics. Herd management plans must ultimately be approved by the Colorado Wildlife Commission and are reviewed every 10 years and changes are made if warranted. A traditional herd management plan contains two primary goals: a “herd objective,” (i.e., the number of animals the area should contain) and the sex ratio of males to females in that herd. Population estimates are derived using computer model simulations that involve estimations for mortality rates, hunter harvest, wounding loss and annual production. These simulations are then adjusted to align on measured post-hunting season age and sex ratio

classification surveys. Cattle and sheep numbers are determined by landowners on their own lands, and in conjunction with BLM on public lands. Current domestic sheep grazing occurs primarily in the Cow Creek-McCarthy Gulch area west of Rio Blanco.

Wild and domestic grazing animals follow the same general pattern, that is, they use lower elevations in winter, moving to higher elevation ranges as spring turns to summer, and back to lower elevations in the fall as winter approaches. In the PPR area, sage-grouse currently occupy the higher elevations areas year-round. Grazing animals are generally spending mid-spring to early winter in these higher elevation areas (up to 9000'). Domestic livestock are usually fed hay in winter and early spring in pasture areas; deer and elk move freely unless restricted by snow depth.

Two key issues relate to grazing and sage-grouse are: 1) the potential impact of herbivores on grouse nesting and hiding cover depending on the timing of grazing; (grazing in grouse nesting areas from late summer through early spring can remove grasses that could provide nesting cover in early spring before new growth provides cover) and 2) the potential for wild herbivores to negate the benefits of a domestic livestock grazing plan intended to leave cover for grouse.

a) Domestic Livestock Grazing

Healthy and productive public and private rangelands are the foundation of a profitable and sustainable ranching industry and abundant wildlife. Many ranches depend on public land grazing for economic viability, and many species of wildlife, including sage-grouse, depend on private lands during one or several periods during their annual life-cycle. Private ranches contribute some of the highest quality sage-grouse habitat in western Garfield and Rio Blanco counties.

Emphasis should be placed on maintaining these lands as viable economic units to preserve large and significant areas of privately owned habitat. The alternative is habitat fragmentation and increased human impacts when agricultural lands are sold for development. It is important to recognize that many ranches with significant private land holdings depend on public land grazing allotments for the viability of their operations. Therefore management decisions on public land can influence private land use patterns.

b) Wild Ungulate Grazing

This issue is closely related to the issue of domestic livestock grazing. The question revolves around whether or not the extent and timing of grazing by wild ungulates, (particularly elk) can negatively affect sage-grouse and their habitat. First, are elk eating vegetation that might otherwise provide food, hiding, or nesting cover for sage-grouse? Second, could foraging elk negate positive grazing management actions taken on public or private lands meant to leave cover for sage-grouse?

Many agree that these scenarios are possible, and that there are areas where the first occurs. There may be other areas where elk are not a problem (case by case basis). The second point arises from the concerns of ranchers that altering domestic grazing practices at inconvenience

and expense to their operation may yield no positive effect for sage-grouse habitat if elk negate the benefit.

In addition to being closely related to the livestock grazing issue, the issue of elk management and herd numbers is particularly contentious. Various attempts and efforts have not resulted in significant reductions of the elk herd. The winter of 2003-2004 exhibited a decrease in elk numbers so some of the efforts may be working. Reducing elk numbers is beyond the scope of this conservation Plan. The Parachute-Piceance-Roan Conservation Plan area overlaps several different deer DAUs, but the primary DAU of interest is elk unit E-10, which comprises the lower White River basin and the north side of the Colorado River Basin from Rifle to the Utah state line. The herd objective for DAU E-10 is 8,000-10,000 elk, while the current population estimate is 8,000 animals.

Regarding deer, the DAU picture is more complicated and overlaps large areas outside of the grouse conservation Plan area. There is not the same concern about deer grazing/browsing having negative effects on sage-grouse, as with elk. There are places where wintering deer can severely trim back sagebrush foliage, but these tend not to be areas that are important to sage-grouse nesting; there could be impacts to sage-grouse wintering habitat if there is overlap between deer and grouse winter ranges. This is not known to be the case in the conservation Plan area.

Deer DAU D-7 includes Piceance and Yellow Creeks, and Maybell on the west, and ranges to Steamboat Springs, Oak Creek and Yampa on the east. It is a huge area, and attempting to estimate the number of deer in the Piceance and Yellow Creek areas is very difficult. However, CDOW biologists estimate there are 5,000 resident deer and 5,000-8,000 wintering deer in this area. This compares to wintering deer numbers thought to be in the neighborhood of 50,000 deer in the 1950's and 1960's, when Piceance Creek was considered the largest migratory deer herd in the world. The current herd objective for all of D-7 is 67,500, the current population estimate is 72,000 deer post-hunt 2007.

The southern end of the conservation Plan area is part of the much smaller deer DAU D-41, which is wholly comprised of the Roan and Parachute Creek drainages. The herd objective here is for 16,500 deer, and it is estimated that post-hunt 2007 there were 9,600 deer, well short of the objective.

Current CDOW herd management objectives attempt to stabilize elk herds in this area.

It is difficult to quantify specific issues related to grazing of wild and domestic animals. On one hand, sage-grouse have adapted to existing ranching and livestock grazing systems because the grouse still exist at these sites. However, it will never be known whether the pre-domestic grazing (prior to 1870) GrSG population was higher or lower, thus making the issues and impacts of grazing an important part of the strategy for sage-grouse conservation. Few studies have directly addressed the effect of livestock or wildlife grazing on habitat use by sage-grouse. Thus, rangeland and wildlife biologists must rely on indirect evidence as it relates to grazing and sage-grouse (Crawford et al. 2004). This leaves the central issue of what it is about grazing that is good, neutral or detrimental towards sage-grouse recovery. The Conservation Actions related

to Livestock Grazing are meant to address this issue, and the Conservation Actions relating to other ungulates are intended to address the wildlife component of the grazing issue.

c) Other Wildlife Issues

The Work Group discussed the potential effects of grass consumption and cutting by ground squirrels in the Plan area. Many range managers contend that ground squirrels consume large quantities of range grasses and, therefore, conduct extensive control programs on rangelands (Fagerstone and Ramey 1996). Grinnell and Dixon (1918) estimated that 200 California ground squirrels consumed as much forage as one steer. Shaw (1920) estimated that Columbian ground squirrels consumed 187% of their weight daily and that consumption by 385 Columbian ground squirrels would be equivalent to one cow and 96 squirrels equal to one sheep.

Fagerstone and Ramey (1996) suggest careful evaluation before undertaking control programs. Ground squirrels may have positive roles in grassland ecosystems, particularly as prey for other wildlife species, as well as soil loosening and redistribution, aeration, and nutrient cycling.

2) Conservation Actions Relating to Domestic Livestock Grazing

Goal:	Objectives:	Actions:	Who:	When:
Continue to foster a sustainable and economically viable ranching community while also providing high quality sage-grouse habitat.	1. Maintain and enhance large scale open range habitats to provide both sage-grouse habitat and livestock forage.	1a. Encourage private, local, state, and federal policy makers to consider the importance of the economic viability of ranching (both public and private land) in providing sage-grouse habitat. Examples include: managing elk populations, county planning.	Work Group	Ongoing
		1b. Educate stakeholders about grazing systems and grazing strategies for improved grouse habitat and survivability.	Work Group	Ongoing
		1c. Document (monitor) herbaceous plant cover before and after domestic livestock grazing to determine if the removal of the herbaceous plant cover is a result of wildlife grazing or other environmental factors.	BLM, NRCS, CDOW, Private Landowners & users & land managers, Industry	Ongoing
		1d. Continue to enhance and maintain improved rangeland (public and private) by using all available tools to land managers. These tools include, but are not limited to, timing and intensity of domestic grazing, weed control, fire, water development, vegetation management, and wildlife population management.	CSU Extension, CDOW, NRCS, BLM, Private landowners & users & land managers, Industry	Ongoing
	2. Improve, if possible, livestock & vegetative	2a. Fund further research that scientifically shows how or if domestic grazing and wild ungulate grazing affects grouse	Universities, CDOW, NRCS, CSU Extension, Landowners &	Upon completion of Plan

Goal:	Objectives:	Actions:	Who:	When:
	management for sage-grouse habitat and livestock forage sustainability.	<p>populations during breeding and nesting.</p> <p>2b. Develop watering systems away from riparian areas on both private and public land to better disperse livestock and wildlife while also providing moist areas for broods.</p> <p>2c. Manage livestock movement through use & rotation/placement of salt or minerals to benefit sage-grouse.</p> <p>2d. If research and/or range conditions show that grazing system changes or vegetative management would benefit sage-grouse, propose those changes to grazing systems on a case-by-case basis. If grazing changes are needed, consider elk/wildlife numbers first before adjusting livestock numbers.</p> <p>2e. Identify and develop cost-share programs to help landowners implement actions to benefit sage-grouse.</p>	<p>users & land managers, Industry</p> <p>Private Landowners & users & land managers, BLM, CDOW, HPP, NRCS, Industry</p> <p>Private Landowners & users & land managers, BLM, NRCS, Industry</p> <p>CSU Extension, BLM, CDOW, landowners & users & land managers, NRCS, HPP, Industry</p> <p>NRCS, BLM, HPP, CDOW, Non-Profits, Partners for Wildlife, Industry</p>	<p>Ongoing</p> <p>Ongoing</p> <p>As necessary</p> <p>Ongoing</p>

3) Conservation Actions Relating to Wild Ungulate Grazing

Goal:	Objectives:	Actions:	Who:	When:
<p>In conjunction with sustainable livestock interests & sport hunting industries, ensure that grazing by other ungulates is not adversely affecting sage-grouse habitats.</p>	<p>1. Determine the extent of the effects elk may be having on sage-grouse habitat.</p> <p>2. Manage other ungulate populations to meet desired sustainable plant communities that provide sage-grouse habitat.</p>	<p>1. Identify, monitor, and map big game/sage-grouse conflict areas.</p>	<p>CDOW, BLM, Private Landowners & users & land managers, Work Group, Industry</p>	<p>Upon completion of Plan</p>
		<p>2a. Strive to reach elk harvest objectives on public and private land.</p>	<p>CDOW, BLM, Private Landowners & users & land managers, Work Group, Industry</p>	<p>Ongoing</p>
		<p>2b. Review and encourage coordination of big game herd objectives in future DAU plans and modify as necessary to improve conditions for sage-grouse.</p>	<p>CDOW, Work Group</p>	<p>Within DAU planning schedule or as needed</p>
		<p>2c. Manage big game population levels and habitat to minimize or avoid resource conflicts on grouse habitats. This could include enhancing big game habitat elsewhere to attract big game off certain grouse habitats. Examples: burning, seeding, water development, etc.</p>	<p>CDOW, BLM, Private Landowners & users & land managers, Work Group, Industry, NRCS, HPP</p>	<p>Ongoing</p>
		<p>2d. Manage wild horse population levels and habitat to minimize or avoid resource conflicts on grouse habitats.</p>	<p>BLM, CDOW, Landowners & users & land managers</p>	<p>Ongoing</p>

D. Predation

1) Issues Related to Predation

Although the Work Group recognizes that no one factor is likely the cause for the shrinking of the range or population decline of sage-grouse in Garfield and Rio Blanco counties, many Work Group members believe that predation is one of the most important issues to consider. Some Work Group members believe that predator numbers have increased dramatically. The predator control setting in Colorado changed in 1996 with voter passage of Amendment 14. The constitutional amendment states “It shall be unlawful to take wildlife with any leg hold trap, any instant kill body-gripping design trap, or by poison or snare in the state of Colorado.” While the intent of the amendment was to stop lethal trapping, it also curtails the control of animals causing damage. The amendment does contain an agricultural exemption allowing farmers and ranchers to lethally trap animals causing damage to their livestock and crops during one 30-day period per year. Also, governmental health departments are allowed to use lethal traps to protect public health and safety. Lethal traps remain legal to kill all types of rodents except beavers and muskrats. (You can still use mousetraps to kill mice in your house, shed or barn). Non-lethal traps can be used for scientific research, falconry, for relocation, or for medical treatment pursuant to regulations established by the Colorado wildlife commission. The text of amendment 14 is contained in Appendix B.

Some members of the Work Group note that sage-grouse are killed by predators and have always been killed by predators. These Work Group members believe that predation is not a limiting factor in sage-grouse populations provided that adequate cover is available. In addition, some Work Group members believe that predator control over broad geographic areas is impractical and will not be effective without habitat improvement. Predator control to increase production and recruitment in bird populations has been used in extreme cases such as endangered species, but has been effective and incorporated only on small, intensively managed areas.

Sage-grouse and other ground nesting birds have developed effective strategies for hiding from predators when they occupy habitat of sufficient quality. Schroeder and Baydack (2001) suggest that predation has the potential to affect the annual life cycle of sage-grouse in three primary ways 1) success of nests, 2) survival of juveniles, and 3) annual survival of breeding-age birds. However, little is known about the relative importance of predation on the viability of grouse populations.

Documented nest predators include ground squirrel, weasel, badger, elk, coyote, common raven, American crow, red fox, striped skunk, black-billed magpie and various species of snakes. Numerous species have also been documented killing and/or consuming adult sage-grouse and include Cooper’s, ferruginous, red-tailed and Swainson’s hawks, northern goshawks, coyote, red fox, bobcat, and golden eagle. Numerous predator species are also known to kill juvenile sage-grouse. Because of the small size of juvenile grouse, additional predators have been documented and include American kestrels, merlin, northern harrier, common raven, and weasel. Some Work Group members also feel that birds such as great horned owl, and loggerhead shrike, might kill sage-grouse in the area.

Some of the Work Group members are particularly concerned with the increased diversity of predators in local sagebrush communities. For example raccoons, striped skunk, and red fox are not believed to have inhabited sagebrush communities prior to intensive Euro-American settlement. However, humans have introduced additional food supplies (grain, garbage, carrion) and places for such predators to over-winter and rear their young (abandoned buildings, barns, haystacks). Raccoons and red fox were not considered common in western Colorado 50 years ago. In addition, raptors, eagles, and ravens now have more places to nest and perch in the form of planted trees and artificial structures built by humans. Connelly et al. (2000) suggest that as habitat has become more fragmented, the addition of nonnative predators (red fox, domestic dogs and cats) and the increased abundance of native predators (i.e. common ravens and crows) can result in decreased nest success. Red fox have been implicated in affecting nest success and the annual survival of breeding age birds. Researchers in Utah's Strawberry Valley area suggest that red fox are responsible for preying upon the sage-grouse population in that area (Flinders 1999). Red fox have been implicated in other areas, but rigorous field studies are needed to support or refute these hypotheses (Connelly et al. 2000).

Landowners are also concerned with increasing numbers of Wyoming ground squirrels. Ground squirrels have been documented as a sage-grouse nest predator, however, it is not known if ground squirrel nest predation significantly impacts sage-grouse populations. Connelly et al. (2000) suggested that several studies on nest success have found nest success to be greater than 40% and that nest predation does not appear to be a problem across the range of sage-grouse. In contrast, Gregg (1991) and Gregg et al. (1994) suggested that nest predation may be limiting grouse numbers in Oregon. Research in Moffat County has found nest success between 45-60% (Hausleitner 2003, A. D. Apa unpublished data).

Most of the Work Group believes that we need more information on specific sage-grouse predators in the local area. More information is needed on whether predators are having a negative impact on the viability of the sage-grouse population in western Garfield and Rio Blanco Counties. Research could help determine if specific predators are having a negative impact during specific periods of sage-grouse survival (e.g., nest success, juvenile survival, and adult survival).

Research is necessary before the Work Group recommends specific predator control. Any recommended control will be species and site specific. In addition, it is important to consider unanticipated effects of predator control. For example, controlling red fox and coyotes might have the unanticipated effect of increasing ground squirrel numbers, which in turn may increase sage-grouse nest predation. On the other hand, reducing ground squirrels, which are common prey for some of the predators that also prey on sage-grouse, could possibly increase other types of predation pressure on sage-grouse.

2) Conservation Actions Relating to Predation

Goal:	Objectives:	Actions:	Who:	When:
Evaluate predation of sage-grouse.	1. Move toward a better understanding of local predator/prey relationships relating to sage-grouse.	1a. Clearly define data quality objectives for monitoring & research.	Work Group	Beginning 2005
		1b. Develop plan, obtain funding for, and initiate research to monitor local predator populations and how they affect the sage-grouse population.	CDOW, Work Group, BLM, CSU Extension	As necessary
		1c. Evaluate the data (as available) & determine if continued monitoring is necessary.	CDOW, Work Group, BLM, CSU Extension, NRCS	Ongoing
		1d. If research documents that predation is having a significant negative effect on the local sage-grouse population, obtain funding and implement appropriate site and species-specific practices in accordance with CDOW and United States Department of Agriculture (USDA) predator management plans and policies.	CDOW, USDA, NRCS	Ongoing
	2. Maintain productive quality sage-grouse habitat to reduce predation opportunities.	2a. Use best management practices (identified in the Monsen manual) in habitat management to improve or maintain vegetation in sage-grouse habitats (see Conservation Actions for Habitat Change, and Conservation Actions for Grazing).	CDOW, Work Group, BLM, NRCS	Ongoing
	3. Reduce or	3a. Follow Conservation	Utility	Ongoing

Goal:	Objectives:	Actions:	Who:	When:
	modify factors that facilitate predation.	<p>Actions for power lines in order to reposition new power lines and install raptor deterrents when applicable and feasible.</p> <p>3b. Selectively remove trees, remove/modify raptor perches, and maintain quality sagebrush habitat, where raptor predation concerns on sage-grouse have been identified.</p>	<p>companies, CDOW, Work Group</p> <p>CDOW, BLM, Work Group, NRCS</p>	Ongoing

E. Energy Industry and Mineral Development

1) Issues Related to Energy Industry and Mineral Development

Development and transmission of energy and mineral resources in the geologic Piceance Basin (which includes the Parachute, Piceance, and Roan Creek watersheds) has been a possibility since at least 1920, when energy interests began acquiring lands, patents, and leases in this area. Varying efforts involving oil, oil shale, and natural gas have taken place over the years leaving relatively small footprints on the landscape, with impacts concentrated at several experimental oil shale plants and the Magnolia oil field.

Advances in drilling technology and rising natural gas demand and subsequent rising prices have led to a significant increase in natural gas drilling activity in the Parachute-Piceance-Roan area. Recently, Garfield County became the most active drilling area in Colorado. Simultaneously, oil-shale leasing has resumed, interest in oil-shale development has increased, and several companies have initiated pilot projects. The timing of this increased activity corresponds with increasing concern for the status of Greater Sage-Grouse range-wide, and locally for the population of grouse in western Garfield and Rio Blanco counties. Natural gas activity is currently the most common and constant type of human activity occurring across much of the conservation Plan area. Other mineral development (e.g. sodium minerals) is ongoing but has not been coincident or influential on sage-grouse in the Parachute-Piceance-Roan area.

Wildlife managers and local Work Group stakeholders are concerned that the amount and timing of energy and mineral development has the potential to impact Greater Sage-Grouse populations. Of particular concern is the rapidly expanding (see Table 8) nature of the natural gas activities, including exploration, increased traffic, increased number of roads, well pad spacing, associated pipelines, powerlines, compressor stations, etc. The primary dilemma faced by wildlife managers and energy operators is the close overlap in the types of terrain used by sage-grouse and the type of terrain required to access and locate energy production facilities from engineering, economic, and environmental standpoints. This common terrain is the relatively level, narrow ridge tops lying between steep, and often very deep, canyons. These ridge tops are generally where the largest patches of sagebrush are located within the area. Further complicating the situation is the fact that the suitable habitat (<20% slope) comprises a relatively small portion of the terrain in most of the area.

Table 8. Number of Drilling Permits Issued Statewide and by County, 2004-2007

Area	2004	2005	2006	2007	Pending
Garfield County	796	1509	1834	2663	405
Rio Blanco County	154	161	360	317	65
State total	2915	4373	5905	?	?

(Data current as of 2/4/2008, Colorado Oil and Gas Conservation Commission [COGCC] web site)

A key factor affecting the development of this conservation Plan is that approximately 65% of the land within the Plan area is privately owned. A large majority of that private land is owned by energy companies. While there are stipulations and regulations in place on public lands that are intended to protect key sage-grouse habitat components, similar restrictions are discretionary on private lands. Private lands encompass a majority of the wetter, higher elevation, high-quality grouse habitat. Public lands within the Plan area are generally lower and drier. The long-term persistence of Greater Sage-Grouse within the Parachute-Piceance-Roan area could be largely affected by the voluntary cooperation of private landowners. Energy and mineral development is happening and will continue to happen. It is essential to develop a plan that promotes the survival of the sage-grouse population in the area during the relatively more intense development phase of natural resource extraction.

To maintain a Greater Sage-Grouse population in the Parachute-Piceance-Roan area while developing the various energy and mineral resources, the local working group will endeavor to develop and integrate new and existing information on sage-grouse, continuously communicate and share information among all parties, develop plans and strategies for avoiding, reducing, minimizing, and mitigating impacts on grouse and grouse habitat, and to research and monitor the response of the grouse population as development continues.

The Work Group discussed whether or not to include the Colorado Conservation Plan Population Viability Analysis (PVA) report in our local Plan. The PVA was created by a consultant, hired by CDOW for the state-wide plan (Colorado Greater Sage-grouse Steering Committee, 2008). It is a tool to simulate real situations to help forecast what might happen with different risk scenarios. To our knowledge, none of the other local work groups included the PVA, in most cases because it was not available when those plans were written. It was suggested that *“we should reference it in our Plan, but we need to be clear that it is just a model, and we will not add the PVA in its entirety into our Plan. In the text of our Plan we need to include that the information presented in the PVA was the basis for much of this group’s discussions and decisions. Decisions on population targets and strategies attempted to incorporate the findings of the PVA model.”* (PPR Work Group meeting summary, 4-27-07.) If in the future, this Plan is criticized, the Work Group felt we should be able to defend our decisions because of the awareness of the PVA, but we are not using it as a sole basis for our decisions. Over the next several years as more data is collected, this Work Group hopes that the PVA model will be refined with new data and cross-checked. Among the risks examined in the PVA are “Impacts of Oil and Natural Gas Development on Greater Sage-grouse Population Dynamics.”

2) Conservation Actions Relating to Energy Industry and Mineral Development

Goal:	Objectives:	Actions:	Who:	When:
Maintain a viable population for Greater Sage-grouse while developing energy & mineral resources	1. Develop & consolidate maps that show important GSG habitats to guide energy industry and agencies	1.a. Develop a map that depicts SG seasonal habitat (i.e. occupied, etc.) based on current knowledge and ongoing updates. Assemble into a GIS program useable by agencies and industry.	CDOW, BLM, NRCS, Industry, Work Group, USFWS	Immediately and ongoing
		1.b. Design maps to fit the audience structure (leave the details out or in as needed for the focus of the presentation).	CDOW, BLM	Immediately and ongoing
		1.c. As means to evaluate extent and distribution of physical habitat modification and sources of behavioral disruption, develop real time map (GPS accuracy standards) of on-going activity, surface disturbance, and habitat reclamation status. Require accurate project delineation submitted as compatible shapefile to appropriate regulatory agencies in an ongoing collaborative fashion.	CDOW, BLM, NRCS, Industry, Work Group, USFWS, CDRMS	Immediately and ongoing
		1.d. Continue, integrate and accelerate current agency and industry efforts to identify, evaluate, and map grouse habitat in PPR --goal of approximately 90,000 acres by end of 2009 --obtain access on private holdings	CDOW, BLM, NRCS, Industry, Landowners	Immediately and ongoing
		1.e. Use and refine existing vegetation and other map data to develop a better understanding of piñon-juniper/mountain shrub and industrial encroachment on GrSG habitat	Industry, CDOW, BLM, Landowners	Ongoing
	2. <i>Improve communication among</i>	2.a. Incumbent on agencies to clearly define and educate industry reps on desired wildlife objectives.	Work Group, BLM, CDOW, NRCS,	Ongoing

Goal:	Objectives:	Actions:	Who:	When:
	<p>agencies, industry, and affected publics involved with mining and energy development, to facilitate improved trust, working relationships, planning, and more effective management of GrSG and their habitats</p>	<p>Work with industry to develop matrix for 1) general guidance to understand sage-grouse habitat requirements seasonally and geographically; and 2) for site specific project analysis for well fields or mine sites.</p> <p>2.b. Incumbent on industry to clearly define and educate agency biologists on desired industry objectives for gas & mineral production; 1) develop matrix for general guidance to understand types and timing of activities necessary to produce and transport gas and/or other minerals; 2) site specific project analysis for well fields or mine sites. Including identifying and sharing benefits of new technology with wildlife officials.</p> <p>2.c. Use local Work Group as a forum for coordination of resources for integration of ideas.</p> <ul style="list-style-type: none"> • Continue the Work Group well after the Plan is done. Meeting frequency to be determine (refer to I.C. Process). • Promote and provide regular opportunities for public involvement to improve energy and mineral planning as it relates to management of GrSG and GrSG habitat. <p>2.d. Recognizing private lease and surface rights, develop a voluntary communication process to assist the energy industry to work with LWG's in planning energy activity on non-federal surface-owned leases.</p>	<p>Industry, COGCC, CDRMS</p> <p>Industry, Work Group, BLM, CDOW, COGCC</p> <p>Work Group, Industry, BLM, CDOW, counties, COGCC, CDRMS</p> <p>Work Group, Industry, Agencies, Landowners</p>	<p>Ongoing</p> <p>Ongoing</p> <p>Ongoing</p>

Goal:	Objectives:	Actions:	Who:	When:
		2.e. Share energy development plans with agencies ASAP to facilitate improved planning, analysis, and management of GrSG within sagebrush habitats, recognizing confidentiality sensitivities.	Industry, Consultants, Agencies	Ongoing
		2.f. Encourage open communication between companies to entertain opportunities to reduce impacts and/or maximize benefits to GrSG	Counties, COGCC, CDOW, BLM, Work Group, Industry	Ongoing
		2.g. Encourage oil, gas, and mining companies to participate on local GrSG Work Groups.	BLM, CDOW, Industry, Landowners, Work Group, Counties, COGCC, CDRMS	Ongoing
		2.h. Promptly and frequently update information related to energy and mineral development and GrSG to foster a better understanding of impacts to the species.	Industry, BLM, CDOW, CDRMS, COGCC, Landowners, etc. (Everyone!)	Ongoing
		2.i. Communicate and improve the understanding, sharing, and acceptance of research and modeling efforts regarding GrSG and mining/energy development.	Industry, Work Group, CDOW, BLM, Landowners, NRCS, CDRMS	Ongoing
		2.j. Confer with all interested parties on current findings and new information for actions that benefit GSG to adapt accordingly.	BLM, LWG, Industry, Landowners, CDOW, COGCC, BLM, CDOW, Industry, CDRMS, Landowners	Ongoing

Goal:	Objectives:	Actions:	Who:	When:
	3. Develop and implement appropriate <i>on- and off-site mitigation practices</i> within GrSG habitat	<p>3.a. Evaluate the need for near-site and/or off-site mitigation possibilities to maintain sage-grouse populations during oil and gas development and production and energy and mineral development through mining.</p> <p>3.b. Define what constitutes meaningful mitigation to meet site- and/or issue-specific GrSG population and/or habitat objectives, based on current, regularly updated information, site capacity and timeline restrictions. Monitor the response of sage-grouse population.</p> <p>3.c. Identify impediments inclusive of environmental regulation to implementing beneficial mitigation measures (e.g. storm water management).</p> <p>3.d. Continue to invite/query/charge industry group with ideas that may reduce disruption of habitat. Wherever possible, incorporate site-specific COAs, SUAs, BMPs (on-site mitigation measures) on proposed operations in GrSG habitat, in accordance with decision matrix and mitigation practices (see Appendix C) consistent with lease rights, or as negotiated with operators, leasees, and landowners.</p> <p>3.e. Determine whether sage-grouse will move to mitigation areas as mine and energy development sites develop in active habitat. Based on research and monitoring.</p> <p>3.f. Identify and conduct habitat enhancements on potential</p>	<p>CDOW, BLM, Industry, Landowners</p> <p>BLM, CDOW, Industry, Landowners, COGCC</p> <p>BLM, CDOW, Industry, Landowners, COGCC, CDRMS</p> <p>CDOW, CDOW Research, in cooperation with Industry, BLM, NRCS, CDRMS, etc.</p> <p>BLM, CDOW, Industry, Landowners</p> <p>BLM, CDOW, Work Group,</p>	<p>End of 2007 and Ongoing</p> <p>End of 2007 and Ongoing</p> <p>Ongoing</p> <p>Ongoing</p> <p>Ongoing</p> <p>Ongoing</p>

Goal:	Objectives:	Actions:	Who:	When:
		locations where there may be opportunities for off or on-site mitigation for GrSG. Identify suitable mitigation practices within those areas. Use mapping information.	Industry, Landowners	
		3.g. Consider site capability and the timeline necessary to restore areas to suitable GrSG habitat, when determining which mitigation practices should be implemented on a site-by-site basis. Use mapping information.	BLM, CDOW, Industry, COGCC, Landowners, CDRMS	Ongoing
		3.h. Conduct mitigation measures (e.g. off site habitat enhancement) prior to mine site development or expansion, or energy field development, where possible, to minimize sage-grouse population disruption.	BLM, CDOW, Industry, Landowners, Work Group	Ongoing
		3.i. Investigate, evaluate, and implement mitigation trust/banking opportunities within PPR (as the first priority) area where appropriate for GrSG habitat. Secondly consider opportunities outside of PPR area.	BLM, CDOW, Industry, Landowners, Work Group	Ongoing
		3.j. Augment populations or promote occupation in areas not influenced by development or where development is less likely.	BLM, CDOW, Industry, COGCC	Ongoing
		3.k. Refer to BMP's located in appendix for mitigation options for different phases: Planning Project Siting Construction/Drilling Completion Production & Operations Reclamation (interim & final) (check if there is a BMP that addresses water development for	Industry, CDOW, BLM, COGCC, CDRMS	Ongoing

Goal:	Objectives:	Actions:	Who:	When:
	<p>4. Minimize the <i>impacts during gas field life cycle, mining, and energy development</i> in GrSG habitat, in order to sustain viable GrSG populations in Colorado.</p>	<p>SG).</p> <p>4.a. Where substantial development may occur, prepare a plan that evaluates the impacts to sage-grouse from the entire project development, not just from individual site development.</p> <p>4.b. Investigate opportunities and provide incentives to promote cluster development in key GrSG habitats. Cluster the development of roads, pipelines, electric lines, and other facilities, and use existing, combined corridors where possible.</p> <p>4.c. Investigate opportunities and provide incentives to promote GrSG conservation measures.</p> <p>4.d. Where a 3 year consecutive downward trend in lek counts (as measured by the 3-year running average) is seen in areas with intense energy development, consider aggressively pursuing additional strategies to address population sustainability including:</p> <ul style="list-style-type: none"> • options for increasing GrSG female survival • short duration of energy development and expedite reclamation • see “Population Augmentation” strategy section of Statewide Plan for GrSG. <p>4.e. Minimize disturbance/mortality during construction/development/production of oil & gas resources (see Appendix C/BMP’s)</p> <p>4.f. Share the management results</p>	<p>BLM, Counties, CDOW, Industry</p> <p>BLM, Counties, CDOW, Industry, NRCS</p> <p>CDOW, BLM, Counties, Industry</p> <p>Industry, BLM, Counties, COGCC</p> <p>Industry, CDOW, BLM, COGCC</p> <p>All</p>	<p>Ongoing</p> <p>Ongoing</p> <p>Ongoing</p> <p>Ongoing</p> <p>Ongoing</p> <p>Ongoing</p>

Goal:	Objectives:	Actions:	Who:	When:
	5. Research & monitoring.	<p>and mitigation efforts that are occurring within different companies and agencies within PPR.</p> <p>5.a. Integrate and share the various research occurring in the PPR area on a regular and reoccurring basis.</p> <p>5.b. Develop and encourage opportunities to cooperate on research efforts in the PPR area. (Research could include broader topics e.g. threshold of noise tolerance, augmentation, relocation, cumulative impacts, etc.)</p> <p>5.c. Evaluate potential additional impacts from alternative energy development to minimize impacts to GrSG.</p>	<p>All</p> <p>All</p> <p>All</p>	<p>Ongoing</p> <p>Ongoing</p> <p>Ongoing</p>

F. Recreation

1) Issues Related to Recreation

When recreational activities occur on a recurring basis in sage-grouse habitat during critical periods, such activities have the potential to disturb or alter sage-grouse habitat use. Critical periods include the breeding period, which includes strutting and nesting, and winter months when available habitat may be limited. In addition to direct disturbance, various recreational activities can also cause habitat degradation such as soil erosion and damage to plant communities.

Public recreation in the Parachute-Piceance-Roan area occurs primarily in the fall during the big game seasons and somewhat concurrently with small game hunting, primarily blue grouse. Most of this activity takes place on BLM and CDOW lands in the area, and seems to be at lower levels now than 10-50 years ago. Due to the high percentage of private land ownership (65% in occupied range, 46% within the Plan area), recreation is and likely will continue to be limited in scope in the area. However, the Work Group recognizes the potential for increases in recreational activities on public lands, including, but not limited to, hiking, mountain biking, horseback riding, OHV use, dispersed camping, cross-country skiing, snowshoeing, and snowmobiling. The Bureau of Land Management manages most public lands in the Piceance Creek drainage and these areas are, with some exceptions, open to motorized vehicles.

Another potential source of recreation disturbance to sage-grouse is viewing of the grouse themselves on leks in the spring. At this time, this is not known to be a problem, and seems unlikely to become an issue given the remoteness and difficulty in access associated with private land and poor road conditions. There are other areas in Colorado to view strutting sage-grouse that are more accessible and more likely to yield sightings of birds.

The issue of hunting in the area includes two aspects. The first is potential effects of hunting associated activities on sage-grouse. Currently, hunting of game animals in the area occurs in the fall. By fall, a sage-grouse's diet has switched primarily to sagebrush leaves, and as a result, the potential habitat for food and cover for the grouse is probably at its broadest compared with any other time of the year. Thus, although birds may be disturbed and flushed by hunters chasing other quarry, it is not a critical time for sage-grouse since their vulnerability to disturbance is relatively low during this time.

The second hunting-related issue is the potential impact of hunting sage-grouse. At that time, it was estimated that there were fewer than 100 males in the population, the number considered necessary to allow hunting. The hunting season for grouse in the Parachute-Piceance-Roan area has been closed since 1995. Due to better techniques and more consistent effort, recent (2005-2007) lek counts have averaged 195 males, well above the 100 male threshold necessary to permit a hunting season for the PPR population." The Work Group expressed little or no interest in asking for an opening of the season on sage-grouse at this time, given the potential threats from activities addressed elsewhere in this Plan.

2) Conservation Actions Relating to Recreation

Goal:	Objectives:	Actions:	Who:	When:
1. Maintain a viable population of GrSG while allowing appropriate levels of recreational use within GrSG habitat.	1. Minimize the impacts of recreation in GrSG habitat, in order to sustain viable GrSG populations and their habitat.	1.a. Develop signs and brochures that illustrate differences between GrSG and Dusky (Blue) Grouse and post in area due to overlap in habitat in area.	CDOW, Landowners	Fall 2008
		1.b. Monitor recreation use in area during spring and summer; if roads/trails or recreational uses conflict with sage-grouse habitat requirements, pursue management options such as seasonal use restrictions, closure, removal, re-alignments, buffers, etc.	BLM, Landowners	Ongoing

G. Water Project Development and Water Management

1) Issues Related to Water Project Development and Water Management

New water developments, or changes in existing water use, have the potential to change grouse habitat for better or for worse. An issue in some geographic areas is that plans for water reservoirs could cover important grouse habitats, potentially brood-rearing habitat and /or winter range. In some cases, significant amounts of acreage could be converted into reservoirs. Small reservoirs might be beneficial to GrSG, providing them a new water source, particularly at lower elevations (Water availability is generally not a problem above 8,000 ft). Also, changes in points of diversion of natural springs and rivers may also impact the GrSG (also more relevant in the lower areas), e.g., loss of hay meadows used as brood-rearing habitat.

2) Conservation Actions Relating to Water Project Development and Water Management

If plans for water developments and water management changes in the area begin to take shape, the Work Group should become actively involved in analyzing such plans as they arise, with an eye toward the potential effects on Greater Sage-Grouse. However, given the nature of water issues and that potential projects will arise from a variety of sources, it will be difficult to address this issue comprehensively. Therefore developing a specific set of strategies is difficult. Rather than doing so, points to keep in mind with regard to such potential are listed below:

- Encourage proponents to advise or come to Work Group with proposals
- Work informally with proponents and other interested parties within Work Group setting if possible and agreeable prior to regulatory process
- Work within established regulatory processes
- Analyze water development projects on a case-by-case basis for effects on GrSG
- Analyze changes in current water management on a case-by-case basis.

The Work Group will maintain contacts with the Colorado River Water Conservation District and the local Bluestone and Yellowjacket conservancies.

IV. MONITORING AND EVALUATION OF CONSERVATION PLANNING EFFORTS

This Plan contains over 100 conservation actions relating to 7 primary issues that the Work Group identified as factors that have the potential to affect sage-grouse populations or sage-grouse habitat in Parachute Piceance and Roan Creek drainages of Rio Blanco & Garfield Counties, Colorado.

Monitoring efforts will focus on evaluating methods of enhancing, and protecting breeding, brood-rearing, and wintering sage-grouse habitats as well as mitigation techniques for behavioral effects. Conservation actions and management efforts relating to sage-grouse and their habitats will be monitored and adaptive management applied. Adaptive management is characterized by management that monitors results of policies and/or management actions, and then integrates these results into future actions to adapt policy and management actions as necessary.

As this plan was being prepared, the U. S. Fish and Wildlife Service made an “unwarranted” listing finding for the Greater Sage-Grouse (December 2005). A court complaint was filed on July 14, 2006, by the Western Watersheds Project, alleging that the USFWS 12-month finding is incorrect, arbitrary, and unwarranted by the facts. In December, 2007, the court granted the motion by the plaintiff and the USFWS will be required to review its earlier decision to not list the species. In light of this court action, the Workgroup, going forward, should be mindful of the USFWS “Proposed Policy for Evaluating Conservation Efforts When Making Listing Decisions (PECE).” The PECE was not specifically addressed in the preparation of this plan. The policy identifies criteria USFWS will use in determining whether formal conservation efforts (such as this Plan) contribute to making the need to list a species unnecessary. This policy is included as Appendix G.

The Work Group members recognize the need to continue to gather information and report on efforts to improve conditions for sage-grouse. Therefore, the working group will use a GIS database maintained and operated by CDOW to document habitat treatments designed to improve sage-grouse habitat in the area. The Work Group will also work with local counties to document land use changes in sage-grouse habitat. In addition, the Work Group will work with the Counties and local Land Conservation Organizations to document the number of acres of sage-grouse habitat protected through conservation easements, etc.

The primary population data that will be collected includes total number of active and inactive leks, average number of males per lek, and number of new leks located annually. The CDOW will provide an annual report of these population data to the Work Group and U.S. Fish and Wildlife Service (USFWS).

Annual meetings will be held to review and discuss the population data, to discuss and compile information on the habitat treatments completed, as well as to discuss any new information regarding sage-grouse and their habitats. Annual meetings with the Work Group will also serve as a forum to discuss and develop a yearly Annual Work Plan for the Parachute Piceance and Roan Creek drainages of Rio Blanco & Garfield Counties. The CDOW will provide the Annual

Work Plans as well as a yearly status report detailing management efforts relating to sage-grouse to the USFWS.

A. Conservation Actions Relating to Monitoring and Evaluation

Goal:	Objectives:	Actions:	Who:	When:
Continue to foster public/private partnerships to benefit sage-grouse, monitor and evaluate such actions, share information relating to sage-grouse, and provide pertinent information to the USFWS.	1. Continue to work within the sage-grouse Work Group context.	1a. Convene annual Work Group meetings.	CDOW	Beginning 2008
		1b. Develop yearly Annual Work Plan outlining planned efforts to benefit sage-grouse.	Work Group	Beginning 2008
	2. Use the concepts of Adaptive Management to maximize understanding and insure that efforts will benefit sage-grouse.	2a. Monitor the effects of treatments to benefit sage-grouse.	CDOW, BLM, Work Group	Ongoing
		2b. Integrate monitoring results to modify management actions as necessary.	CDOW, BLM, Work Group	Ongoing
		3. Document management actions completed to benefit sage-grouse.	3a. Communicate management actions and results to other members of the Work Group.	Work Group
	3b. Develop GIS database to document sagebrush habitat treatments in the area.		CDOW	Beginning 2008
	3c. Provide outreach to new and current landowners to increase awareness of the local Conservation Plan and best management practices.		CSU Extension, CDOW, NRCS, Work Group, Conservation Districts	Ongoing
	4. Document other impacts (positive and negative) to sage-grouse habitat as part of an overall habitat	4a. Work with Rio Blanco and Garfield Counties to be proactive in land-use planning (for the benefit of sage-grouse) and monitor land-use changes in the area.	CDOW, County Planners, Land Trusts	Ongoing

Goal:	Objectives:	Actions:	Who:	When:
	<p>assessment.</p> <p>5. Provide documentation of Work Group efforts to benefit sage-grouse and their habitat.</p>	<p>5a. Provide annual status report to the USFWS.</p>	<p>CDOW</p>	<p>Beginning 2008</p>