

TABLE OF CONTENTS

THE PLAN AND ITS PURPOSE	1
PART I. CONSERVATION ASSESSMENT	5
A. DESCRIPTION OF NORTHWEST COLORADO GREATER SAGE-GROUSE TAXONOMY AND LIFE HISTORY, AND MORTALITY FACTORS	5
Area Description	5
Vegetation	11
Description of Greater Sage-Grouse	11
Range and Distribution	16
Life History and Habitat Requirements	22
Introduction.....	22
Breeding Habitat.....	22
Strutting Grounds.....	22
Pre-laying Habitat.....	27
Nesting Habitat.....	27
Early Brood-rearing Habitat	30
Summer-Late Brood-rearing Habitat	30
Winter Habitat	32
Food Habits.....	33
Breeding Habitats-Yearlings/Adults/Juveniles	33
Summer-Late Brood-rearing Habitats- Yearlings/Adults/Juveniles.....	35
Winter Habitats-Yearlings/Adults/Juveniles	35
Survivorship and Life Span	35
Factors Affecting Survivorship and Life Span.....	36
Climatic Factors.....	36
Predation (nonhuman).....	37
Documented Predators	37
Predation Defense Mechanisms	37
Predator Impacts to Grouse Life Cycle	39
Predator and Alternative Prey Relationships	40
Hunting Harvest.....	40
Other Human Induced Mortality	47
B. GREATER SAGE-GROUSE POPULATIONS.....	47
Population Trends and Current Status	47
Moffat:	47
Rio Blanco:	48
Routt:	48
C. SAGEBRUSH OBLIGATES OTHER THAN GREATER SAGE-GROUSE	55
D. TRENDS IN NUMBERS AND DISTRIBUTION OF WILDLIFE POPULATIONS.....	58
Big Game.....	58

Lagomorph Populations	73
Predator Populations	73
E. LAND USE TRENDS	75
Trends in Land Use and Management.....	75
Trends in Land Development	75
Homestead History.....	79
Trends in Agriculture	80
Livestock Grazing	80
Wheat Farming and CRP.....	82
Socioeconomic Considerations.....	86
F. HISTORIC AND PRESENT ROLE OF FIRE IN SAGEBRUSH HABITATS .	88
Fire Effects On Different Species of Sagebrush.....	88
Fire Suppression.....	90
Fire Planning	90
PART II. IDENTIFICATION OF ISSUES AFFECTING GREATER SAGE-GROUSE .	94
Habitat Quality.....	94
Habitat Loss and Fragmentation.....	96
Predation.....	97
Hunting	99
Physical Disturbance	100
Disease and Genetics.....	101
Planning and Outreach.....	102
PART III. CONSERVATION STRATEGY	104
Overall Goal	104
Identified Issues.....	104
Severity of Impacts	104
Habitat Quality.....	105
Habitat Loss and Fragmentation.....	116
Predation.....	127
Hunting	129
Physical Disturbance	131
Disease and Genetics.....	135
Planning and Outreach.....	137
PART IV. IMPLEMENTATION AND MONITORING.....	141
Implementation Process	141
Working Group Structure and Role	141
The Role of the Conservation Plan.....	142
Greater Sage-Grouse Management Zones.....	143
Greater Sage-Grouse Inventory	148
Development of Population Targets	155
Prioritization of Management Zones	157
Implementation by Management Zone—Where the Rubber Meets the Road	159
Monitoring and Evaluation of Plan.....	159

PART V. LISTING FACTOR ANALYSIS	165
Listing Factor A-The present or threatened destruction, modification, or curtailment of its habitat or range	165
Listing Factor B-Overutilization of the species for commercial, recreational, scientific, or educational purposes.....	166
Listing Factor C-Disease or predation.....	167
Listing Factor D-The inadequacy of existing regulatory mechanisms	167
Listing Factor E-Other natural or manmade factors affecting the its continued existence	168
GLOSSARY AND ACRONYMS USED IN THE CONSERVATION PLAN	170
LIST OF SPECIES MENTIONED IN THE CONSERVATION PLAN.....	178
LITERATURE CITED AND OTHER REFERENCES	181
APPENDIX A: MANAGEMENT ZONE LEK COUNT DATA	197
APPENDIX B: HUNTING AND HARVEST INFORMATION	221
APPENDIX C: COMPLETED PROJECTS	225

LIST OF DATA TABLES

Table 1. Northwest Colorado greater sage-grouse habitat by county	5
Table 2. Northwest Colorado greater sage-grouse habitat by land ownership	8
Table 3. Vegetation types in Northwest Colorado.....	12
Table 4 . Greater sage-grouse predators by life stage.....	38
Table 5. Greater sage-grouse hunting season structure in Northwest Colorado.....	41
Table 6. Greater sage-grouse harvest estimates for Northwest Colorado.....	45
Table 7. Greater sage-grouse wing collection data for Northwest Colorado.....	46
Table 8. Northwest Colorado current elk population estimates and objectives by DAU	69
Table 9. Northwest Colorado current mule deer population estimates and objectives by DAU .	69
Table 10. Northwest Colorado current pronghorn antelope population estimates and objectives by DAU	69
Table 11. Big game data analysis units—acreage and overlap with greater sage-grouse habitat	70
Table 12. Northwest Colorado habitat assessment model forage allocation	70
Table 13. Characteristics of sagebrush rangeland needed for productive greater sage-grouse habitat (after Connelly et al. 2000, Hausleitner 2003).....	106
Table 14. Whole population and Management Zone specific population targets.....	156
Table 15. Assessment of Management Zones (as of March 2007).....	158

LIST OF CONSERVATION ACTIONS TABLES

Conservation Actions Table I. Improving Habitat Quality.....	111
Conservation Actions Table II. Habitat Loss and Fragmentation.....	121
Conservation Actions Table III. Predation	129
Conservation Actions Table IV. Hunting	131
Conservation Actions Table V. Reduction of Physical Disturbances.....	134
Conservation Actions Table VI. Disease and Genetics	137
Conservation Actions Table VII. Planning and Outreach Activities.....	138

LIST OF FIGURES

Figure 1. Location Map—Northwest Colorado greater sage-grouse population.....	6
Figure 2. Distribution of the Northwest Colorado greater sage-grouse population across Moffat, Routt, and Rio Blanco counties	7
Figure 3. Northwest Colorado land ownership map	9
Figure 4. Precipitation map of Northwest Colorado.....	10
Figure 5. Northwest Colorado vegetation distribution map.....	15
Figure 6. Historic and current distribution of greater sage-grouse in the western United States	17
Figure 7. Location map of Colorado greater sage-grouse populations.....	19
Figure 8. Comparison map of potential pre-settlement and current greater sage-grouse distribution in Northwest Colorado	20
Figure 9. Greater sage-grouse occupied, vacant/unknown, and potentially suitable habitat in Northwest Colorado	21
Figure 10. Greater sage-grouse Management Zones	23
Figure 11. Distribution of lek sites in Northwest Colorado.....	25
Figure 12. Relative size of active lek sites in Northwest Colorado.....	26
Figure 13. Greater sage-grouse nesting (production) areas in Northwest Colorado.....	29
Figure 14. Identified greater sage-grouse brood areas in Northwest Colorado	31
Figure 15. Greater sage-grouse winter range in Northwest Colorado	34
Figure 16. Open greater sage-grouse hunting units in Northwest Colorado.....	44
Figure 17. High male counts—Northwest Colorado greater sage-grouse population.....	52
Figure 18. High male counts (three year running average)—Northwest Colorado greater sage-grouse population.....	52
Figure 19. Number of active leks and average number of males per lek—Northwest Colorado greater sage-grouse population	53
Figure 20. High priority sagebrush obligate conservation areas in Colorado.....	57
Figure 21. Northwest Colorado elk winter range and data analysis unit map	59
Figure 22. Northwest Colorado elk population trends by DAU	60
Figure 23. Northwest Colorado mule deer winter range and data analysis unit map	62
Figure 24. Northwest Colorado mule deer population trends by DAU	63
Figure 25. Northwest Colorado pronghorn antelope winter range and data analysis unit map...	65
Figure 26. Northwest Colorado pronghorn antelope population trends by DAU.....	66
Figure 27. Coal potential and mine locations in Northwest Colorado.....	77
Figure 28. Oil and natural gas potential and development in Northwest Colorado.....	78

Figure 29. Historic homesteads, modern residential development, and major power line map ..	81
Figure 30. Federal land grazing allotments in Northwest Colorado	83
Figure 31. Sheep numbers for Moffat County	84
Figure 32. Cattle numbers for Moffat County	84
Figure 33. Cropland areas in Northwest Colorado	85
Figure 34. Map of recent wildfires in Northwest Colorado greater sage-grouse habitat.....	92
Figure 35. Management Zone map	147
Figure 36. Whole population lek counts—three year running average	149
Figure 37. Management Zone 1 lek counts—three year running average	149
Figure 38. Management Zone 2 lek counts—three year running average	150
Figure 39. Management Zone 3a lek counts—three year running average	150
Figure 40. Management Zone 3b lek counts—three year running average	151
Figure 41. Management Zone 3c lek counts—three year running average	151
Figure 42. Management Zone 4a lek counts—three year running average	152
Figure 43. Management Zone 4b lek counts—three year running average	152
Figure 44. Management Zone 5 lek counts—three year running average	153
Figure 45. Management Zone 6 lek counts—three year running average	153
Figure 46. Management Zone 7 lek counts—three year running average	154

**NORTHWEST COLORADO
GREATER SAGE-GROUSE CONSERVATION PLAN**

FINAL
April 2008

THE PLAN AND ITS PURPOSE

The mission of the Northwest Colorado Greater Sage-Grouse Conservation Plan is to address the needs of greater sage-grouse (*Centrocercus urophasianus*) in the context of multiple land ownerships, uses, and species through a Conservation Plan. A key attribute of this Plan is that the Northwest Colorado Greater Sage-Grouse Working Group (GSGWG) intends to enhance greater sage-grouse populations while taking into account the importance of local economies for the long-term maintenance of greater sage-grouse habitats and while maintaining all existing human uses of sage grouse habitats in Northwest Colorado. The Plan is intended to prevent or preclude the federal listing of greater sage-grouse as threatened or endangered in Northwest Colorado by demonstrating the ability and the intent to maintain or enhance greater sage-grouse populations and greater sage-grouse habitat well into the future.

The U.S. Fish and Wildlife Service (USFWS) determines the need to list species under the Endangered Species Act (ESA) by evaluating five listing factors. These factors are:

- A. Present or threatened destruction, modification, or curtailment of its habitat or range.
- B. Overutilization for commercial, recreational, scientific, or educational purposes.
- C. Disease or predation.
- D. The inadequacy of existing regulatory mechanisms
- E. Other natural or man-made factors affecting its continued existence.

This Conservation Plan addresses all five listing factors both directly and indirectly, identifies potential solutions, and provides for implementation of conservation actions to address issues the GSGWG believes impact greater sage-grouse and sage grouse habitat. If greater sage-grouse are listed as threatened or endangered under the ESA, it is intended that this Plan will serve as the basis of a recovery plan for the species in Northwest Colorado.

The Conservation Plan consists of five main sections.

Part I: Conservation Assessment--A description of the area covered by this Plan, greater sage-grouse habitat, species distribution, and factors that influence or affect greater sage-grouse are discussed.

The Conservation Assessment is further divided into five sections:

- F. Description of Northwest Colorado, Greater Sage-Grouse Taxonomy and Life History, and Mortality Factors.
- G. Greater Sage-Grouse Populations
- H. Trends in Numbers and Distribution of Wildlife Populations
- I. Land Use Trends
- J. Historic and Present Role of Fire in Sagebrush Habitats

Part II: Identification of Issues Affecting Greater Sage-Grouse Populations--identifies and describes the primary threats faced by greater sage-grouse in Northwest Colorado.

Part III: Conservation Strategy--outlines the goals and objectives for greater sage-grouse populations and habitat in Northwest Colorado and specific conservation actions to meet those goals and objectives.

Part IV: Implementation and Monitoring--describes how the Conservation Plan will be applied, how it will be kept current, and how progress will be measured.

Part V: Listing Factor Analysis--describes the extent to which the Conservation Plan addresses the five ESA listing factors described above and the U.S. Fish and Wildlife Service's Policy for Evaluation of Conservation Efforts (PECE) standards.

This document has evolved as a cooperative effort between community members, landowners, local industry, conservation groups, and county, state, and federal agency personnel known collectively as the Northwest Colorado Greater Sage-Grouse Working Group (GSGWG). It formed in 1996 to discuss and address issues relating to sage grouse management and has worked consistently and cooperatively toward the completion and implementation of this Conservation Plan since that time. Portions of the Conservation Plan have been in effect since early in the working group's existence. Through an open public process based on consensus decision making, the GSGWG has established specific goals and objectives that extend across property boundaries and that view management of greater sage-grouse populations and habitats on a landscape level to achieve the overall mission of the Plan. Annual working group meetings, work plans and accomplishment reports will monitor progress toward meeting the goals of the Plan. It is important to note that this Conservation Plan must be a dynamic document, incorporating principles of adaptive management and evolving as new information arises, to be successful. Management strategies and recommendations will be updated to incorporate results of local studies, new information, and management successes and failures during annual review meetings.

This Plan outlines a process to stabilize and enhance greater sage-grouse populations in Northwest Colorado and establishes a framework to improve greater sage-grouse habitat condition and population performance; thus maintaining greater sage-grouse populations at desired objectives. Implementation of this Plan (and the conservation actions presented within) is intended to be **voluntary** by private landowners and organizations. State and federal resource agencies involved with greater sage-grouse management, however, are required to manage greater sage-grouse populations and habitat by various statutes and policies. The information contained in this Plan will be used as a set of guidelines by those state and federal agencies to maintain and enhance greater sage-grouse habitat and greater sage-grouse populations in Northwest Colorado. Participation of private landowners and consideration of the landowners' needs are critical for management of greater sage-grouse habitat on private lands to meet the overall goal of the Plan. True success cannot be achieved without managing on an overall landscape scale. This Plan provides an opportunity to promote ecologically sound management of private and public lands for greater sage-grouse without impinging on private property rights. The GSGWG believes the best way to guide actions to improve greater sage-grouse population

trend in Northwest Colorado is through citizen involvement with federal and state resource agencies.

While this Conservation Plan focuses on greater sage-grouse, the GSGWG acknowledges that many other species of sagebrush obligates and a host of facultative species also utilize the sagebrush habitats occupied by greater sage-grouse in Northwest Colorado. Effective management of sagebrush environments in Northwest Colorado for healthy populations of greater sage-grouse will also result in healthy populations of other sagebrush obligate and facultative species.

Two conventions are used throughout the Plan that should be noted here. First, the official species name, greater sage-grouse, is generally used to identify the species in the Plan. The unofficial name sage grouse (without the hyphen) is often used interchangeably, but can also include the Gunnison sage-grouse along with greater sage-grouse. Secondly, Northwest Colorado is used in the text when discussions are intended to reflect specifically on the population area covered by this Plan. The more grammatically correct northwest or northwestern Colorado is used when the discussion reflects the surrounding area as well.

It is the intent of the GSGWG that this Plan be read and interpreted in its entirety. If the reader reads only isolated sections of this Plan, single statements may be taken out of context or misinterpreted.