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Glenwood Springs and Kremmling Resource Management Plan Revisions

Final Analysis of the Management Situation Glenwood Springs Field Office

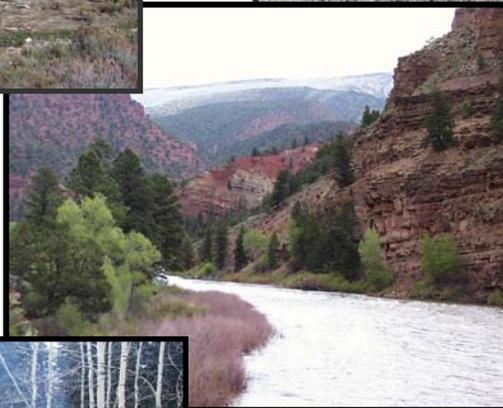


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Deep Creek SRMA – Physical
Deep Creek SRMA – Social
Eagle River SRMA (Lower) – Administrative
Eagle River SRMA (Lower) – Physical
Eagle River SRMA (Lower) – Social
Eagle River SRMA (Upper) – Administrative
Eagle River SRMA (Upper) – Physical
Eagle River SRMA (Upper) – Social
Gypsum Hills SRMA – Administrative
Gypsum Hills SRMA – Physical
Gypsum Hills SRMA – Social
Hack Lake SRMA – Administrative
Hack Lake SRMA – Physical
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LIST OF ACRONYMS

Acronym or Abbreviation	Full Phrase
AAQS	ambient air quality standards
ACEC	area of critical environmental concern
AMS	analysis of the management situation
APCD	Air Pollution Control Division
APD	application for permit to drill
ATV	all terrain vehicle
AUM	animal unit month
BLM	United States Department of the Interior, Bureau of Land Management
BMP	best management practice
CMB	coalbed methane
CCR	Colorado Code of Regulations
CDPHE	Colorado Department of Public Health and Environment
CDOW	Colorado Department of Natural Resources, Division of Wildlife
CFR	Code of Federal Regulations
cfs	cubic feet per second
CNHP	Colorado Natural Heritage Program
CO ₂	carbon dioxide
COA	condition of approval
CSU	controlled surface use
CWCB	Colorado Water Conservation Board
EA	environmental assessment
EIS	environmental impact statement
EPCA	Energy Policy and Conservation Act Amendments of 2000
ERMA	extensive recreation management area
ESA	Endangered Species Act of 1973
ESR	Emergency Stabilization and Rehabilitation
F	degrees Fahrenheit
FAR	functioning at risk
FAR-DOWN	functioning at risk downward trend
FAR-NA	functioning at risk not apparent trend
FAR-UP	functioning at risk upward trend
FLPMA	Federal Land Policy and Management Act of 1976
FMP	fire management plan
FMU	Fire Management Unit
FWFMP	Federal Wildland Fire Management Policy
GIS	geographic information system
GSFO	Glenwood Springs Field Office
HMP	habitat management plan
I-	Interstate
IM	instruction memorandum
KFO	Kremmling Field Office
LHA	land health assessment
MIS	Management Information System

LIST OF ACRONYMS *(continued)*

Acronym or Abbreviation Full Phrase

MOU	memorandum of understanding
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969
NFP	National Fire Plan
NGD	no (long-term) ground disturbance
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSO	no surface occupancy
OHV	off-highway vehicles (off-road vehicles)
PFC	proper functioning condition
PM	particulate matter
PSD	prevention of significant deterioration
R&PP	Recreation and Public Purposes
RMP	resource management plan
RMPA	resource management plan amendment
RNA	research natural area
ROD	record of decision
ROS	recreation opportunity spectrum
ROW	right-of-way
SRMA	special recreation management area
SRP	special recreation permit
SSR	site-specific relocation
TMA	travel management area
TMDL	total maximum daily load
US	United States
USC	United States Code
USDA	US Department of Agriculture
USDI	US Department of the Interior
USFS	US Department of Agriculture, Forest Service
USFWS	US Department of the Interior, Fish and Wildlife Service
USGS	US Geological Survey
VRM	visual resource management
WFU	wildland fire use
WSA	Wilderness Study Area
WSR	Wild and Scenic River
WUI	wildland-urban interface
µg/m ³	micrograms per cubic meter

CHAPTER 1

INTRODUCTION

The United States (US) Department of the Interior (USDOI), Bureau of Land Management (BLM), Glenwood Springs Field Office (GSFO) and Kremmling Field Office (KFO) have initiated a combined planning process to revise their respective resource management plans (RMPs). The BLM will prepare an environmental impact statement (EIS) that will cover public land use and uses for both field offices on approximately 945 thousand acres of BLM-administered public lands and approximately 1.4 million acres of federal mineral estate. The land is in Eagle, Grand, Garfield, Mesa Pitkin, Routt, Summit, and Rio Blanco Counties in north-central Colorado (Glenwood Springs Reference Map, **Appendix E**).

The management of public lands and federal mineral estate within the GSFO boundaries (the RMP planning area) is the subject of this document (Kremmling and Glenwood Springs Field Office Administrative Boundaries map, **Appendix E**). Planning for areas within the RMP planning area administered by other federal agencies, such as the US Department of Agriculture, Forest Service (USFS), the US Department of the Interior, Fish and Wildlife Service (USFWS), and the National Park Service (NPS), and state agencies, such as the Colorado State Land Board, are not the subject of this document or the current RMP revision effort. Additionally, planning decisions and descriptions in this document do not apply to private lands.

The decisions in the *Roan Plateau Planning Area RMP Amendment (RMPA) and EIS* have, with the exception of area of critical environmental concern (ACEC) decisions, been approved (June 2007). The decisions have been evaluated and are considered to be current and valid. With approval of the EIS, it adequately addresses all resources and resource uses for that landscape. With the exception of the Wild and Scenic River (WSR) suitability for those stream segments that were determined to be eligible in the Roan Plateau RMPA, the Roan Plateau landscape will be excluded from land use planning decisions to be made in the GSFO RMP revision.

1.1 PURPOSE OF THE AMS

The analysis of the management situation (AMS) is the first step in revising the RMP. The purpose of the AMS is to summarize the situation for the GSFO RMP planning area and explain the need for change (i.e., the preliminary issues). The KFO has summarized the situation for that FO in a separate AMS, which can be found at <http://www.blm.gov/rmp/co/kfo-gsfo/>.

The AMS is required to provide a starting point to describe the biological, physical, social, and economic components of the environment that would be affected by the decision made as part of the GSFO RMP. The AMS is the basis for the RMP and the associated EIS, but it is not a comprehensive detail-oriented document, nor does it represent complete details about the various resources.

1.2 PURPOSE OF AND NEED FOR THE RMP REVISION

The Federal Land Policy and Management Act of 1976 (FLPMA) requires that BLM “develop, maintain, and, when appropriate, revise land use plans” (43 US Code [USC] 1712 [a]). The BLM has deemed it necessary to revise the RMP for the GSFO based on a number of new issues that have arisen since preparation of the initial RMP in 1984. An RMP is a set of comprehensive long-range decisions concerning the use and management of resources administered by BLM and in general accomplishes two objectives:

- Provides an overview of goals, objectives, and needs associated with public lands management and
- Resolves multiple-use conflicts or issues associated with those requirements that drive the preparation of the RMP.

The BLM resource management planning process, explained in Title 43 of the Code of Federal Regulations, Part 1600 (43 CFR 1600), BLM 1601 Manual, and BLM Land Use Planning Handbook (H-1601-1), falls within the framework of the National Environmental Policy Act of 1969 (NEPA) environmental analysis and decision making process described in the Council on Environmental Quality regulations of 40 CFR 1500-1508, the USDI NEPA Manual (516 DM 1-7), and the BLM NEPA Handbook H-1790-1. This AMS is a planning precursor to developing potential alternatives, as required by NEPA regulations.

Preliminary issues to be addressed in the RMP revision are addressed in **Table 1-1**.

1.3 OVERVIEW OF THE BLM PLANNING PROCESS

The process for the development, approval, maintenance, and amendment or revision of RMPs was initiated under the authority of Section 202(f) of FLPMA and Section 202(c) of NEPA. The process is guided by BLM planning regulations in 43 CFR 1600 and Council on Environmental Quality regulations in 40 CFR 1500.

**Table 1-1
Preliminary Issues to be Addressed**

Resource	Issues
Oil and gas development	There is increasing demand for energy resources. Thus, the RMP will address management of energy and mineral resources, including identifying areas and conditions in which mineral development can occur
Range health and upland management	There are a growing number of resource uses that are affecting the natural function and condition of upland communities; thus, in the RMP the BLM will address the management of upland communities to support domestic animals and numerous wildlife and plant species and their habitat, such as the greater sage-grouse, elk, and threatened and endangered plants.
Water and riparian Issues	There is a need to address the management of riparian areas along the stream and river corridors and wetlands to ensure their valuable ecological resources are protected; thus, in the RMP the BLM will address the desired outcomes and conditions for riparian areas and will determine what restrictions or protective measures are needed.
Recreation demands and uses	Increased recreation use throughout the RMP planning area has led to increased concerns regarding resource protection and conflicting issues; thus, in the RMP the BLM will address how to best manage for this increased and conflicting uses.
Comprehensive travel management and transportation	There is a need to address increased off-highway vehicle (OHV) use and to establish travel management networks; thus, in the RMP the BLM will address which areas should be open, limited, or closed to OHV use and will delineate travel management networks within the RMP planning area.
High concentrations of cultural sites	There are high concentrations of unique and significant archaeological regions throughout the RMP planning area that have been identified since the last RMP; thus, in the RMP the BLM will identify goals for the regions' management and management actions and prescriptions that will contribute to achieving these goals.
Maintaining habitat for sage-grouse and sagebrush obligate species	Sagebrush habitat continues to be threatened by a variety of influences, such as conversion to agriculture, invasion by nonnative plant species, recreation, rural expansion, and other associated developments; thus, in the RMP the BLM will allocate land uses and will identify management activities to help conserve sagebrush habitat and sagebrush-obligate species, such as the greater sage-grouse.
Rapidly expanding urban interface areas	The wildland-urban interface (WUI) areas (zones where public lands and urban lands are side by side or intermixed) have grown significantly throughout the RMP planning area since the last RMP; thus, in the RMP the BLM will need to address management of these areas where population and development are rapidly expanding adjacent to public lands.

Development of the RMP represents the first of the two-tiered BLM planning process: the land use planning tier. As such, the RMP prescribes the allocation of and general future management direction for the resource and land uses of the BLM-administered public lands in the RMP planning area. In turn, the RMP guides the

second tier of the planning process: the more site-specific activity or implementation planning tier and daily operations.

Activity or implementation planning extends the resource and land use decisions of the RMP into site-specific management decisions for smaller geographic units of public lands within the RMP planning area. Activity planning includes such elements as grazing plans, habitat management plans (HMPs), and interdisciplinary or coordinated activity plans. Through these plans, the BLM issues various land and resource use authorizations, identifies specific mitigation needs, and develops and implements other similar plans and actions.

All management direction or actions developed as part of the BLM planning process are subject to valid rights and must meet the objectives of the BLM's multiple use management mandate and responsibilities (FLPMA Section 202[c] and [e]). Valid rights include all valid lease, permit, patent, right-of-way (ROW), or other land use right or authorization existing on the date of approval of FLPMA.

1.4 GENERAL DESCRIPTION OF THE PLANNING AREA, GEOGRAPHIC SCOPE, AND RESOURCE/PROGRAMS

The GSFO covers approximately 2,906,461 acres of federal, state, and private land in Eagle, Garfield, Mesa, Pitkin, and Rio Blanco Counties in north-central Colorado. The area is bordered on the north by the White River National Forest, the BLM White River Field Office, and the KFO; on the east by the White River National Forest; on the south by the White River National Forest; and on the west by the Grand Junction Field Office. Of the total area, 568,055 acres are BLM-administered public lands (**Tables 1-2 and 1-3**).

Resources, resource uses, and topics discussed in this AMS include air quality, soil, vegetation, rangelands, forests and woodlands, riparian areas and wetlands, fish and wildlife habitat, special status species, fire, cultural and heritage resources, paleontological resources, special management designations, visual resources, energy and minerals, livestock grazing, recreation, lands and realty, transportation and access, and social and economic conditions.

1.5 KEY FINDINGS

The 1984 Glenwood Springs RMP, along with subsequent amendments, has served as an effective guide for management of BLM-administered public lands within the planning area. However, there have been many changes in national and state level BLM policy (i.e. revised Planning Handbook: H-1601-1, state-level policy mandating going to a "limited to designated travel system") and changing resource conditions and demands (i.e. increased OHV use and recreation demands unforeseen in 1984).

The GSFO also completed its scoping process in May 2007. All written scoping comments received through June 16, 2007, were evaluated and documented. A total of 105 written submissions, including a total of 766 individual comments, were

Table 1-2
Glenwood Springs Field Office Land Status by County

Land Status (acres)	Eagle County	Garfield County	Mesa County	Pitkin County	Rio Blanco County	Routt County	Total
Bureau of Land Management	232,249	265,011	9,906	27,551	319	33,019	568,055
Colorado Division of Wildlife	182	0	0	332	0	0	514
Bureau of Reclamation	0	679	76	0	0	0	755
Department of Energy	0	206		0	0	0	206
Private	212,169	411,940	13,659	107,868	636	62,589	808,861
State	10,268	14,946	0	496	0	2,552	28,262
US Forest Service	575,121	353,905	485,723	485,723	0	5,370	1,499,808
Total	1,029,989	1,046,687	509,364	621,970	955	103,530	2,906,461

Table 1-3
Glenwood Springs Field Office Mineral Status by County

Land Status (acres)	Eagle County	Garfield County	Mesa County	Pitkin County	Rio Blanco County	Routt County	Total
BLM/Federal Minerals	224,928	265,934	9,904	27,560	319	32,851	561,496
Private Surface/Federal Minerals	62,095	81,050	5,531	19,563	80	26,419	194,737
State Surface/Federal Minerals	1,413	10,609	0	4	0	0	12,026
Total	288,436	357,593	15,435	47,127	399	59,270	768,259

received by June 16, 2007. During alternative formulation and project planning, the BLM will consider these and any other comments received during the RMP process.

Individuals provided 68% of the total comments received during the GSFO/KFO RMP scoping period. Private organizations provided 14%. Businesses submitted 4% of the total. Elected officials and law firms each provided 3% of the total number of comments received for a combined total of 6%. Federal, state, and county governmental agencies each submitted 2%, for a total of 6%. Special districts provided 2% of the total number of comments received. No comments were

received from municipalities or from tribal governments. Most of the comments on planning issues focused on travel management (26%), recreation (24%), and lands and realty (11%). Special designations (8%), urban interface (7%), and energy development (7%) issues also received relatively large numbers of comments.

Issue Summary

In September 2005, the BLM prepared a Pre-Plan Analysis and Project Management Plan for the GSFO/KFO RMP/EIS. This plan, used by the interdisciplinary team to begin the planning process, summarized the purpose and need for the RMP. It also highlighted anticipated planning issues, management concerns, and preliminary planning criteria developed by the BLM interdisciplinary team during internal scoping. Based on the lands and resources managed in the planning area, these preliminary issues fell into eight preliminary issue categories in the analysis:

1. Energy development;
2. Range health/upland management;
3. Water/riparian;
4. Recreation demand and uses;
5. Comprehensive travel management and transportation;
6. Cultural resources (high concentrations of cultural sites);
7. Maintaining habitat for sage-grouse and sagebrush obligate species; and
8. Rapidly expanding urban interface areas.

Four new issue categories were identified from public input during the scoping process. In addition, other general concerns that were expressed and captured in a General Concerns category. The four additional issue statements are as follows:

9. Wildlife;
10. Vegetation;
11. Special designations; and
12. Lands and realty.

A planning issue statement was developed for each of the twelve planning issue categories. A planning issue statement was not developed for the category of Other Concerns due to the very general nature of the comments. Each planning issue statement summarizes the issues and concerns heard for each category. The twelve planning issue statements follow.

1. **Travel management and transportation**—How will transportation be managed to protect natural and cultural resources, to provide motorized and nonmotorized recreation opportunities, to reduce user conflicts, to enforce route designations and closures, and to improve public access?

2. **Recreational demand and uses**—How will recreation be managed to maintain and improve recreation sites and trails, especially in close proximity to communities, to reduce user conflicts, to protect natural and cultural resources, to provide a variety of recreational opportunities, and to maximize socioeconomic benefits?
3. **Lands and realty**—What opportunities exist to make adjustments to public land ownership that would result in greater management efficiency, in appropriate and agreeable levels of public access, and in increased public and natural resource benefits?
4. **Special designations**—Where are special designations appropriate to protect unique resources and how should existing special designations be managed to protect the natural and cultural resources and maximize recreational opportunities and socioeconomic benefits?
5. **Urban interface**—How will BLM lands in urban interface areas be managed to provide desired benefits by the public and to be consistent with future land use plans in neighboring communities?
6. **Energy development**—Which areas should be open to energy development, particularly oil and gas leasing, and what restrictions should be employed to protect cultural and natural resources and minimize user conflicts?
7. **Range health/upland management**—How will the BLM manage livestock grazing on public lands while protecting, managing, restoring, and using natural and cultural resources?
8. **Vegetation**—What actions or restrictions will be needed to reduce dangerous fuel loading, to control and prevent the spread of noxious weeds and other undesirable plant species, and to maintain healthy forest ecosystems?
9. **Wildlife**—How will uses and land management activities be managed to maintain and improve terrestrial and aquatic habitats in a scattered land ownership pattern, while maintaining multiple-use land management?
10. **Water/riparian**—What measures will be implemented to protect water resources, especially riparian areas, from the effects of other uses?
11. **Sagebrush habitat and species**—How will sagebrush habitat be managed to reduce continued habitat loss and fragmentation?
12. **Cultural resources**—How can the BLM protect and conserve cultural resources, and where do interpretation opportunities exist?

The BLM will use the planning issues and associated statements, planning criteria, and other information collected in the early planning and scoping phases of the RMP process to help formulate a reasonable range of alternative management strategies that will be analyzed during the planning process.

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CHAPTER 2

CURRENT MANAGEMENT

This chapter is a description of the current management direction provided by the existing RMP and associated planning and NEPA documents (**Table 2-1**). Management direction from the existing RMP that is still valid will be carried forward in the GSFO RMP as direction common to all alternatives. Those management directions and actions from the existing RMP that are valid but may need some modification in wording or intent will be incorporated into the alternatives of the GSFO RMP.

Table 2-1
Glenwood Springs RMP Amendments

Document Title	Year
Glenwood Springs RMP and Record of Decision	1984 (Revised 1988)
Amendment for Oil and Gas Leasing and Development	1991
Amendment for Colorado Land Health Standards	1997
Amendment for Castle Peak Travel Management Plan	1997
Supplemental Amendment for Oil and Gas Leasing Development	1999
Environmental Assessment-Level Amendment for Red Hill Management Plan	1999
Amendment for Oil Shale Revocation	2001
Amendment for Fire Management Plan	2004
Amendment for the Roan Plateau Planning Area	ROD 1 of 2: 2007 ROD 2 of 2: pending

The chapter is divided into four sections, resources, resource uses, special designations, and social and economic conditions that each contain the original RMP planned actions and maintenance or amendment actions that have taken place since 1984. Resource uses involve activities that use the natural, biological, and cultural components of the RMP planning area, such as livestock grazing, recreation, and mineral development. Special designations are those areas that contain a formal

special designation, such as areas of critical environmental concern (ACECs). The current social and economic conditions will be described in this section.

Each section is mirrored in Chapters 3 and 4 to assist in cross referencing current resource and resource use management with resource conditions and trends (Chapter 3) and management opportunities (Chapter 4). Collectively, these management actions represent current management of BLM-administered lands within the RMP planning area and will form the basis of the no action alternative in the RMP/EIS. This management direction would continue into the future without additional RMP changes.

Plan Decision Guidance

The BLM Land Use Planning Handbook (Handbook 1601-1, Appendix C), available at the GSFO and the BLM Web site (<http://www.blm.gov/nhp/efoia/wo/handbook/h1601-1.pdf>), provides specific and updated direction concerning land use plan decisions that need to be made during the revision process. The relevant decision guidance for each resource, resource use, and special designation are contained in **Appendix A**. The following is a brief summary of the types of decisions that are made in an RMP.

The RMP will express desired outcomes or desired future conditions in terms of specific goals, standards, and objectives. These will direct the BLM's actions most effectively in meeting legal mandates, such as the Endangered Species Act of 1973 (ESA), numerous regulatory responsibilities, national policy (including BLM strategic plan goals), State Director guidance (see 43 CFR 1610.0-4 [b]), and other resource or social needs.

The RMP will identify goals and objectives. Goals are generally broad statements of desired conditions, such as maintaining ecosystem health and productivity, promoting community stability, and ensuring sustainable development; they are often not quantifiable. Standards are descriptions of physical and biological conditions or the degree of function required for healthy lands and sustainable uses; standards may address both site-specific and landscape or watershed-scale conditions. Objectives identify specific desired conditions for resources; objectives will establish desired time frames, as appropriate and will be developed using quantifiable measures whenever practical.

In the RMP, the BLM will identify appropriate uses, or allocations, that are allowable on BLM-managed lands. These allocations will identify surface lands and subsurface mineral interests where uses are allowed, including any restrictions that may be needed to meet goals, standards, and objectives. It will also identify lands where specific uses are excluded to protect resource values. Certain lands may be open or closed to specific uses based on legislative, regulatory, or policy requirements, or criteria to protect sensitive resource values. If land use plans close areas of 100,000 acres or greater to a particular use, Congress must be notified of the closure, as prescribed in 43 CFR 1610.6.

The RMP will identify management actions that would likely be needed to achieve desired outcomes of the plan. These actions may include proactive measures, such as those that could be taken to enhance watershed function and condition) or reasonable development scenarios for allowable uses, such as motorized trails, mineral development, recreation, timber harvest, utility corridors, and livestock grazing. These management actions provide a context for the land use plan's decisions, an analytical base for the NEPA analysis, and a basis for future budgeting and resource requests.

In the RMP, the BLM will establish administrative designations or recommendations for ACECs, research natural areas (RNA), and national natural landmarks and, where appropriate, will recommend or make findings of suitability for congressional designations, such as WSR status.

The Glenwood Springs RMP was approved in January 1984. This RMP provides management direction to approximately 566,000 acres of BLM-administered public lands within the GSFO. Since being approved, the RMP has been amended seven times (**Table 2-1**).

The one ongoing RMPA is the Roan Plateau EIS-level RMP Amendment for approximately 73,602 acres of BLM-administered public lands within the GSFO. The second of two RODs is pending approval.

Since being approved, the major implementation-level activity plans that have been completed with some projects implemented are the Bocco Mountain Special Recreation Management Area (SRMA) and the Gypsum Hills SRMA (ongoing).

2.1 RESOURCES

2.1.1 Air Quality

Management Objectives

The objective for managing this resource is to limit air quality degradation in the resource area by ensuring that public land use activities are in compliance with federal, state, and local legislation.

Management Actions

Glenwood Springs Field Office Resource Management Plan (Revised 1988)

The action for managing this resource is to inventory air quality to establish a baseline from which changes associated with the BLM's or other agencies' proposals can be determined. Another action is to ensure that proposals comply with all applicable local, state, and federal regulations to limit air quality degradation.

2.1.2 Geology

The 1984 RMP did not specifically address management objectives or management actions for geologic resources.

2.1.3 Soil Resources

Management Objectives

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 11: To protect the municipal watersheds providing domestic water for the communities of Rifle and New Castle, to manage debris flow hazard zones adjacent to Glenwood Springs, and to protect watershed conditions in erosion hazard areas.

Management Actions

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 11-12: Take measures to protect 7,126 acres of debris flow hazard zones and 50,200 acres of erosion hazard areas. Restrict motorized vehicle use, vegetation manipulations, timber harvesting, mineral development, fire, livestock grazing, and utility development in these areas, as shown in Table 1 [of the Record of Decision and RMP GSRA]. In addition, designate the debris flow hazard zones adjacent to Glenwood Springs as an ACEC.

Glenwood Springs Resource Area Oil and Gas Leasing and Development ROD and RMPA (1999)

P. 8: No Surface Occupancy (NSO) Stipulation #15 for Steep Slopes. To maintain site stability and site productivity, no surface disturbance for oil and gas facilities will be authorized on slopes greater than 50 percent. If the lessee demonstrates that operations can be conducted without causing unacceptable impacts and that less restrictive measures will protect the public interest, this NSO can be waived. This NSO does not apply to pipelines.

P. 11-12: Controlled Surface Use (CSU) Stipulation #4 for Erodible soils and Slopes Greater Than 30 Percent. Special design, construction, operation, and reclamation measures will be required to limit the amount of surface disturbance, to reduce erosion potential, to maintain site stability and productivity, and to ensure successful reclamation in identified areas of highly erodible soils and of slopes greater than 30 percent. Highly erodible soils are soils in the “severe” and “very severe” erosion classes, based on Natural Resources Conservation Service’s (NRCS) Erosion Condition mapping. Areas identified in the RMP as Erosion Hazard Areas and Water Quality Management Areas are also included in this stipulation. Implementation may include relocation of operations beyond 200 meters.

The surface use plan of an application for permit to drill (APD) submitted for wells on erodible soils or slopes greater than 30 percent must include specific measures to comply with the Glenwood Springs Field Office Reclamation Policy, such as

stabilizing the site to prevent settling, land sliding, slumping, high wall degradation, and controlling erosion to protect the site and adjacent areas from accelerated erosion and sedimentation and siltation of nearby water sources.

Specific performance objectives for the plan include the following:

- Limitation of total disturbance to 3.0 acres or the well pad;
- Limitation of the interim in use area to half an acre; and
- Maximizing the area of interim reclamation that is shaped to a grade of 3:1 or less; any planned high wall must be demonstrated to be safe and stable and to include enhanced reclamation and erosion prevention measures as needed.

The operator must also evaluate the site's reclamation potential based on problematic characteristics of the site (slope, aspect, vegetation, depth of soils, soil salinity, and alkali content) and a comparison of the site with comparable sites already constructed.

Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado (1997)

P. 6: Standard 1—Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate, land form, and geologic processes. Adequate soil infiltration and permeability allows for the accumulation of soil moisture necessary for optimal plant growth and vigor and minimizes surface runoff. Indicators include the following:

- Expression of rills and soil pedestals is minimal;
- Evidence of actively eroding gullies (incised channels) is minimal;
- Canopy and ground cover are appropriate;
- There is litter accumulating in place and is not sorted by normal overland water flow;
- There is appropriate organic matter in soil;
- There is diversity of plant species with a variety of root depths;
- Upland swales have vegetation cover or density greater than that of adjacent uplands; and
- There are vigorous desirable plants.

GSFO Roan Plateau Planning Area RMPA (2007)

P. S-5: Soils would be managed on a watershed level to meet land health standards. A no ground disturbance (NGD)/NSO restriction is proposed for slopes steeper than 50 percent. A site-specific relocation (SSR)/CSU restriction is stipulated for areas with highly erodible soils on slopes steeper than 30 percent.

Existing Management, Monitoring, Marketing, Interpretation, and Partnerships/Collaboration Practices

Management

Current soils stipulations for oil and gas development are generally being applied. However, NSO and CSU stipulations are applied depending on proposed actions under a variety of resource uses. Where necessary, the RMP revision should address areas where NSO and CSU stipulations would be exempted for resource uses other than oil and gas (e.g., trail building). BMP's and tools identified in the *Gold Book* – Surface Operating Standards and Guidelines for Oil and Gas exploration will be implemented for these activities to meet the objectives of Standard 1 and reduce sedimentation downstream.

Land Health Standard 1 is being implemented through annual land health assessments (LHAs) on a watershed basis using Technical Reference 1734-6, Version 4-2005 as a guide.

Management actions identified in the GSFO RMP/Record of Decision (ROD) are being implemented and supported by 1999 Oil and Gas Final EIS, which further defined CSU and NSO stipulations for fragile soils and steep slopes. The Glenwood Springs debris flow zone restriction on timber harvesting was determined to be superseded by the Fire Management Plan (FMP) of 2002, which amended the 1988 RMP.

The NSO is being implemented on gas production-related actions and are not necessarily applicable to all other resource uses. The NSO is subject to management discretion on a case-by-case basis.

The CSU stipulation is currently being implemented on gas production-related actions and is not necessarily applicable to all other resource uses. The CSU is subject to management discretion on a case-by-case basis.

Monitoring

LHAs across the planning area are scheduled to be completed by 2011. Soils are evaluated during each assessment by using the criteria outlined in the above table. To date, land health standards for soils are largely being met with few exceptions. One notable exception has been identified in the Hubbard Mesa area (north of Rifle, Colorado) due to livestock grazing and heavy OHV use. Land health standards and guidelines are enforced through the grazing regulations (CFR 4180) when grazing is determined to be a causal factor. When other resource uses, such as OHV use, are determined to be causal factors, there is not necessarily a mechanism in place to initiate changes. It would be beneficial to have the RMP revision address lacking mechanisms to provide a way to meet land health standards for a variety of resource uses.

Marketing/Interpretation/Partnerships/Collaboration

Currently there are no goals for marketing and interpretation. The NRCS is recognized as the federal agency responsible for soil survey development and interpretation, although the BLM does collaborate on a number of soil surveys. Interagency work is needed to complete and publish the survey for the Routt County Soil Survey.

The BLM does consult with the City of Rifle concerning gas field development in the Rifle City Watershed (Beaver Creek and Colorado River). No recent actions have driven work in the Glenwood Springs debris flow zone and watershed area. Planning requires that the BLM collaborate with the Town of New Castle when authorizing work in that town's watershed, although no recent actions have prompted cooperation.

2.1.4 Water Resources

Management Objectives

Surface Water

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 9: Maintain or improve existing water quality in the resource area, where possible.

P. 11: Increase water yield throughout resource area through forest management practices and vegetation manipulation for livestock and big game forage.

Groundwater

Glenwood Springs Field Office Resource Management Plan (revised 1988)

No specific objectives for groundwater.

Management Actions

Surface Water

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 10: Identify the origins of water quality problems and take actions to correct them: (1) Divide Creek; (2) Horse, Willow, and Poison Creeks; (3) Upper Colorado River; (4) Milk and Alkali Creeks.

P. 11: Protect the municipal watersheds of Rifle and New Castle by limiting motorized vehicle travel to designated roads and trails, prohibiting vegetation manipulations and oil and gas surface facilities, and including the watersheds in the fire exclusion zone.

P. 11: Manage debris flow hazard zones adjacent to Glenwood Springs by designating them as an ACEC, limiting motorized vehicles to existing roads and

trails, prohibiting vegetation manipulations, timber harvesting, and oil and gas surface facilities, including them in the fire exclusion zone, and allowing light livestock grazing only.

P. 11: Protect erosion hazard areas by limiting motorized vehicle travel to existing roads and trails.

Glenwood Springs Resource Area Oil and Gas Leasing and Development ROD and RMPA (1999)

Pp. 3, 6-8: Riparian and wetland zones, major river corridor, domestic watershed areas, debris flow hazard zones, steep slope areas, and ACECs will be protected with NSO stipulations on oil and gas leases.

Pp. 3, 11-12: CSU stipulations will be issued for riparian and wetland zones and areas with erodible soils or steep slopes.

Glenwood Springs Resource Area Fire Management Plan (revised 2004)

Chapter 3, p. 12: Avoid aerial application of retardant or foam within 300 feet of any body of water.

Chapter 3, p. 12: Minimize sediment transport into the Colorado River and specified tributaries by minimizing vegetation loss, placing fire lines to minimize erosion, constructing water bars, and rehabilitating affected areas.

Chapter 3, p. 15: Attempt to minimize vegetation loss within 100 yards of fish-occupied drainages to create a buffer for sediment control.

Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado (1997)

Pp. 6-7: Standard 5—The water quality of all water bodies, including groundwater where applicable, located on or influenced by BLM lands will achieve or exceed the water quality standards established by the State of Colorado. Water quality standards for surface water and groundwater include the designated beneficial uses, numeric criteria, narrative criteria, and antidegradation requirements set forth under state law in 5 Colorado Code of Regulation (CCR) 1002-8, as required by Section 303(c) of the Clean Water Act. Indicators include the following:

- Appropriate populations of macroinvertebrates, vertebrates, and algae are present, and
- Surface and groundwaters contain substances, such as sediment, scum, floating debris, odor, and heavy metal precipitates on channel substrate, that are attributable only to humans within the amounts, concentrations, or combinations, as directed by the water quality standards established by the State of Colorado (5 CCR 1002-8).

GSFO Roan Plateau Planning Area RMPA (2007)

P. S-4: Most of the top of the plateau will be designated as a Watershed Management Area, which will be protected by SSR of more than 200 meters for surface disturbance and CSU restrictions, as needed.

P. S-4: Stream segments found eligible for WSR designation will be protected by an SSR/CSU restriction stipulation until a suitability determination is made.

P. S-5: Soils will be managed to meet land health standards, with an NGD/NSO restriction for slopes steeper than 50 percent and an SSR/CSU restriction for areas with highly erodible soils on slopes steeper than 30 percent.

P. S-4: Surface water will be managed to meet all state and federal water quality standards based on NGD/NSO, SSR/CSU restrictions and best management practices (BMPs).

Chapter 2, p. 30: Ensure authorized activities comply with all applicable water quality standards and that objectives associated with management of the watershed management area are achieved.

Existing Management, Monitoring, Marketing, Interpretation, and Partnerships/Collaboration Practices

Surface Water

RMP

- Recommendations and decisions went into effect on approval of the RMP;
- Watershed activity plans were developed and implemented for the highest priority areas: Milk and Alkali Creek (1985), Poison Creek (1985), and Horse and Willow Creek (1986).

Land Health Standard 5 (Water Quality)

- In effect since the amendment.

Oil and Gas

- Implemented (subject to valid and existing rights) as new leases are issued, new APDs are approved, and new ROWs are issued, and

Fire Management Plan

- Decision approved as part of 2004 FMP revision (BLM 2004a).

LHAs indicate that management needs to be changed in some areas to restore damaged lands and resources and to keep abreast of current public usage and future demand. Many areas of sensitive soils around Rifle, Gypsum, and Eagle are being damaged by OHV use. Both legal and illegal public uses of these areas have increased significantly due to population growth and development. Travel management is a very important tool to address these resource issues. The areas

around Gypsum and Eagle were recognized as Erosion Hazard Areas in the RMP due to the fragile nature of their erodible soils, and the RMP offered protection by limiting motorized vehicle travel to existing roads and trails. Despite the Erosion Hazard Area designation, these areas have not received the management and enforcement needed to protect them. This inadequacy needs to be addressed in the RMP revision. Once damaged, restoring these lands will likely take decades considering the semiarid conditions in which they occur. Hubbard Mesa and the Government Creek corridor (stream and riparian zones) are not under any special designation, but they need to be protected from the resource destruction being caused by motorized vehicles. Many informal trails criss-cross the landscape in this region, causing erosion and damaging terrestrial and riparian vegetation.

Travel management is directly related to water quality due to erosion and sediment production potential. The main stem of the Colorado River from the Roaring Fork River downstream to the Gunnison River is listed for sediment impairment on Colorado's Monitoring and Evaluation list. This means that there is reason to believe that sediment concentrations are not meeting water quality standards, but more data is needed to support or deny the suspicion. Because BLM strives to manage water resources to meet state water quality standards, sustainable travel management is necessary to minimize recreational contributions to sediment pollution.

Natural gas development and its related surface disturbance on a landscape level needs to be examined in the RMP revision. The cumulative impacts from individual projects are often referred to in the RMP, thus it is imperative that it be addressed adequately in this document.

Watershed collaboration is an emerging trend that offers opportunities for the BLM to work with federal, state, and local partners to achieve common watershed goals and to improve water quality in the resource area. Much of this collaboration has focused on a more holistic approach to nonpoint and point source pollution. Regulating point sources, such as industrial pollution—the “low-hanging fruit”—through the National Pollutant Discharge Elimination System has largely been successful. Now attention has turned toward nonpoint source pollution, generated from the more diffuse sources where there are no clear pipes or outlets to determine the source. Stormwater, agriculture, construction, and forestry are some of the largest sources of nonpoint source pollution.

The BLM provides input and collaborates with the Colorado Water Quality Control Commission on 303(d) listing for water-quality impaired stream segments, particularly on BLM lands. A BLM representative also participates in the Colorado River Basin Roundtable as a liaison. The goal of the roundtables process is to facilitate discussions on water management issues within each river basin and to encourage locally driven collaborative solutions. The Colorado Water Quality Monitoring Council has started a data sharing network to function as a clearinghouse for water quality data in the state, in which the BLM has an opportunity to take part. The objective of the data-sharing network is to reduce duplicative sampling efforts

within basins and to allow nonprofit organizations, government agencies, and other entities with limited funding to focus inventory and monitoring efforts in areas with scarce or no data.

An opportunity exists in this RMP revision to remove the water yield objective from the existing RMP. The goal of increasing water yield through forestry practices and vegetation manipulation no longer enjoys political or public support. Water yield will be affected indirectly through such actions as vegetation treatments and forest thinning to benefit livestock, wildlife, forestry, and other management programs.

The RMP revision also has the option of formalizing the inventory of and application for water rights to benefit BLM programs in livestock, wildlife, recreation, and other uses. The BLM is working with the Colorado Water Conservation Board (CWCB) in collecting stream flow and fisheries data and making in-stream flow water right recommendations for suitable streams and rivers in the resource area. Only the CWCB can hold in-stream flow water rights in Colorado.

2.1.5 Vegetative Communities

Management Objectives

Forests, Woodlands, and Rangelands

Glenwood Springs Field Office Resource Management Plan (revised 1988)

(Pp. 18, 20, and 31): The 1984 RMP (revised in 1988) did not specifically identify outcome-based management objectives for upland vegetation (forests, rangelands, and woodlands). However, the 1984 RMP did state the following objectives related to vegetation management:

- Provide approximately 57,933 animal unit months (AUMs) of big game forage (the amount needed to meet Colorado Department of Natural Resources, Division of Wildlife (CDOW) big game population goals in 1988) to improve wildlife habitat conditions and to increase wildlife species diversity;
- Provide 56,885 AUMs of livestock forage, commensurate with meeting Colorado's Public Land Health Standards; and
- Manage all suitable commercial forest land and woodland to meet saw timber and fuel wood demand and maintain stand productivity.

Riparian Areas and Wetlands

Glenwood Springs Field Office Resource Management Plan (revised 1988)

The 1988 RMP did not specifically address outcome-based management objectives for riparian areas and wetlands.

Management Actions

The following management actions are approved with the GSFO RMP/ROD, approved with an RMPA, or being implemented and are ongoing.

Forests, Woodlands, and Rangelands

Glenwood Springs Field Office Resource Management Plan (revised 1988)

p. 52: Required Management Stipulations to be included in project designs:

- Areas receiving moderate to high soil disturbance during treatment or an understory ground cover less than 10 percent will be seeded with a mixture of grass, forb, and browse species. Livestock grazing will be prohibited on all seeded areas for two growing seasons.

Glenwood Springs Resource Area Oil and Gas Leasing and Development ROD and RMPA (1999)

P. 3: Conditions of approval (COAs) may be attached to any oil and gas development activity. COAs establish common management practices to reduce the adverse impacts associated with oil and gas development and associated ROWs.

Glenwood Springs Resource Area Oil and Gas Leasing and Development FSEIS (1999)

P. D-2: All surface disturbances will be recontoured and revegetated according to an approved reclamation plan. Reclamation will be considered successful when the objectives described in the Glenwood Springs Resource Area Reclamation Policy (see Appendix I of the Draft SEIS) are achieved. Specific performance objectives for vegetation reclamation include:

- No noxious weeds are present;
- Undesirable vegetation comprises little (less than 5%) of the species composition on sites with three or more growing seasons;
- Desirable vegetation appears vigorous and self sustaining; and
- Adequate diverse vegetation is present.

Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado (1997)

P. 7: Standard 3—Healthy, productive plant and animal communities of native and other desirable species are maintained at viable population levels commensurate with the species and habitat potential. Plants and animals at both the community and population level are productive, resilient, diverse, vigorous, and able to reproduce and sustain natural fluctuations and ecological processes. Indicators include the following:

- Noxious weeds and undesirable species are minimal in the overall plant community;

- Native plant and animal communities are spatially distributed across the landscape with a density, composition, and frequency of species suitable to ensure reproductive capability and sustainability;
- Plants and animals are present in mixed age classes sufficient to sustain recruitment and mortality fluctuations;
- Landscapes exhibit connectivity of habitat or presence of corridors to prevent habitat fragmentation;
- Photosynthetic activity is evident throughout the growing season;
- Diversity and density of plant and animal species are in balance with habitat/landscape potential and exhibit resilience to human activities;
- Appropriate plant litter accumulates and is evenly distributed across the landscape; and
- Landscapes composed of several plant communities that may be in a variety of successional stages and patterns.

GSFO Roan Plateau Planning Area RMPA (2007), Vol. III, Appendix J

P. J-1: Appendix J describes the goals, objectives, success criteria and monitoring activities that will be applied to all ground-disturbing activities in the Roan Plateau planning area. The following are Short-Term (Two-Year) Interim Reclamation Objectives and Success Criteria for vegetation resources:

- Establish and maintain a healthy and diverse composition of the species naturally growing on the site, which will provide for natural plant and community succession; and
- Prevent establishment of noxious weeds and undesirable plants on the disturbed areas and expansion onto adjacent uninfected areas.

Long-Term (Five-Year) Interim and Final Reclamation Objectives and Success Criteria for vegetation resources include:

- Achieve or exceed the pre-disturbance cover and diversity of native species on the site. Total cover will be at least 80 percent of the reference area and have a similar composition of woody, grass-like and herbaceous species.

State of Colorado A-, B-, or C-listed noxious weeds or other undesirable plant species will be absent (including kochia and Russian-thistle), with an exception for cheatgrass. If cheatgrass is present adjacent to the disturbed area in overall concentrations of less than 50 percent cover, the percentage vegetative cover of cheatgrass on the reclaimed site will not exceed five percent. In areas where adjacent lands have greater than 50 percent cheatgrass cover, the percentage cover on reclaimed lands will not exceed 30 percent.

Riparian Areas and Wetlands

Glenwood Springs Field Office Resource Management Plan (revised 1988)

Designate the Lower Colorado River as an ACEC to protect important riparian and wildlife values.

Management actions that were specific to riparian areas and wetlands included the following:

- Designate as sensitive for utility and communication facilities;
- Enhance habitat through cottonwood, willow, and shrub plantings;
- Create additional wetland, riparian, and pond habitat through sand and gravel mining; and
- Potentially exclude livestock grazing with fencing.

Riparian habitat stipulations to be included in project design:

- Surface disturbance will be restricted in or near riparian areas.
- Fences should be constructed to minimize impact on significant riparian and aquatic habitat.
- Equipment will not be allowed to move up or down stream channels. Heavy equipment will cross stream channels only at designated or constructed crossings...
- Fire retardant will not be dropped within 100 yards of any wetland riparian area. Drops of retardant will be made parallel to and not across drainages.
- Fire lines, angular or perpendicular to a drainage, will not be allowed within 300 feet of a drainage to reduce soil movement into the drainage system.
- If visitor use causes adverse impacts on critical riparian habitat, the visitor use will be reduced until the vegetation conditions are restored.

Glenwood Springs Resource Area Oil and Gas Leasing and Development ROD and RMPA (1999) (Pp. 3, 6, and 11)

Special management areas, including...riparian and wetland zones, major river corridors...will be protected with NSO stipulations on oil and gas leases. NSO Stipulations (Appendix A) – To maintain the proper function of riparian zones, activities associated with oil and gas exploration and development, including roads, transmission lines, and storage facilities, are restricted to an area beyond the outer edge of the riparian vegetation. Exception: a) An exception may be granted if the AO determines that the activity will cause no loss of riparian vegetation, or that the vegetation lost can be replaced within three to five years with vegetation of like species and age class; b) Within the riparian vegetation, an exception is permitted for stream crossings, if an area analysis indicates that no suitable alternative is available.

CSU stipulations will be issued for...riparian and wetland zones... CSU Stipulations (Appendix A) – Within 500 feet of the outer edge of the riparian or wetland vegetation, activities associated with oil and gas exploration and development, including roads, pipelines, and well pads, may require special design, construction, and implementation measures, including relocation of operations beyond 200 meters, in order to protect the values and functions of the riparian and wetland zones.

Major river corridors will be protected with an NSO stipulation on oil and gas leases within a half mile of either side of the high water mark (bank full stage) of six major rivers: Colorado, Roaring Fork, Crystal, Frying Pan, Eagle, and Piney. Certain exceptions apply.

Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado (1997)

P. 2: Standard 2—Riparian systems associated with both running and standing water function properly and have the ability to recover from major disturbance, such as fire, severe grazing, or 100-year floods. Riparian vegetation captures sediment and provides forage, habitat, and biodiversity. Water quality is improved or maintained. Stable soils store and release water slowly. Indicators include the following:

- Vegetation is dominated by an appropriate mix of native or desirable introduced species;
- Vigorous desirable plants are present;
- There is vegetation with diverse age class structure, appropriate vertical structure, and adequate composition, cover, and density;
- Streambank vegetation is present and is composed of species and communities that have root systems capable of withstanding high streamflows;
- Plant species present indicate maintenance of riparian moisture characteristics;
- Stream is in balance with the water and sediment being supplied by the watershed (e.g., no headcutting and no excessive erosion or deposition);
- Vegetation and free water indicate high water tables;
- Vegetation colonizes point bars with a range of age classes and successional stages;
- An active floodplain is present;
- Residual floodplain vegetation is available to capture and retain sediment and dissipate flood energies;
- Stream channels with size and meander pattern appropriate for the stream's position in the landscape and parent materials; and

- Woody debris contributes to the character of the stream channel morphology.

Existing Management, Monitoring, Marketing, Interpretation, and Partnerships/Collaboration Practices

Forests, Woodlands, and Rangelands

- There are 44,762 current permitted AUMs;
- Current demand for saw timber and fuel wood is rather low in the RMP planning area. Small fuel wood sales remain open on public land in Garfield and Eagle Counties. The Black Mountain Beetle-Kill and Hazardous Fuel Reduction Project is currently addressing timber demand in Routt County and attempting to reduce stand mortality and maintain stand productivity. Pole-cutting areas have also been made available as needed; and
- Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado is ongoing.

In January 1997, the Colorado BLM approved the Standards for Public Land Health, which describes conditions needed to sustain public land health and relate to all uses of the public lands. The GSFO has divided the field office into 13 “landscape units” and completes an LHA on one landscape each year. The LHA determines whether the landscape or portions of the landscape are meeting or not meeting one or more of the standards. This information is then used to decide if changes in management are needed or if vegetation treatment projects are desirable for maintaining or moving toward meeting the standard for healthy plant communities.

If livestock grazing is a significant contributing factor in the failure to meet any of the standards, appropriate actions are initiated to make progress toward meeting them. These actions may include changes in grazing systems, fencing of riparian areas to exclude or limit grazing, and designing and implementing vegetative treatments to restore land health. Changes in grazing systems are designed to adhere to the guidelines for livestock grazing management, which are intended to promote plant health by providing for one or more of the following:

- Periodic rest or deferment from grazing during critical growth periods;
- Adequate recovery and regrowth periods; and
- Opportunity for seed dissemination and seedling establishment.

Current upland vegetation management focuses on identifying and treating areas where vegetative communities are not meeting land health standards or management objectives.

In general, areas where vegetative treatments may be needed to move toward meeting land health standards or land health objectives are identified through the

LHA process. In addition, vegetative studies have been conducted in sagebrush habitat in Eagle County to assess the condition of the sagebrush communities, relative to the habitat needs for greater sage grouse and other sagebrush-dependent species. The GSFO has also conducted monitoring studies on selected grazing allotments to determine whether management objectives are being met. Techniques employed have included Daubenmire transects, nested frequency transects, line-intercept transects, one-meter by one-meter photo plots, and photo points.

Vegetation treatment projects have included selective removal of encroaching pinyon pine and Utah juniper trees in sagebrush communities, brush beating of sagebrush communities, mechanical thinning of pinyon-juniper woodlands, and prescribed fire.

Based on the Colorado Guidelines for Livestock Grazing Management, “Where reseeding is required, on land treatment efforts, emphasis will be placed on using native plant species. Seeding of nonnative plants species may be considered based on local goals, native seed availability and cost, persistence of nonnative plants and annuals and noxious weeds on the site, and composition of nonnatives in the seed mix” (BLM 1997).

The 1998 Draft Oil and Gas RMPA, Appendix I, pp. I-1 through I-5 provides details on the policy for reclamation practices and objectives. The Final Oil and Gas RMPA, Appendix D, pp. D-2 through D-4 contains additional COAs designed to achieve acceptable reclamation of vegetative resources.

Riparian Areas and Wetlands

Most management practices for riparian areas and wetlands have been focused on improving grazing management (i.e., changing the duration of grazing use, reducing animal units, and improving grazing distribution). Reducing the duration of grazing use and improving livestock distribution are generally the key to meeting riparian area and wetland objectives. Improved grazing management has been accomplished by employing a variety of actions, such as making adjustments in grazing permits (including adding terms and conditions designed to maintain/improve riparian zones and wetlands, adding utilization/trampling limits, adding herding/riding requirements, and/or placing salt and supplemental feed away from riparian zones), constructing water developments in uplands, constructing exclosures and riparian pasture fencing, ensuring compliance with maintenance of range improvements, and ensuring compliance with grazing permits. Season-long grazing has generally been found to be most detrimental to riparian zones. Rest rotation grazing systems have also been found to be unsuccessful at improving the condition of riparian zones because these typically increase the duration of grazing use in pastures that are not rested. Construction of corridor fencing (i.e., exclosures) to protect riparian zones from grazing, although they can be effective, have very high construction and maintenance costs and probably should be considered as a last resort compared to other alternatives.

Another focus of riparian area management in the GSFO has been on Horse Creek. In 1984, the BLM acquired 2,435 acres known as the Dotsero Wildlife Area in the Horse Creek and Sheep Creek area through a land exchange with the CDOW. As part of this land exchange, the BLM also acquired the highest priority water rights on Horse Creek (the Snodgrass and Manners Ditch water right of 2.7 cubic feet per second [cfs] and the Tuke Ditch water right of 0.7 cfs). The BLM must use its water rights to maintain them in accordance with state law. Before the BLM's acquisition of these water rights, the CDOW had not used them and virtually all the Horse Creek water was being diverted down Willow Creek by another water right holder. The historic irrigated fields had been abandoned and were reverting back to native rangeland. Riparian vegetation along Horse Creek was declining due to the lack of water, and the fishery that once existed had disappeared. In 1986, the BLM began exercising its priority water rights by irrigating the historic fields in the Horse Creek area. This effort was initially done by BLM employees, but this proved to be impractical since proper irrigation of the area required daily attention. In 1995, the BLM entered into a cooperative agreement with the grazing permittee, Luark Land Company, to administer the water rights by irrigating the historic fields. The work also includes maintenance, such as repairing/cleaning ditches, and repair/installation of headgates. It was thought this arrangement would be best since Luark Land Company is headquartered near the irrigation project and could provide daily attention to it. The project has resulted in maintenance of in-stream flows in Horse Creek, improved riparian conditions, a return of the fishery in Horse Creek, and improved habitat for big game and other wildlife species. Other partners involved in the project include Habitat Partnership Program and the CDOW.

Other existing management practices that have occurred with the GSFO include the following:

- Willow and cottonwood plantings;
- Reclamation of disturbed riparian/wetland areas;
- Tamarisk removal and control of other noxious weeds;
- In-stream flow studies/assessments;
- Application to oil and gas activities (leases, APDs, ROWS) and other land use activities to protect and reclaim riparian areas and wetlands; and
- Installation of structures within stream channels.

To determine whether management objectives are being met, the GSFO has monitored a number of riparian zones. Techniques commonly used are trend photo points and stubble height measurements. Priority has been placed on those riparian zones with known resource problems (e.g., areas that are functioning at risk (FAR) with a downward trend (DOWN)). In addition to monitoring, the GSFO conducts proper functioning condition (PFC) assessment annually as part of LHAs within landscapes.

The GSFO has had a long-standing partnership with Trout Unlimited. Most of their emphasis has been on improving the riparian zone and aquatic habitat along Trapper Creek. The GSFO range staff has worked closely with grazing permittees to ensure success in improved grazing management and the condition of riparian zones.

2.1.6 Fish and Wildlife Habitat

Management Objectives

Terrestrial Wildlife

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 16: To provide approximately 57,933 AUMs of big game forage (the amount needed to meet CDOW big game population goals in 1988), to improve existing habitat conditions, and to increase wildlife species diversity.

Aquatic Wildlife/Fisheries

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 14: To increase fish production and recreational fishing use on streams having more than one-half mile of continuous flow across public land and on lakes surrounded by at least 40 acres of public land. (Only streams and lakes with existing or easily obtainable public access and either an existing or potential fishery qualify for management).

Management Actions

The following management actions are approved with the GSFO RMP/ROD or approved with a RMPA or are being implemented and are ongoing.

Terrestrial Wildlife

Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado (1997)

P. 7: Standard 3—Healthy, productive plant and animal communities of native and other desirable species are maintained at viable population levels commensurate with the species and habitat potential. Plants and animals at both the community and population level are productive, resilient, diverse, and vigorous and are able to reproduce and sustain natural fluctuations and ecological processes. Indicators include the following:

- Noxious weeds and undesirable species are minimal in the overall plant community;
- Native plant and animal communities are spatially distributed across the landscape with a density, composition, and frequency of species suitable to ensure reproductive capability and sustainability;

- Plants and animals are present in mixed age classes sufficient to sustain recruitment and mortality fluctuations;
- Landscapes exhibit connectivity of habitat or presence of corridors to prevent habitat fragmentation;
- Photosynthetic activity is evident throughout the growing season;
- Diversity and density of plant and animal species are in balance with habitat/landscape potential and exhibit resilience to human activities;
- Appropriate plant litter accumulates and is evenly distributed across the landscape; and
- Landscapes composed of several plant communities that may be in a variety of successional stages and patterns.

Glenwood Springs Resource Area Oil and Gas Leasing and Development ROD and RMPA (1999)

Pp. 7-11: NSO stipulations will be used to protect raptor nests. NSO within fourteen seclusion areas that provide high wildlife value are the Roan Cliffs, Cottonwood Gulch, and Webster Hill/Yellowslide Gulch (all in the Navy Oil Shale Reserve Production Area), Hayes Gulch, Riley and Starkey Gulch, Crawford Gulch, Magpie Gulch, Paradise Creek, Coal Ridge, Lower Garfield, Jackson Gulch, Bald Mountain, and Battlement Mesa.

Timing limitations designed to protect crucial habitat during birthing, fledgling and nesting (big game species, raptor species, white pelicans, and waterfowl and shorebirds).

Glenwood Springs Resource Area Fire Management Plan (revised 2004)

Chapter III, pp. 13-16, Chapter IV, pp. 27-29: Timing limitations and other mitigations were incorporated into the FMP to protect wildlife species and their habitat.

Aquatic Wildlife/Fisheries

Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado (1997)

P. 7: Standards 1 (soils), 2 (riparian areas), 3 (healthy plant and animal communities), 4 (threatened and endangered species), and 5 (water quality) establish the standards and indicators. Each of the five standards relate to fisheries and aquatic habitats.

Glenwood Springs Resource Area Oil and Gas Leasing and Development ROD and RMPA (1999)

Pp. 2-8: NSO 2 for Riparian and Wetland Zones on oil and gas leases; NSO 3 for major river corridors on oil and gas leases; NSO within a two-mile radius of Rifle Falls and Glenwood Springs Fish Hatcheries; and NSO 15 for steep slopes on oil and gas leases.

Glenwood Springs Resource Area Fire Management Plan (revised 2004)

Chapter 3, pp. 3-15: Avoid aerial application of retardant or foam within 300 feet of any body of water, whether or not it contains aquatic life. The GSFO will provide for drainage with waterbars on constructed hand/dozer lines and affected areas in critical watershed areas. Attempts will be made to minimize losses of vegetation within 100 yards of fish-occupied drainages to minimize the potential for erosion of sediments into occupied waters.

2.1.7 Special Status Species

Special status plant and animal species are either listed as endangered or threatened or are proposed or candidate species for listing under the ESA, or those species designated by the BLM State Director as sensitive (BLM Manual 6840, Rel. 6-121).

Section 7 of the ESA requires that BLM land managers ensure that any action authorized, funded, or carried out by the BLM is not likely to jeopardize the continued existence of any threatened or endangered species and that it avoids any appreciable reduction in the likelihood of recovery of affected species. Consultation is required on any action proposed by the BLM or another federal agency that affects a listed species or that jeopardizes or modifies critical habitat.

The BLM's Special Status Species Policy outlined in BLM Manual 6840 is to conserve listed species and the ecosystems on which they depend and to ensure that actions authorized or carried out by BLM are consistent with the conservation needs of special status species and do not contribute to the need to list any of these species. The BLM's policy is intended to ensure the survival of those plants that are rare or uncommon, either because they are restricted to specific uncommon habitat or because they may be in jeopardy due to human or other actions.

By BLM policy, species proposed for federal listing are to be managed with the same level of protection provided for threatened and endangered species. The policy for federal candidate species and BLM sensitive species is to ensure that no action that requires federal approval should contribute to the need to list a species as threatened or endangered.

Other management direction is based on RMP management objectives, activity level plans, and other aquatic habitat and fisheries management direction, including 50 CFR 17, the Land Use Planning Handbook, Appendix C, Part E, Fish and Wildlife.

Management Objectives

Terrestrial Wildlife

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 16: To improve existing habitat conditions and to increase wildlife species diversity.

Aquatic Wildlife

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 16: To monitor, maintain, or improve aquatic habitat on streams and lakes containing threatened or endangered species.

Glenwood Springs Field Office Resource Management Plan FEIS (1984)

P. 94: The 1984 RMP (revised in 1988) identified one threatened plant species and six BLM Sensitive plant species that were known to occur within the Field Office. No specific management objectives were developed for these species in the RMP.

Management Actions

The following management actions are approved with the GSFO RMP/ROD or approved with a RMPA or are being implemented and are ongoing.

Terrestrial Wildlife

Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado (1997)

P. 7: Standard 4: Special status and threatened and endangered species (federal and state) and other plants and animals and their habitats officially designated by the BLM are maintained or enhanced by sustaining healthy, native plant and animal communities.

Indicators:

- All the indicators associated with the plant and animal communities standard apply;
- There are stable and increasing populations of endemic and protected species in suitable habitat; and
- Suitable habitat is available for recovery of endemic and protected species.

Glenwood Springs Resource Area Oil and Gas Leasing and Development ROD and RMPA (1999)

Pp. 7, 9-11: NSO stipulations #6, #7, #8, #9, and #10 to protect sage and sharp-tailed grouse leks and raptor nests.

NSO stipulation #12 on habitat areas for those species listed by the federal or state government as endangered or threatened and for federal proposed or candidate species.

Timing limitations #3, #4, #5, #6, #7, #8, #9, #10, #11, #12, and #13 designed to protect crucial habitat during birthing, fledgling, and nesting (grouse species, raptor species, and sandhill cranes).

P. 11: CSU stipulation #3 to protect BLM sensitive species and significant plant communities.

Glenwood Springs Resource Area Fire Management Plan (revised 2004)

Chapter 3, pp. 3-42: Timing limitations and other mitigation were incorporated into the FMP to protect federally listed and BLM sensitive species and their habitat.

Aquatic Wildlife

The following management actions are approved with the GSFO RMP/ROD or approved with a RMPA or are being implemented and are ongoing.

Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado (1997)

P. 7: Standard 4—Special status and threatened and endangered species (federal and state) and other plants and animals and their habitats officially designated by the BLM are maintained or enhanced by sustaining healthy, native plant and animal communities.

Indicators:

- All the indicators associated with the plant and animal communities standard apply;
- There are stable and increasing populations of endemic and protected species in suitable habitat; and
- Suitable habitat is available for recovery of endemic and protected species.

Glenwood Springs Resource Area Oil and Gas Leasing and Development ROD and RMPA (1999) (p. 2, 6, 7, 8)

Pp. 2, 6-8: NSO stipulation #2 for riparian and wetland zones on oil and gas leases, NSO 3 stipulation #3 for major river corridors on oil and gas leases, NSO stipulation #12 for threatened or endangered species on oil and gas leases, and NSO stipulation #15 for steep slopes on oil and gas leases.

Glenwood Springs Resource Area Fire Management Plan (revised 2004)

Chapter 3, pp. 13-15: Avoid aerial application of fire retardant or foam within 300 feet of any body of water, whether or not it contains aquatic life.

The GSFO will provide for drainage with waterbars on constructed hand/dozer lines and affected areas in critical watershed areas.

Attempts will be made to minimize losses of vegetation within 100 yards of fish-occupied drainages to minimize the potential for erosion of sediments into occupied waters.

Glenwood Springs Field Office Resource Management Plan FEIS (1984)

P. 130: Threatened, endangered, or sensitive plant species would be protected from adverse impacts of management actions through activity plans and environmental assessments (EAs) when specific site locations are identified. If a project is proposed near a known occurrence of a threatened, endangered, or sensitive species or in its habitat, a survey would be done to determine if any individuals of the species were present.

Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado (1997)

P. 7: Standard 4: Special status, threatened and endangered species (federal and state) and other plants and animals officially designated by the BLM, and their habitats are maintained or enhanced by sustaining healthy, native plant and animal communities.

Indicators:

- All the indicators associated with the plant and animal communities standard apply;
- There are stable and increasing populations of endemic and protected species in suitable habitat; and
- Suitable habitat is available for recovery of endemic and protected species.

Glenwood Springs Resource Area Oil and Gas Leasing and Development ROD and RMPA (1999)

P. 7: NSO stipulation #12 on habitat areas for those species listed by the federal or state government as endangered or threatened, and for federal proposed or candidate species. Habitat areas include occupied habitat and habitat necessary for the maintenance or recovery of the species.

P. 11: CSU stipulation #3. The BLM may require special design, construction and implementation measures, including relocation of operations by more than 200 meters, for the protection of those species listed as sensitive by BLM and for significant natural plant communities. For plants, habitat areas include occupied habitat and habitat necessary for the maintenance or recovery of the species or communities.

Glenwood Springs Resource Area Fire Management Plan (revised 2004)

P. 24: Threatened & Endangered/Special Status Species Wildland Fire Suppression Guidelines:

- Minimize surface disturbance by using retardant, water, engines/wet lines, etc in known Uinta Basin hookless cactus habitat;
- Where firefighter safety is not compromised, construct fire line outside the perimeter of known cactus populations; and

- Avoid off-route use of motorized vehicles and mechanical equipment within known cactus populations.

2.1.8 Wildland Fire Ecology and Management

Federal Wildland Fire Management Policy (FWFMP)—This policy was developed by the Secretaries of the USDI and US Department of Agriculture (USDA) in 1995 to respond to dramatic increases in the frequency, size, and catastrophic nature of wildland fires in the US. This policy was reviewed and reaffirmed by the Secretaries in 2001. The 2001 Review and Update of the 1995 FWFMP consists of findings, guiding principles, policy statements, and implementation actions. The guiding principles, policy statements, and implementation actions are called the 2001 FWFMP, which replaces the 1995 FWFMP. The 2001 Review and Update of the 1995 FWFMP directs federal agencies to achieve a balance between fire suppression to protect life, property, and resources and fire use to regulate fuels and maintain healthy ecosystems. The FWFMP provides nine guiding principles that are fundamental to the success of the federal wildland fire management program and the implementation of review recommendations. These umbrella principles compel each agency to review its policies to ensure compatibility. BLM policies were reflected through the fire management planning process and this plan.

The guiding principles are as follows:

- Firefighter and public safety is the first priority in every fire management activity;
- The role of wildland fire as an essential ecological process and natural change agent will be incorporated into the planning process;
- FMPs, programs, and activities support land and RMPs and their implementation;
- Sound risk management is a foundation for all fire management activities;
- Fire management programs and activities are economically viable, based on values to be protected, costs, and land and resource management objectives;
- FMPs and activities are based on the best available science;
- FMPs and activities incorporate public health and environmental quality considerations;
- Federal, state, tribal, local, interagency, and international coordination and cooperation are essential; and
- Standardization of policies and procedures among federal agencies is an ongoing objective.

The National Fire Plan—The Secretaries of USDI and USDA initiated the National Fire Plan (NFP) in 2000 to address the needs identified in the FWFMP.

The NFP is not an actual document but a nationally coordinated effort to protect communities and natural resources from the harmful effects of increasing wildland fire occurrence and severity in the US. The NFP establishes the overarching purpose and goals, which are articulated and carried forward through the 10-Year Comprehensive Strategy (USDA and USDI 2002), the Cohesive Strategy for Protecting People and Sustaining Natural Resources, and other supporting documents.

Policies of the National Fire Plan and the 10-Year Comprehensive Strategy—

Under the FWFMP, federal land management agencies with vegetation capable of sustaining wildland fire is required to prepare FMPs. The FMP is a strategic plan that defines a program to manage wildland and prescriptive vegetation treatments. The foundation of the FMP is the agency's land use plan. FMPs are dynamic documents that are reviewed annually and updated whenever better information is available. The plan is supplemented by operational plans, such as preparedness plans, dispatch plans, prescribed fire plans, and prevention plans. Development of this collaborative FMP is an essential implementation task and performance measure for accomplishing the goals of the NFP and the 10-Year Comprehensive Strategy. The FMP is the on-the-ground operational framework by which the Upper Colorado Fire Management Unit (FMU) will implement national direction for wildland fire suppression, wildland fire use (WFU), fuels treatment, emergency stabilization and rehabilitation (ESR), and community assistance/protection programs (see Wildland Fire Ecology and Management in 3.1.8).

The FWFMP establishes the concept of Appropriate Management Response, which is further defined in *The Interagency Strategy for the Implementation of the Federal Wildland Fire Management Policy* (USDA and USDI 2003). This policy states “A wildland fire that is not a prescribed fire requires an appropriate management response. The appropriate management response, which can range from aggressively suppressing the incident as a wildland fire, to managing the incident as a WFU event, is guided by the strategies and objectives outlined in the RMP reflecting land and resource values and objectives. The FMP outlines fire management activities and procedures to accomplish those objectives. The objective of a WFU project is to obtain resource benefits whereas a wildland fire is to be extinguished at minimum cost.” The FWFMP identified the need for a new approach to fire management on federal lands and led to the development of the NFP (www.fireplan.gov).

Management Objectives

Glenwood Springs Resource Area Fire Management Plan (revised 2004)

The GSFO fire program goals reflect the core principles and direction of the Comprehensive Strategy and the Cohesive Strategy where they are supported by the GSFO RMP. The intent of the FMP is to convey fire program direction from the NFP and the RMP to wildland fire management, fuels treatments, and community assistance/protection actions. The GSFO will work safely and effectively with

partners to manage wildland fire, use prescribed fire, and use mechanical, chemical, hand, and animal vegetation treatments to accomplish the following:

- Protect human life and property;
- Reduce hazardous fuel loading and the risks of wildfire escaping public lands to an acceptable level;
- Protect facilities on public lands (such as recreation sites and communication sites);
- Restore physical function and biological health of the land and achieve Colorado Land Health Standards at the watershed scale;
- Prevent the listing of sensitive, candidate, and proposed species and conserve species currently listed as threatened or endangered under the ESA;
- Ensure long-term survival of special status species;
- Protect existing and improve degraded riparian vegetation for long-term health;
- Limit the spread of noxious and invasive plants, insect infestations, and disease;
- Protect archaeological and historic sites;
- Minimize emissions using available, practicable methods that are technologically feasible and economically reasonable in order to minimize the impact or reduce the potential for such impact on both the attainment and maintenance of national ambient air quality standards (NAAQS) and achievement of federal and state visibility goals.

The 2002 land use plan amendment (BLM 2002a) for the FMP complemented the resource decisions in the GSFO RMP and provided the specific fire program direction to help achieve national and RMP goals and objectives. The FMP was updated and revised in 2004.

Management Actions

The following management actions were approved with the FMP RMPA and are being implemented and are ongoing.

Glenwood Springs Resource Area Fire Management Plan (revised 2004)

The GSFO FMP identified specific FMUs, and public lands administered by the GSFO were delineated into 20 FMUs. For each FMU, fire managers, fuels specialists, and resource specialists assessed the risk of wildfire, potential damage to resource values, similar vegetation type and condition, management constraints, and WUI issues. Fire management objectives and strategies were then identified based on the individual FMU assessment.

Appropriate Management Response

The appropriate management response is defined as the specific actions taken in response to a wildland fire to implement protection or fire use objectives. It allows managers to use a full range of responses, and, as conditions change, the particular response can change to accomplish the same objectives. The appropriate management response is a concept that offers managers a full spectrum of responses. It is not a replacement for prescribed natural fire or the suppression strategies of (control, contain, confine, limited, or modified). It is based on objectives, environmental and fuel conditions, constraints, safety, and ability to accomplish objectives. It includes wildland fire suppression at all levels, including aggressive initial attack. Use of this concept dispels the interpretation that there is only one way to respond to each set of circumstances. The purpose of giving management the ability to select the appropriate management response on every wildland fire is to provide the greatest flexibility possible and to promote opportunities to achieve greater balance in the program. Ranges of appropriate management responses are based on objectives, relative risk, complexity, and defensibility of management boundaries.

2.1.9 Cultural and Heritage Resources

Cultural resources are recognized as fragile irreplaceable resources with potential public and scientific uses, representing an important and integral part of our nation's heritage. Within the GSFO cultural resource management encourages responsible scientific use of cultural resources by protecting and preserving examples of cultural and historical resources and by continuing to identify and evaluate cultural resources in accordance with existing laws, regulations, and guidelines; 36CFR800, Antiquities Act of 1906 (16 USC 432, 433); Historic Sites Act of 1935 (16 USC 461); National Historic Preservation Act of 1966 (16 USC 470, as amended); NEPA of 1969 (42 USC 4321); Executive Order 11593 (36 CFR 8921); Historical and Archaeological Data-Preservation Act (of 1974 (16 USC 469); FLPMA (43 USC 1701); Archaeological Resources Protection Act of 1979 (16 USC 470a et seq., as amended), American Indian Religious Freedom Act of 1978 (42 USC 1996); Native American Graves and Repatriation Act of 1990 (25 USC 3001-3013), the American Indian Religious Freedom Act (42 USC 1996 and 1996a), and Executive Order 13007 (Indian Sacred Sites).

The 1984 RMP does not contain any specific decision guidance relating to tribal interests. However, as part of the cultural resource program, the GSFO will continue Native American consultation to identify any traditional cultural properties, sacred/religious sites, or special use areas. Letters to the Southern Ute, Ute Mountain Ute, Eastern Shoshone, Northern Arapaho, and Northern Ute tribes were sent asking for their comments and input. Phone contact will be made to confirm tribes' interest in commenting and input, and consultation with interested tribes will continue throughout the planning process. If tribally sensitive areas are identified or become known through the Native American notification or consultation process, their concerns will be addressed through planning. The GSFO will protect and preserve Native American cultural and sacred sites and Native American access to

these sites whenever possible. The GSFO will take no action that would adversely affect these areas or location without consulting the appropriate Native Americans.

Management Objectives

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 36: Protect the cultural and historical values in the resource area from accidental or intentional destruction and give special protection to high value cultural resource sites.

GSFO Roan Plateau Planning Area RMPA (2007)

Chapter 4, p. 91: To preserve and protect significant cultural resources and ensure they are available for appropriate uses by present and future generations by inventory and evaluation of cultural resources and the classification of these resources into use categories: scientific, conservation, traditional, public, experimental, or discharged from management.

Management Actions

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 36: Development and use of a cultural RMP to make decisions for cultural resources and types.

P. 36: Write annual overview and summaries of cultural resource management efforts and resources.

P. 36: Nominate Blue Hill Archaeological District to the National Register of Historic Places (NRHP).

P. 36: Inventory proposed project areas before permitting project. Take measures to protect any cultural resource found.

GSFO Roan Plateau Planning Area RMPA (2007)

Chapter 4, pp. 91-92: Identify priority geographic areas based on probability of unrecorded significant resources via development of high, medium, and low sensitivity areas.

Chapter 4, pp. 92-95: Specific mitigation treatments within each sensitivity area.

All federal undertakings, as defined by 36 CFR 800, are subject to review of cultural resources and require adequate cultural inventories within the area of potential effect. The purpose of the inventory is to identify and evaluate cultural resources (using 36 CFR 60 criteria of properties) that may be affected by the proposed undertaking. The level of inventory is determined by the National Programmatic Agreement between the BLM, Advisory Council on Historic Preservation and the National Council of State Historic Preservation Officers (1997), Colorado BLM/State Historic

Preservation Officer/BLM protocol (1998), policy, and federal laws. Additionally, all new cultural resources are allocated according to their nature and relative preservation value (BLM Manual 8110.4). These include scientific use, conservation for future use, traditional use, public use, experimental use, and discharged from management.

The GSFO is working in conjunction with Dominguez Archaeological Research Group and the Colorado Historical Society to conduct research projects on Native American wickiup habitation sites, Paleo-Indian sites, and the development of a radiocarbon database for the Colorado State Historic Preservation Officer and the Office of Archaeology and Historic Preservation.

Consultation

The BLM continues Native American consultation to identify any traditional cultural properties, sacred/religious sites, or special use areas through letters, phone calls, and on-site visits. On November 30, 2006 the GSFO/KFO invited the Ute Tribes to be a Cooperating Agency and a formal Notice of Intent consultation letter was sent on April 20, 2007. No responses were received.

If any areas are identified or become known through the Native American notification or consultation process, their concerns are addressed through the planning process. The BLM would like to protect and preserve Native American cultural and sacred sites and Native American access to these sites whenever possible. The BLM will take no action that would adversely affect these areas or locations without consultation with the appropriate Native American tribes.

2.1.10 Paleontological Resources

Management Objectives

Current management direction is based on RMP management objectives, RMPAs, and other paleontology resource management direction, including H-8270-1-Paleontological Resources Management Handbook, H-1601-1-Land Use Planning Handbook, Appendix C, I. Natural, Biological, and Cultural Resources, Part H – Paleontology.

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 34: The GSFO RMP objective for paleontological resource management is to manage the paleontological resource program as required by law and policy to protect significant paleontological values.

Management Actions

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 34: Inventory projects for paleontological resources in areas of high paleontological values before project approval. Take measures to protect any significant paleontological resources found.

Glenwood Springs Resource Area Oil and Gas Leasing and Development ROD and RMPA (1999)

P. 12: Special survey, design, construction, and reclamation measures may be required in the Sharrard Park Paleontological Area, including relocation of operations beyond 200 meters, in the identified portions of Wasatch outcrops. All management actions are implemented and ongoing.

2.1.11 Wilderness Characteristics

The GSFO does not manage any congressionally designated wilderness areas. The GSFO RMP did not address wilderness characteristics outside of Wilderness Study Areas (WSAs). During the RMP revision process, the GSFO will analyze whether any BLM-administered public lands outside of the current WSAs possess wilderness characteristics.

2.1.12 Visual Resources

Management Objectives

Visual quality is of concern to most residents in the resource area. Visual Resource Management (VRM) class decisions in the RMP were chosen to provide special emphasis to the scenic quality along Interstate (I-) 70 and Highway 82 travel corridors. Three additional areas—Deep Creek, Thompson Creek, and Bull Gulch—were proposed for special management to protect their outstanding scenic qualities.

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 38: To maintain visual quality throughout the resource area and protect unique and fragile resource values.

Management Actions

The following management actions were approved with the GSFO RMP/ROD, approved with a RMPA, or are being implemented and are ongoing.

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 38: Designate VRM classes, as shown on RMP Map 13. Manage visual resources on public land according to the objectives for each class.

P. 38: Review future project proposals to determine whether or not proposed management actions are consistent with the designated VRM classes to identify possible mitigation measures.

P. 38: Designate Deep Creek (2,380 acres) and Bull Gulch (6,714 acres) as ACECs.

Deep Creek

- Designate as unsuitable for utility and communication facilities;
- Manage under VRM Class I objectives;
- Identify as a recreation management area;

- Identify as a potential peregrine falcon introduction site; and
- Prohibit vegetation manipulations for livestock, wildlife, and timber management.

Bull Gulch

- Designate as unsuitable for utility and communication facilities;
- Close the area to off-road vehicle use;
- Designate as fire management zone ecosystem management area; and
- Identify as a recreation management area.

P. 39: Manage these areas and the Thompson Creek Natural Environment Area under Class I objectives.

P. 39: Do not identify specific visual modifications for rehabilitation.

Glenwood Springs Resource Area Oil and Gas Leasing and Development ROD and RMPA (1999)

P. 6: NSO #3. Major River Corridors. NSO stipulations within one-half mile of either side of the high water mark (bank-full stage) of six major rivers: Colorado, Roaring Fork, Crystal, Frying Pan, Eagle, and Piney. These riverine and adjacent areas provide high scenic and recreation values.

P. 6: NSO #16. Special Recreation Management Areas. For the protection of the recreational setting, recreation opportunities and recreation facilities provided within the SRMSs, the Class I VRM values in the ACECs and cave resources in Deep Creek Area, no surface occupancy will be permitted within Deep Creek, ACEC/SRMA, Deep Creek Cave Area (includes no subsurface occupancy for 5,000 feet below the surface). Bull Gulch ACEC/SRMA, Thompson Creek ACEC/SRMA, Hack Lake SRMA, and Rifle Mountain Park.

P. 9: NSO #18. The I-70 viewshed is protected with NSO stipulations on oil and gas leases. Specifically NSO stipulations apply on slopes over 30 percent with high visual sensitivity in the I-70 viewshed. Lands with high visual sensitivity are those lands within five miles of the Interstate, of moderate to high visual exposure, where details of vegetation and landform are readily discernible, and changes in visual contrast can be easily noticed by the casual observer on the Interstate.

P. 12: CSU #5. CSU stipulations will be used for areas in VRM Class II. Specifically, within VRM Class II areas, relocation of operations by more than 200 meters may be required to protect visual values.

P. 14: Lease Notice # 10. Sensitive Viewsheds. Lease notices will also be used to inform oil and gas lessees of operational concerns in sensitive viewsheds. Special design and construction measures may be required in order to minimize the visual

impacts of drilling activities within five miles of all communities or population centers throughout the GSFO, major BLM or county roads, and state or federal highways.

Decision Record and Resource Management Plan Amendment for the Red Hill Area (1999)

P. 1: Revise the VRM classification to VRM CLASS II for the Red Hill SRMA.

Glenwood Springs Resource Area Fire Management Plan (revised 2004)

Chapter 3, p. 3: During fire suppression, consider visual qualities in VRM Class I and II areas where the classification goal is to preserve landscape character and where landscape modifications are not evident.

VRM decisions for lands within the Roan Plateau planning area can be found in the Final Roan Plateau EIS, 2006.

2.1.13 Cave and Karst Resources

Management Objectives

The 1988 RMP did not specifically address management objectives for cave or karst resources. In accordance with the Federal Cave Resources Protection Act, both LaSunder and the Anvil Points Claystone Cave complex have been determined to meet the significant criteria.

Management Actions

Glenwood Springs Resource Area Oil and Gas Leasing and Development ROD and RMPA (1999)

P. 8: NSO #16. The Deep Creek Cave Area (includes no surface occupancy for 5,000 feet below the surface) is covered by a NSO stipulation to protect the cave resources.

P. 9: NSO #19. The Anvil Point Claystone Cave complex is covered by NSO stipulation to protect the scientific and wildlife values provided by the cave.

In 2006, a cave management plan was completed in coordination with Colorado Cave Survey for LaSunder Cave.

2.2 RESOURCE USES

2.2.1 Energy and Minerals

Management Objectives

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 14: To maintain the maximum amount of public land available for exploration and development of minerals.

Minerals (locatable, salable, leasable except oil and gas)

- Maximize the availability of the federal mineral estate for exploration and development, and

Glenwood Springs Resource Area Oil and Gas Leasing and Development ROD and RMPA (1999)

Facilitate orderly, economic, and environmentally sound exploration and development of the solid mineral resources.

Fluid Minerals and Geothermal Resources

Glenwood Springs Resource Area Oil and Gas Leasing and Development ROD and RMPA (1999)

P. 3: The overall objective is to facilitate orderly, economic, and environmentally sound exploration and development of oil and gas resources using balanced multiple-use management.

Management Actions

General

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 14: Continue withdrawals for other uses not compatible with mineral development. Continue existing constraints placed on mineral activities by other resources. Place constraints on mineral activities to protect high value recreation resources, wilderness resources, critical wildlife habitat, and water resources (critical watersheds). Periodically review the need for restrictions on minerals. Submit a withdrawal proposal to the Secretary of the Interior to withdraw the Deep Creek and Thompson Creek areas for recreation purposes, thus excluding mineral development in these areas. Continue to allow mineral exploration and development on lands not withdrawn for other uses or restricted to mineral activity.

Coal

The leasing of coal is authorized under the Mineral Leasing Act of 1920.

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 14: Designate approximately 28,520 acres in the Hogback Coal Field as acceptable for further consideration for coal leasing based on a coal unsuitability review. Designate approximately 1,560 acres as unacceptable for coal leasing based on multiple use conflicts as explained in the 1978 coal update of the Glenwood Springs Management Framework Plan.

Glenwood Springs Resource Area Oil and Gas Leasing and Development ROD and RMPA (1999)

P. 6: Surface Coal Mines—NSO #1. An NSO stipulation will be applied within the area of an approved surface coal mine for the conservation of natural resources.

P. 11: Underground Coal Mines—CSU #1. A CSU stipulation will be applied within the area of federally leased coal lands, and oil and gas operations will be relocated outside the area to be mined or located to accommodate room and pillar mining operations.

Oil Shale

Oil Shale Withdrawal Revocation/RMP Amendment (CO-GJFO-01-81-EA) (2001)

P. 12: The BLM amended three RMPs to revoke withdrawals placed on BLM-administered lands for the purpose of protecting the oil shale resource. The three RMPs are the White River RMP, Glenwood Springs RMP, and Grand Junction RMP, all in Colorado. This proposed action pertains only to oil shale lands withdrawn under Executive Order 5327, dated April 15, 1930, as amended, and Public Land Order 4522, dated September 13, 1968, as amended. These two oil shale withdrawal orders were no longer needed because existing regulations, policies, and land use decisions provide adequate protection and conservation of oil shale resources. The proposed action revoked these two withdrawal orders in their entirety.

The Energy Policy Act of 2005 requires development of a commercial scale leasing program for oil shale.

Fluid Minerals and Geothermal Resources

Glenwood Springs Resource Area Oil and Gas Leasing and Development ROD and RMPA (1999)

P. 3: The entire federal mineral estate in the GSFO, except the WSAs, would be open for oil and gas leasing and development;

P. 3: The BLM will apply lease stipulations and lease notices as appropriate to all new leases.

P. 3: The BLM will develop appropriate COAs for all APDs for leases issued before the 1999 RMPA, provided the COAs are consistent with lease rights granted.

P. 3: All oil and gas leases will be subject to the standard terms and conditions of an oil and gas lease.

P. 3: COA will be applied to individual permits to drill and subsequent field operations at the time of actual lease development.

P. 3: Approximately 27,760 acres of BLM-administered mineral estate within the GSFO are closed to oil and gas leasing (the WSAs).

P. 3: Special management areas will be protected with NSO stipulations on oil and gas leases. These include surface coal mines, riparian and wetland zones, major river corridors, state wildlife areas, fish hatcheries, domestic watershed areas, debris flow hazard zones, steep slope areas, ACECs, SRMAs, recreation management area, I-70 viewshed and the Anvil Points Cave Area.

P. 3: Important wildlife habitat areas will also be protected with NSO stipulations. These include grouse leks, raptor nest sites, bald eagle roost or nest sites, peregrine falcon nest complexes, Mexican spotted owl roost or nest sites, wildlife seclusion areas, and threatened or endangered species habitat. Timing limitations will additionally be used to avoid development activities during periods critical to many wildlife species.

P. 3: CSU stipulations will be used for underground coal mines, riparian and wetland zones, BLM sensitive species habitat, areas with erodible soils or steep slopes, areas in VRM Class 11, and in the Sharrard Park Paleontological Area.

P. 3: Lease notices notifying oil and gas lessees of special inventory requirements or reporting requirements will be used for Class I and II paleontological areas, biological inventory areas, annual reclamation progress reporting, and emergency communication plans.

The BLM considers leasing geothermal energy resources as each application is received.

Locatable Minerals

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 14: BLM approval will not be needed for prospectors to claim and develop locatable minerals on areas open to mineral location if proposed actions disturb five acres or less per year.

Approximately 509,612 acres are open to mineral entry and development under the Mining Law of 1872. Locatable mineral exploration and development on public land is regulated under 43 CFR 3809.

Mineral Materials (Salables)

Mineral materials are sold or permitted under the Mineral Materials Sale Act of 1947. Approximately 549,508 acres are available for mineral material (salables) disposal. Applications for mineral material removal would be processed on a case-by-case basis. Mineral material sales would not be allowed in areas considered suitable for wilderness, the Thompson Creek Natural Environment Area, and Deep Creek Recreation Management Area.

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 14: Salable minerals (moss rock, top soil, sand and gravel, scoria, fill dirt) will be primarily purchased from established common use areas.

Nonenergy Leasables

The leasing of nonenergy leasable minerals is authorized under the Mineral Leasing Act of 1920. The BLM considers leasing nonenergy mineral resources, such as potassium and sodium, as each application is received. Mineral reports and EAs are prepared on all applications for prospecting and development.

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 14: Mineral reports and EAs will be prepared for all applications to prospect and develop potassium and other leasable minerals except oil and gas.

2.2.2 Livestock Grazing Management

Management Objectives

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 20: To provide 56,885 AUMs of livestock forage commensurate with meeting public land health standards.

Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado (1997)

P. 7: Manage the grazing program to meet Colorado standards and guidelines.

Management Actions

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 20: Intensively manage the following allotments:

- Garfield Unit 8009, 8017, 8018, 8026, 8039, 8046, 8105, 8106, 8107, 8213, 8218, 8219, 8220, 8221, 8222, 8908, 8909, 8910;
- Roaring Fork Unit 8334, 8335, 8336, 8341, 8342;
- Eagle-Vail Unit 8501, 8502, 8504, 8506, 8734;
- Castle Peak Unit 8601, 8606, 8616, 8619, 8620, 8639, 8641, 8642, 8643, 8730, 8731, 8732, 8733, 8735; and

- King Mountain Unit 8506.

P. 20: Initially, allocate 37,852 AUMs of existing forage for livestock use. Allocate additional forage produced through vegetation manipulation on wildlife winter range first to big game to meet existing use and then to livestock up to active preference.

P. 21: Following initial allocation, manipulate 27,800 acres of vegetation on 98 allotments to increase livestock forage by 12,742 AUMs using vegetation manipulation techniques. The resultant total projected allocation will be 50,594 AUMs.

P. 21: Make 756 AUMs on 24 unallotted allotments available for livestock use.

P. 21: Any increases in forage due only to improved grazing management will be allocated to livestock.

2.2.3 Recreation and Visitor Services

Current management direction is based on RMP management objectives, RMPAs, activity level plans, and other recreation management direction, including 43 CFR 8340, Subchapter H, Recreation, Part 8342 and Part 8364 and H-1601-1-Land Use Planning Handbook, Appendix C, II. Resource Uses, Part C - Recreation and Visitor Services.

Management Objectives

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 34: To ensure the continued availability of outdoor recreational opportunities, which the public seeks and which are not readily available from other sources, to reduce the impacts of recreational use on fragile and unique resource values, and to provide for visitor safety.

Management Actions

The following management actions are approved with the GSFO RMP/ROD, approved with a RMPA, or being implemented and are ongoing.

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 34: Adopt recreation opportunity spectrum (ROS) management classes.

Identify Bull Gulch, Hack Lake, the Upper Colorado River, and Deep Creek as recreation management areas.

Submit withdrawal proposal to the Secretary of the Interior to withdraw the Deep Creek and Thompson Creek areas for recreation purposes.

Manage recreation resources and activities throughout the resource area. Adopt ROS management classes. Review future project proposals to determine whether or not

planned management actions are consistent with the class to identify possible mitigation measures.

Maintain existing recreational facilities as long as they remain cost effective. Develop new recreational facilities to meet present and future demands, protect resource values, and provide for visitor safety.

Recreation Guidelines to meet Public Land Health Standards

In February 1997, Standards for Public Land Health in Colorado were approved by the Secretary of Interior and adopted as decisions in all of the BLM's RMPs. The standards describe natural resource conditions that are needed to sustain public land health and encompass upland soils, riparian systems, plant and animal communities, special, threatened, and endangered species, and water quality. The standards relate to all uses of the public lands, including recreational use. The recreation management guidelines are tools, methods, and techniques that can be used by managers to maintain or meet the standards as they implement various programs on the public lands. The Colorado BLM now has recommended recreation guidelines designed to meet public land health standards. The recreation guidelines can be found the Internet at <http://www.co.blm.gov/rguideline/guidrv12.htm>.

Glenwood Springs Resource Area Oil and Gas Leasing and Development ROD and RMPA (1999)

Pp. 6-8: Major River Corridors. NSO stipulations within one-half mile of either side of the high water mark (bank-full stage) of six major rivers: Colorado, Roaring Fork, Crystal, Frying Pan, Eagle, and Piney. These riverine and adjacent areas provide high scenic and recreation values. Included in this area are public lands near the Eagle and Colorado Rivers designated as SRMAs in which the BLM provides facilities to enhance recreation opportunities and maintain the recreational setting.

SRMAs and Recreation Management Areas will be protected with NSO stipulations on oil and gas leases.

- For the protection of the recreational setting, recreation opportunities, and recreation facilities provided within the SRMAs, no surface occupancy will be permitted within the Bull Gulch ACEC/SRMA, Thompson Creek ACEC/SRMA, Hack Lake SRMA, and Rifle Mountain Park.
- For the protection of nonmotorized recreation opportunities, no surface occupancy will be authorized within King Mountain area, Siloam Springs area, Castle Peak area, Bull Gulch area (The portion of the Bull Gulch WSA not within the Bull Gulch SRMA), Sunlight Peak area, and Fisher Creek area (Haff Ranch). No exceptions are permitted in any of the above areas.
- NSO exceptions as noted in the Oil and Gas Leasing and Development ROD and RMPA (1999) permitted in the King Creek area (840 acres on the north side of King Mountain) and Pisgah Mountain area.

Castle Peak Final Travel Management Plan Amendment (1997)

P. 34: Manage the Castle Peak, Bull Gulch, and Pisgah Mountain areas for semiprimitive nonmotorized recreation opportunities totaling 29,139 acres. Manage the remaining public lands in the Castle Peak planning area for semiprimitive motorized opportunities (61,795 acres), except along the Colorado River Road, which would be managed to provide roaded natural opportunities (24,314 acres) and along I-70 and Highway 131, which would be managed to provide semiurban recreation opportunities (4,309 acres). Manage the remaining public lands in the Castle Peak area for motorized recreation opportunities.

The Bocco Mountain and Gypsum Hills areas will be designated as SRMAs and managed to provide opportunities for OHV use, including four-wheel trail driving, all-terrain vehicle (ATV) and motorcycle trail riding, and motocross track riding for a variety of challenge and skill levels.

Adopt Castle Peak ROS management classes.

Decision Record and Resource Management Plan Amendment for the Red Hill Area (1999)

P. 1: Administratively recognize the Red Hill area as a SRMA.

2.2.4 Comprehensive Trails and Travel Management

Management Objectives

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 40: To protect fragile and unique resource values from damage by OHV use and to provide OHV use opportunities, where appropriate.

Management Actions

The following management actions were approved with the GSFO RMP/ROD or with a RMPA or are being implemented and are ongoing.

Glenwood Springs Field Office Resource Management Plan (revised 1988)

Pp. 40 and 41: Manage recreation resources and activities throughout the resource area. Adopt ROS management classes, as shown on Map 9 and described in Appendix C. Review future project proposals to determine whether or not planned management actions are consistent with the class to identify possible mitigation measures. Each class also indicates the type of recreational setting one can expect to find in the area.

Identify Bull Gulch, Hack Lake, the Upper Colorado River, and Deep Creek as recreation management areas.

Acquire legal access to most large public land parcels and open them to public use.

Leave 397,946 acres (70 percent) of public land open to motorized vehicle use.

Close 19,620 acres (4 percent) to motorized vehicle use.

Limit motorized vehicle use to existing roads and trails, designated roads and trails, and certain seasons of use on 148,476 acres (26 percent).

Castle Peak Final Travel Management Plan Amendment (1997)

P. 34: To protect the wilderness values and be consistent with BLM's Interim Wilderness Management Policy, close the entire Bull Gulch and Castle Peak WSAs (27,438 acres) to motorized travel, including snowmobiles, and to mechanized uses, including mountain bicycles.

To protect erodible soils, wintering wildlife, scenic views, sensitive water quality management areas, cultural resources, and critical habitats, motorized travel is limited to designated roads and trails year-round, with seasonal restrictions.

Decision Record and Resource Management Plan Amendment for the Red Hill Area (1999)

P. 1: Close the Red Hill area to unauthorized motorized vehicles. Designate, construct and maintain routes open for mountain biking.

2.2.5 Forestry

Management Objectives

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 31: To manage all suitable commercial forest land and woodland to meet saw timber and fuel wood demand and maintain stand productivity.

Management Actions

The following management actions were approved with the GSFO RMP/ROD or with a RMPA or are being implemented and are ongoing.

Glenwood Springs Field Office Resource Management Plan (revised 1988)

Pp. 31 and 32: Manage 17,905 acres of commercial forest land and 82,407 acres of woodland (GSFO RMP/ROD Table 8). GSFO RMP/ROD Map 8 shows locations of forest land suitable for management.

Manage all forest land supporting commercial forest land and woodland species, including the five forest management units (King Mountain, Black Mountain, Castle Peak, Seven Hermits, and Naval Oil Shale Reserve). Major commercial species include lodgepole pine, Engelmann spruce, Douglas-fir, and ponderosa pine (commercial forest land) and pinyon and juniper (woodland). Aspen and subalpine fir are not considered major commercial species.

Manage forest land to minimize losses of, or damage to, forest resources from insects and disease. Practices that will be used in managing the suitable forest land are listed in GSFO RMP/ROD Appendix A. Multiple use and timber production capability classification restrictions prohibiting the harvesting of both commercial forest land and woodland are shown in GSFO RMP/ROD Table 9.

Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado (1997)

P. 7: Please see Section 2.1.5, Vegetative Communities, for a description of Standard 3.

2.2.6 Lands and Realty

Management Objectives

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 14: The management objective is to increase overall efficiency and effectiveness of public land management by identifying public land suitable for disposal through public sale (*Category I lands*) and suitable for continued management under multiple use concepts (*Category II lands*).

P. 41: To respond, in a timely manner, to requests for utility and communication facility authorizations on public land while considering environmental, social, economic, and interagency concerns.

Management Actions

The following management actions are approved with the GSFO RMP/ROD and with a RMPA or are being implemented and are ongoing.

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 14: Administrative actions will require special attention beyond the scope of the plan. They include issuance of permits for land actions, including issuance of grants, leases, permits, and resolution of trespass.

Manage 15,500 acres as Category I lands suitable for disposal through exchange, state selections, and Recreation and Public Purpose Act purchases.

Manage 550,542 acres as Category II lands, the land base to be managed under multiple use principles, which is not suitable for disposal through public sale. On a case-by-case basis, disposal of Category II lands would be considered through exchange, boundary adjustment, state selection, Recreation and Public Purpose Act purchase, or other appropriate statutory authority, providing such disposal is consistent with management efficiency and effectiveness under multiple use principles for specific areas.

Manage 62,780 acres of Category II lands as cooperative management areas where multiple use principles are influenced by other adjacent or interested governmental agencies. Cooperative management areas can be managed through cooperative agreements, memoranda of understanding, or withdrawals. They can also be exchanged with other governmental agencies if exchange best meets management objectives and public needs.

P. 41: Designate 443,993 acres (78 percent) of public land suitable for consideration, 101,293 acres (18 percent) sensitive, and 20,756 acres (4 percent) unsuitable for utilities and communication facilities development. The sensitive acreage does not include VRM Class II areas or public land along the Colorado River where location of public land is in question. Suitable, sensitive, and unsuitable zones are shown on in the GSFO RMP on Map 17.

Suitable zones are areas where no restrictive resource values have been identified. Sensitive zones are areas where existing resource values have been identified. Sensitive zones are areas where existing resource values must be mitigated before utilities or communication facilities are located there. Unsuitable areas are areas where existing fragile or unique resource values preclude location of utilities and communication facilities.

Designate Monument Peak, Castle Peak, Doghead Mountain, Sunlight Mountain (in conjunction with the White River National Forest), Bellyache Ridge, and Lookout Mountain as communication sites and prepare management plans.

2.2.7 Transportation Facilities and Access

Management Objectives

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 40: The GSFO RMP/ROD objective for transportation is to provide access to public land by acquiring those legal rights on nonpublic land that are essential to implement BLM planned actions.

Management Actions

The management actions below are approved with the GSFO RMP/ROD or with a RMPA or are being implemented and are ongoing.

Glenwood Springs Field Office Resource Management Plan (revised 1988)

Pp. 40 and 41: Acquire legal access into areas of public land where legal access does not exist.

Use and improve existing roads and trails in areas where feasible.

Construct new roads and trails where none exist or where existing roads and trails are inadequate for BLM needs.

Maintain 258 miles of road and 48 miles of trail, the amount needed to serve the area.

Decision Record and Resource Management Plan Amendment for the Red Hill Area (1999)

P. 1: Closures and limitations will not apply to federal, state, and local law enforcement officers, to members of organized rescue or firefighting forces in the performance of official duties, or to persons with a permit specifically authorizing the otherwise prohibited use. To provide necessary or mandated motorized access on public lands, the following policy addressing administrative access will be implemented. Administrative access is defined as “motorized travel for purposes specifically related to completing [BLM] work or specific work completed by a permittee related to a preexisting right or valid BLM permit or right-of-way.” Examples of projects warranting administrative access could include, but not limited to; maintenance of fences, ditches, spring developments, communication sites and reservoirs.

2.2.8 Renewable Energy

Management Objectives

The GSFO RMP did not discuss renewable energy, and there are no existing RMPAs that set objectives for wind and solar renewable energy.

Management Actions

The BLM Washington Office issued an instruction memorandum (IM) for the ROD for the Programmatic EIS on Wind Energy Development and guidance on processing ROW applications for wind energy projects on public lands administered by the BLM. It is BLM general policy, consistent with the National Energy Policy of 2001 and the Energy Policy Act of 2005, to facilitate environmentally responsible commercial development of solar energy projects on public lands and to use solar energy systems on BLM facilities where feasible.

IM No. 2005-006, Solar Energy Development Policy, states “Applications for commercial solar energy facilities will be processed as right-of-way authorizations under Title V of the FLPMA and Title 43, Part 2802 of the CFR. Commercial CSP or PV electric generating facilities must, however, comply with BLM’s planning, environmental and current right-of-way application requirements, as do other similar commercial uses. BLM right-of-way project managers are available to coordinate the planning, environmental, application, permitting, and monitoring process.

“The BLM will evaluate the feasibility of installing PV systems on administrative facilities and projects involving resource monitoring, range improvements, public safety and recreation projects. Project planning and design should incorporate an appropriate analysis to determine the feasibility, cost and benefits of using PV systems.”

2.3 SPECIAL DESIGNATIONS

The GSFO has no congressionally designated areas, such as wilderness, national monuments, national conservation areas, outstanding natural areas, or national scenic or historic trails.

2.3.1 Areas of Critical Environmental Concern

Management Objectives

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 34: The ACEC objective is to designate areas where special management is needed to protect important geologic, botanic, historic, cultural, and scenic values, fish and wildlife resources, other natural systems (rare or exemplary), and human life and property from natural hazards.

Management Actions

The management actions below are approved with the GSFO RMP/ROD or with an RMPA or are being implemented and are ongoing.

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 34 and Map 12: Designate Deep Creek (2,380 acres), Bull Gulch (6,714 acres), Blue Hill (4,718 acres), the Glenwood Springs Debris Flow Hazard Zone (6,675 acres), Lower Colorado River (4,269 acres) and Thompson Creek (formally Natural Environment Area, 4,286 acres) as ACECs (Federal Register Vol. 49, No. 11, January 17, 1984) and manage as follows:

Deep Creek

- Designate as unsuitable for utility and communication facilities;
- Manage under VRM Class I;
- Identify as and recreation management areas;
- Identify as a potential peregrine falcon introduction site;
- Prohibit vegetation manipulations for livestock, wildlife, and timber management; and
- Recommended for formal mineral withdrawal

Bull Gulch

- Designate as unsuitable for utility and communication facilities;
- Close to OHV use;
- Designate as fire management zone-ecosystem management area; and
- Identify as a recreation management area.

Blue Hill Archaeological District

- Designate as sensitive zone for utility and communication facilities;

- Restrict OHV use to existing roads and trails;
- Designate as fire exclusion zone;
- Classify as a critical watershed because of the soil erosion hazard; and
- Designate as sensitive area for cultural and Native American resources.

Glenwood Springs Debris Flow Hazard Zone

- Limit motorized vehicle use to designated roads and trails;
- Designate as sensitive zone for utility and communication facilities;
- Designate as fire exclusion zone;
- Prohibit surface facilities for oil and gas development;
- Prohibit timber harvesting; and
- Limit livestock use to light grazing.

Lower Colorado River Cooperative Management Area

- Identify cooperative management with the CDOW;
- Designate as sensitive zone for utility and communication facilities; and
- Exclude livestock.

Thompson Creek

Thompson Creek Natural Environment Area was designated as an ACEC in 1985 (Federal Register Vol. 50, No. 65, April 4, 1985) to preserve geological, ecological, cultural, and scenic values and to provide for educational and recreational use.

- Designate as unsuitable for utility and communication facilities;
- NSO on oil and gas leasing;
- Prohibit vegetation manipulation and timber harvesting;
- Close to OHV use; and
- Recommended for formal mineral withdrawal.

Glenwood Springs Resource Area Oil and Gas Leasing and Development ROD and RMPA (1999)

P. 8: NSO #16 stipulations on oil and gas leases. NSO (no exceptions are permitted) will be permitted in the following areas:

- Deep Creek ACEC/SRMA;
- Deep Creek cave area (includes NSO for 5,000 feet below the surface);
- Bull Gulch ACEC/SRMA;
- Thompson Creek ACEC/SRMA;

- Hack Lake SRMA; and
- Rifle Mountain Park.

Castle Peak Final Travel Management Plan Amendment (1997)

Travel management decisions were made to protect wilderness values in the entire Bull Gulch WSA, which overlaps the Bull Gulch ACEC. The decision closed travel to motorized and mechanized travel, including snowmobiles and mountain bicycles. This implemented the 1988 RMP decision to close the area to OHVs.

Glenwood Springs Resource Area Fire Management Plan (revised 2004)

Chapter 3, p. 12: Wildland fires require immediate and continued closed coordination with the resource advisor, who also notifies the appropriate GSFO staff person of fires and actions taken in WSAs and ACECs.

Restrictions for ACECs are the same as for WSAs.

Within ACECs, the use of motorized vehicles, fire engines, and mechanical ground-disturbing equipment requires approval of the field manager or designated field manager, except when lives or homes are in imminent danger of being lost, in which case the Fire Management Officer may authorize vehicle use within the WSAs and ACECs.

The use of air tankers, chainsaws, and pumps and the delivery of personnel, equipment, and water by helicopter require the approval of the Fire Management Officer or designate.

Reduce the negative effects of wildland fire management by applying minimizing measures (see Appendix E for minimum impact suppression tactics)

Large fire camps should be placed outside WSAs.

Perform rehabilitation of fire suppression impacts as defined by the resource advisor to restore visual and wilderness characteristics.

The use of natural firebreaks and roads to contain a wildland fire is encouraged.

Management decisions for proposed ACECs within the Roan Plateau planning area should reference the Roan Plateau Planning Area RMPA and EIS on the following Web site: http://www.blm.gov/rmp/co/roanplateau/final_eis_document.htm.

2.3.2 Wilderness Study Areas

Management Objectives

The management objective is to determine the suitability or unsuitability of WSAs for wilderness designation. Subsequent to final report in 1991 wilderness study

reports were passed to the president, who agreed with the BLM's recommendations and passed them on to Congress in January of 1993. Until Congress designates these study areas as wilderness or releases them for other uses, the lands are managed under Handbook -8550-1 *Interim Management Policy for Lands under Wilderness Review and H-1601-1-Land Use Planning Handbook*, Appendix C, III. Special Designations, Part B – Administrative Designations.

This applies to four WSAs managed by the GSFO: Eagle Mountain, Hack Lake, Bull Gulch, and Castle Peak. A discussion of resource values for these WSAs can be found in the Colorado BLM Wilderness Study Report (BLM 1991a)

Management Actions

The management actions below were approved with the GSFO RMP/ROD or with an RMPA or are being implemented and are ongoing.

Glenwood Springs Field Office Resource Management Plan (revised 1988)

P. 37: Recommend 9,778 acres in Bull Gulch WSA as preliminarily suitable for wilderness designation (under Section 603 of FLPMA), pending mineral survey.

Recommend 330 acres in Eagle Mountain WSA and 10 acres in Hack Lake WSA as preliminarily suitable for wilderness designation (under Section 202 of FLPMA), pending mineral survey.

Recommend 16,526 acres (4,586 in Bull Gulch and 11,940 acres in Castle Peak) as preliminarily nonsuitable for wilderness designation under Section 603 of FLPMA. These areas will be managed under Interim Management Policy and Guidelines for Lands Under Wilderness Review, pending congressional action.

Release 3,350 acres of Hack Lake WSA from further wilderness consideration. This acreage will continue to be managed under the Interim Management Policy until further notice.

Recommend administration of the Eagle Mountain WSA and the preliminarily suitable portion of Hack Lake WSA for transfer to the USFS on designation as wilderness.

Recommend the 636 acres excluded from the Bull Gulch WSA as a suitable addition to the Bull Gulch Wilderness, should it be designated by Congress and provided the state-owned minerals can be exchanged. This acreage will continue to be managed under the Interim Management Policy until further notice.

Castle Peak Final Travel Management Plan Amendment (1997)

P. 7: Protect the WSAs consistent with the BLM's interim wilderness management policy. Alternatives must close the WSAs to motorized and mechanized vehicle use, including snowmobiles and mountain bicycles, to be rated with a high degree of compatibility with this objective.

Glenwood Springs Resource Area Oil and Gas Leasing and Development ROD and RMPA (1999)

P. 3: Approximately 27,760 acres of BLM-administered mineral estate within the GSFO are closed to oil and gas leasing (the WSAs).

Glenwood Springs Resource Area Fire Management Plan (revised 2004)

Chapter 3, p. 12: To protect wilderness characteristics (roadlessness and naturalness), wildland fire management follows H-8550-1 – Interim Management Policy for Lands under Wilderness Review and Grand Junction District WSA Fire Suppression Tactics Policy (05-10-95).

Within WSAs, the use of motorized vehicles, fire engines, and mechanical ground-disturbing equipment requires approval of the field manager or designate, except when lives or homes are in imminent danger of being lost, in which case the Fire Management Officer may authorize vehicle use within the WSAs and ACECs.

The use of air tankers, chainsaws, and pumps and the delivery of personnel, equipment, and water by helicopter require the approval of the Fire Management Officer or designate.

Reduce the negative effects of wildland fire management by applying minimizing measures (see Appendix E for minimum impact suppression tactics).

Large fire camps should be placed outside WSAs.

Perform rehabilitation of fire suppression impacts, as defined by the resource advisor to restore visual and wilderness characteristics.

The use of natural firebreaks and roads to contain a wildland fire is encouraged.

2.3.3 Wild and Scenic Rivers

The GSFO does not manage any designated WSRs. Refer to the WSR Eligibility Report for the Glenwood Springs and Kremmling Field Offices on the following Web site: http://www.blm.gov/rmp/co/kfo-gsfo/documents/FinalEligibilityReport_Mar2007.pdf.

Management objectives relating to WSR eligibility for the Roan Plateau Planning area should reference the following Web site: <http://www.co.blm.gov/gsra/documents/WSR-Eligibilityfindings.pdf>.

2.3.4 Backcountry Byways/National Trails

The GSFO does not manage any byways or national trails.

2.4 SOCIAL AND ECONOMIC

2.4.1 Social and Economic Conditions

In the 1988 RMP, the BLM did not specifically address management objectives for social and economic conditions.

CHAPTER 3

AREA PROFILE

3.1 RESOURCES - CURRENT CONDITIONS AND CHARACTERIZATION

3.1.1 Air Quality

Climate. The planning area lies along the Colorado River drainage. Because of broad variations in elevation and topography within the study area, climatic conditions vary considerably. Along the Colorado River valley floor, average daily temperatures typically range between 12° degrees Fahrenheit (°F) and 40°F in midwinter and between 50°F and 95°F in the summer.

The frost-free period, during which temperatures do not dip below 32°F, is generally 170 days between mid-April and mid-October. The annual average total precipitation at lower elevations is approximately 12 inches, with 30 to 40 inches of annual snowfall. At higher elevations atop the plateau, temperatures are cooler, frost-free periods are shorter, and both precipitation and snowfall are greater than at lower elevations (e.g., approximately 25 inches of mean annual precipitation and 60 to 80 inches of annual snowfall). Wind conditions reflect channeling and mountain valley flows due to complex terrain. Nighttime cooling enhances stable air, inhibiting air pollutant mixing and transport along the Colorado River valley. Dispersion potential improves farther east and west and along the ridges and mountaintops, especially during the winter/spring weather transition and summertime convective heating periods.

Three long-term climate sites exist adjacent to the GSFO at the Eagle Airport and in Glenwood Springs and Rifle. Two SNOTEL sites also exist in the planning area, including McClure Pass and Bison Lake. Monthly average precipitation is spread evenly across the water year but occurs in different forms: summer convective thunderstorms occur in the summer, and snow occurs in the late fall, winter, and spring. Half the annual snowfall occurs during December and January. The GSFO also monitors precipitation at Sweetwater; average annual precipitation is 10 inches. Precipitation at the Bison Lake SNOTEL site averages 40 inches for the period of

record, and the McClure site averages approximately 20 inches for the period of record.

Air Quality. Under FLPMA and the Clean Air Act, the BLM cannot conduct or authorize any activity that does not conform to all applicable federal, tribal, state, and local air quality laws, statutes, regulations, standards, and implementation plans. An extensive air quality impact assessment was prepared during the Roan Plateau RMPA and is available at <http://www.blm.gov/rmp/co/roanplateau>.

The Colorado Department of Public Health and Environment (CDPHE) - Air Pollution Control Division (APCD) implements the Clean Air Act. The APCD is responsible for maintaining compliance with Prevention of Significant Deterioration (PSD) Increments and NAAQS. The APCD may also set its own state ambient air quality standards (AAQS) that are equally or more stringent than the federal NAAQS. The BLM is required to comply (through FLPMA and the Clean Air Act) with federal, state, tribal, and local air quality standards and regulations.

Existing air quality is generally good, based on regional monitoring. Air pollution emission sources are limited to a few industrial facilities, transportation emissions along the I-70 corridor, and residential emissions in the relatively small communities adjacent to the planning area. Based on data provided by CDPHE-APCD, concentrations of particulate matter (PM) less than 10 microns (μ) in effective diameter (PM_{10}) were measured at Rifle at 24 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) annual and 54 $\mu\text{g}/\text{m}^3$ second 24-hour maximum. Concentrations of particulate matter less than 2.5 microns in effective diameter ($PM_{2.5}$) measured at Grand Junction (7 $\mu\text{g}/\text{m}^3$ annual and 19 $\mu\text{g}/\text{m}^3$ second 24-hour maximum) are well below the Colorado AAQS and NAAQS. Rural values are likely to be lower. Similarly, gaseous pollutant concentrations at several locations are well below AAQS.

Two National Atmospheric Deposition Program stations are located in the planning area, including Sunlight Peak and Four-mile Park. Sulfate values appear to range from 0.3 – 0.7 milligrams per liter, whereas nitrate varies from 0.5 -0.9 milligrams per liter, depending on the site. There is also an IMPROVE site on Storm Peak.

The Colorado and national AAQS set upper limits for specific air pollutant concentrations at all locations accessible to the public. The PSD Program is designed to limit the incremental increase of specific air pollutant concentrations above a legally defined “baseline” level, based on the specific conditions at a particular location. All NEPA analysis comparisons to the PSD Class I and II increments are intended to evaluate a “threshold of concern” and do not represent a regulatory PSD Increment Consumption Analysis. The determination of PSD increment consumption is a regulatory agency responsibility conducted as part of the New Source Review process, which also includes a Federal Land Management Agency evaluation of potential impacts on Air Quality Related Values, such as visibility, aquatic ecosystems, and flora and fauna.

Although the US Environmental Protection Agency has revised the PM_{2.5} AAQS, this revised limit will not be enforceable until it is formally approved in the Colorado State Implementation Plan. However, due to public concern and possible impacts on human health and visibility, PM_{2.5} is considered in this analysis. Current Colorado and National AAQS and PSD Class I and II increments are provided in **Table 3-1**.

Table 3-1
Air Pollutant Background, Ambient Air Quality Standards, and Prevention of Significant Deterioration Incremental Concentrations (µg/m³) by Applicable Averaging Time

<i>Pollutant and Averaging Time</i>	<i>Measured Background Concentration¹</i>	<i>National Ambient Air Quality Standards</i>	<i>Colorado Ambient Air Quality Standards</i>	<i>PSD Class I Increment</i>	<i>PSD Class II Increment</i>
Carbon Monoxide (CO)					
1 hour	8,000	40,000	--	NA	NA
8 hours	4,444	10,000	--	NA	NA
Particulate Matter (PM ₁₀)					
24 hours	54	150	--	8	30
Annual	24	50	--	4	17
Particulate Matter (PM _{2.5})					
24 hours	19	65	--	NA	NA
Annual	7	15	--	NA	NA
Sulfur Dioxide (SO ₂)					
3 hours	110	1,300	700	25	512
24 hours	39	365	--	5	91
Annual	11	80	--	2	20
Nitrogen Dioxide (NO ₂)					
Annual	34	100	--	2.5	25

PSD Class I areas and sensitive Class II areas included in the analysis are listed in **Table 3-2**. Limitations on incremental air pollution allowed in PSD Class I areas from additional major sources are strict. Similar but less stringent incremental limits apply to PSD Class II areas.

CDPHE-APCD is the air quality regulatory agency responsible (under the US Environmental Protection Agency-approved State Implementation Plan) for determining potential impacts once detailed development plans have been made, subject to applicable air quality laws, regulations, standards, control measures, and management practices. Therefore, the State of Colorado has ultimate responsibility for reviewing and permitting air pollutant emission sources before they become operational.

Table 3-2
PSD Class I and Sensitive Class II Areas

<i>Mandatory Federal Class I Areas and Sensitive Class II Areas</i>	<i>Managing Agency</i>	<i>Class Category</i>	<i>State</i>	<i>Distance and Direction</i>
Black Canyon of the Gunnison National Park	NPS	Class I	Colorado	25 mi SSE
Colorado National Monument	NPS	Class II ^{2,3}	Colorado	40 mi SW
Dinosaur National Monument	NPS	Class II ^{2,3}	Utah/Colorado	60 mi NW
Eagles Nest Wilderness Area	USFS	Class I	Colorado	65 mi E
Flat Tops Wilderness Area	USFS	Class I	Colorado	30 mi ENE
Holy Cross Wilderness Area	USFS	Class II ²	Colorado	45 mi ESE
Hunter-Frying Pan Wilderness Area	USFS	Class II ²	Colorado	40 mi ESE
La Garita Wilderness Area	USFS	Class I	Colorado	80 mi SSE
Maroon Bells-Snowmass Wilderness Area	USFS	Class I	Colorado	25 mi SE
Mount Zirkel Wilderness Area	USFS	Class I	Colorado	90 mi NE
Raggeds Wilderness Area	USFS	Class II ²	Colorado	25 mi SE
Rawah Wilderness Area	USFS	Class I	Colorado	120 mi NE
Weminuche Wilderness Area	USFS	Class I	Colorado	100 mi SSE
West Elk Wilderness Area	USFS	Class I	Colorado	35 mi SE

¹ NPS = National Park Service; USFS = U.S. Forest Service.

² Sensitive Class II areas included in the analysis (Trinity 2003a).

³ SO₂ increment in these Class II areas in Colorado has the same protection as Class I areas.

3.1.2 Geology

Regional Setting

The location of the GSFO in west-central Colorado, combined with its generally east-west configuration along a length of roughly 80 miles, results in considerable geologic diversity. This diversity includes differing lithologic, geomorphic, and structural geologic conditions, which in turn have shaped widely divergent topography (landforms) and superficial geology (bedrock outcrops and recent deposits).

At a very basic level, the geology of the GSFO strongly influences many other resources and uses of the land: soils, vegetation, wildlife, recreation, and scenic quality, as well as metals, nonmetals, and fluid minerals are affected either directly or indirectly by the ancient and recent geologic history of the region. While the geology of the region could be the topic of an entire book, the following subsections are an overview of current and future land uses and resource management. Because of the differing geology within the GSFO, the information is organized by major areas.

Northeastern Area—Portions of Eagle and Upper Colorado River Basins

Roughly 40 percent of the GSFO lies east and northeast of Glenwood Canyon, encompassing the Colorado River upstream to near State Bridge and the lower Eagle River Valley to its confluence with the Colorado River. This portion north of the Eagle River, which makes up most of this area, is between the Gore Range to the east and the White River Plateau and Flat Tops to the west and is part of the Eagle Basin.

Near the northeastern end of this area, Tertiary volcanics cap higher elevations along the western flank of Piney Ridge, which lies east of the GSFO boundary. These volcanics are primarily Miocene and Pliocene lava flows, but there are also areas of the Miocene Browns Park Formation (ashfall deposits mixed with water-deposited sediments).

The flat-lying volcanics overlie folded and faulted sections of late Paleozoic to Mesozoic sedimentary rocks laid down in marine and shoreline depositional regimes along a trough oriented northwest-southeast. The folding and faulting in this area was associated with the Laramide Orogeny that created the present-day southern Rocky Mountains, including the Gore Range east of the GSFO boundary. These sedimentary units, from younger to older age (higher to lower stratigraphic and topographic positions) include the Cretaceous Pierre Shale (deep marine shales), Colorado Group (shallow marine limestones and calcareous clastics), and Dakota Formation (shallow marine sandstones), the Jurassic Morrison and Entrada Formations (onshore swamps and beach deposits, respectively), the Triassic and Upper Permian Chinle and State Bridge Formations (nearshore to onshore sandstones and shales), and the Permian-Pennsylvanian Maroon Formation (interbedded onshore arkoses, sandstones, and shales). The Maroon Formation “redbeds” form spectacular outcrops along I-70 west of Wolcott and along the Colorado River downstream from Burns. The color of the Maroon Formation reflects its origin in the oxidizing (aerobic) environment of desert bajadas and alluvial fans, in contrast to the greens and purples of the Morrison Formation, with its origin in the reducing (anaerobic) environment of swamps.

The sedimentary formations described above occur as roughly concentric arcs radiating southwestward from the volcanic highlands at the northeastern end of the GSFO. The concentric configuration is related to the progressively lower elevations extending westward from the volcanic highlands. Essentially the entire stratigraphic section is visible from I-70 along the Eagle River on the south, County Roads 11 and 301 along the Colorado River on the north, and State Highway 131 between Wolcott and State Bridge.

Farther west in this area, the exposed bedrock becomes progressively older along the western flank of the Eagle Basin. Among these units are the barren, distinctively folded “marble cake” exposures of the Eagle Valley Formation and Eagle Valley Evaporite of Pennsylvanian age. These units consist of fine clastics and salts—including extensive deposits that give the town of Gypsum its name—that formed in

arid basins. The contorted strata—conspicuous along I-70 from near the town of Eagle to the eastern end of Glenwood Canyon—result from deformation of the relatively plastic evaporites in response to uplift and then removal of the thick overlying section of sediments. North of the Eagle River, areas capped by Tertiary lava flows create higher more rugged terrain on Crystal Mountain. South of Eagle River, Suicide Mountain and The Seven Hermits, created by localized faulting, stand as islands of younger Triassic and Jurassic rocks.

Another notable geologic feature in the northeastern area of the GSFO is the Dotsero Cinder Cone. This small volcano and its associated lava flow are of Quaternary age and estimated to be only about 4,000 years in age. The lava flow has mostly been obliterated by commercial activities (and construction of I-70), while portions of the cinder cone itself have been excavated to manufacture bricks.

From the confluence of the Eagle and Colorado Rivers westward, exposures of the Eagle Valley Evaporite and the underlying Belden Shale, also of Pennsylvanian age, give way to the spectacular scenery of Glenwood Canyon and its high cliffs formed of much older rocks of the lower and middle Paleozoic. These ancient sediments—from higher (younger) to lower (older) include three marine units (Mississippian Leadville Limestone, Devonian Chaffee Formation, and Ordovician Manitou Dolomite) and a beach deposit (Cambrian Sawatch Quartzite). The quartzite is sandstone that has been metamorphosed by the heat and pressure of its great depth before being exposed by the White River Uplift. The high cliffs of Glenwood Canyon result from the combination of very resistant rocks, rapid (in geologic time) uplift, and rapid (in geologic time) downcutting by the Colorado River.

Southeastern Area—Roaring Fork Valley

A small portion of the GSFO extends southeastward from Glenwood Springs to the town of Aspen. This area, dissected by the Roaring Fork River, is highly folded and faulted and more recently dissected by streams, resulting in rugged terrain. East of the Roaring Fork, nearly level lava flows of Tertiary age (giving the town of Basalt its name) overlie and cap brightly colored rocks of the Maroon Formation and barren, marble-cake exposures of the Eagle Valley evaporite. The contact between the red Maroon Formation and the tan Eagle Valley Formation below is visible on the flanks of Lookout Mountain, just east of Glenwood Springs, and in outcrops along State Highway 82 toward Carbondale.

West of the Roaring Fork, this portion of the GSFO consists of steeply tilted layers along the southern extension of the Grand Hogback, described more fully below. An area northwest of Carbondale along the Thompson Creek drainage provides good exposures of the Triassic and Jurassic bedrock formations in steeply dipping outcrops.

Central Area—Glenwood Canyon to Grand Hogback

Downstream from Glenwood Canyon and the confluence with the Roaring Fork River to Rifle, the GSFO includes the east-west oriented Colorado River Valley but

is cut across diagonally by the edge of the White River Uplift. This edge, where the Southern Rocky Mountains meet the Colorado Plateau, is marked by a monocline called the Grand Hogback. The hogback topographic feature and the outcrops of steeply dipping sediments that form it include most of the same formations as in the northeastern part of the GSFO (e.g., Maroon, Morrison, Entrada, and Dakota). These units form narrow bands along a broadly arching edge margin to the core of lower Paleozoic sediments and have been exposed in the White River Uplift and Glenwood Canyon. At the outer edge of the hogback are younger sediments of the Mesaverde Group, including the Mesaverde and Williams Fork Formations.

These exposures provide brief glimpses of formations that plunge steeply into the depths of the Piceance Basin to the west. For example, the Mesaverde is the major producer of oil and natural gas in the basin, where wells along I-70 are typically 6,000 to 8,000 feet deep. The Mesaverde and Williams Fork Formations also include some coal layers, the mining of which led to the naming of New Castle after the coal-mining district of England and gave rise to the coal-mine fires that gave Burning Mountain (a section of the Grand Hogback near New Castle) its name.

Farther north along the core of the uplift, the ancient sediments are overlain by Tertiary lava flows that give the Flat Tops area its name and characteristic topography. This area lies north of the GSFO.

Western Area—Grand Hogback to De Beque

West of the Grand Hogback, and extending to the western end of the GSFO, is the edge of the Colorado Plateau Province. While portions of the GSFO that lie within the Southern Rocky Mountain Province are characterized by middle Cretaceous and older sediments, considerable folding and faulting, and localized volcanism, the western area is dominated by younger and generally flat-lying sediments and more extensive volcanism.

Just as the northeastern part of the GSFO was formed in the Eagle Basin, the sedimentary units in the western part were formed in the Piceance Basin. This deep depositional basin extends from beneath Battlement Mesa northward along a distance of approximately 120 miles, and westward from the Grand Hogback to beyond the western edge of the GSFO. In contrast to the Eagle Basin, which produces no oil and gas, the Piceance Basin is a major gas-producing region, with most production from the Tertiary Williams Fork Formation (Mesaverde Group) and Wasatch Formation. The Tertiary sediments also contain coal and associated coalbed natural gas, but at depths and quantities in the Piceance Basin that are not currently economical to develop.

The broad Colorado River valley floor in this area, and in most of the uplands south of the river, is underlain by the Paleocene/Eocene Wasatch Formation, composed of conglomerates, sandstones, and shales of onshore and nearshore origin, with some coal near its base. Like the underlying Mesaverde, the Wasatch Formation includes fluvial (stream) deposits that reflect a more variable environment, in both space and

time, than most marine environments. The heterogeneity typical of stream deposits can be seen in the exposures of Wasatch Formation north of I-70, where the more resistant sandstones thicken and thin, or disappear entirely, within a relatively short horizontal distance and alternate vertically with layers of finer-grained siltstones. The harder sandstones represent stream channels, while the softer siltstones represent overbank deposits.

South of the Colorado River, older (Mesaverde) units are exposed in deeper stream valleys, such as West Divide Creek, while younger (Eocene) units are exposed at higher elevations along the flanks of Battlement Mesa and other highlands within the White River National Forest. These younger units include the lacustrine (lake-deposited) rocks of the Green River Formation and the interbedded siltstones, sandstones, and marlstones of the overlying Uinta Formation. Because of relatively dense vegetation cover on the generally north-facing aspects south of the river, exposures of the Green River and Uinta Formations are mostly limited to very steep slopes, many of which are eroding to talus and scree. At the highest elevations, Tertiary lava flows from caprocks.

North of the Colorado River, the western portion of the GSFO is dominated by the Roan Cliffs, a high escarpment that separates the Roan Plateau from low-lying areas along the river. The Roan Cliffs are outcrops of a thick section of the Green River Formation, which includes carbonaceous layers called oil shale. The upper surface of the Roan Plateau is mostly Uinta Formation, with older Green River rocks exposed along some of the deeper drainages that dissect it. The western edge of the Roan Plateau is defined by the escarpment toward Parachute Creek, but similar terrain and bedrock exposures also extend from Parachute Creek to the western edge of the GSFO.

3.1.3 Soil Resources

Indicators

Erosion Class: Available geographic information system (GIS) data on soils for the GSFO were previously grouped into four water erosion classes, namely light, moderate, severe, and very severe. These groupings were derived from available soil survey soil map unit descriptions (see current condition section above). Erosion class is typically considered, among other applicable physical characteristics, in the decision making process. When proponents desire to develop a given resource in severe and very severe erosion class areas, engineering should be required to ensure the success of the project or propose use outside of these areas. The BLM should propose a severe or very severe NGD or NSO in the plan.

Slope and Erosion Potential: In the 1999 GSFO Final EIS, slope and “erodible soils” designations are used to define two stipulated areas. The first area is described as a CSU area for slopes greater than 30 percent and erosive soils. These designations require some correction because soils are not considered erosive but rather prone to

erosion or are described as erodible. Future designations should be renamed in terms of slope and erodibility.

The second designation, NSO, relies solely on slopes greater than 50 percent in order to protect soils and prevent undue soil erosion. Both of these stipulations are addressed in the final Roan Plateau RMPA. However, there are some soil map units that are inherently prone to or have experienced mass wasting. These areas could be mapped and designated as NGD or NSO areas where geotechnical engineering is required, on the part of a proponent, to allow development.

Land Health Standards: Public Land Health and Guidelines for Livestock Grazing Management in Colorado, January 1997, state that “Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate, land form, and geologic processes. Adequate soil infiltration and permeability allows for the accumulation of soil moisture necessary for optimal plant growth and vigor, and minimizes surface runoff.” Designated indicators are used to determine if the standards for soils are being met. Rilling, gully formation, canopy cover, litter accumulation, litter movement, the amount of organic matter in a soil, plant diversity, and vegetation density are factors used in determining soil health.

Current Condition

Soil map units are used to make management decisions that would likely affect soils. Each soil survey applicable to the GSFO describes soil map units by their individual soil or soils that make up a unit. These descriptions indicate the limitations and hazards inherent in each. Descriptions include soil depth, range of elevation, origin, climate, physical properties, runoff capabilities, erosion hazard, associated native vegetation, wildlife habitat use, and capability for community development and other uses.

Third-order soil surveys, provided by the NRCS, cover most of the GSFO. These surveys are the Soil Survey of Rifle Area, Colorado, Parts of Garfield and Mesa Counties (NRCS 1985), Soil Survey of Aspen-Gypsum Area, Colorado, Parts of Eagle, Garfield and Pitkin Counties (NRCS 1992), and Soil Survey of Douglas-Plateau Area, Colorado, Parts of Garfield and Mesa Counties (NRCS 2002), and the Routt County Area Survey (unpublished but compiled in 1977).

With the exception of the Routt County Survey, the remaining survey areas are digitized and available to specialists through the GSFO Intranet. The NRCS has supplied the GSFO aerial photo overlays of the Routt County Soil Survey that are poorly projected, making digitizing the survey for Routt County impractical.

In addition, there are some tracts of land near the Garfield, Mesa, and Pitkin County borders that have no survey information available. General soil maps, found in existing surveys, have been used to derive general statements about soils in these areas. Consequently, Routt County and these small unsurveyed areas need to be surveyed and digitized in order to allow for soils analysis for future proposed actions.

Trends

Land Health Standards will continue to be an important method of evaluating the condition of soils. A revised BLM technical reference, 1734-6, Version 4-2005, directs the implementation of land health monitoring. This reference calls for a greater emphasis on matching land health evaluation areas to the appropriate ecological site and its related soils. Consequently, the identification of soils and subsequent evaluation require greater soils expertise in the field.

Forecast

Large-scale changes to soils management are not anticipated in the near future. Maintaining current soil resources will likely continue to be a priority. Responsible management should continue to prevent undue soil loss and sedimentation of area streams and rivers, whenever possible.

As mentioned above, hydrology and soils have the potential to drive management of each resource. The State of Colorado 303 (d) list for impaired waters may alter policy on soils management by listing streams for sediment loss when development in area watersheds warrants listing. When this occurs, BMP's will be utilized to minimize soil loss and productivity, as well as adhering to Standard 1. Additional BMP's may be warranted in areas adjacent to 303(d) listing(s).

3.1.4 Water Resources

Surface

The BLM manages for clean and adequate surface water to sustain aquatic ecosystems, wildlife and plant communities, livestock, recreation, and other multiple-use objectives. The primary water objective of the 1983 Glenwood Springs RMP is to maintain or improve the water quality in the resource area. Water flowing through BLM administered lands is regulated by the State under authority from EPA under the Clean Water Act (CWA). These include Executive Order 11988 (floodplains management), Colorado Public Land Health Standards, Colorado River Salinity Act, and the Colorado Water Quality Control Division Stormwater Permit Program.

Current Conditions

Surface Water

The GSFO is within the headwaters of the Upper Colorado River Basin and includes the Roaring Fork and Eagle River drainages. The Roaring Fork drainage includes the Frying Pan and Crystal Rivers. Precipitation ranges from 10 inches along the Colorado River to over 40 inches annually in the mountains. The rivers and streams in the resource area usually convey peak flows in May and June from the melting snowpack in the higher elevation areas. The timing of peak spring runoff depends on the size of the snowpack. Intense summer convective storms are common within the resource area and can lead to significant stream flows, particularly in intermittent and smaller perennial streams. Active US Geological Survey (USGS) gage data are available at the following locations within the resource area: Piney River near State

Bridge (09059500), Colorado River near Dotsero (09070500), Eagle River below Milk Creek near Wolcott (394220106431500), Eagle River below Gypsum (09070000), Roaring Fork River near Aspen (09073400), Roaring Fork River at Glenwood Springs (09085000), Crystal River below Carbondale (09083800), Frying Pan River near Reudi (09080400), and Colorado River below Glenwood Springs (09085100). Historic gage data are also available at select stations within the resource area. The Watersheds and Hydrologic Features maps in **Appendix E** depict this information.

Water Quality

Surface water quality in the GSFO is generally good, although it varies greatly throughout the resource area depending primarily on geology, precipitation, vegetative cover, and land use. Where water is impaired in the Upper Colorado River Basin, sediment, salinity, and/or selenium tend to be the primary water quality pollutants. The geology of the watershed is a main determinant of surface water quality. In areas of predominately granite, basalt and sandstone, the surface water is a calcium bicarbonate type and tends to be good quality, with low sediment and salinity yields. These formations tend to occur in higher elevation areas within the GSFO. In the lower elevations, geologic formations such as the Mancos and Pierre shale, Eagle Valley Evaporite, Green River, Wasatch, and Morrison tend to supply sediment, salinity, and/or selenium to surface water, thereby naturally contributing to water quality degradation. In general, concentrations of major ions tend to increase and in an upstream to downstream gradient in major rivers, causing overall water quality to become poorer.

Precipitation is another factor that influences water quality. Intense summer thunderstorms and spring snowmelt create high flow conditions that tend to produce greater sediment and salinity yields than do low flows. The type and amount of vegetative cover also greatly affects pollutant yield from watersheds. Areas with more expansive and thicker vegetative cover are likely to have a greater potential to resist soil erosion, thus limiting sediment and salinity input into streams during storm events. Land uses such as urban/suburban development and recreation along a rapidly expanding WUI can be significant sources of point and nonpoint pollution. For instance, land disturbance from activities such as housing construction and OHV use can increase sediment yield and other pollutant loads in the form of stormwater that washes into rivers and streams. Increased development due to population growth and second homes is occurring at a rapid rate in many parts of the resource area, particularly the Eagle River Valley.

Surface water quality in Colorado is governed by the Department of Public Health and Environment, Water Quality Control Division. The Clean Water Act gives the State of Colorado the authority to create, implement, and revise Water Quality Standards for stream segments within each river basin of the State, depending on the beneficial uses assigned to each segment. Beneficial uses include aquatic life warm or cold, water supply, agriculture, and recreation. Stream segments not meeting water quality standards for assigned uses for one or more pollutants are placed on the

Section 303(d) list of water-quality impaired bodies. A Total Maximum Daily Load (TMDL) is then required for the stream segment.

Tributaries to the Colorado River from the Roaring Fork River to Parachute Creek are listed on Colorado's 303(d) list of water-quality impaired water bodies for selenium (**Table 3-3**). Selenium, a pollutant derived from marine sediments like Mancos shale, occurs in the western resource area. One of the main causes of selenium pollution is farmland irrigation on Mancos Shale. This irrigation water percolates deep into the shale, causing selenium and other ions to leach into groundwater, eventually re-surfacing in area rivers and streams. The lower Gunnison River Basin and Grand Valley are other areas in the region with high selenium concentrations in surface water. Interagency efforts including the Selenium Task Force have been created to develop cost-effective methods for addressing selenium pollution in western Colorado.

Where stream segments are suspected of having water quality problems, but existing data is inadequate to make a determination, segments are placed on Colorado's Monitoring and Evaluation List until more data becomes available. Once a stream segment is on the Monitoring and Evaluation list, two outcomes are possible: it becomes listed on the 303(d) list of water-quality impaired water bodies, or it becomes de-listed. The main stem of the Colorado River from Roaring Fork to the westernmost extent of the GSFO is currently listed for sediment on the Monitoring and Evaluation list. Mamm Creek and South Canyon Creek are listed for total recoverable iron (**Table 3-3**).

The Colorado Public Land Health Standards (1997) requires assessing five different standards on BLM lands to determine land health. Land Health Standard 5 calls for the water quality of all water bodies located on or influenced by BLM lands to meet or exceed Colorado State Water Quality Standards. LHAs have been conducted in the GSFO since 1999. Each year, a set of usually neighboring watersheds are selected for assessment. The results for the land health water quality standard are displayed in **Table 3-4**.

Two important factors influencing the amount of sediment and salinity contributed to streams is proximity of disturbance to streams and amount and condition of vegetation cover between surface disturbance and streams. This riparian or upland vegetative buffer is crucial to the protection of water quality. Riparian vegetation stabilizes stream banks and filters out sediment and other pollutants from stormwater and overland flows before they enter water bodies. Along Government Creek, for example, illegal OHV use has destroyed riparian vegetation, thereby destabilizing stream banks and causing water quality degradation from excessive erosion and sedimentation.

**Table 3-3
Water Bodies in GSFO on Colorado's 2006 Section 303(d) List
or Monitoring and Evaluation List**

List	Segment Description	Portion	Impairment	Water Body ID
303(d)	Tributaries to Colorado River, Roaring Fork to Parachute Creek except for specific segments	All	Selenium	COLCLC04a
303(d)	Roan Creek and tributaries, Clear Creek to the Colorado River	Dry Fork	Selenium	COLCLC14b
Monitoring and Evaluation	Colorado River, Roaring Fork to Parachute Creek	All	Sediment	COLCLC01
Monitoring and Evaluation	Colorado River, Parachute Creek to Gunnison River	All	Sediment	COLCLC02
Monitoring and Evaluation	Tributaries to Colorado River, Roaring Fork to Parachute Creek excl. specific segments	Mamm Creek, South Canyon Creek	Fe (Trec)	COLCLC04a

Current special management areas in the field office include Water Quality Management Areas, Municipal Watersheds, and Debris Flow Hazard Zones. Water Quality Management Areas include four areas with known water quality problems: Divide, Horse, Willow, Poison, Milk, and Alkali Creeks and the Upper Colorado River. Of these areas, Horse, Willow, Poison, Milk, and Alkali Creeks were investigated. Due to the severity of the water quality problems encountered, watershed plans were designed and implemented in the mid-1980s. The goal was to halt upstream migration of active headcuts and stabilize severely eroding stream banks. In addition, riparian habitat and functions would be created and/or enhanced by planting willow cuttings. Headcuts and bank erosion were addressed by engineering methods including rock and double fence check dams and rock headcut control structures. An evaluation of the Milk and Alkali Creek watershed management plan in 1992 indicated that several activities were taking place in the project area that have affected the watershed plan objectives. These included a dramatic increase in OHV use, which was removing vegetative cover, creating erosion pathways, and causing gully development. Motorcycles were driving over installed check dams and sediment retention structures and driving through riparian vegetation.

**Table 3-4
Public Land Health Assessments for Water Quality (Standard 5) from 1999 to 2006**

Landscape Assessed	Description/Status	Standard 5 met?	Year Assessed
Roan Cliffs*	All waters on the Roan Cliffs appear to be meeting water quality standards established by the state of Colorado	Yes	1999
Battlement Mesa	Most streams are ephemeral and water quality data is limited, but existing data do not suggest that the standards established for the classified uses are being exceeded	Yes	2000
Rifle Creek	Assessment area principally in the Colorado River basin between Rifle and DeBeque incl. Government Creek, West Rifle Creek, Middle Rifle Creek, and East Rifle to Rifle Creek	Yes	2001
South Eagle	Assessed the Gypsum, Spring, Alkali, and Brush Creek basins which feed the Eagle River	Yes	2002
North Eagle	Eagle from confluence with Colorado River upstream to just east of Wolcott, and the reach of Colorado River from confluence with Eagle upstream to near Horse Creek	Yes	2003
Rifle West (Grand Valley)	Tributaries to the Colorado River between Rifle and DeBeque; tributaries on the north side of the river included Smith, Kelly, Riley, Starkey, Hayes, Cottonwood Gulches, and Sharrard Creek. South side tributaries included Cottonwood, Spruce, Porcupine, and Beaver Creeks.	Yes	2004
Colorado River from Sweetwater to Burns	Tributaries of Colorado River between Burns and Sweetwater including Sheep, Horse, Willow, and Red Dirt Creeks; Bull, Trail, Sheep gulches, Alamo and Posey Creeks	Yes	2005
Colorado River from Burns to State Bridge+	Colorado River and its tributaries between Burns and State Bridge, including Piney River, Elk, Antelope Castle, Tepee, Norman, Catamount, Goodson Creeks	TBD	2006

* The Roan Cliffs Assessment Unit is covered under the pending Roan Plateau RMPA and therefore will not be further discussed.

+ Data has been collected, but a final report on this assessment unit is not yet available.

Municipal watersheds designated in the RMP include those of the City of Rifle and Town of New Castle. These designations appear to be working adequately to protect surface water for these municipalities. As part of the 1996 Safe Drinking Water Act and Colorado's Source Water Assessment and Protection Program, the State mandated that local municipalities identify the pollution risks to their water supply so that decision makers can develop and implement appropriate preventive measures to protect these water sources. To the extent that these source areas are on or influenced by BLM lands, opportunities are present for collaboration with local governments to create management options that protect these municipal watersheds and thus human health while enhancing the natural resource goals of the BLM. The

city of Rifle's Beaver Creek watershed is an important water source. However, Beaver Creek and adjacent watershed are also experiencing oil and gas development on both private and federal lands. The BLM should continue managing the sensitive Beaver Creek watershed under the Municipal Watersheds designation which allows no surface disturbance on BLM lands within the watershed. The primary source of drinking water for New Castle is East Elk Creek. Most of this watershed is in federal ownership, with BLM lands in the lower watershed area and USFS lands in higher elevation areas. The BLM has the opportunity with the RMP revision to redefine as necessary the municipal watershed boundaries of Rifle and New Castle to concur with any changes in BLM land status in these watersheds. Most of the municipal watersheds for other towns within the field office are excluded from the municipal watershed designation in the RMP because they are on higher elevation areas managed by the USFS or are privately owned.

Debris Flow Hazard Zones adjacent to the city of Glenwood Springs have been designated an ACEC, with restrictions including light grazing only and limiting motorized travel to designated roads and trails.

Water Use

To ensure water availability for multiple use management and the functioning of healthy riparian and upland systems, the BLM files for water rights on water sources such as springs when the opportunity arises. The BLM also collects stream data and makes recommendations to the CWCB for stream segments suitable for in-stream flow rights, which only the CWCB can hold in Colorado. In-stream flows are the minimum flows necessary to support fish, other aquatic organisms, and aquatic habitat in a stream or stream segment.

Groundwater

Standards for protecting groundwater quality are found in Regulations 41 and 42, *Basic Standards for Groundwater and Site Specific Water Quality Classification and Standards for Groundwater*, respectively. The superficial geology for the GSFO consists of the lower part of the Green River Formation (below the Parachute Creek Member) and underlying Wasatch Formation. These formations are not known to contain significant usable water-bearing zones. A slight potential exists for minor aquifers in the lenticular sandstones of the Wasatch Formation.

Nearly all of the wells below the cliffs are on private lands. Many of these are less than 100 feet deep and generally intersect the alluvial aquifers along the Colorado River, Parachute Creek, and other lower elevation streams and tributaries throughout the area. The deeper wells range in depth from about 100 to 250 feet, with a few in excess of 400 feet. These wells are mostly on the slopes and benches south of the Colorado River and south of the planning area. Produced waters from oil and gas development typically are of poor quality and must be disposed of in accordance with Onshore Order #7. Most water is disposed of onsite (in ponds) or trucked to an approved facility. The larger companies are treating the produced water and re-

using it for drilling operations. Management of produced waters is a big issue and the GSFO will likely get proposals to build large evaporation ponds on public lands

Indicators

Land uses for the GSFO include forest, rangeland, agriculture, and increasingly, urban development and recreation. The Eagle, Roaring Fork, and Upper Colorado River Valleys are all experiencing unprecedented development and recreational pressures on BLM public lands and natural resources. The BLM owns and manages 568,064 acres of land surface out of the 2.9 million acres in the resource area. Approximately 20 per cent of land surface is BLM managed; the rest is owned by other federal agencies, the state of Colorado, and private landowners. In addition to the surface land acreage, the BLM manages 196,935 acres of minerals under both BLM and private land.

Given the extent of surface acres managed by the resource area, it can be challenging assessing land and resource conditions. The resource condition is assessed primarily through the LHA process. Different watersheds are targeted every year for a systematic analysis of the five standards, including riparian condition and water quality. The idea is to rotate through the resource area, focusing on a set of neighboring watersheds each year for field visits and analysis. The water quality parameters usually measured in the field, include flow, water temperature, pH, and specific conductivity. Riparian condition is assessed using PFC, which is part of the LHA.

Trends

Trends in the resource area include rapidly increasing recreation use and demand, growth in urban/suburban development, and burgeoning gas development. OHV activity is increasing significantly in more easily accessible WUI boundaries as well as more remote areas, due in part to population growth in the river corridor towns like Rifle and Eagle. Mountain biking is also on the increase. Current recreation management is insufficient to protect water quality and other important natural resource values in these and other areas of the RMP planning area. Increased OHV activity on unauthorized and open access areas, and the resultant resource damage, needs to be addressed in the RMP revision. Sustainable travel management would prevent or mitigate much of the water resource damage, including erosion, sediment production and gully creation, and riparian and terrestrial vegetation destruction. An evaluation of the Milk and Alkali Creeks watershed plan determined that a substantial increase in OHV use in these watersheds has had detrimental effects on riparian and terrestrial vegetation, erosion, and gully development, leading to increased sediment and salinity loading in streams. Current levels of recreation use and demand calls for a sustainable and comprehensive travel management plan to address current and anticipated needs.

Expansion of the WUI and sprawled development in the Eagle, Roaring Fork, and Upper Colorado River Valleys is anticipated to have long-term impacts on surface water quality and flow. Runoff in urban areas picks up and carries urban pollutants

including sediment, oil and grease, nutrients (nitrogen and phosphates), and metals into streams. This stormwater is regulated by the US Environmental Protection Agency. In addition, increased development with the resultant impermeable surfaces such as roads, parking lots, shops, and houses is expected to permanently alter the natural hydrograph of local streams, creating a flashier system that responds quickly to precipitation. Rain on impermeable surfaces is conveyed more rapidly to local drainages, causing rapidly swelling creeks with greater power to flood and erode stream banks.

Forecast

Given current management, the water quality condition is anticipated to decline in parts of the resource area due to increased development and population growth and the additional recreation and resource demands that follow. Additional pressure will also be placed on water quantity and supply, with the potential to threaten aquatic organism and ecosystem health in both lotic and lentic systems.

An unprecedented rate of natural gas development is occurring in the western portion of the resource area, creating an infrastructure of roads, pipelines, and well pads from surface disturbance, earth movement, and vegetation removal. Gas development impacts on water resources are primarily due to erosion and sediment production from surface disturbance. NSO and CSU stipulations, case-specific COAs, stipulations, and BMPs mentioned in the oil and gas amendment (1999) helps to mitigate surface water impacts.

3.1.5 Vegetative Communities

Current Conditions

Forests, Woodlands, and Rangelands

The RMP planning area lies within three physiographic regions (ecoregions): the Southern Rocky Mountains, the Colorado Plateau, and the Utah High Plateaus. The Southern Rocky Mountains ecoregion extends from approximately Rifle to the east. The Colorado Plateau extends from Rifle to the south and southwest. Only the very western part of the RMP planning area falls within the Utah High Plateaus ecoregion. The Utah High Plateaus extends from the top of the Roan Plateau northwest of Rifle to the north and west. Within a specific area, the type and amount of vegetation are largely determined by precipitation, elevation, topography, aspect, soil types, and human actions.

Within the RMP planning area, this complex juxtaposition of ecoregions supports ten primary vegetative cover types (**Table 3-5** and the Vegetation Types map, **Appendix E**).

Rangelands

Grasslands. Grasslands and grass/forb-dominated rangelands consist of a perennial grass type often intermixed with forbs or scattered shrubs. Grasslands occupy three

percent of public land in the GSFO and generally occur as scattered patches on windswept ridges, on south-facing slopes, or on deeper soils in valley bottoms. At low- to mid-elevations, these grasslands are dominated by needle-and-thread grass, bluebunch wheatgrass, or Indian ricegrass. In a deteriorated condition, these grasslands may become dominated by annual grasses, noxious weeds, or shrubs. In the higher elevations of the RMP planning area, such as on the flanks of Castle Peak or the northern side of King Mountain, subalpine grassy meadows are dominated by Thurber's fescue or Columbia or Letterman's needlegrass.

Salt-desert shrubs. Salt-desert shrublands (one percent of public lands) are found in the lower elevations of the RMP planning area (generally below 6,000 feet) in areas underlain by saline soils, such as on the Wasatch Formation on terraces and slopes above the Colorado River between DeBeque and Rifle. Salt desert shrub communities are usually dominated by black greasewood, shadscale, or other saltbushes, with Wyoming big sagebrush, low rabbitbrush, winterfat, and bud sagebrush often a part of the shrub community. The understory is often sparse due to the saline soils, which inhibit the growth of all but salt-tolerant vegetation. The understory is generally dominated by galleta grass, western wheatgrass, or prickly pear cactus. Stands in a deteriorated condition may support substantial infestations of cheatgrass, annual forbs, and noxious weeds.

These salt-desert shrublands are very important winter ranges for wildlife and livestock as the shrubs provide forage that is not buried by snow, and the shrubs maintain relatively high levels of protein and carbohydrates through the winter.

Sagebrush. Sagebrush communities in the RMP planning area are dominated by Wyoming big sagebrush, mountain big sagebrush, subalpine sagebrush or basin big sagebrush. Collectively, all four sagebrush communities make up about 16 percent of public lands within the GSFO.

Wyoming big sagebrush. Wyoming sagebrush grows on the driest sites of all big sagebrush species and subspecies, where annual precipitation ranges from 7 to 11 inches (Winward 2004). It is found on shallow to moderately deep coarse soils, between the elevations of 5,000 and 7,000 feet. Shrub height varies from as low as eight inches on shallow soils to around 30 inches on deeper soils. Canopy cover is not as dense as for basin, mountain, or subalpine sagebrush and rarely exceeds 30 to 40 percent.

Wyoming sagebrush is palatable to wildlife and livestock and is important winter forage for big game species, such as mule deer. Greater sage grouse also depend heavily on this subspecies of sagebrush. Fire is an important component of all sagebrush-dominated plant communities. Fire in the Wyoming big sagebrush ecosystems would have burned at less frequent intervals (roughly 100 years or more)

Table 3-5
Vegetation Types in the GSFO

Vegetation Type	Percent	Characteristic Species
Aspen woodlands	5	Quaking aspen-dominated woodlands
Barren/talus slopes/rock	5	Barren talus slopes, rock outcrops, soil
Coniferous forest	9	Douglas-fir, lodgepole pine, Engelmann spruce, subalpine fir
Gambel oak woodlands	9	Gambel oak dominated shrublands
Grasslands	3	Grass or forb-dominated rangelands (bluebunch wheatgrass, needle-and-thread grass), subalpine meadow (Thurber's fescue), agricultural land
Mesic mountain shrublands	14	Shrublands with big sagebrush, Gambel oak, serviceberry, snowberry, mountain mahogany, antelope bitterbrush)
Pinyon-juniper woodlands	37	Pinyon pine, Utah juniper, sometimes Rocky Mountain juniper, with shrubs, grass, rock
Riparian	1	Cottonwood, willow, tamarisk, alder, Colorado blue spruce, sedge, and rush
Salt-desert shrublands	1	Black greasewood, shadscale, Gardner's and four-wing saltbush, low rabbitbrush, black and bud sagebrush, and some big sagebrush
Sagebrush shrublands	16	Basin, Wyoming, mountain, and subalpine big sagebrush; sometimes low rabbitbrush; rubber rabbitbrush
TOTAL	100	

than other big sagebrush types due to the lack of fine fuels that could carry fire in this habitat type (Welch 2005). However, where intervals since the last fire are long, the trend in the RMP planning area is for sagebrush stands to become dense and unproductive, outcompeting the grasses in the understory and supporting a high ratio of dead or decadent sagebrush. In these areas with long intervals since the last fire, Utah junipers, and to some extent pinyon pines, often become established in these Wyoming big sagebrush sites.

Basin big sagebrush. Basin big sagebrush is typically found on deep well-drained soils of valley bottoms and along ephemeral drainages in the 10-18 inch precipitation zone. It requires slightly more moisture than adjacent Wyoming big sagebrush communities. This subspecies of sagebrush can reach up to 12 feet in height, with a canopy cover reaching 70 percent.

Basin big sagebrush can be found in association with green and rubber rabbitbrush, serviceberry, snowberry, mountain mahogany, or antelope bitterbrush. Basin big sagebrush is the least palatable subspecies of sagebrush and often will show little or no browsing use, even in extreme winters when little other forage is available. The

primary importance of basin big sagebrush for wildlife habitat is as hiding and thermal cover for mule deer and elk and as nesting habitat for other wildlife species. Basin big sagebrush often increases in density and cover with livestock overgrazing and with long intervals between fires. Prescribed fires or mechanical or chemical treatment may be used to increase structural diversity in the sagebrush community and to increase cover and density of grasses, forbs, and sprouting shrubs.

Mountain big sagebrush. Mountain big sagebrush is found in deep soils at mid- to upper elevation slopes and ridges between 6,800 feet and 8,500 feet. Most sites supporting this sagebrush are very productive and diverse. The fire return interval in mesic mountain big sagebrush sites with abundant grass and forb cover is more frequent than other sagebrush sites, roughly 25 to 30 years. Mountain big sagebrush can increase in canopy cover without periodic fire, disease, or other disturbance. Canopy cover on areas that have not had disturbance for several decades can reach between 40 and 50 percent (Winward 2004). This sagebrush type is an important component of sage grouse brood-rearing habitat, so any sagebrush reduction projects must be designed to consider sage grouse habitat requirements (Winward 2004).

Subalpine big sagebrush. This variety of big sagebrush is found on sites that are slightly moister than mountain big sagebrush. It can be found between the elevations of 8,500 and 10,000 feet, often as openings adjacent to aspen and spruce-fir forests (Winward 2004). In disturbed areas or areas of excessive grazing, it can develop canopies over 40 percent cover. When canopy covers reach these levels, the understory species suffer.

Subalpine sagebrush receives little browsing, not because it is unpalatable, but because of the abundance of understory forage production and its high elevation habitats, which are frequently buried in snow during all but the mildest winters. It appears that wildfire has played less of an ecological role in maintaining a balanced overstory/understory ratio in subalpine sagebrush than in mountain big sagebrush habitats (Winward 2004).

Mixed mountain shrubs. Mountain shrublands are a major component of the middle elevations of public lands within GSFO. Mesic mountain shrubs, which include a mixture of serviceberry, snowberry, Gambel oak, sagebrush, mountain mahogany, rabbitbrush, chokecherry, squawapple, and antelope bitterbrush, make up about 14 percent of public land habitat. These communities generally lie between the low elevation pinyon-juniper woodlands and the higher elevation aspen and mixed conifers. Mesic mountain shrublands are common in the mountains south of I-70, including the Hardscrabble, Divide Creek, and the Crown areas. Since this community type generally grows in areas of relatively abundant moisture, herbaceous plants associated with mesic mountain shrubs are often diverse and numerous. The understory density and diversity is inversely proportional to the amount of overstory canopy cover. Commonly associated herbaceous plants include Letterman's and Columbia needlegrass, prairie junegrass, bluebunch wheatgrass, Indian paintbrush, buckwheat, mat penstemon, arrowleaf balsamroot, and hawksbeard.

Gambel oakbrush. Gambel oakbrush is a type of mixed mountain shrubland in which Gambel oak is the dominant species. This plant community is also found at middle elevations. Approximately nine percent of the RMP planning area supports Gambel oak shrublands. Gambel oak is a rapid resprouter following fire, but fire reduces the height of these shrub stands, making the tender shoots more accessible for wildlife browsing. Fire often increases herbaceous production, at least for 10 to 20 years until the shrubs regain their former height and density.

Forests and Woodlands

Pinyon-juniper woodlands. Pinyon-juniper woodlands are the single most abundant vegetative type in the GSFO, making up approximately 37 percent of the vegetative communities. Pinyon-juniper woodlands include pure stands of Utah juniper at the lower elevations, with an increasingly greater component of pinyon pines at higher elevations, and some Rocky Mountain juniper along streams and other mesic locations. These woodlands tend to grow in the lower to middle elevations along ridges where soils are too rocky or shallow to support shrubs. As pinyon-juniper woodlands mature and the canopy cover increases, the understory vegetation often decreases dramatically. In mature stands, microbiotic crusts are a large factor in holding the soils in place.

A widespread phenomenon throughout the RMP planning area is the expansion of Utah juniper and pinyon pines into adjoining big sagebrush sites. Once established, juniper has the ability to outcompete other plant species for limited soil moisture and nutrients. Juniper expansion has been attributed to livestock grazing, which reduces the fine fuels required for effective fire spread, climatic changes (mild temperatures and above-average precipitation in the late 1880s and early 1900s) and reduction in fire frequency due to fire suppression (Miller and Rose 1999). Pinyon pine and Utah juniper are poorly adapted to survive fire. Pinyons and junipers whose trunks are girdled by fire will die; crown-fire conditions are not required to kill these woody species.

Aspen. Aspens are vigorous resprouters following fire and are often an early seral stage species in forested communities. A small percentage of the aspen stands, especially some on the Roan Plateau, appear to be climax aspen stands with little evidence of invasion or replacement by conifers. However, most of the aspen stands within the RMP planning area are being invaded by shade-tolerant conifers, which may eventually replace the aspens. Removal of the conifers would promote aspen regeneration. Aspens make up about five percent of the vegetative community types in the RMP planning area and are often found as small groves within the mountain sagebrush or coniferous forest communities. Aspen stands are most abundant on the Roan Plateau uplands, on the flanks of Castle Peak, and in the upper Hardscrabble area. They usually support a dense understory of mixed grasses and forbs, with an occasional shrub component.

Douglas-fir. This forest type is generally found in steep north or north-east facing drainages at the middle elevations in the RMP planning area. The soils are usually

shallow, and the slopes are colder and moister than the surrounding habitat, which supports primarily mixed mountain shrubs or aspens.

Lodgepole pine. Lodgepole pine produces cones that do not open at maturity because they are sealed shut by a resinous bond between the cone scales. These cones remain on the tree for years and generally remain closed until the heat from a fire melts the resin and releases the seed. Hence, this early seral or pioneer forest type is the result of past, stand-replacing wildfires which favor this species' quick germination following fires. Lodgepole pine forests are not readily self-thinning, so they frequently form dense "dog-hair" stands of tall slender trees that have low vigor and a high susceptibility to insects, disease, and fire. These thin tree boles are not generally in demand for commercial timber. In the last century, fire prevention and suppression policies have not allowed natural fires to run their course. In the absence of periodic fires, lodgepole pines stands have developed into an overmature and overly dense condition. Insects and diseases have increased, and tree health and vigor have declined.

Mixed conifers. The major species component of the mixed conifer type is subalpine fir and Engelmann spruce. This climax forest type is present in small amounts on the Roan Plateau and Castle Peak areas.

Riparian. Riparian vegetation is usually present in narrow strips alongside perennial streams, rivers, lakes, reservoirs, and some intermittent streams. This vegetative type makes up approximately one percent of the total vegetative cover in the RMP planning area (see Riparian Section).

Barren/talus/rock outcrops. Barren areas, talus slopes, and rock outcrops are those areas within the RMP planning area that consist of barren soil, rock outcrops, or cliffs and talus slopes that support little or no vegetation. Barren areas, talus slopes, and rock outcrops are too steep and too sparsely vegetated to be beneficial to livestock or big game animals for forage. This cover type occupies approximately five percent of the RMP planning area and is found in both the Colorado and Eagle River drainages.

Barren areas are usually caused by soil conditions that preclude the growth of vegetation. Barren soils are concentrated on gypsiferous soils between the towns of Dotsero and Eagle. Although vegetation in these areas is quite sparse, microbiotic crusts are abundant and diverse and are key to holding these soils intact. Other barren areas are found as small inclusions on Wasatch soils between DeBeque and Rifle that are too steep or lack the proper soil characteristics to support vegetative growth.

Talus slopes form below cliffs of the Green River formation as the cliffs begin to weather and crumble. These talus slopes consist of shale shards of various sizes and often have very little soil development or are too steep and unstable to support most forms of vegetation. However, many endemic rare plant species in the RMP planning

area occur on these talus slopes. Most of these species have biological characteristics that enable them to grow in these extreme conditions.

Rock outcrops are usually areas of sandstone that are resistant to weathering. These areas are exposed rock ledges and benches with soil deposition occurring only in cracks and low spots where soil accumulates.

Land Health Assessment Results

Seven of the 13 landscapes within the RMP planning area have a completed LHA and determination document. One landscape has had the fieldwork portion of the assessment completed, and the report and determination document are being developed. Observations in the completed assessments that are relevant to the condition of vegetative communities are discussed below.

Battlement Mesa

- The condition of the vegetative communities was the most widespread problem noted in this landscape. Nearly half of the observation sites in this assessment were rated at risk or not functional. Much of the sagebrush and woodland sites on the Battlement Mesa landscape are not achieving the standards for healthy lands. The poor condition sites are concentrated along the northwest portion of the landscape in the Alkali Creek Common and Alkali Gulch allotments. The lower elevations of the Dry Creek-Pete and Bill and Battlement Creek Common allotments are also in unsatisfactory condition.
- Characteristics of the vegetative communities that were failing to meet the standards included dominance of many sagebrush sites by cheatgrass, poor diversity and abundance of perennial grasses and forbs, dead, decadent, or severely hedged sagebrush, and pinyon-juniper woodlands with a lack of understory vegetation and inadequate microbiotic crusts.

Eagle River South

- Most of the higher elevation, more mesic sites had good species diversity and cover. In the lower elevations, and adjacent to residential development, more concerns were noted. However, only two allotments (Brush Creek and East Hardscrabble) had deficiencies sufficient to be considered not meeting the standard as a whole. In low-elevation sagebrush parks, where big game concentrate in the winter, heavy browsing of shrubs resulted in poor vigor and even some mortality. Many sagebrush parks are old and dominated by even-aged class shrubs. Pinyon-juniper encroachment was widespread. Herbaceous cover and diversity was lacking. Some old crested wheatgrass seedings were still largely dominated by crested wheat and sagebrush with poor vegetative diversity and cover and lack of biological soil crusts. High density OHV activity has created habitat fragmentation issues in some areas.

North Eagle

- The landscape as a whole was meeting the healthy plant and animal communities' standard. Of the 54 sites visited, 42 were meeting the standard, 11 were meeting the standard but with problems noted, and one was considered not meeting the standard. The upper elevations of the landscape (aspen and conifer stands and Thurber fescue meadows) were generally in the best condition, with diverse and dense vegetative growth. Most of sites that had land health concerns were in the lower elevations of Bocco Mountain, Blowout, and Greenhorn allotments. Some of the lower elevation sagebrush parks had been brush beaten and seeded to crested wheatgrass in the 1960s, 1970s, or 1980s. Some of these treatments continue to be heavily dominated by crested wheatgrass, with few other native perennial grasses or forbs. Of untreated sagebrush sites, more than half are dominated by old decadent sagebrush with poor recruitment or with varying degrees of pinyon-juniper encroachment. In two former pinyon-juniper woodcutting areas, cheatgrass is now common.

Rifle Creek

- Of the 71 upland sites visited, 48 were found to be meeting Standard 3 and 23 sites were not meeting the standard. The following six allotments were considered not to be meeting the standard: Hubbard Mesa, Government Creek, Simpson & Nichols, Andgee, Brosius Gulch, and Wittwer. Most of the sagebrush ecological sites were in a late seral stage, with poor productivity and little evidence of reproduction. Shrubs were heavily to severely hedged and exhibited low vigor. Many sites had moderate to advanced encroachment of pinyon pine or juniper trees. Few native perennial grasses or forbs occur under the sagebrush or low-elevation pinyon-juniper canopies. Cheatgrass was dominant on several sagebrush and pinyon-juniper sites.

Rifle West

- On a site-specific basis, 20 sites were meeting Standard 3, seven were not meeting Standard 3, and nine were considered to be meeting the standard but with problems identified. Most sites that were not meeting were found in the County Line and Smith Gulch Allotments. Current livestock grazing was a causal factor for the County Line allotment not meeting the standard; historic livestock grazing contributed to Smith Gulch not achieving the standard. Cheatgrass has become a dominant component of the lower elevation south-facing slopes of the landscape, with a corresponding loss of native perennial grasses and forbs. Sagebrush communities dominated by old, age-class decadent sage and encroaching pinyon and juniper are also common land health concerns in this landscape. Fire return intervals outside of the normal range, along with fire suppression, and big game grazing contributed to these land health concerns.

- Habitat fragmentation, loss of habitat, reduction in habitat quality, and increased human use associated with natural gas exploration and development resulted in a failure to meet Standard 3 on approximately 16,500 additional acres of public land.

Roan Cliffs

- In general, plant communities were healthy and productive. However, many vegetative communities were in mid- to late-seral stage, and age-class diversity could be improved. Kentucky bluegrass was present on more than a quarter of the sites but rarely dominated. Houndstongue was reported at over two-thirds of the sites. Many aspen stands were decadent. Wildlife populations, except Colorado River cutthroat trout, were healthy and productive.

Sweetwater to Burns

- All individual assessment sites were meeting Standard 3 for healthy plant and animal communities, but some watershed-wide concerns were noted. The primary concern was the condition of some sagebrush communities. Many stands are old, decadent, and heavily hedged due to repeated and prolonged browsing by wintering wildlife. Lack of recruitment of young sagebrush plants is also a concern. The condition of the herbaceous understory was pretty good overall, but several sites had a poor diversity or cover of grasses and forbs and some small areas of cheatgrass were noted. Decades of fire suppression and climatic conditions favorable to woodland species has led to the encroachment of pinyon and juniper trees into sagebrush communities, which are contributing to the reduction in quality and quantity of sagebrush habitat. Although these sites are still meeting the standards, some type of treatment to remove the trees will be necessary in the near future to sustain land health.

Riparian Areas and Wetlands

Riparian areas are a form of wetland transition between permanently saturated wetland and upland areas. These areas exhibit vegetation or physical characteristics reflective of permanent surface or subsurface water influence. Typical riparian areas are lands along, adjacent to, or contiguous with perennially and intermittently flowing rivers, streams, glacial potholes, and shores of lakes and reservoirs with stable water levels. Excluded are such sites as ephemeral streams or washes that do not exhibit vegetation dependent on free water in the soil (BLM Manual 1737). Wetlands are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and which, under normal circumstances, do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include marshes, shallows, swamps, lakeshores, bogs, muskegs, wet meadows, estuaries, and riparian areas (BLM Manual 1737). Even though riparian and wetlands areas occupy only a small percentage of land, these areas provide a wide range of functions critical to many different wildlife species, water quality, scenery, and recreation (Brimson 2001). A variety of

physiognomic groups (Carsey et al. 2003) of riparian zones and wetlands occur with the GSFO, such as evergreen riparian forests and woodlands, mixed coniferous and deciduous forests and woodlands, deciduous dominated forests and woodlands, tall willow shrublands, short willow shrublands, non-willow shrublands, and herbaceous vegetation. These can be further subdivided into a variety of plant association (plant community) types; however, insufficient data exists to provide a comprehensive listing of these. The location of riparian areas and wetlands within the GSFO can be found on USFWS National Wetlands Inventory maps, GSFO GIS layers (streams, rivers, lakes, springs, vegetation, and proper function condition assessment), aerial photos, USGS quadrangle maps, and GSFO specific maps of lentic and lotic resources.

Information on the condition of these riparian areas and wetlands is available from PFC assessments that have been conducted from 1993 to the present time. Many of these have been conducted as part of LHAs on various landscapes within the GSFO. On the basis of hydrology, vegetation, and erosion/deposition (soils) attributes and processes (Technical Reference BLM-RS-ST-98-001+1737), the PFC assessments place the riparian area in one of five ratings: PFC, FAR upward trend (UP), FAR not apparent trend (NA), FAR-DOWN, and nonfunctional (NF). Since the approach of the PFC assessment is to evaluate most of the indicators for land health Standard 2, the resultant functional rating (PFC, FAR, NF) for each riparian area determines whether the standard is being achieved. A PFC rating means most or all of the indicators (within the system's potential) have been met, and therefore Standard 2 has been achieved. A FAR-UP rating generally means that several indicators have not been met but that significant progress is being made toward achieving Standard 2. A FAR-DOWN or FAR-NA rating means several indicators have not been met and generally Standard 2 will not have been achieved. Likewise, a NF rating means that critical indicators have not been met and consequently Standard 2 has not been achieved.

For lotic systems, a riparian-wetland area is considered to be in proper functioning condition when adequate vegetation, landform, or large woody debris is present to accomplish the following:

- Dissipate stream energy associated with high water flow, thereby reducing erosion and improving water quality;
- Filter sediment, capture bed load, and aid floodplain development;
- Improve floodwater retention and groundwater recharge;
- Develop root masses that stabilize streambanks against cutting action;
- Develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; and
- Support greater biodiversity (Technical Reference BLM-RS-ST-98-001+1737).

For lentic systems, riparian-wetland areas are functioning properly when adequate vegetation, landform, or debris is present to accomplish the following:

- Dissipate energies associated with wind action, wave action, and overland flow from adjacent sites, thereby reducing erosion and improving water quality;
- Filter sediment and aid floodplain development;
- Improve floodwater retention and groundwater recharge;
- Develop root masses that stabilize islands and shoreline features against cutting action;
- Restrict water percolation;
- Develop diverse ponding characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterbird breeding, and other uses; and
- Support greater biodiversity (Technical Reference BLM-RS-ST-99-001+1737).

Each riparian-wetland area has to be judged against its capability and potential (Technical Reference BLM-RS-ST-98-001+1737).

Tables 3-6 and 3-7 and the Riparian Proper Functioning Condition Assessment map (**Appendix E**) show the most current results of PFC assessments with the GSFO (including those within the Roan Plateau RMPA planning area). Areas determined to be nonriparian systems are not shown on the tables. Causal factors for a FAR and NF rating are listed in **Table 3-8**. The lotic and lentic tables show only those riparian-wetland areas that have had a PFC assessment. The lotic table represents most riparian areas that occur along streams and rivers within the GSFO. PFC has not been assessed on riparian areas at springs/seeps within the GSFO, so there is no data depicted in the tables for these sites. In addition, PFC assessment has not been conducted on many of the relatively smaller lentic systems that occur within the GSFO (e.g., Castle Peak area).

Table 3-6
GSFO Lotic PFC Assessment (as of 2006)

Riparian Area Name	Date Assessed	PFC	Assessment Rating (In Miles)			
			FAR-UP	FAR-NA	FAR-DOWN	NF
Abrams Creek Lower	6/4/02	3.4				
Abrams Creek Upper	6/4/02	3.4				
Alamo Creek	4/27/05	2.4				
Alkali Creek#1	8/22/97		0.9			
Alkali Creek#2	7/8/03	2.4				
Alkali Creek#3 Lower	5/14/03	1.7				
Alkali Creek#3 Upper	7/7/03	0.9				
Alkali Creek#4 Lower	5/23/02	1.1				

Table 3-6
GSFO Lotic PFC Assessment (as of 2006) (continued)

Riparian Area Name	Date Assessed	Assessment Rating (In Miles)			
		PFC	FAR-UP	FAR-NA	FAR-DOWN NF
Alkali Creek#4 Upper	5/23/02			1.0	
Alkali Creek E Branch#3	5/14/03	0.8			
Alkali Creek South Fork	7/8/03	2.0			
Antelope Creek – Lower Reach	5/22/06	0.6			
Antelope Creek – Middle Reach	5/11/06		0.3		
Antelope Creek – Upper Reach	5/10/06	0.8			
Baldy Creek	6/16/94	1.7			
Barbers Gulch	6/21/95	3.2			
Battlement Creek#1	6/24/94	0.2			
Battlement Creek#3	5/2/00	1.4			
Bear Gulch	7/20/94			1.4	
Bearwallow Creek	6/26/94			1.5	
Beaver Creek	4/28/04	0.1			
Belodi Creek	6/16/94		0.5		
Ben Good Creek	7/12/99		1.2		
Big Alkali Creek – Lower Reach	5/26/06	3.5			
Big Alkali Creek – Upper Reaches	6/19/06	5.7			
Big Alkali Creek-NR	4/20/00				
Bionaz Creek	6/15/95	1.4			
Black Creek	8/8/95	2.1			
Bob Creek	7/11/95	1.2			
Boiler Creek	6/25/94				1.2
Brook Creek	6/16/94	0.9			
Brush Creek	5/22/01	3.1			
Buck Gulch	6/14/99				0.7
Bull Gulch #1	6/15/99	1.9			
Butler Creek	5/16/01	0.03			
Butler Creek Lower	5/16/01	1.4			
Butler Creek Upper 1	6/21/01	0.8			
Butler Creek Upper 2	6/21/01	0.1			
Butler Creek Upper 3	6/21/01	0.2			
Cabin Creek Lower Reach	8/10/94			0.01	
Cabin Creek Upper Reach	7/5/95	1.7			
Camp Gulch	7/12/99		1.8		
Camp Gulch Br	7/18/94	0.9			
Canyon Creek	6/26/94	1.7			
Cascade Creek	6/20/95				1.3
Castle Creek Lower Reach#1	5/18/06	1.6			
Castle Creek Upper Reach	6/21/06		2.9		
Catamount Creek	6/20/06	5.4			
Cattle Creek	6/19/94	1.5			

Table 3-6
GSFO Lotic PFC Assessment (as of 2006) (continued)

Riparian Area Name	Date Assessed	Assessment Rating (In Miles)			
		PFC	FAR-UP	FAR-NA	FAR-DOWN NF
Cedar Creek	7/5/95	0.9			
Clear Creek	6/15/94	1.5			
Colorado River	7/18/03	1.2			
Colorado River#1	5/23/06	12.2			
Colorado River#2	5/4/04	17.6			
Colorado River Lower ACEC ¹	8/27/04	1.1			
Colorado River Lower Crescent	7/8/04	0.6			
Colorado River Lower Eagles Nest	7/8/04	0.2			
Colorado River Lower Gentry	7/8/04	0.5			
Colorado River Lower Pipeline	7/8/04	0.6			
Corral Creek	6/23/94	1.0			
Cottonwood Creek	7/11/95	3.5			
Cottonwood Creek#1	4/27/04	0.4			
Cottonwood Creek West Fork	4/27/04	0.6			
Cottonwood Gulch Lower	4/27/04		0.7		
Cottonwood Gulch Upper	4/27/04	1.4			
Cottonwood Gulch West Branch 1	4/20/04	0.6			
Cottonwood Gulch West Branch 2	4/20/04	0.7			
Deep Creek	9/19/94	4.5			
Derby Creek	8/10/94	0.3			
Doodlebug Gulch	05/07/01			0.4	
Dry Creek	4/27/00	4.7			
Dry Fork Cabin Creek	7/5/95			1.4	
Dry Hollow Creek	6/28/94				2.4
Dry Possum Creek	9/30/97	0.1			
Dry Rifle Creek	5/22/01	1.3			
Eagle River	7/9/02	0.7			
Eagle River Lower	7/17/03	3.0			
Eagle River Upper	7/31/95	2.6			
East Canyon Creek	7/1/94	2.2			
East Divide Creek Reach#1	6/15/94	0.7			
East Divide Creek Reach#2	7/14/97			0.7	
East Fork Parachute Creek Middle Reach	7/7/99	2.7			
East Fork Parachute Creek Upper Reach	7/7/99	1.6			
East Fork Sheep Creek	4/26/05	2.2			
East Mamm Creek	6/28/94				1.2

¹A recent development has raised an issue with the title of this parcel. An adjacent landowner has disputed that the parcel is public land and has claimed ownership. At the time of this AMS was prepared, the BLM is still investigating the title issue.

Table 3-6
GSFO Lotic PFC Assessment (as of 2006) (continued)

Riparian Area Name	Date Assessed	Assessment Rating (In Miles)			
		PFC	FAR-UP	FAR-NA	FAR-DOWN NF
East Middle Fork Parachute Creek	7/20/94		1.2		
East Sopris Creek	6/13/94	0.4			
Eby Creek	7/17/03	1.5			
Egeria Creek	8/10/95	7.7			
Elk Creek	5/11/06	1.8			
First Anvil Creek Lower Reach	7/18/94	1.2			
First Water Gulch	7/21/94	0.7			
Fisher Creek Lower	9/15/95	0.6			
Fisher Creek Upper	7/22/97	1.5			
Fitzpatrick Gulch	7/9/02	0.4			
Forked Gulch	7/13/99		1.1		
Forked Gulch Upper	7/13/99		0.7		
Fourmile Spring	12/5/03	0.3			
Frost Creek	7/9/02	0.6			
George Creek	6/21/01	1.4			
Golden Castle Gulch	7/8/99	1.3			
Goodrich Gulch 2	05/07/01	0.5			
Goodson Creek	5/11/06	2.0			
Government Creek Lower Reach 1	5/23/01				0.6
Government Creek Lower Reach 2	5/23/01			2.5	
Government Creek Upper Reach 1	5/23/01				0.4
Government Creek Upper Reach 2	5/23/01	0.6			
Grassy Gulch	7/19/94	1.1			
Grundell Creek	7/8/01	1.8			
Hack Creek – Mooney Reach	10/19/06	0.8			
Hardscrabble Gulch	7/8/02	2.4			
Harris Gulch	6/19/01	2.5			
Hayes Gulch	4/21/04	2.4			
Hernage Creek Lower	6/27/02	0.3			
Hernage Creek Upper	6/21/02	3.6			
Horse Creek Lower	4/20/05	4.9			
Horse Creek Middle	4/26/05	1.7			
Horse Creek Upper	8/17/94	0.4			
Huffman Gulch Creek	6/19/01	0.4			
JQS Gulch	7/8/99	1.7			
June Creek	6/23/94	2.9			
JV Gulch	7/18/94	1.0			
Keyser Creek	7/1/94	0.9			
Magpie Gulch Lower	5/8/01	0.5			
Magpie Gulch Upper	5/8/01	0.4			
McHatten Creek	5/23/02				1.5

Table 3-6
GSFO Lotic PFC Assessment (as of 2006) (continued)

Riparian Area Name	Date Assessed	Assessment Rating (In Miles)			
		PFC	FAR-UP	FAR-NA	FAR-DOWN NF
Mesa Creek	6/14/94	0.6			
Middle Mamm Creek	6/28/94		0.9		
Middle Rifle Creek	5/16/01	0.1			
Middle Rifle Creek 1	6/26/01	0.9			
Middle Rifle Creek 2	5/22/01	1.3			
Milk Creek N Fork Lower#1	7/14/03	0.7			
Milk Creek N Fork Upper	7/8/03	1.7			
Milk Creek Reach#1	7/15/03	0.8			
Milk Creek Reach#2	7/15/03	0.3			
Milk Creek Reach#3	7/15/03	0.6			
Milk Creek Reach#4	7/8/03	3.2			
Mitchell Creek	6/19/94	0.9			
Monument Gulch	5/2/00		0.8		
Morris Creek	6/8/95	0.5			
Muddy Creek Lower	7/17/03		0.1		
Muddy Creek Upper	7/17/03	0.3			
Neilson Gulch	7/6/95	1.4			
Norman Creek	6/19/06	2.8			
North Fork Dry Rifle Creek	5/22/01	0.5			
North Fork Pete And Bill Creek	5/4/00		0.9		
North Fork Wallace Creek	5/3/00	0.8			
North Thompson Creek Lower Reach	6/20/94	0.6			
North Thompson Creek Upper Reach	6/20/94	1.7			
Northwater Creek Lower Reach	7/20/94			2.1	
Northwater Creek Middle Reach	6/14/99		1.7		
Northwater Creek Upper Reach	7/6/99		1.2		
Old Mans Gulch	7/8/02	1.0			
Paradise Creek	6/22/94	0.7			
Piceance Creek	5/16/01	0.6			
Piney River	5/11/06	2.0			
Poison Creek	4/27/05	2.9			
Pole Creek	6/22/95	0.6			
Posey Creek Upper	5/5/05	1.6			
Posey Creek Lower	5/6/05	2.6			
Possum Creek	9/30/97	4.1			
Prince Creek	7/22/97			0.8	
Prince Creek Enclosure	6/13/94	0.1			
Raspberry Creek	7/7/99		2.0		
Red Canyon Creek#1	6/19/94				0.3

Table 3-6
GSFO Lotic PFC Assessment (as of 2006) (continued)

Riparian Area Name	Date Assessed	Assessment Rating (In Miles)				
		PFC	FAR-UP	FAR-NA	FAR-DOWN	NF
Red Canyon Creek#2	6/15/95	0.4				
Red Dirt Creek Reach#1	4/27/05	1.4				
Red Dirt Creek Reach#2	8/9/94	0.8				
Riley Gulch Lower	4/16/04				0.9	
Riley Gulch Upper	4/16/04	1.0				
Rock Creek	8/9/94	3.2				
Rube Creek	7/27/95	0.7				
Salt Creek	6/28/02	0.5				
Sawmill Creek	6/21/02	3.8				
Second Anvil Creek Lower Reach	7/13/99	1.0				
Second Anvil Creek Upper Reach	7/13/99		0.6			
Second Water Gulch	7/12/94	1.3				
Sheep Creek	4/26/05	0.9				
Sheep Trail Hollow	7/14/99	0.9				
South Canyon Creek	8/22/97				0.5	
Spring Creek Reach#1	7/11/95	0.3				
Spring Creek Reach#2	5/30/02	1.2				
Spring Gulch	7/19/94	0.9				
Spruce Crossing Gulch Creek	9/28/99		1.5			
Starky Gulch South Fork	4/16/04	0.3				
Stifel Creek	5/10/06	1.8				
Stone Quarry Gulch	7/17/95					1.0
Sunnyside Creek	8/6/93	2.1				
Sutton Creek	9/27/02	1.5				
Sweetwater Creek	7/11/94	0.4				
Tepee Creek	5/12/06	2.6				
Third Gulch	6/27/02			2.6		
Third Water Gulch	7/7/99	1.3				
Thirty Two Mile Gulch	05/07/01	0.6				
Thomas Creek	7/22/97	0.8				
Thompson Creek	6/20/94	2.0				
Tichner Draw	7/30/94				0.7	
Timber Gulch	7/13/94	1.3				
Tom Creek	6/19/95	1.2				
Trail Gulch1	7/19/94	1.1				
Trail Gulch3	6/28/02	0.9				
Trapper Creek #1 (Lower)	7/20/94			1.2		
Trapper Creek #2 Lower Exclosure	7/6/99	0.5				
Trapper Creek #3 Upper Exclosure	7/29/94			0.6		
Trapper Creek #4 Upper	7/12/99		2.5			
Travis Creek	7/9/02	0.4				

Table 3-6
GSFO Lotic PFC Assessment (as of 2006) (continued)

Riparian Area Name	Date Assessed	Assessment Rating (In Miles)				
		PFC	FAR-UP	FAR-NA	FAR-DOWN	NF
Unnamed Gulch – South tributary E Fork Parachute Ck	7/12/94	0.4				
Ute Creek	7/17/03	1.7				
Wallace Creek	5/3/00	1.3				
West Coulter Creek	6/14/94	2.0				
West Fork Sheep Creek	7/11/94	2.7				
West Forked Gulch	7/13/99		0.4			
West Rifle Creek	5/16/01	0.1				
West Sopris Creek	7/15/93	1.4				
Wheatley Gulch	6/15/95	0.9				
Willow Creek	5/4/05	3.5				
Yellowjacket Creek	7/7/99		2.0			
Totals		272	26	15	5	8

Table 3-7
GSFO Lentic PFC Assessment (as of 2006)

Riparian Area Name	Date Assessed	Assessment Rating (In Acres)				
		PFC	FAR-UP	FAR-NA	FAR-DOWN	NF
Blue Lake	7/8/03	9.0				
Castle Creek Ponds	6/21/06	2.4				
Consolidated Reservoir	6/14/94	5.9				
Domantle Lake	7/26/06	2.0				
Edges Lake	6/19/06	0.3				
Fravert Reservoir	5/23/01	2.0				
Grimes Brooks Reservoir	8/9/95	5.0				
Hack Lake	6/23/95	1.5				
Horse Lake	6/23/95	0.5				
Picture Lake	7/25/95	7.0				
Totals		35.6	0	0	0	0

**Table 3-8
Causal Factors for FAR and NF Ratings**

Riparian Area Name	Causal Factor(s)
Alkali Creek	Road encroachment has caused excessive sediment deposition.
Alkali Creek #4 Upper	Drought and soils (gypsum land-gypsumsiorthids complex) producing sparse vegetation coverage in uplands adjacent to streams and causing some reduction in the amount of riparian vegetation.
Antelope Creek – Middle Reach	Diversion dam has produced an artificial sediment wedge and headcut.
Bear Gulch	Insufficient woody vegetation to stabilize streambank. Possibly caused by livestock grazing.
Bearwallow Creek	Insufficient flow to support riparian vegetation.
Belodi Creek	Insufficient woody vegetation to stabilize streambank. Possibly caused by livestock grazing.
Ben Good Creek	Not enough riparian vegetation in some sections to withstand high stream flows. Cause was past livestock grazing management.
Boiler Creek	Very large mud slide scoured out channel and riparian vegetation.
Buck Gulch	Little potential to support riparian vegetation due to lack of flow and steep gradient.
Cabin Creek Lower Reach	Insufficient woody vegetation to stabilize streambank. Cause unknown.
Camp Gulch	Lack of riparian vegetation in some spots to protect banks and dissipate energy during high flows. Possible cause was elk use.
Cascade Creek	Insufficient riparian vegetation to stabilize streambank. Steep grade and rocky stream bed prevents riparian vegetation from establishing. Mining activities (quarry) has had some influence on the lack of establishment of riparian vegetation.
Castle Creek Upper Reach	Old beaver dams that had washed out and past livestock grazing influenced width/depth ratio and reduced riparian vegetation.
Cottonwood Gulch Lower	Road encroachment changed flow patterns, caused a headcut, and increased sediment.
Doodlebug Gulch	Insufficient riparian amount and cover of riparian vegetation to stabilize streambank and withstand high streamflows. System was vertically unstable. Cause was lack of flow (ephemeral) and drainage subject to flashy runoff.
Dry Fork Cabin Creek	Livestock grazing and washed out beaver dams reduced riparian vegetation and resulted in a vertically unstable system.
Dry Hollow Creek	Insufficient riparian vegetation to stabilize streambank and withstand high stream flow. System was downcutting and had excessive erosion. Highly erodible slopes adjacent to the stream and heavy livestock grazing use were noted as issues.
East Divide Creek Reach #2	Road encroachment had caused high sediment load and downcutting. An irrigation diversion was also noted as causing downcutting.
East Middle Fork Parachute Creek	Sections lack sufficient riparian vegetation cover to protect banks and dissipate energy during high flows. Possible cause was past livestock grazing management.
Forked Gulch	Sections lack sufficient riparian vegetation cover to protect banks and dissipate energy during high flows. Possible cause was past livestock grazing management.

Table 3-8
Causal Factors for FAR and NF Ratings *(continued)*

Riparian Area Name	Causal Factor(s)
Forked Gulch Upper	Sections lack sufficient riparian vegetation cover to protect banks and dissipate energy during high flows. Possible cause was past livestock grazing management.
Government Creek Lower Reach 1	Riparian vegetation and adjacent uplands were heavily affected by OHV use.
Government Creek Lower Reach 2	Sections lack sufficient riparian vegetation. Cause may be due to poor water quality and flashy runoff.
Government Creek Upper Reach 1	Sections lack sufficient riparian vegetation cover and structure to protect banks and dissipate energy during high flows. Cause was livestock use (sheep); trailing use causing areas of bare ground.
McHatten Creek	Heavy livestock grazing and trampling have reduced riparian vegetation cover. Convective storms, livestock, and big game use in uplands have also resulted in excessive erosion.
Middle Mamm Creek	High stream flow has caused erosion and reduced establishment of riparian vegetation.
Monument Gulch	Plugged culvert had caused a headcut.
Muddy Creek Lower	Washed out beaver dams resulting in raw banks and sediment deposition.
North Fork Pete and Bill Creek	The artificially natural system (flow regulations and augmented flows) has great influence on the amount of flow and riparian vegetation.
Northwater Creek Lower Reach	Insufficient riparian vegetation cover, amount, and structure to protect banks and dissipate energy during high flows. Cause was livestock grazing.
Northwater Creek Middle Reach	Insufficient riparian vegetation cover to protect banks and dissipate energy during high flows. Cause was past livestock grazing and a major flood.
Northwater Creek Upper Reach	Riparian vegetation lacks adequate structure. Cause was not listed because trend was upward.
Prince Creek	Cattle and people had reduced the composition and coverage of riparian vegetation. This has also resulted in eroded streambank.
Raspberry Creek	Insufficient riparian vegetation cover and amount to protect banks and dissipate energy during high flows. Cause was not listed because trend was upward.
Red Canyon Creek #1	Insufficient flow to support riparian vegetation.
Riley Gulch Lower	Road encroachment has increased sediment deposition.
Second Anvil Creek Upper Reach	The system was considered vertically unstable due to the presence of a number of nick points. The cause was past livestock grazing.
South Canyon Creek	The system lacks sufficient amount and cover of riparian vegetation. The cause is not clear.
Spruce Crossing Gulch Creek	Several old nick points present throughout the system was the only reason preventing the system from being considered PFC.
Stone Quarry Gulch	Insufficient amount and cover of riparian vegetation due to lack of flow.
Third Gulch	Heavy livestock trampling and grazing in places has caused some reduction in the amount of riparian vegetation.
Tichner Draw	The system lacks adequate riparian vegetation structure, cover, and composition. Possible cause was livestock grazing.

Table 3-8
Causal Factors for FAR and NF Ratings *(continued)*

Riparian Area Name	Causal Factor(s)
Trapper Creek #1 (Lower)	The system lacks adequate riparian vegetation structure, cover, and composition. Possible cause was livestock grazing and beaver activity.
Trapper Creek #3 Upper Exclosure	The system lacks adequate riparian vegetation structure, cover, and composition. Cause was not listed.
Trapper Creek #4 Upper	Insufficient amount and cover of riparian vegetation to protect banks and dissipate energy during high flows. Cause was not listed because trend was upward.
West Forked Gulch	Insufficient amount and cover of riparian vegetation to protect banks and dissipate energy during high flows. Cause was not listed because trend was upward.

Indicators

Forests, Woodlands and Rangelands

In the past decade, the GSFO's primary means of assessing the current condition of the vegetative communities within the RMP planning area has involved using the LHA process. This process involves a checklist of biotic, abiotic, and hydrologic features to determine whether the public land health standards are being met. The indicators associated with Standard 3 for healthy plant and animal communities are as follows:

- Noxious weeds and undesirable species are minimal in the overall plant community;
- Native plant and animal communities are spatially distributed across the landscape with a density, composition, and frequency of species suitable to ensure reproductive capability and sustainability;
- Plants and animals are present in mixed age classes sufficient to sustain recruitment and mortality fluctuations;
- Landscapes exhibit connectivity of habitat or presence of corridors to prevent habitat fragmentation;
- Photosynthetic activity is evident throughout the growing season;
- Diversity and density of plant and animal species are in balance with habitat/landscape potential and exhibit resilience to human activities;
- Appropriate plant litter accumulates and is evenly distributed across the landscape; and
- Landscapes are composed of several plant communities that may be in a variety of successional stages and patterns.

Weeds. Currently the GSFO has contracts and cooperates with Garfield County and the USFS for management and control of weeds. Efficiency and effectiveness of

weed management efforts could be significantly improved with a full-time Field Office Weed Coordinator and seasonal staff.

Riparian Areas and Wetlands

Riparian-wetland areas are subject to Land Health Standard 2. Indicators that relate to this standard are as follows:

- Vegetation is dominated by an appropriate mix of native or desirable introduced species;
- Vigorous desirable plants are present;
- There is vegetation with diverse age class structure, appropriate vertical structure, and adequate composition, cover, and density;
- Streambank vegetation is present and is composed of species and communities that have root systems capable of withstanding high streamflows;
- Plant species indicate maintenance of riparian moisture characteristics;
- Stream is in balance with the water and sediment being supplied by the watershed (e.g., no headcutting, excessive erosion, or deposition);
- Vegetation and free water indicate high water tables;
- Vegetation colonizes point bars with a range of age classes and successional stages;
- An active floodplain is present;
- Residual floodplain vegetation is available to capture and retain sediment and dissipate flood energies;
- Stream channels have appropriate size and meander patterns for the streams' position in the landscape and parent material; and
- Woody debris contributes to the character of the stream morphology.

Trends

Forests, Woodlands, and Rangelands

With few exceptions, very little monitoring data has been collected in the past two decades from which to assess the trends in the condition of plant communities throughout the RMP planning area. One exception is the Hubbard Mesa allotment, which has had trend data collected and analyzed. The results of the data analysis indicate that the cover and frequency of key perennial grasses and overall vegetative cover has declined in much of the allotment since 1998.

General observations of trends throughout the rest of the RMP planning area are based in the LHAs that have been completed on over half of the landscapes to date.

Of the seven landscapes with completed assessments, five had at least some portions that were not meeting Standard 3 for healthy plant and animal communities. Causes for failing to meet Standard 3 include the following:

- Historic over-grazing—Contributed to reduction in cover of herbaceous plants, loss of native plants, perennial grasses, and forbs, increase in noxious weeds, such as cheatgrass, and encroachment of pinyon-juniper trees;
- Lack of fire—Increase in density and cover of sagebrush, sometimes leading to reduction in cover of grasses and forbs, encroachment of pinyon-juniper trees;
- Drought—Reduced vigor of vegetation, some mortality, some reduction in recruitment of young plants;
- OHV and other human recreation use—Destruction of vegetation, habitat fragmentation, introduction of noxious weeds;
- Natural gas development and ROWs—Direct loss of vegetation, change in species composition to early seral stage, introduction of noxious weeds and other undesirable, aggressive, nonnative grasses, habitat fragmentation;
- Grazing—Heavy livestock grazing combined with heavy big game winter use on some sagebrush and salt desert shrub communities, resulting in poor vegetative vigor, decadent sagebrush with poor recruitment, as well as reduction of native perennial grasses and forbs; and
- Development of private lands—Physical loss of habitats on private lands due to development, thus reducing the connectivity and continuity of habitat on BLM lands.

To a large degree, the above trends are likely to continue without improved funding and interagency cooperation to achieve the BLM's goals for desired future conditions of vegetative communities. Improved data collection and analysis is key to understanding the condition and trend of vegetative communities and directing and prioritizing future management actions needed to resolve land health concerns. The BLM can contribute toward improving the trends discussed above, monitoring and controlling livestock use of allotments to sustain vegetative health, monitoring and regulating recreational uses, including and enforcing protective stipulations in leases and permits for gas development and other uses of BLM land, and identifying habitat problems related to unbalanced animal populations and working with the appropriate managing agency to resolve them.

In addition, the energy industry must become a major partner in the BLM's efforts to maintain land health. This may require new and innovative approaches to developing natural gas and oil shale resources. It will require more focus on implementing BMPs in the construction of natural gas facilities and associated ROWs and greater monitoring of reclamation results and adaptive management to respond appropriately when desired outcomes are not being achieved.

Increased knowledge of the vital role of fire in many ecosystems may contribute to changes in the use and management of fire to return to a more normal fire regime, which may assist in sustaining the health of the BLM's vegetative communities.

Riparian Areas and Wetlands

Generally, the conditions of riparian areas and wetlands within the GSFO have improved over time. **Table 3-9** compares data from initial PFC assessments to current assessment data (includes the most current reassessment data).

It is important to note that reassessments were generally more accurate since they incorporated more of an interdisciplinary approach, more improved training was involved, and more recent technical references for conducting the assessments were available. Earlier PFC assessments were often done by an individual. Training and technical references were also inferior to what is available currently. Reassessments often revealed errors with the initial assessment, so improved PFC ratings are sometimes the result of better processes/procedures for conducting assessments.

Table 3-9
Initial and Current Functional Rating Data

Functional Rating	Initial Assessment Data		Current Assessment Data Including Reassessments	
	Miles	Percent	Miles	Percent
PFC	213	64	272	83
FAR-UP	23	7	26	8
FAR-NA	62	19	15	5
FAR-Down	13	4	5	2
NF	22	6	8	2

For example, many areas initially rated as nonfunctional were determined after reassessment to be nonriparian systems (e.g., systems that do not have the potential to support riparian zones). The data does show a substantial increase in miles rated at PFC and a substantial reduction of those rate as FAR-NA. This is more indicative of changes in condition rather than the result of improved processes/procedures for assessing riparian areas. Current data shows that 91 percent of lotic systems are at PFC or FAR-UP. This demonstrates that the land health standard is being met or moving in that direction for 91 percent of the lotic systems in the GSFO.

For lentic systems, 100 percent of acres assessed are currently in PFC. This has changed little from initial assessments, but it does demonstrate that all lentic systems assessed to date are at PFC and meeting the land health standard for riparian systems.

The GSFO began more focus on riparian area and wetlands management after the issuance of BLM Riparian Area Management Policy and the subsequent release of the Riparian-Wetland Initiative for the 1990s (BLM-WO-GI-91-001+4340). These

documents provided policy, strategies, and goals for the management of riparian areas and wetlands on public lands. Soon after the release of TR-9, riparian area management: process for assessing PFC of riparian-wetland areas (Prichard et al. 1993), the GSFO began aggressively inventorying (PFC assessment) riparian areas. The results of these inventories focused management attention on those areas identified as NF, FAR-DOWN and FAR-NA and actions were implemented to improve many of those areas.

Improved grazing management that has occurred over time has probably been one of the biggest factors driving improved conditions of riparian areas. There are still documented instances where livestock grazing is still a factor preventing improved conditions of riparian-wetland areas although these cases are now fairly isolated.

Forecast

Riparian Areas and Wetlands

Although improved conditions of riparian-wetland areas have generally occurred within the GSFO, there are a number of trends/changes (including regional and global changes/trends) that could cause a decline in the conditions of riparian-wetland areas. These include the following:

- Increased urbanization of the west;
- The increase of the human population;
- Increased recreational use/activities (e.g., OHV use);
- The establishment and spread of noxious weeds (tamarisk invasion probably being the major current threat);
- Increased oil and gas development and the demand for other natural resources;
- Increased demand for ROWS (e.g., roads and utilities);
- Increased big game (elk) populations;
- Increased demand and supply for water; and
- Global climatic change.

3.1.6 Fish and Wildlife Habitat

The aquatic and terrestrial animal resources within the RMP planning area include fish and wildlife and their habitats. While the USFWS and the CDOW are directly responsible for managing fish and wildlife species, the BLM is responsible for land management. Therefore, on the lands under its purview, the BLM is directly responsible for managing fish and wildlife habitat and is indirectly responsible for the health and well being of fish and wildlife populations that are supported by the habitats that public lands provide. In addition, the BLM is mandated to ensure that special status species are protected, by virtue of the ESA and the BLM's Land Use

Planning Handbook. This goal is furthered through a memorandum of agreement with the USFWS and the USFS.

The fish and wildlife habitats provided by BLM-administered lands have largely been characterized in other chapters of this document through discussions of the air quality, water, soil, and vegetation within the RMP planning area. The discussions of aquatic and terrestrial habitat below identify attributes of these resources that are particularly important to their role in providing fish and wildlife habitat.

Current Conditions

The GSFO manages approximately 568,000 acres of fish and wildlife habitat. The presence and interspersion of many habitat types support a large number of wildlife species. Elk, mule deer, bighorn sheep, mountain lion, raptors, and many nongame species, including migratory birds, use habitats in the area. The diversity and populations of fish and wildlife throughout the RMP planning area provide considerable recreational opportunity and economic benefit. The species discussed characterize the fish and wildlife resources of the RMP planning area and emphasize those taxa that are most important to the BLM GSFO in their land management. These include game species, species vulnerable to impacts, and species with high economic or recreational value (**Table 3-10**). The special status species are discussed in Section 3.1.7.

Terrestrial Resources

Terrestrial Habitats

The GSFO provides habitat for an undetermined number of terrestrial wildlife species. Some of these species are year-long residents, while others migrate seasonally. The description of the existing vegetation in the vegetation section of the AMS provides a good overview of most wildlife habitats that occur within the GSFO. In addition, the special status species section of the AMS more specifically discusses the federally listed and BLM sensitive species found within the GSFO. In large part, the emphasis for management of wildlife habitat has been determined by the social and economic values, and to some extent, the prominence of resident wildlife species within the ecosystem. The CDOW is responsible for managing the states fish and wildlife resources, while the BLM works cooperatively with the CDOW to manage wildlife habitats on public lands. Because the CDOW manages several species for sporting values, these species and their habitats have received management priority.

The RMP planning area has six primary habitat types, as follows:

- 1) Grasslands make up slightly less than six percent of the recreation management areas;
- 2) Broadleaf tree-riparian

- a. Quaking aspen stands cover approximately five percent of the resource area,
- b. Riparian-related species including cottonwood, willow, and riparian grasses and forbs, cover less than one percent of the area;
- 3) Mountain shrub is composed primarily of oakbrush and serviceberry and covers approximately 29 percent of the resource area;
- 4) Semidesert shrub is composed mostly of sagebrush, with some greasewood and saltbrush and covers approximately 15 percent of the area;
- 5) Conifer forest consists of mixed stands of Engelmann spruce and subalpine fir and covers six percent of the resource area; and
- 6) Conifer Woodland consists of mixed stands of pinyon pine and juniper and covers 37 percent of the area.

Table 3-10
Fish and Wildlife Species of Primary Interest in the BLM's Environmental Planning

BIRDS	
<i>Species</i>	<i>Rationale for Key Designation</i>
Golden eagle	High interest and protected by law
Upland game birds	Economic and recreational value
Great blue heron	Protected by law and uses concentrated nesting areas
Migratory birds	High interest and protected by law
Other raptors (prairie falcon, red-tailed hawk, goshawk)	High interest; protected by law, top of food chain
FISH	
Cold water gamefish	Recreational value
Warm water gamefish	Recreational value
MAMMALS	
Bighorn sheep	High economic and recreational value
Black bear	High interest, economic and recreational value
Elk	High interest, economic and recreational value
Mule deer	High economic and recreational value
Mountain lion	High interest, economic and recreational value
White-tailed prairie dog	High interest; association with federally listed black-footed ferret

Key observations made in the LHAs with regard to wildlife habitat and its condition include the following:

- Battlement Mesa

- The current condition of fish and wildlife habitats varies across the landscape. Habitats within the landscape have been altered by roads, powerlines, pipelines, fences, residential development, oil and gas development, and livestock and wild ungulate grazing. Natural geology also plays a role in some areas, as do regional climatic conditions.
- Sagebrush habitats vary from poor to good condition with evidence of light to heavy use. In many areas, the perennial grass and forb understory is poor with annuals, most notably cheatgrass, outcompeting native species. Many sagebrush stands are decadent, with little herbaceous understory and a tall dense canopy. In addition, juniper and pinyon trees are encroaching into many sagebrush stands.
- Pinyon-juniper habitats vary in condition as well. Many sites have a sparse herbaceous understory, while others have a more diverse grass and forb component. Understory shrubs are also lacking in many areas and, where present, are generally in poor condition.
- Mixed mountain shrub and oak habitats are generally in good to excellent condition. Oak is especially dense in the upper portions of the landscape. These dense oak stands impede some wildlife species' ability to access available understory forage resources. Understory vegetation is generally diverse and productive, with a good perennial grass and forb component. These habitats are important to turkey, black bear, mule deer, and elk, among others.
- The amount and availability of big game winter range is of concern in the Battlement Landscape area. As private lands become developed and native habitat is converted to unsuitable habitat or is lost all together, more emphasis is placed on the remaining public lands that contain important winter range habitats.
- Eagle River South
 - Habitats in this landscape range from predominantly sagebrush flats in the lower elevations to pinyon-juniper woodlands, mixed mountain shrub, oak, aspen, aspen/mixed conifer, and some mixed conifer in the highest elevations.
 - Sagebrush stands provide important habitat for a variety of bird species that depend on them and are particularly important as food and cover for wintering big game within the Eagle South landscape. Pinyon-juniper woodlands provide important foraging and nesting habitat for some raptor species and many migratory songbirds, and provide security, foraging, and thermal cover for a variety of small game, big game, and nongame wildlife. Mixed mountain shrub and oak habitats are important to turkey, black bear, mule deer, and elk among others.
 - Aspen are important habitats for a variety of species, including big game, turkeys, blue grouse, black bears, and rabbits. Aspen provide forage and

thermal and hiding cover, as well as birthing and nursing habitat for big game, and nesting habitat for some species of raptors and cavity nesting birds. Lodgepole pine and spruce-fir stands provide thermal, security, and bedding cover for big game and are important for cavity-nesting birds, some raptors, and many owl species. Snowshoe hare, red squirrels, and many other species of small mammals as well as Canada lynx prefer these habitats. Mapped Canada lynx habitat exists within the conifer portions of the landscape assessment area.

- The current condition of wildlife habitats varies across the landscape. Upland habitats have been altered by roads (both authorized and unauthorized), powerlines, pipelines, fences, public recreation use, residential and commercial development, vegetative treatments, and livestock and wild ungulate grazing. These human uses contribute to degradation of habitat quality, fragmentation of habitat for several species and the expansion of areas supporting noxious and exotic vegetative species.
- North Eagle
 - The upper elevations of the landscape (aspen and conifer stands and Thurber fescue meadows) were generally in the best condition, with diverse and dense vegetative growth. Some of the conifer stands on the east flanks of Castle Peak show evidence of spruce beetle infestation, with five to ten percent mortality among the conifers in these stands. Insect infestations are natural occurrences that contribute to increased diversity within the conifer stands.
 - The lower elevations are largely sagebrush/mixed grasses, and pinyon-juniper woodlands. Eleven of these sagebrush sites assessed had been brush beat or burned in the past. Five of these sites were reseeded to crested wheatgrass. These treatments continue to be heavily dominated by crested wheatgrass, and few other native perennial grasses or forbs have become established. The six treated sites that were not reseeded to crested wheatgrass have much greater diversity and cover of grasses and forbs, as well as fewer signs of soil movement.
 - Of those sagebrush sites not treated, more than half are dominated by old decadent (single-age class) sagebrush with poor recruitment. Other sagebrush communities are at risk due to invading pinyon-juniper trees that will eventually crowd out the shrubs. Lack of fire or other disturbance seems to be contributing to a condition of extensive homogeneous stands of mature to overmature shrubs and trees, with a decline in cover and productivity of shrubs and herbaceous vegetation. Habitat quality and usability for sagebrush-dependent species has declined. Although these sites are still meeting the standards, some type of treatment to remove the trees will be necessary in the near future to sustain land health.

- Some stands of sagebrush and other shrub species show signs of heavy browsing, although overall shrub conditions here are better than in the South Eagle Landscape. In addition, in the northern portion of the landscape, adjacent to more developed private lands, habitat fragmentation and loss of habitat connectivity are of concern.
- Rifle Creek
 - The diversity, health, and viability of wildlife species with known or potential habitat within the landscape depends on the condition of their habitats. The current condition of fish and wildlife habitats varies across the landscape as described in the vegetation section above. Habitats within the landscape have been altered by roads (both authorized and unauthorized), powerlines, pipelines, fences, public recreation use, residential and commercial development, uranium spoils, and livestock and wild ungulate grazing. Natural geology and regional climatic conditions also play a role in the condition of wildlife habitat in the area.
 - The lower elevation salt desert shrub and sagebrush steppe habitats vary from poor to good condition with livestock and wildlife use varying from light to heavy in any given area.
 - The pinyon-juniper woodlands are variable in condition. Many stands at lower elevations and on south-facing hillsides consist of mature to old trees with little understory vegetation. Other stands have a fairly good cover of grasses and forbs. Shrubs are lacking in many areas, or, where present, are in poor to fair condition. Shrubs are old, decadent, and severely hedged with little or no recruitment. Localized areas have light to moderate cheatgrass infestations. These are closely associated with surface disturbances, such as roads or logged areas.
 - In general, the higher elevation, north-facing hillsides and steeper slopes of the watershed tend to be in good condition, with evidence of regeneration common. These areas generally have good diversity, cover, and productivity of the vegetative community.
 - Oakbrush and mixed mountain shrub communities generally exhibit good to excellent diversity and productivity of shrubs, grasses, and forbs. Many sites are almost completely covered by vegetation or litter. Shrubs show little to moderate amounts of hedging, and regeneration is evident. Mountain shrub habitats are important to turkey, black bear, mule deer, and elk, among others.
 - Aspen stands are generally in good condition, with good herbaceous understory productivity. However, some stands are dominated by older trees, with less than desired recruitment or regeneration of clones. Fire suppression is likely one of the main factors that has limited regeneration of aspen. Aspen are important habitat for a variety of species, including big game, turkeys, blue grouse, black bears, and rabbits. Aspen provide

forage and thermal and hiding cover, as well as nesting habitat for some species of raptors and cavity-nesting birds.

- Spruce-fir stands are in good condition. Stands have good structural diversity, with moderate amounts of snags and dead and down material. Understory conditions are generally good, but these sites are generally less productive due to the closed canopy, which reduces sunlight and limits understory plant growth. Spruce-fir stands provide thermal, security, and bedding cover for big game and are important for cavity-nesting birds, some raptors, and many owl species. Snowshoe hare and many other species of small mammals as well as Canada lynx prefer these habitats.
- Rifle West
 - Signs of big game were noted in several parts of the Spruce Gulch Common, Porcupine Common, and Beaver-Mamm allotments. Some evidence of moderate hedging on browse species was also observed in smaller patches on Webster Park, Cottonwood Gulch, and Riley Gulch allotments. This wildlife hedging, combined with the drought and other stress factors, is a contributing factor in the decadence and lack of recruitment in sagebrush communities.
- Roan Cliffs
 - There do not appear to be any limiting factors to the health and productivity of wildlife populations on the Roan Cliffs. The vegetative communities on most of the upland assessment sites were in mid to late-seral stage. Management actions designed to increase the distribution of age classes within and between communities may slightly improve wildlife habitat. Prescribed fire may be beneficial to set back succession in several community types (shrublands and aspen) but should not be given a high priority due to the generally good conditions of these types.

In summary, the condition of wildlife habitat varies across the planning area, where some habitats have been fragmented and degraded by human encroachment and activities. In other areas, where there are areas of productive habitat for several wildlife species. Many sagebrush stands, which also provide important big game critical winter habitat, are in poor condition. Many stands are even aged and hedged by browsing and show signs of pinyon-juniper encroachment. Less than half of the landscapes within the planning area have been evaluated for Standard 3 (healthy plant and animal communities), so comments from the LHAs may not reflect habitat conditions throughout the entire planning area.

Key Terrestrial Wildlife

The key terrestrial wildlife species are primarily reptiles, birds, and mammals. Adequate populations of terrestrial invertebrates are assumed when populations of the vertebrate groups that prey on invertebrates are healthy. The LHAs, Rocky Mountain Bird Observatory, Colorado Natural Heritage Program (CNHP), and GIS

data maintained by CDOW provide information on terrestrial wildlife distribution in the RMP planning area. In addition, CDOW maintains statistics on big game harvests, recreational use days, and population trends.

Reptiles. Several species of reptile occur within the resource area, mostly in lower elevations and in dryer habitats, such as semidesert shrub, sagebrush, and pinyon-juniper; thus, species diversity of reptiles is higher in the western drier portion of the RMP planning area. Species that occur in the RMP planning area include bull snake, midget faded rattlesnake (a subspecies of the western rattlesnake), sagebrush lizard, plateau lizard, collared lizard, smooth green snake, western terrestrial garter snake, and milk snake.

Birds. Upland game birds common to the resource area include blue grouse and Merriam's turkey. Blue grouse are widely distributed throughout the higher elevation woodlands and mountain meadows. Turkeys use a variety of habitats, including riparian areas, mixed mountain shrub, and pinyon-juniper woodlands. Turkeys are common in the western half of the resource area. Small flocks of chukars can also be found in the western portion of the RMP planning area, particularly along the foothills and side slopes of the Roan Cliffs.

Streams, rivers, reservoirs, ponds, and associated riparian vegetation provide habitat for waterfowl and shorebirds. Canada geese, mallards, teals, gadwalls, and widgeons are a few of the waterfowl species found in the area. Shorebirds, such as great blue herons, cattle egrets, snowy egrets, and white-faced ibis occur along the Colorado, Eagle, and Roaring Fork Rivers.

Raptors in the RMP planning area include eagles, falcons, hawks, and owls. Because they are at the top of the food chain and therefore present in fewer numbers than their prey, raptors serve as important indicators of overall ecosystem health. Red-tailed hawks, golden eagles, and goshawk are the most common raptor species breeding and nesting in the area. Other raptors known to nest in the area include American kestrel, great horned owl, Cooper's hawk, sharp-shinned hawk, and prairie falcons. Precipitous rock formations and large trees provide suitable nesting habitat for these species. The numerous songbirds and small mammal populations provide the primary prey base.

Many species of migratory birds exhibit variable habitat requirements and are found in a variety of habitat types. The planning area supports a wide variety of migratory bird species that spend a portion of their annual life-cycle here but conduct other life-cycle requirements, such as breeding or wintering, elsewhere in North America, South America, or Central America. Populations of some of these species are declining, due in part to land use and management practices. The habitat diversity provided by the broad expanses of sagebrush, mixed mountain shrub, aspen, pinyon-juniper woodlands, other types of coniferous forests, and riparian/wetland areas support many species. Some species found in the RMP planning area include

mourning dove, American crow, turkey vulture, Virginia warbler, mountain bluebird, green-tailed towhee, sage sparrow, and Brewer's sparrow.

Big Game Species. The two primary big game species in the RMP planning area are elk and mule deer, but bighorn sheep occur in more limited numbers. Moose and antelope may occasionally use BLM lands but not to the extent that habitat is extensively managed for these two species. Moose may occur on BLM lands near the USFS boundary or may occasionally use riparian habitats within the RMP planning area. Antelope occur in very limited numbers within the extreme northern portions of the RMP planning area near Toponas, Colorado.

Mule deer and elk occupy higher elevations, usually forested habitat, during the summer and then migrate to lower elevation sagebrush dominant ridges and south-facing slopes in the winter. BLM-administered public lands provide most of the winter range available to deer and elk in the resource area. Critical winter ranges for elk and mule deer are essential to the survival of these species in the RMP planning area. In several areas, concentrations of big game species are degrading winter habitats. Browse species in particular show poor vigor and moderate to severe hedging. Mule deer and elk concentration on winter range and use of browse species can reduce plant vigor and productivity over time. Mule deer typically concentrate in the winter in sagebrush habitats along the Colorado, Eagle, and Roaring Fork Rivers. Elk typically concentrate along the Colorado and Roaring Fork Rivers, and most of the severe winter habitat for elk is located west of Glenwood Springs. Refer to Elk Summer Range, Elk Winter Range, Mule Deer Summer Range and Mule Deer Winter Range maps in **Appendix E** for a depiction of this information.

Deer data analysis units D-8, D-12, D-13, D-14, D-41, D-42, D-43, and D-53 are entirely or partially within the GSFO boundary. With the exception of D-41 and D-42, the population of mule deer within the RMP planning area appears to be healthy, and populations are above long-term objectives. The population of D-41 is 21 to 30 percent under the long-term objective, and the population of D-42 is one to ten percent under the long-term objective (CDOW 2006). Elk data analysis units E-6, E-10, E-12, E-14, E-15, and E-16 are entirely or partially within the GSFO boundary. The population of elk appears healthy and all of the data analysis units in the RMP planning area are above long-term objectives.

Bighorn sheep primarily occur on USFS lands bordering the RMP planning area, but this species is known to use BLM lands in Bull Gulch, Glenwood Canyon, Crystal River, and north of New Castle. Habitat supporting bighorn sheep is primarily pinyon-juniper woodlands and adjacent mountain shrub habitat, where topography plays the most important role in locations used by this species.

Other Key Mammal Species. Limited habitat exists in the RMP planning area for white-tailed prairie dogs. In its surveys conducted in 1988 the CDOW identified six prairie dog colonies within the planning area. Historic data and records indicated that 12 prairie dog colonies may have existed within the planning area boundary. The

largest known site is approximately 150 acres of mostly private land near I-70 at DeBeque, Colorado. Five smaller prairie dog towns, all approximately 20 acres in size, are north of Rifle, north of Gypsum on private lands, east of the Eagle airport on private lands, and south of the Eagle airport on BLM lands.

A variety of predator/furbearer species are known to reside within the planning area, including black bear, mountain lion, coyotes, bobcats, and fox. These species occur within all habitat types, with coyotes being the most habitat-general species. Black bears prefer the more mesic habitats and riparian areas, while mountain lions are generally found where high densities and concentrations of mule deer are located.

An undetermined number of small mammals reside within the planning area, including ground squirrels, mice, chipmunks, rabbits, skunks, and raccoons. Many of these small mammals provide the main prey for raptors and larger carnivores.

Indicators

Primary indicators of health of terrestrial animals are their population numbers, the condition of the individuals that make up these populations, the age structure represented within the population, and the population's distribution relative to its historic range. These are the types of information that CDOW tracks for species of game animals and, increasingly, for key nongame species. The BLM, in managing the habitat of these populations, uses a different set of metrics, such as the condition of shrubs, forbs, and grasses that make up the habitat used by key animal species. Indicators of condition include estimates of overall vegetative cover, in absolute terms, or a relative comparison between portions of the habitat that are available and unavailable to foraging animals. The vigor and production of individual plants and various plant indicators may also be evaluated. In evaluating plant indicators, species composition is assessed, as is the form of forage plants. The assessment of Standard 3 considers the presence of noxious weeds and other undesirable species, species composition, species and successional stage diversity, age, and spatial distribution and habitat connectivity and fragmentation for native plant and animal communities.

Trends

The current trends exhibited by wildlife habitat have a solid foundation in the LHAs that are being completed for nearly all of the landscapes on BLM-administered land within the RMP planning area. LHAs have been completed on six of the 13 landscapes identified in the RMP planning area. Portions of each landscape were found to be Meeting Standard 3, and portions were failing to meet this standard. Reasons for failure to Meet Standard 3 include the following:

- OHV and other human recreation use—Habitat fragmentation, loss of habitat, and abandonment of area due to an increase in human activity;
- Natural gas development—Habitat fragmentation, loss of habitat, increased human use;

- Physical loss of habitats on private lands in the area due to development, thus reducing the continuity and value of habitat located on BLM lands;
- Lack of fire—Juniper encroachment and loss of sagebrush habitat;
- Ungulate grazing—Heavy livestock grazing in some areas, combined with heavy big game winter use, resulting in loss of vegetative diversity and productivity;
- Drought—Poor productivity and vigor of vegetation; and
- Dominance of vegetation by undesirable/weedy species—Most notably cheatgrass.

Forecast

Without marked interagency cooperation and adequate funding, the above trends are likely to continue. To some degree, these trends are a result of natural factors, such as drought and disease, which are beyond management or regulatory control. They can, however, be better understood and potentially aided by better data on population trends, better understanding of epidemiology and antidotes, continually improving cooperation among responsible agencies and increasing engagement of the public. The BLM can contribute importantly toward improving the trends discussed above by doing the following:

- Continue to collect data in response to the Standards and Guidelines;
- Control livestock use of allotments to sustain habitat health;
- Monitor and regulate recreation;
- Include protective stipulations in leases and permits for development uses of BLM-administered land; and
- Persistently identify animal population problems with the appropriate managing agency.

Aquatic Wildlife/Fisheries

The aquatic wildlife/fisheries resources within the RMP planning area include fish, amphibians, and aquatic insects and their habitats. While the USFWS and CDOW are directly responsible for managing fish and amphibian species, the BLM is directly responsible for aquatic habitat management on the lands under its jurisdiction. The BLM is indirectly responsible for the health and well being of fish and amphibian populations that are supported by the habitats that public lands provide. In addition, the BLM is mandated to ensure that special status aquatic species are protected, by virtue of the ESA, the BLM's Land Use Planning Handbook, and BLM Policy under section 6840 Special Status Species Management. This goal is furthered through a memorandum of agreement with the USFWS and the USFS.

The aquatic habitats provided by BLM-administered lands have largely been characterized in other chapters of this document through discussions of the water resources within the RMP planning area. The discussions of aquatic habitat below

identify attributes of these resources that are particularly important to their role in providing fisheries and amphibian habitat.

Fish management emphasis in the resource area is primarily on Colorado River cutthroat trout, brook, and rainbow trout; however, other cold water and warm water game fish and nongame fish in the resource area will benefit from the planned actions.

Key Aquatic Species

Coldwater Species. Higher elevation waters located generally above 5,200 feet support cold water fishes, consisting primarily of brook trout, rainbow trout, brown trout, and cutthroat trout. Other higher elevation species include lake trout, kokanee salmon, sculpin, speckled dace, mountain whitefish, white suckers, and long-nose suckers.

Boreal toad habitat is located in the highest elevation areas within the RMP planning area that contain sufficient aquatic habitat.

Cool Water and Warm Water Species. Waters generally below 6,500 feet support primarily cool water and warm water fishes, including roundtail chubs, flannelmouth suckers, razorback suckers, Colorado pikeminnow, carp, largemouth bass, smallmouth bass, crappie, yellow perch, bluegill, channel catfish, walleye, and others.

Lower elevation amphibians include the Great Basin spadefoot toad.

Generalists. Bluehead suckers, white suckers, long-nose suckers, speckled dace, northern leopard frogs, chorus frogs, and tiger salamanders use various aquatic habitats and are found at varying elevations throughout the RMP planning area.

The diverse abundance of fish throughout the RMP planning area provides considerable recreational opportunity and economic benefit. At least six species of amphibians occur in or near aquatic and riparian habitats within the RMP planning area. CDOW data document the presence of northern chorus frogs, northern leopard frogs, tiger salamanders, boreal toad, woodhouse's toad, and Great Basin spadefoot toad across portions of the RMP planning area.

The aquatic species discussed characterize the fisheries (see Fisheries map, **Appendix E**) and amphibian resources of the RMP planning area and emphasize those taxa that are of most importance to the BLM in their land management, either because they are game species, are species that occur in concentrated areas where they might be vulnerable to impacts, or because they are special status species (**Table 3-11**). The special status species listed in **Table 3-11** are discussed in Section 3.1.7 below.

Table 3-11
Fish Species of Primary Interest in BLM's GSFO Environmental Planning

Species	Rationale for Key Designation
FISH	
Colorado pikeminnow	Federally listed as endangered*
Razorback sucker	Federally listed as endangered*
Bonytail chub	Federally listed as endangered*
Humpback chub	Federally listed as endangered*
Colorado River cutthroat trout	BLM sensitive species*
Bluehead sucker	BLM sensitive species*
Flannelmouth sucker	BLM sensitive species*
Roundtail chub	BLM sensitive species*
Cold water gamefish	Economic and recreational value
Warm water gamefish	Economic and recreational value
AMPHIBIANS	
Northern leopard frogs	BLM sensitive species*
Boreal toad	BLM sensitive species*
Great Basin spade-foot toad	BLM sensitive species*

*These species are discussed in Section 3.1.7 on special status species.

Aquatic habitats in the RMP planning area consist of both lentic (still, as in ponds and lakes) and lotic (moving, as in streams and rivers) systems. Not all of the perennial aquatic habitats support fish, but it is very likely that most all of the perennial waters support some abundance of aquatic insects. Amphibians are scattered across the landscape and may occur either exclusively or seasonally in a variety of aquatic habitat types. The CDOW and BLM have identified stream reaches that provide habitat for fish species and are perennial within the RMP planning area.

Fish and aquatic wildlife habitat administered by the BLM within the RMP planning area consists of approximately 328 miles of perennial streams and approximately 1,971 acres of lakes. Within these aquatic systems, the diversity of habitats and differing elevations in which aquatic systems reside dictate the presence of a diverse array of fish and amphibian species.

Current Conditions

Invertebrates and aquatic plants provide the foundation of the aquatic food chain in which fish and amphibians, as well as some species of invertebrates, depend. Data on aquatic species and their habitat are collected primarily by the CDOW during periodic fisheries sampling and during BLM-driven LHAs, PFC surveys, fisheries and fish habitat surveys, and macro-invertebrate sampling efforts. These sampling efforts help to determine whether aquatic organisms and plants appropriate for the site are present, whether invertebrate species are present and what water quality they reflect, and whether fish are present as part of the evaluation of Colorado Public Land Health Standards 2, 3, 4, and 5.

The six watersheds within the RMP planning area with a completed LHA report are generally meeting Standard 5 (water quality), indicating a basis for the presence of healthy invertebrate populations and a good aquatic food chain foundation. Given individual stream/riparian potential, most of these landscapes were meeting Standard 2 (riparian). Where stream/riparian reaches were not meeting Standard 2 and in cases where natural geology and potential were not limiting factors, it is likely that riparian/stream habitat needs improvement. Standards 3 and 4 were generally being met on a watershed basis, but some site-specific stream sections were either not meeting these standards or were trending away from meeting them, due primarily to excessive sediment concerns or the presence of nonnative species.

Key observations made in the completed LHA reports with regard to aquatic habitats and their condition include the following:

- Battlement Mesa
 - Of the 7.5 miles of riparian areas evaluated, 6.2 miles (83 percent) were determined to be meeting Standard 2. The PFC assessment forms show all of the applicable indicators had been achieved for these riparian systems. The remaining 1.3 miles (17 percent) were determined to be making significant progress toward meeting Standard 2. Although most of the applicable indicators had been achieved, the riparian areas were classified as FAR because some important indicators were not met.
 - Colorado River cutthroat trout have been documented in the uppermost portions of Battlement Creek on private lands within the landscape boundary. Suitable habitat is within portions of Battlement, Wallace, and North Fork Wallace Creeks on public lands, and it is likely that all three streams historically contained this trout species.
 - Competition with nonnative salmonids, including rainbow trout, brook trout, and brown trout, is the major factor contributing to the absence or decline of this native species. Riparian habitats in and adjacent to all three of these streams are properly functioning, and water quality data related to Standard 5 show parameters to be suitable to support and sustain fish species.
 - Use classifications and water quality standards established to protect those uses are assigned by the Colorado Water Quality Control Commission. The limited data collected for each of the streams sampled during the LHA suggests that existing water quality is adequate to sustain the classified uses. Standard 5 is being achieved for all surface waters within the assessment area.
- Eagle River South
 - Colorado River cutthroat trout are found within Abrams Creek and possibly Spring Creek within the assessment area. In addition, suitable habitat and flow occurs within portions of the Eagle River and Gypsum

and Brush Creeks, and it is likely that these waters historically contained this native species.

- Competition with nonnative salmonids, including rainbow trout, brook trout, and brown trout, is the major factor contributing to the absence or decline of this native species in Brush and Gypsum Creeks. Water quality and riparian conditions in Abrams Creek are providing good aquatic habitat. Standard 4 is being achieved for Abrams Creek as it contains a genetically pure population of wild, self-sustaining, Colorado River cutthroat trout
- These data indicate the higher elevation stream segments generally have better water quality than lower elevation segments. The water quality parameters measured in the Eagle River South assessment area are very limited, but the data do not show any violations of the water quality standards established to protect the classified uses. The only stream within the assessment area that is included on the 303(d) list or 305(b) report for Colorado is the Eagle River. This list and report include impaired water bodies, those streams that do not meet water quality standards with technology-based controls alone. The fact that the other streams evaluated in this assessment are not on the 303(d) list suggests these water bodies are currently meeting standards. Only the reach of the Eagle River from Gore Creek to the Colorado River is included on the 303(d) list because of elevated levels of manganese from the Eagle Mine, which is not within the assessment area.
- North Eagle
 - Fisheries potential is limited for all of the waters within the watershed assessment area, except the Colorado and Eagle Rivers. These rivers are known to contain cold water sport fisheries, including those for rainbow trout, brown trout, and brook trout. In addition, both waters contain native fishes, including mountain whitefish, bluehead suckers, and mottled sculpin.

The remaining streams have limited fisheries potential, primarily due to low seasonal flows, irrigation diversions, and heavy sedimentation caused by flashy runoff and local geologic conditions.

- Blue Lake and Picture Lake appear to have fisheries potential, but overwinter survival is a limiting factor. Both lakes are shallow and occur in the higher elevations of the assessment area, which would precipitate annual winter kill conditions. There is limited potential for a recreational put-and-take trout fishery at these lakes, but long-term sustainable fisheries are not likely.
- Habitat/riparian management are not a concern for any of the perennial streams assessed. Geological factors outside of BLM management are limiting most of the streams as fisheries. Given the streams' potential, Standard 3 is being met for aquatic wildlife within the watershed.

- The findings of this impairment assessment indicate that the narrative standard for sediment for Milk, Alkali, and Muddy Creeks is being met. Other water quality parameters measured in the Eagle south assessment area, while very limited, do not show any violations of the water quality standards established to protect the classified uses. Virtually all waters on the assessment area appear to be meeting the standards for water quality established by the State of Colorado. The only reach in question is the Colorado River above the confluence with the Eagle River. While it is on the monitoring and evaluation list, the reference protocol is not applicable for large river systems. Further study by the CDPHE will be required to determine if the narrative standard is being met; if not, then a TMDL will be required. Current information indicates Standard 5 is being met on surface waters within the assessment area.
- Rifle Creek
 - Colorado River cutthroat trout has been documented in the uppermost portions of Butler Creek on both BLM lands and lands administered by the USFS. This species may occur on BLM lands within the Cedar Mountain and Chirp allotments. Suitable habitat occurs within portions of Rifle, Middle Rifle, George, and West Rifle Creeks on public lands, and it is likely that all of these streams historically contained this species.
 - Competition with nonnative salmonids, including rainbow trout, brook trout, and brown trout, is the major factor contributing to the absence or decline of this native species. Riparian habitats in and adjacent to all of these streams was rated as properly functioning, and water quality data related to Standard 5 show conditions suitable to harbor and sustain fish species. Standard 4 is not being achieved for these streams on public lands with regard to Colorado River cutthroat trout. There are no stable or increasing populations of Colorado River cutthroat trout in any of these streams, despite the presence of suitable habitat. These conditions are not due to current land management practices or a lack of suitable habitat, but to factors described above. If nonnative trout could be removed and Colorado River cutthroat trout reintroduced, the existing habitat would be suitable for the recovery of Colorado River cutthroat trout, and Standard 4 would be met for this species.
 - The water quality parameters measured on the Rifle Creek assessment area are very limited. Data collected do not show a violation of the water quality standards established to protect the classified uses. Additionally, no streams in the assessment area are included on the 303(d) list or 305(b) report for Colorado. These documents include impaired water bodies, those streams that do not meet water quality standards with technology based controls alone. All waters on the assessment area appear to be meeting the standards for water quality established by the State of Colorado. Water quality Standard 5 is being met on surface waters.

- Rifle West
 - Fisheries potential is limited for all of these waters, except the Colorado River and perhaps a few portions of Beaver Creek, Cottonwood Creek, and Cottonwood Gulch. The Colorado River has a diverse fish assemblage, including native suckers (flannelmouth, bluehead), chubs (roundtail), and mountain whitefish. Nonnative species include red shiners, fathead minnows, bass, bluegill, green sunfish, channel catfish, white suckers, and rainbow and brown trout, among others. Aquatic insects are also abundant and diverse along the river. Beaver Creek has some fishery potential but mainly in the upper reaches on private and USFS lands. Cottonwood Creek is small and steep but has consistent flow. No fish are known to inhabit the creek. Cottonwood Gulch has limited potential in the upper reaches but is hampered by seasonal low flows. All of these perennial streams had some aquatic insects present.
 - Given the potential of the streams within the watershed, overall Standard 3 is being met for aquatic wildlife, except in the lower Cottonwood Gulch and Riley Gulch stream segments. These suffer from intensive natural gas development, and more specifically, poor quality roads and culverts adjacent to each stream and increases in numbers and miles of well pads, roads, and pipelines that all contribute to increased sediment.
 - While the limited data collected by BLM do not show a violation of the water quality standards established to protect the classified uses, observations indicate accelerated erosion, creating elevated sediment loading within the assessment area. Most serious problems were observed in Riley Gulch and lower Cottonwood Gulch, with most sediment introduced from improperly installed or maintained culverts and road management associated with natural gas development. Additionally, the listing of the tributaries of the Colorado River for selenium and mainstem for sediment indicates Standard 5 is not being met on some surface waters. The assessment indicates Smith Gulch, Kelly Gulch, upper Riley Gulch, south fork Starkey Gulch, upper Hayes Gulch, Cottonwood Creek, upper Cottonwood Gulch, Beaver Creek, and Porcupine Creek (7.5 miles total) are meeting Standard 5; lower Cottonwood Gulch, lower Riley Gulch, and the Colorado River (4.1 miles total) are not.
- Roan Cliffs
 - Standard 2 for healthy riparian zones is being met on all but one site. Virtually all the riparian zones assessed show definite signs of improvement since the 1994 assessment, with widening of the riparian zone evident, a decrease in the amount of bare soil or cut banks, and recruitment of young woody and herbaceous riparian species. However, grazing distribution continues to be a concern. Since the streambank in the Roan Cliffs landscape require vegetative cover to protect the streambank from erosion and to trap sediment and debris, proper grazing

management that retains adequate herbaceous stubble height and limits utilization of woody riparian species is critical. Also, the uplands immediately adjacent to some riparian zones are dominated by Kentucky bluegrass, houndstongue, and other weedy species. Range developments and grazing management practices designed to draw livestock out of the riparian areas should be encouraged.

- The Roan Cliffs are drained by East Parachute Creek on their south side and by East Middle Fork Parachute Creek on their north side. Both of these creeks have numerous tributaries, and both also leave the Roan Cliffs via spectacular waterfalls before joining Parachute Creek north of Parachute, Colorado. Overall, the streams on the Roan Cliffs are very productive and support healthy fish populations where there are adequate year-round flows.
- Standard 3 is not being met for JQS Gulch or East Fork Parachute Creek due to the ongoing decline of native Colorado River cutthroat trout in these streams. Native Colorado River cutthroat trout are not being maintained at a viable population level commensurate with the species and the habitat's potential. Colorado River cutthroat trout are not distributed within these creeks at a density, composition, or frequency suitable to sustain reproductive capability and sustainability. Extremely low survival of young Colorado River cutthroat trout indicates that these fish are not present in mixed-age classes necessary to sustain recruitment and mortality fluctuations. These fish are being outcompeted by introduced nonnative brook trout.
- The water quality parameters measured on the Roan Cliffs were admittedly limited. Nevertheless, none of the values measured show a violation of the water quality standards established to protect the classified uses. All waters on the Roan Cliffs appear to be meeting the standards for water quality established by the State of Colorado. The water quality measurements do not indicate that there are any problems with management on the Roan Cliffs assessment area. Standard 5 is being met for surface waters in the Roan Cliffs landscape.

In summary, most of aquatic systems managed by the BLM within the RMP planning area are in good condition. Site-specific portions of some streams are in a less than desirable condition due to a variety of factors, including overuse of streamside vegetation by terrestrial animals in search of drinking water and succulent forage, natural geological features, reduced seasonal flows due to irrigation and other water rights uses, limited aquatic habitat potential, and road building and other ground-disturbing activities that increase sediment amounts being transported off-site. Where stream habitats are degraded, negative effects include physical stream bank and instream habitat damage, siltation of important microhabitats, diminished water quality, elevated organic compounds, loss of streamside shading and thermal cover, and diminished oxygen levels.

3.1.7 Special Status Species

Terrestrial Wildlife

Special status wildlife species are those whose populations have declined significantly. These declines may result from habitat loss, habitat modification, and changes in competition, predation, or disease. Habitat loss and modification by human activities are the primary causes of declining populations, particularly of species that are highly adapted to specific ecological niches. Such species may or may not be legally protected by federal or state agencies. BLM land management practices are intended to sustain and promote species that are legally protected and prevent species that are not yet legally protected from needing such protection.

Current Conditions

Species discussed in this section have been listed by the USFWS or the State of Colorado or have been placed on the Colorado BLM State Director's Sensitive Species List (**Table 3-12**). Federal threatened and endangered species and designated critical habitat crucial to species viability are managed by the USFWS in cooperation with other federal agencies to support recovery. For listed species that have not had critical habitat identified and designated, the BLM cooperates with the USFWS to determine and manage habitats to support the species. Candidate species are managed to maintain viable populations, thereby preventing federal listing from occurring. Species identified by the State of Colorado and Colorado BLM are treated similarly. The BLM, USFWS, and the State of Colorado have developed formal and informal agreements to provide guidance on the management of species within the RMP planning area. Consultation is required on any action proposed by the BLM or another federal agency that affects a listed species or that jeopardizes or modifies critical habitat.

There are nine federally listed wildlife species in the RMP planning area, including one that is a candidate for federal listing. These species may also be listed by the BLM or the State of Colorado. Within the RMP planning area, the distribution of most of the special status wildlife species is generally known from LHA comments, CDOW GIS data, and CNHP GIS data. Limited inventories and surveys have been conducted for special status wildlife species in the RMP planning area. Specific management direction to influence habitat components, leading to species recovery, is integrated into BLM management plans.

Birds

Bald eagle: Bald eagles are known to winter along portions of the Colorado River and its major tributaries within the planning area. Wintering bald eagles are generally present within the planning area from mid-November to mid-April. Large mature cottonwood trees along the Colorado and Eagle Rivers and their major tributaries are used as roosting and perching sites, and these waterways provide the main food sources of fish and waterfowl. Upland habitats adjacent to these waterways are used as scavenging areas primarily for winter killed mule deer and elk. Major threats include habitat loss, disturbance by humans, biocide contamination (DDT) and

illegal shooting (USFWS 2006). Bald eagles are increasing in numbers range wide and may be delisted in the future.

Table 3-12
Special Status Wildlife Species in the Glenwood Springs Field Office

BIRDS			
<i>Species</i>	<i>Status</i>	<i>Species</i>	<i>Status</i>
Bald eagle	FT, ST	White-faced ibis	BLM-S
Mexican spotted owl	FT, ST	Northern goshawk	BLM-S
Western yellow-billed cuckoo	BLM-S, C, SC	Barrow's goldeneye	BLM-S
Gunnison sage-grouse	BLM-S, SC	Burrowing owl	ST
Greater sage-grouse	BLM-S, SC	Peregrine falcon	ST
Columbian sharp-tailed grouse	BLM-S, SC	Greater sandhill crane	SC
Ferruginous hawk	BLM-S, SC		
FISH			
Bonytail*	FE, SE	Colorado River cutthroat trout	BLM-S, SC
Colorado pikeminnow*	FE, ST	Flannelmouth sucker	BLM-S
Greenback cutthroat trout	FT, ST	Bluehead sucker	BLM-S
Humpback chub*	FE, ST	Roundtail chub	BLM-S
AMPHIBIANS			
Boreal toad	SE	Northern leopard frog	BLM-S, SC
Western spadefoot toad	BLM-S		
REPTILES			
Midget faded rattlesnake	BLM-S	Utah milksnake	BLM-S
MAMMALS			
Black-footed ferret	FE, SE	Big free-tailed bat	BLM-S
Canada lynx	FT, SE	Yuma myotis	BLM-S
Townsend's big-eared bat	BLM-S, SC	Spotted bat	BLM-S
Fringed myotis	BLM-S	River otter	ST

BLM-S: BLM sensitive species

SC: State species of concern

FE: Federal endangered species

SE: State endangered species

FT: Federal threatened species

ST: State threatened species

C: Federal candidate for listing as threatened or endangered

*Water depletions in the Upper Colorado River and San Juan River Basins may affect the species or critical habitat in downstream reaches in other states.

Water depletions in the South Platte River may affect the species or critical habitat in downstream reaches in other states.

Mexican spotted owl: Mexican spotted owls occupy large steep canyons with exposed cliffs and dense old growth coniferous forests (fir and pine). This species also uses canyons in pinyon-juniper woodlands with patches of Douglas-fir (Reynolds 1990). Threats include habitat loss and disturbance from recreation, overgrazing, road

development, catastrophic fire, timber harvest, and mineral development. Limited potential exists for Mexican spotted owl habitat within the RMP planning area where the BLM has surface jurisdiction. Habitat analysis reveals that potentially suitable habitat is predicted at seven locations within the RMP planning area, but the planning area is relatively distant from any known active territories.

Western yellow-billed cuckoo: The western yellow-billed cuckoo is a federal candidate species that has declined due to loss of riparian habitat from agricultural use, water use, road development, and urban development. Cottonwood-willow galleries along streams and river corridors provide habitat for the western yellow-billed cuckoo, which historically occurred in portions of western Colorado, although it was likely never common there. No individuals have been recorded or confirmed to nest on public lands within the planning area. Limited potential exists for western yellow-billed cuckoo habitat within the GSFO where the BLM has surface jurisdiction. Habitat analysis reveals that potentially suitable habitat is predicted at two locations along the Colorado River and one location along the Eagle River in the resource area, totaling 197 acres of riparian habitat.

Gunnison sage-grouse: The Gunnison sage-grouse is a recently delineated species of grouse that is known to reside in portions of southwestern Colorado and southeastern Utah. This species requires a diverse age-class of sagebrush, as well as open grassland habitats with a diverse forb component. Historical habitat for Gunnison sage-grouse within the RMP planning area is sagebrush stands south of the Eagle River. Population declines of this species are due to loss of habitat and habitat fragmentation and degradation from urbanization, agriculture, energy development, and sagebrush control (NatureServe 2006).

Greater sage-grouse: Sage-grouse require a diverse age-class of sagebrush and open grassland habitats. Greater sage-grouse has declined dramatically within the past 20 years in large portions of its overall range. This species historically occurred in the larger sagebrush habitats west of Glenwood Springs, between New Castle and Rifle, and south of I-70 near Eagle. Current populations within the planning area are north of Eagle, Gypsum, and Wolcott on scattered BLM and private lands (Greater Sage Grouse map, **Appendix E**). Based on 2004 lek counts, this population of grouse numbers from 304 to 489 birds (CDOW 2004). Habitat loss and fragmentation from agricultural encroachment, urbanization, lack of fire, and overgrazing are the primary threats to the greater sage-grouse. Since approximately half of all remaining greater sage-grouse habitat in the nation is managed by the BLM, the management of this habitat is an extremely critical tool in halting the decline of the greater sage-grouse in the western US.

Considerable attention has focused on this species since the 1980s, as evidenced by the National Sage-Grouse Habitat Conservation Strategy released by the BLM in November 2004 (IM No. 2005-024). This conservation strategy provides national sage-grouse habitat conservation guidance in BLM land use plans. In addition, the Northern Eagle/Southern Routt Greater Sage-Grouse Conservation Plan was

finalized in September of 2004. This plan identifies potential conservation actions that might be implemented in order to maintain and enhance greater sage-grouse populations and habitat (CDOW 2004). The BLM has participated in the sage-grouse workgroup and cooperated with CDOW and private interests to conserve sage-grouse habitat.

Columbian sharp-tailed grouse: Columbian sharp-tailed grouse require a mixture of habitat types with mountain shrub, grassland, and riparian vegetation. Cultivated fields with alfalfa and wheat are important at certain times of the year as are aspen and small conifer stands with open grassy parks. Although some limited potential habitat may exist within the GSFO, only one unconfirmed record exists for this species within the planning area. Portions of the GSFO are within the historic range of the species, but populations are now limited to the extreme northwest portion of the state. Within the GSFO, mixed mountain shrub habitats are generally associated with steep rugged slopes with few open grassy areas. Thus, important breeding habitat is the main limiting factor for this species in the planning area.

Ferruginous hawk: Ferruginous hawk habitat consists of both grassland and shrubland ecosystems. These hawks commonly nest in trees or similar elevated structures and have been recorded to nest on the ground on hilltops or rock outcrops. Primary prey consists of small mammals, such as rabbits, prairie dogs, and ground squirrels (Kingery 1998). Habitat loss, decline in prey species, and disturbances during the breeding season are threats to this species. There are no recorded ferruginous hawk nests on BLM lands within the RMP planning area; they are more likely to inhabit the western portion of the planning area.

Greater sandhill crane: Greater sandhill cranes from the Rocky Mountain population winter in Arizona and New Mexico and summer on breeding and nesting habitats in Northwest Colorado, Wyoming, Idaho, and Montana. This population of sandhill cranes was estimated at 18,510 birds in 2004 (Sharp et al. 2005). Greater sandhill cranes from the Rocky Mountain population migrate through the RMP planning area in the spring and fall. Migrating birds occur on mudflats around reservoirs, in moist meadows, and in agricultural areas. Habitat loss from human development is the major threat to this species. There are no known breeding or nesting grounds on BLM lands within the planning area, but cranes are known to nest in Moffat, Routt, Jackson, Grand, and Rio Blanco Counties in Colorado (Andrews and Righter 1992).

Northern goshawk: Northern goshawk habitat consists of large old-growth or mature conifer stands with small openings. In Colorado, northern goshawks prefer coniferous forests for nesting but also use aspen stands (Kingery 1998). Several goshawks are on BLM lands throughout the RMP planning area. Habitat fragmentation from logging activities is their greatest threat (Kingery 1998).

White-faced ibis: This species prefers large freshwater marshes and typically nests in colonies in the northern states of Montana, Oregon, Idaho, and Minnesota. This species forages in wet hay meadows, flooded agricultural croplands, marshes, and the

shallow waters of ponds, lakes, and reservoirs (Ryder and Manry 1994). Threats to nests, eggs, and young include human disturbances, overgrazing, use of pesticides, and heavy predation from magpies, ravens, and raccoons (Kingery 1998). Very little habitat occurs within the planning area, and few species occurrences have been recorded.

Barrow's goldeneye: Habitat for Barrow's goldeneye, a species of duck, includes wooded lakes and beaver ponds in the northwest; Colorado is in the extreme southern portion of its range. This species is a cavity nester and uses nest holes among beetle-killed trees near montane lakes (Kingery 1998). Kingery lists breeding habitat alterations from logging as the major threat to this species. In Colorado, Barrow's goldeneye is known to inhabit and nest in the Flat Tops area. Several occurrences are recorded in the RMP planning area on BLM lands.

Peregrine falcon: The peregrine falcon was removed from the federal list of threatened and endangered species in 1999 and has steadily increased in numbers throughout its range. This species was originally listed due to population declines from DDT-related reproductive failure. It primarily nests within the planning area on cliff ledges along portions of the Colorado River. At least four known nesting pairs have been noted within the RMP planning area.

Burrowing owl: Burrowing owls are found in short grass prairie and shrubland habitats. This species nests in rodent burrows, and it is often associated with prairie dog colonies. Primary threats include habitat loss and fragmentation (NatureServe 2006). The RMP planning area has limited white-tailed prairie dog colonies, so it is unlikely that high numbers of burrowing owls would inhabit the area. However, there is a possibility that owls would use ground squirrel colonies, which are found within the RMP planning area.

Fish

Big River Fishes (Colorado pikeminnow, razorback sucker, bonytail chub, humpback chub): These four species of fish found in the Colorado River System are classified as endangered under the ESA. All four species require a diversity of habitats at varying life stages. Colorado pikeminnow generally prefer swift flowing turbid rivers with quiet, warm backwaters and adequate spawning substrates. The humpback chub prefers deep turbid pool habitats often found in canyon-bound portions of the Upper Colorado River system. This species is found in the Black Rocks area near the Colorado Utah border, and Westwater Canyon west into Utah along the Colorado River. The razorback sucker is most often found in quiet, muddy backwaters along the Colorado River but uses main channel habitats as well. The bonytail chub is extremely rare in Colorado and no self-sustaining populations exist throughout the Colorado River Basin. This species prefers swift turbid reaches of the Colorado River basin but is now found only in portions of the Green River and Lake Mohave.

The alteration of habitats due to construction and operation of large dams which capture sediment, reduce water temperatures, and change river morphology below

the dams, and cut off migration corridors is one of the major factors that have contributed to the decline of these species. Other factors that have contributed to their decline include reductions in water flow caused by water diversions, and other water depleting activities, introductions of non-native predatory game fish species, such as smallmouth bass, northern pike, and channel catfish among others. A recovery program managed by the USFWS has been underway for several years. Designated critical habitat for the Colorado pikeminnow and razorback sucker is located within the planning area on the Colorado River and includes the rivers 100-year floodplain from Rifle, downstream to Lake Powell. Designated Critical Habitat for the bonytail and humpback chubs is located downstream of the planning area in the Black Rocks area near the Colorado Utah border on the Colorado River. Threats to these fish include: impairment of water quality, disease, introduction of non-native fishes, hybridization, reductions in flow, and physical changes and losses of important habitats.

Colorado River cutthroat trout: The Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*), is a native trout species of the Colorado River Basin. The Colorado River cutthroat trout (CRCT) is designated as a special status species by the states of Colorado, Utah, and Wyoming. In addition, the CRCT is classified as a Sensitive species by Regions 2 and 4 of the USFS and by the BLM in Colorado and Utah. This fish historically occurred in portions of the Colorado River drainage in the states of Wyoming, Colorado, Utah, Arizona, and New Mexico (Behnke 1992). In Colorado, this species was found in most of the larger rivers including the White, Yampa, Colorado, Gunnison, and San Juan. Today, remaining CRCT populations are primarily limited to small headwater streams and lakes within their historic range. Declines in CRCT distribution have been documented in a number of reports (Behnke and Zarn 1976, Binns 1977, Martinez 1988, Young 1995). Young (1995) determined most lotic populations reside in streams with average daily flows less than 0.85 m³/s (30 cfs). Stream gradients usually exceeded 4%, and all populations were found above 2,290 m (7,500 ft). Behnke (1979) stated that CRCT occupy less than one percent of its historical range, though a more rigorous assessment indicates that the true number lies closer to 14 percent (Hirsch et al. 2005).

BLM lands within the GSFO planning area contain 15 streams that harbor this species. At this time, at least eight of these streams contain core conservation populations which are 99 percent genetically pure. Genetic analysis is ongoing for several streams. Threats to this species include introduction of non-native trout species, poor livestock grazing practices, natural gas development, and water diversions among others.

Bluehead sucker, Flannelmouth Sucker, Roundtail chub: The roundtail chub inhabits pools and rapids of moderate to large rivers and large reservoirs. This species prefers cobble-rubble, sand-cobble, or sand-gravel substrate in association with undercut banks, fallen logs, or other overhead cover. The bluehead sucker inhabits a variety of habitats from headwater streams to large rivers, in moderate to fast flowing water above a rubble-rock substrate. Young fish prefer quiet, shallow areas near shoreline.

Flannelmouth suckers are found in a wide variety of habitats, ranging from riffles to backwater areas to large pools, in larger rivers and streams. Within the planning area, these fish are found primarily in the Colorado River and the lower portions of major tributary streams where no barriers preclude movement between the river and the streams. Some tributary streams may be used seasonally for spawning. Threats to these fish include: impairment of water quality, disease, introductions of non-native fishes, predation, hybridization, reductions in flow, and physical changes and loss of important habitats.

Reptiles

Midget faded rattlesnake: Little is known about the midget faded rattlesnake, particularly within the planning area. This snake ranges from across Utah and portions of Wyoming into west-central Colorado, whose populations are in the eastern margin of this species' range. Midget faded rattlesnakes are found within most habitat types in the range. This species is of concern in Colorado because of the small number of records and restricted range. Threats include development, outright killing, and illegal collection of individuals for commercial purposes.

Utah milk snake: Little is known about the Utah milk snake, particularly within the planning area. This snake ranges from across Utah and portions of Wyoming into west-central Colorado, whose populations are in the eastern margin of this species' range. Utah milk snakes occupy various habitats, but many records have been noted within and near floodplains. This species is of concern in Colorado because of the small number of records and restricted range. Threats to this species include development, outright killing, and illegal collection of individuals for commercial purposes.

Mammals

Black-footed ferret: Black-footed ferrets historically occurred throughout much of the western US, where large colonies of prairie dog towns were present. This species was likely never common within the planning area due to the lack of suitable habitat. No black-footed ferrets have been documented in the planning area, and the only known ferret population in the state is a recently reintroduced population in Moffat County. The CDOW's 1988 surveys identified six prairie dog colonies within the planning area. Historic data and records indicated that 12 prairie dog colonies may have existed within the planning area boundary. The largest known site is approximately 150 acres of mostly private land near I-70 at DeBeque, Colorado. Five smaller towns, all approximately 20 acres in size, are north of Rifle, north of Gypsum on private lands, east of the Eagle airport on private lands, and south of the Eagle airport on BLM lands. The USFWS has determined that, at a minimum, potential habitat for black-footed ferrets must include a single white-tailed prairie dog colony of greater than 200 acres or a complex of smaller colonies within a 4.3-mile radius totaling 200 acres (USFWS 1989). None of the prairie dog colonies within the planning area are of a size or prairie dog density sufficient to sustain black-footed ferrets.

Canada lynx: Within the planning area, potential lynx habitat is associated mainly with lodgepole pine, subalpine fir, Engelmann and blue spruce, and aspen cover types. Potential lynx habitat is found in the subalpine and upper montane forest zone, roughly between 8,000 and 11,300 feet elevation within the planning area. Lower montane forests are likely to be important for movement and dispersal. Most potential lynx habitat within the planning area is of marginal quality with the best habitats abutting the White River and Routt National Forests. Winter foraging and denning habitat for lynx includes subalpine fir, lodgepole pine, and Engelmann and blue spruce cover types with abundant prey species or dense woody debris. Conifer-aspen forests with dense regeneration or with an extensive shrub and woody debris understory may be important for snowshoe hare or other prey species (Lynx Biology Team 2000). Extensive stands of pure aspen with shrub and grass understory species may provide some summer foraging habitat but are generally poor as winter foraging areas unless intermixed with spruce-fir or young lodgepole pine stands. Habitat of sufficient size to sustain lynx is not found on BLM lands within the planning area. As such, no exclusive BLM landscape analysis units exist. At this time, most mapped potential lynx habitat on BLM lands within the planning area will be incorporated into jointly defined and managed BLM/USFS landscape analysis units. Other habitats that will be considered include those lands that fall within identified potential habitat linkages (see Canada Lynx Habitat map, **Appendix E**).

Bats (Townsend's big-eared bat, fringed myotis, big free-tailed bat, Yuma myotis, spotted bat): Bats within the planning area prefer natural caves and abandoned mines for winter, summer, day, and maternal roost sites. These species typically forage on a variety of insects and may use a variety of habitats, including pinyon-juniper woodlands, riparian areas, montane forests, and semidesert shrublands. Although some occurrences have been recorded, little is known about the population sizes and distribution of bats within the RMP planning area.

River otter: River otters inhabit riparian vegetation along rivers and streams. This species requires water year-round and feeds on fish and crustaceans (Fitzgerald et al. 1994). River otters were extirpated in Colorado until 1976, when the CDOW began reintroducing them into major waterways, including the Colorado River. Recent surveys have found signs of otters in both the Colorado and Roaring Fork Rivers within the RMP planning area (Schnurr, personal communication).

Land Health Assessment Observations

Key observations made in the LHAs with regard to special status wildlife species habitat and its condition include the following:

Battlement Mesa

- *Canada lynx*—Upland sites visited within and near Canada lynx habitats were all rated as achieving Standard 3 for healthy plant and animal communities. Based on the current condition of these habitats on public lands, Standard 4 for Canada lynx is also being met within the Battlement Mesa Landscape area.

- *Bald eagle*—Bald eagle winter roost habitat is along portions of the Colorado River within the northern boundary of the Battlement Mesa Landscape area. Very little public land is along the Colorado River in this area, and as such, BLM management has little direct influence on the wintering habitat for this species. However, public lands do provide upland foraging habitat. Across the general landscape, suitable foraging habitat exists for bald eagles. Although site-specific locations are not achieving Standard 3, suitable quantities of upland foraging habitat is available within the greater landscape area. Bald eagles generally use upland habitat as a means to scavenge on winter-killed big game and other species. Based on this, Standard 4 is being met for this species within the Battlement Mesa Landscape area.
- *Midget faded rattlesnake and Utah milk snake*—Although potentially suitable habitat may exist, no records are known for either of these species within the Battlement Mesa Landscape area. Although site-specific locations may not be achieving Standard 3, the landscape as a whole appears to provide suitable habitat in quantities commensurate with the limited number of individuals likely to occur in the area. Standard 4 is being achieved for these snake species within the Battlement Mesa Landscape.

Eagle River South

- *Canada lynx*—Range conditions in mapped lynx habitat within the higher elevations of the subject allotments looked good. Only individual sites scattered within the lower elevation portions of the assessment area, within the mapped landscape linkage, were not meeting Standard 3. Overall condition of habitats within the landscape linkage was sufficient, given recent climatic conditions, to facilitate movement of lynx through the area. The bigger concern regarding movement and dispersal is the general fragmentation of habitats due to several factors, including private land proximity and development, I-70, roads, powerlines, and pipelines.

Based on the condition of the higher elevation upland and riparian habitats mapped as lynx habitat and the overall condition of habitats within landscape linkages on public lands, Standard 4 for Canada lynx is being met within the Eagle South Landscape area. There is risk that with continued future development of private lands and OHV use on public lands, the landscape linkage could be compromised.

- *Bald eagle*—Bald eagle winter range and winter roost habitat is along portions of the Eagle River and up portions of Gypsum and Brush Creek, within the landscape area. Very little public land is along most of these streams, and as such, BLM management and programs have little direct influence on the wintering habitats for this species. However, where large cottonwood or conifer trees occur on public land portions of these rivers and streams, habitat looked good.

In addition to water-based foraging opportunities, public lands within the landscape area also provide upland foraging habitat for bald eagles. Winter

foraging areas are mapped for this species on BLM lands within the assessment area. Bald eagles generally use upland habitats as a means to scavenge winter-killed big game and other species. Although site-specific locations are not achieving Standard 3, the overall area is meeting this standard and supplies suitable quantities of upland forage capable of maintaining elk and mule deer above current CDOW populations objectives for both species. Thus, an adequate amount of potential carrion is available within the greater landscape area. Based on the above information, Standard 4 is being met for this species within the Eagle River South Landscape.

- *Greater sage-grouse*—A limited amount of potential/suitable sage-grouse habitat still exists within the South Eagle Watershed, but no birds have been seen in recent years, and no historic or active lek sites have been identified. Habitat fragmentation and loss of habitat resulting from roads, residential and commercial development, OHV use, public recreation, powerlines, and pipelines has reduced connectivity of sagebrush vegetation vital to this species. In addition, fire suppression, drought, and livestock and wild ungulate grazing have all affected habitat quality for sage-grouse. Sagebrush habitats are being invaded by juniper trees, and drought and grazing have reduced vegetative productivity and diversity.

North Eagle

- *Canada lynx*—Allotments containing lynx habitat or that are within a mapped landscape linkage had a minimum of one upland site visited within the habitat/linkage. Thirty-three of fifty-two sites visited within the assessment area were found to be meeting Standard 3 for healthy plant and animal communities. All of the sites in mapped lynx habitat are in good condition and are meeting Standard 3. Some individual conifer trees within the East Castle, East Castle Individual, and West Castle Individual allotments appear to be suffering from pine beetle infestation. However, this is a natural event and will likely create more denning habitat for lynx as trees die and fall to create a denser understory.

Within the landscape linkage, five individual sites scattered across five allotments were not meeting Standard 3 with a moderate departure. None of the individual allotments were found to not be meeting Standard 3. Overall condition of habitats within the landscape linkage was fair to good, given recent climatic conditions, and vegetation sufficient to facilitate movement of lynx through the area exists. The bigger concern regarding movement and dispersal for lynx is the general fragmentation of habitats in the area. This is due to several factors, including private land proximity and development, I-70, smaller roads and trails, recreation, powerlines, and pipelines.

Based on the overall condition of upland and riparian habitats on public lands, Standard 4 for Canada lynx is being met within the Eagle South Landscape area. There is risk that with continued future development of private lands, continued increases in recreation activity (OHV), and

continued impermeability of I-70 the landscape linkage could be compromised.

- *Bald eagle*—Bald eagle winter range and winter roost habitat is along the Eagle and Colorado Rivers and up a portion of Alkali Creek. A limited amount of public land is along most of these waters, and as such, BLM management and programs have little direct influence on the wintering habitats for this species. However, where large cottonwood or conifer trees occur on public land portions of these rivers and streams, habitat looked good. PFC assessment results on the BLM portions of all of these waters determined all of them to be properly functioning.

In addition to water-based foraging opportunities, which provide the primary food source for bald eagles, public lands within the landscape area also provide some upland foraging habitat for bald eagles. Winter foraging areas are mapped for this species on BLM lands within the assessment area. Bald eagles generally use upland habitats as a means to scavenge winter-killed big game and other species. Although site-specific locations are not achieving Standard 3, the overall area is meeting this standard and supplies suitable quantities of upland forage capable of maintaining elk and mule deer above current CDOW population objectives for both species. Thus, an adequate amount of potential carrion is available within the greater landscape area. Based on the above information, Standard 4 is being met for this species within the Eagle River North Landscape.

- *Greater sage-grouse*—Based on the current status of sage-grouse in the assessment area, at this time Standard 4 for sage-grouse is not being met within the watershed assessment area. Although most individual sites assessed within mapped sage-grouse habitats were meeting Standard 3, a combination of habitat condition, fragmentation, recreation, and human use issues, loss of habitat, and fire suppression is negatively affecting sage-grouse on a landscape scale. However, these issues are occurring only in portions of the sagebrush habitats within the assessment area. Some areas are still providing valuable winter range habitat and likely in some nesting and brood rearing habitat. Per reporting requirements, all of the allotment acreage containing sage-grouse habitats is reported as not meeting Standard 4, when in reality with regard to habitat condition, only some of the sagebrush habitats in the watershed are not meeting the standard. Other than riparian habitat and some very limited mixed mountain shrub/aspen habitat, all other vegetation types found on these allotments do not provide sage-grouse habitat.

Rifle Creek

- *Canada lynx*—Allotments containing lynx habitat had a minimum of one upland site visited within the mapped habitat. All sites but one visited within these allotments were found to be meeting Standard 3 for healthy plant and animal communities. One site in the Harris Gulch allotment was found not to be a moderate departure from the standard. Range conditions in lynx

habitat within the subject allotments looked good. However, portions of the habitat did not look to be good lynx habitat. Scattered aspen stands and limited mixed conifer habitat, combined with sometimes poor habitat connectivity to larger forested habitats, were main factors. Revised mapping will help to better identify and manage lynx habitat.

Based on the current condition of these habitats on public lands, Standard 4 for Canada lynx is being met within the Rifle Creek Landscape area.

- *Bald eagle*—Bald eagle winter roost habitat is along portions of West, Middle, and Main Rifle Creeks within the Rifle Creek Landscape Area. Very little public land is along most of these streams, and as such, BLM management has little direct influence on the wintering habitat for this species. However, where large cottonwood trees occur on public land portions of these streams, habitat looked good. PFC assessments done on the BLM portions of West and Middle Rifle Creeks rated both streams as properly functioning. In addition to water-based foraging opportunities, public lands within the landscape also provide upland foraging habitat for bald eagles, which generally use upland habitats to scavenge winter-killed big game and other species. Although site-specific locations are not achieving Standard 3, suitable quantities of upland forage for prey species is available within the greater landscape area. Based on this, Standard 4 is being met for this species within the Rifle Creek Landscape Area.
- *Greater sage-grouse*—Historic habitat is mapped for this species in the Hubbard Mesa allotment. Although suitable habitat once existed, no birds are known to inhabit the area, and no historic or active lek sites have been mapped. Habitat fragmentation resulting from roads, residential and commercial development, OHV use, public recreation, powerlines, pipelines, and livestock and wild ungulate grazing have all reduced habitat quality and quantity. This area is not managed for sage-grouse, and no plans for reintroduction of this species into the area are anticipated. Standard 4 is not being met for greater sage-grouse within the Rifle Creek Landscape Area. However, this species has long been absent from the area, and current conditions are not entirely related to current management.

Rifle West

- *Canada lynx*—The Porcupine Common and Spruce Gulch Common allotments each had one upland site visited within the mapped lynx habitat. Both sites were in good condition and were found to be meeting Standard 4. Mapped habitat in both allotments is on steep side hills or within steep drainages that are not being accessed by livestock or used for OHV activity. Understory vegetation was in good condition, and aspen and conifer trees were healthy.

Based on the overall condition of upland and riparian habitats on public lands within mapped Canada lynx habitat, Standard 4 for Canada lynx is being met within the Rifle-West Landscape area.

- *Bald eagle*—Bald eagle winter range and winter roost habitat is along the Colorado River and up a portion of Parachute Creek. A limited amount of public land is located along most of these waters, and as such, BLM management and programs have little direct influence on the wintering habitats for this species. However, where large cottonwood trees occur on the public land portions of these rivers and streams, habitat looked good. PFC assessment results on the BLM portions of the Colorado River determined all of the sites to be properly functioning. Parachute Creek is entirely private but, based on observations, most of the creek appears to be in relatively good condition, with large cottonwood trees present. Individual segments of Parachute Creek are heavily affected by roads, natural gas development, grazing, residential properties, fences, and commercial activities.

In addition to water-based foraging opportunities, which are the primary food source for bald eagles, public lands within the Landscape Area also provide some upland foraging habitat for bald eagles. Winter foraging areas are mapped for this species on BLM lands within the assessment area. Bald eagles generally use upland habitats as a means to scavenge winter-killed big game and other species. Seven of the 36 site-specific upland assessment locations were found not to be achieving Standard 3 for vegetation. Larger portions of the watershed are not meeting the standard for some wildlife species due primarily to large-scale habitat fragmentation from increased natural gas development within the watershed. Increases in numbers of roads, well pads, pipelines, compressor stations, and other ancillary facilities have all contributed to habitat fragmentation. As importantly, increases in the amount of human activity within the watershed required to facilitate natural gas development has affected the ability of some species to fully use available habitats. Specific to bald eagles, the watershed is still meeting Standard 4 because bald eagles are generally present only during the winter and they concentrate along the major water corridors. Although the upland habitats are being affected, suitable foraging habitat is available over the greater area.

- *Greater sage-grouse*—A small amount of mapped sage-grouse habitat is within the assessment area. Within the mapped habitat are individual lek sights, winter range habitat, and production/nesting habitat. Habitat is on mostly private lands in the extreme northwest portion of the landscape assessment area. The BLM land in the Circle Dot Gulch area provides suitable nesting, brood rearing, and winter habitat for sage-grouse. This BLM land is not permitted for livestock grazing, but some trespass grazing appears to be occurring. Habitat in the area looks good, despite some trespass cattle use.

Within the watershed assessment area there are two known lek sites identified, both on private land. In association with these lek locations is mapped production/nesting habitat, some of which is on small isolated tracts of BLM land. Winter habitat is just outside the watershed, but some winter use may occur within the watershed as well. Little is known about the birds

in this area, as census is difficult due to access and seasonal weather conditions.

The population in the Greater Piceance area is believed to not be doing as well as historically. Habitat fragmentation resulting from natural gas development, roads, residential and commercial development, OHV use, public recreation, powerlines, pipelines, and livestock and wild ungulate grazing have all reduced habitat quality and quantity. In addition, a lack of fire has reduced habitat quality by allowing pinyon-juniper trees and in some areas serviceberry to invade and dominate sagebrush habitats. Lack of fire has also resulted in poor age-class diversity and limited recruitment of young sagebrush. Based on the assessment of the small amount of BLM land in the area, habitat is in good condition and is meeting Standard 4 for this species. No habitat problems were noted. However, pending natural gas development in the area will likely result in further fragmentation of sagebrush habitats and further reduce habitat quality and usability over time.

In summary, special status wildlife species habitat condition varies across the planning area. Population numbers, occurrences, and habitat conditions for many species are lacking. Canada lynx, bald eagle, and greater sage-grouse are the three species with the most information collected. In general, habitats on BLM lands for both lynx and bald eagles are in good condition, providing productive habitat for these species. Although some areas are providing productive sage-grouse habitat, overall, habitat for this species is in fair to poor condition. Habitat quality and quantity has been reduced by fragmentation, livestock and wild ungulate grazing, and pinyon-juniper encroachment. Less than half of the landscapes within the planning area have been evaluated for the Special Status wildlife species Standard, so comments from the LHAs may not reflect habitat conditions throughout the entire planning area.

Indicators

Primary indicators for special status wildlife species are their population numbers, population viability, and habitat stability. For most of the special status wildlife species, habitat loss and fragmentation have been and remain the primary cause of their imperiled status. Some of these species have also suffered from historic efforts to extirpate them, and some suffer competition or predation from species that have expanded their range or that have been introduced.

Trends

By definition, the populations of all special status wildlife species have historically suffered downward trends. Management efforts by the BLM, USFWS, CDOW, and others have reversed the downward trend for a number of these populations, but none of the populations are near their historic levels and most remain at levels that are biologically insecure, regardless of their legal status. In addition to continued threats from habitat loss and fragmentation, variability in habitat condition is an ongoing factor in the distribution and density of these special status wildlife species.

For example, population viability for special status plant, fish, and amphibian species varies with hydrologic conditions. The recent drought has reduced the amount or quality of habitat in some areas, further stressing populations of these species.

Forecast

The future of most of the special status wildlife species depends on the degree to which their habitat can be maximized and kept in good condition and their populations can be protected from competition and predation that exceed the levels at which these species evolved. Further, more complete information on the location of special status wildlife species within the RMP planning area and monitoring of these populations will facilitate timely and focused management responses to factors that affect them.

Plants

Special status species are those that have suffered significant declines in populations or habitat capability, that are typically small and widely dispersed, or that inhabit specialized or unique habitats. Population declines may result from habitat loss, habitat modification, and changes in competition, predation, or disease. Habitat loss and modification from human activities are the primary causes of declining populations, particularly of species that are highly adapted to specific ecological niches (Special Status Plant Species map, **Appendix E**). BLM land management practices are intended to sustain and promote species that are legally protected and prevent species that are not yet legally protected from needing such protection. **Table 3-13** displays information about Special Status Plants within the GSFO.

Apart from law or policy, three primary reasons stand out for conserving these species. First, each has a definite, although usually unknown, role in its ecosystem. All parts of the system are important for biological diversity and system integrity, even if the connections are not yet understood. Second, plants offer untold potential for human benefit, including as the source of many pharmaceuticals. Loss of a species may mean the loss of a future “wonder drug” or other genetic material valuable to enhance lives. Finally, these species add aesthetic diversity to our world.

Current Conditions

The following special status plants are either known to occur within the planning area or occur immediately adjacent to the planning area and have potential habitat within the planning area.

Uinta Basin hookless cactus—The Uinta Basin hookless cactus is a federally listed threatened plant that occurs in western Colorado and in portions of eastern Utah. The Uinta Basin hookless cactus is typically found on rocky hills and alluvial benches in xeric fine-textured soils overlain with cobbles and pebbles. It grows in salt desert shrub and pinyon-juniper communities at elevations ranging from approximately 4,500 to 6,600 feet. Within the planning area, Uinta Basin hookless cactus has been documented at 19 sites near DeBeque. Most of these sites were first documented

during extensive surveys in 1985 and 1988. Nine sites were revisited in 1993, six were visited in 2001, and four sites were visited and evaluated during the LHA in 2004.

Table 3-13
Special Status Plants in the Glenwood Springs Field Office (2006)

SPECIAL STATUS PLANTS			
<i>Scientific Name</i>	<i>Common Name</i>	<i>Status</i>	<i>CNHP Rank</i>
<i>Sclerocactus glaucus</i>	Uinta Basin hookless cactus	FT	G3/S3
<i>Penstemon debilis</i>	Parachute penstemon (beardtongue)	FC	G1/S1
<i>Phacelia submutica</i>	DeBeque phacelia	FC	G4T2/S2
<i>Astragalus debequaeus</i>	DeBeque milkvetch	BLMS	G2/S2
<i>A. naturitensis</i>	Naturita milkvetch	BLMS	G2G3/S2S3
<i>Cirsium perplexans</i>	Adobe thistle (Rocky Mountain thistle)	BLMS	G2G3/S2S3
<i>Lesquerella parviflora</i>	Piceance bladderpod	BLMS	G2/S2
<i>Mentzelia rhizomata</i>	Roan Cliffs blazing star	BLMS	G2/S2
<i>Penstemon harringtonii</i>	Harrington's penstemon (beardtongue)	BLMS	G3/S3

BLMS: BLM sensitive species

FT: Federally threatened species

FC: Federal candidate for listing as threatened or endangered

CNHP Rank: G1/S1 = critically imperiled; usually fewer than five known occurrences or few remaining individuals.

G2/S2 = imperiled; usually between 5 and 20 occurrences or with many individuals in fewer occurrences.

G3/S3 = vulnerable; usually between 20 and 100 occurrences; may have fewer occurrences but with many individuals.

On BLM-managed lands within the planning area, long-term population monitoring since 1985 indicates numbers of individuals at most populations are relatively constant. There is some trend toward older-age class plants with some mortality, which appears to be caused by insects or disease. Other plants have experienced grazing by small herbivores, but it is unknown at this time if the grazing is contributing to mortality of individuals. Domestic livestock grazing of the plant has not been observed, but incidental trampling of plants may contribute to some mortality.

While the current trend in population numbers seems to be stable, the populations are at risk due to declining habitat conditions. Invasion by cheatgrass seems to be the most detrimental habitat change affecting the cactus. Cheatgrass has been noted at many of the cactus sites and is the dominant vegetation at several sites. Cacti are long-lived plants, and the older individuals seem to be holding their own, but recruitment of seedlings and young in this environment is difficult.

Another significant concern for Uinta Basin hookless cactus appears to be loss of habitat as suitable habitat is developed for oil and gas production and residences. Three occurrences are immediately adjacent to a large natural gas pipeline constructed in 2003. The proximity of the pipeline to several populations increases the risk of indirect impacts on the plants in the form of noxious weed invasions and

reduction in potential habitat and overall habitat quality. Other occurrences are in close proximity to well pads and roads, which creates a long-term loss of habitat.

Although there is a minor amount of OHV activity near known locations of the cactus within the RMP planning area, more activity has been observed near cactus habitat outside of the planning area. Unrestricted, this OHV activity could destroy much of the occupied and potential habitat.

Parachute penstemon—Parachute penstemon is a candidate species for federal listing as threatened or endangered, with a listing priority of 2 (Federal Register Sept 12, 2006). This species is extremely rare, with only five known locations, all within Garfield and Mesa Counties... Of these, two populations (including the largest) are entirely on private land. A third population is split between private land and the Grand Junction Field Office. The remaining two populations occur within the GSFO (one above the Mount Logan Road, and the other near the Anvil Points Oil Shale Mines). The species is considered critically imperiled (G1/S1) by the CNHP, based on its very few occurrences, narrow global distribution, and current and potential threats to its known populations.

This species is restricted to steep slopes of decomposing shale in the Parachute Creek Member of the Green River Formation. It is uniquely adapted to steep and constantly moving talus slopes. The stems of Parachute penstemon elongate downslope from their initial rooting point as the leaves become buried by shifting shale shards. When these stems encounter a surface sufficiently stable, they may develop a new tuft of leaves, flower, and set seed. Vegetation on these talus slopes is generally quite sparse (less than 20 percent canopy cover), providing little competition for the Parachute penstemon.

One of the two populations in the planning area is on a steep slope immediately above the Mount Logan Road. This site had 10 to 20 plants when it was first documented in 1996. Monitoring of the Mount Logan Road population has documented a decline of numbers to only three individuals by 2005. This site is atypical for Parachute penstemon as it is on a north-facing slope. All other known locations are on south- or southwest-facing slopes. There is no evidence of direct impacts on this site related to livestock or human activities, other than dust accumulation on the plants due to traffic on the road.

The other known population in the planning area occurs on a bench below the Roan Plateau adjacent to portals of the Anvil Points Mine. This population appears to be stable and is composed of approximately 500 to 1,000 rosettes. Scattered plants occur above and below the Anvil Points Mine Road. The road itself, being a flat, packed gravel surface, may be limiting recruitment and establishment of additional individuals in the area. Road maintenance or other surface-disturbing activities in the area would pose a severe threat to some of these plants.

Monitoring of the Anvil Points Mine population has only recently begun, and no statistical population trend data is available. Ocular estimates appear to indicate that population numbers at this site are steady and plants are in a variety of age classes, indicating recruitment is occurring.

A third population of Parachute penstemon once existed on a steep open slope southeast of the Anvil Points Rim Road. This population was first recorded in 1991, and “hundreds of plants” were observed at this location in 1994. However, monitoring of this population of Parachute penstemon documented a rapid decline in numbers of plants during the following decade (Scheck 2002). In 1998, only three of the original plants were found. In that same year, 53 small seedlings were transplanted to this site after being used in germination trials for a graduate research project (McMullen 1998). However, in 2005 and 2006, no plants were observed either of the original population or of the transplants. The local population has apparently been extirpated. The factors contributing to the loss of this population are unknown. Livestock grazing is not thought to be a factor in the decline as the area is too steep and sparsely vegetated to attract much livestock grazing. The steepness of the slope also restricts OHV use, and no noxious weeds or other invasive species have been documented at the site.

Natural gas production has become a significant threat to this species, with increased energy development underway in the region in which these plants occur. Oil shale development is also a serious threat for this oil shale endemic and others (NatureServe 2006). Other possible threats include grazing, recreation, and habitat fragmentation from roads. Road and communication tower maintenance could also cause habitat degradation (USFWS 2005).

DeBeque phacelia—DeBeque phacelia is a candidate for listing under the ESA, with a listing priority of 8. The species is a tiny annual plant with a narrow global distribution from approximately 10 miles northwest of the town of DeBeque to six miles west of the town of Rifle. Within this range, the DeBeque phacelia is further restricted to small patches of shrink-swell clay soils on moderately steep slopes of the Atwell Gulch and Shire members of the Wasatch Formation. This plant is a pioneer species, specifically adapted to an environment where most plants cannot grow (Burt and Spackman 1995).

The plant was first documented in the planning area in 2001 in several locations on the slopes above the Garfield County Landfill. The initial report did not document the population size or trend, and efforts to relocate these reported occurrences have failed to find any plants. However, the plant is an ephemeral annual whose germination is highly dependent on favorable moisture conditions; in some years a given site may have several thousand plants and in other years the same site may produce no plants (Burt and Spackman 1995). This characteristic must be considered when assessing potential impacts on this species.

A second population was documented within the planning area in 2004, four miles northeast of the town of DeBeque. This small population was found during a survey for a proposed natural gas pipeline. The pipeline was installed immediately adjacent to the occupied habitat. No plants were found at this site in 2006, but it was an unfavorable year for germination of *Phacelia submutica*, and no plants were observed at other known locations that were visited that year. Visits to the pipeline did find that the surface disturbance resulted in a high occurrence of weedy species along the pipeline. Impacts on the rare plant population may result from competition with weedy plants.

Phacelia submutica is inherently vulnerable to habitat loss by virtue of it being restricted to barren and semibarren habitat on only specific members of the Wasatch geological Formation that has a limited distribution within the Piceance Basin (Ladyman 2003). The habitat coincides with high quality natural gas reserves and has historically been affected by activities associated with resource extraction. Current and future levels of resource extraction activity are likely to be substantial. Activities that lead to significant soil disturbance, or progressive soil erosion, would likely eliminate or sharply reduce the seed bank, which appears to be the mechanism by which populations survive. Therefore, all actions that cause significant disturbances, including mechanized vehicle traffic and intensive hoof action, are threats (Ladyman 2003).

DeBeque milkvetch—DeBeque milkvetch is a BLM sensitive species that occupies a very small geographic range on a very specific geologic formation (Spackman et al. 1997). DeBeque milkvetch is found only on the Wasatch Formation in the vicinity of DeBeque and in a satellite population near Rulison, Colorado. The CNHP gives this species a rank of G2/S2, which means it is considered imperiled, with fewer than 20 known occurrences. Plants are common on the Atwell Gulch Member of the Wasatch Formation but are rare elsewhere. Although suitable habitat for this species is present in various places within the Field Office between Rifle and DeBeque, Colorado, the only known occurrences within the Field Office are in the Roan Plateau RMPA planning area.

Naturita milkvetch—Naturita milkvetch occurs on sandstone mesas, ledges, crevices, and slopes in pinyon-juniper woodlands at elevations from 5,000 to 7,000 feet. It grows in areas of shallow soils over exposed bedrock. Although this species is fairly widespread in southwestern Colorado, it is considered rare because of the sporadic distribution of its small populations. Although naturita milkvetch has been found less than two miles west of the planning area and some potential habitat for naturita milkvetch exists within the planning area, no populations have yet been documented within the planning area.

Adobe thistle (aka Rocky Mountain thistle)—The adobe thistle is endemic to the Colorado and Gunnison River Valleys in Delta, Mesa, Montrose, and Ouray Counties. The habitat of this species is characterized by open areas and disturbed sites in mixed shrublands and pinyon-juniper woodlands at an elevation ranging from

5,000 to 8,000 feet (Spackman et al. 1997). During surveys conducted in 2004, this species was observed in the planning area between DeBeque and Parachute, both north and south of I-70. All the sites that supported Adobe thistle were on reddish-gray or chocolate-brown clay soils of the Shire member of the Wasatch Formation, sometimes concurrent with the DeBeque phacelia (Buys and Associates 2004; Klish and Alward 2004). As with the DeBeque phacelia, the adobe thistle seems to prefer cracked soils with shrink-swell characteristics.

Adobe thistle population numbers seem to exhibit “episodic abundance,” with numbers varying dramatically from year to year (Lyon 2004). The adobe thistle occurs in areas of intense natural gas development, and some direct losses to populations have already occurred as a result of surface disturbances associated with natural gas development (BLM 2004b). Indirect impacts on the adobe thistle and its habitat could result from noxious weed invasion following surface-disturbing activities. Noxious weeds tend to be aggressive and develop dense stands that outcompete native species. Indirect impacts on adobe thistle habitat also may result from increased public access to the area following construction of new roads and improvement of existing roads. Damage to the adobe thistle and its habitat may occur if OHVs diverge from the roads and travel cross-country through open hillsides and benches.

Piceance bladderpod—The Piceance bladderpod is a Colorado endemic known only in Garfield, Mesa, and Rio Blanco Counties. It occurs on shale outcrops of the Green River Formation, on ledges and slopes of canyons in open areas at elevations ranging from 6,200 to 8,600 feet. The species has not yet been documented within the planning area, but it does occur just south of the planning area on south-facing outcrops of the Green River formation on Battlement Mesa and just west of the planning area in the Roan Creek watershed.

Roan Cliffs blazing star—The Roan Cliffs blazing star is a recently identified species endemic to steep talus slopes of the Green River Formation in Garfield County. The species occurs on eroding oil shale at elevations from 5,800 to 9,000 feet. Constantly shifting talus slopes are necessary to maintain the populations; other plants take over if slopes become stabilized. In the planning area, the Roan Cliffs blazing star is known to occur in Main Elk Creek, along the Anvil Points Rim Road and Anvil Points Mine Road, and along the Parachute Creek drainage. Threats to the species primarily include oil and gas development. Livestock trampling has been observed at one atypical flatter site. Generally, slopes are too steep for OHV activity.

Harrington’s penstemon—Harrington’s penstemon is a Colorado endemic plant. Its population is concentrated in Eagle and Pitkin Counties with fewer satellite populations in Garfield, Grand, Summit, and Routt Counties. Although its global distribution is fairly limited, it is locally common within its range. The plant is typically found in open sagebrush slopes on the edges of pinyon-juniper or oakbrush habitats but is rarely found in the deeper soiled sagebrush along drainages. It occurs in rocky clay loams derived from calcareous materials between the elevations of

6,400 and 9,400 feet (Spackman Panjabi and Anderson 2006). Within the planning area, Harrington's penstemon is known to occur in numerous locations in Eagle County, in northwestern Pitkin County, on the eastern edge of Garfield County, near Flatiron Mesa in central Garfield County, and along the southern boundary of Routt County.

Threats to the persistence of *Penstemon harringtonii* include motorized recreation, exotic species invasion, oil and gas development, habitat conversion to cropland and pasture, residential development, grazing by domestic and wild ungulates, and climate change (Spackman Panjabi and Anderson 2006). In addition, ROWs and some range development projects also pose a threat to populations and potential habitat for *Penstemon harringtonii*.

Of the eight landscapes in which an LHA has been conducted, five support known populations of Harrington's penstemon. Standards 3 and 4 were generally being met in terms of watershed, but some sites with Harrington's penstemon habitat were either not meeting the standards or were trending away from meeting them due to overly dense sagebrush, fewer perennial grasses and forbs than expected, and widespread encroachment of pinyon pine and juniper trees, which eventually outcompete the sagebrush and its associated species, such as Harrington's penstemon.

Significant Plant Communities

Significant plant communities are natural plant communities that are globally rare, that are rare within the state, or that have not been substantially altered by human activity. The first two categories include vegetative communities in which the individual component species may not be rare but the unique *association* of plant species is rare or uncommon. The third category of significant plant communities involves plant community types that are significant not because of their rarity, but because they represent relatively pristine natural communities with few nonnative species. See **Table 3-14**.

Table 3-14
Significant Plant Communities

Scientific Name	Common Name	Rarity Rank
<i>Populus deltoids</i> ssp. <i>wislizeni</i> / <i>Rhus trilobata</i>	Rio Grande cottonwood/Skunkbush riparian forest	G2/S2
<i>Populus tremuloides</i> / <i>Acer glabrum</i>	Quaking aspen/Rocky Mountain maple forest	G2/S1S2
<i>P. balsamifera</i>	Balsam poplar	GU/S2
<i>Juniperus scopulorum</i> / <i>Cercocarpus montanus</i>	Rocky Mountain juniper/mountain mahogany	G2/S2
<i>J. scopulorum</i> / <i>Cornus sericea</i>	Rocky Mountain juniper/red-osier dogwood	G4/S2
<i>Betula occidentalis</i> / <i>mesic graminoids</i>	Water birch/mesic grasses	G3/S2
<i>Artemisia tridentate</i> ssp. <i>tridentate</i> / <i>Leymus cinereus</i>	Basin big sagebrush/basin wildrye	G2/S1
<i>Betula occidentalis</i> / <i>Maianthemum stellatum</i>	Water birch/mesic forbs	G4?/S2
<i>Shepherdia argentea</i>	Buffaloberry shrubland	G3G4/S1

Significant plant communities on BLM lands are important for many of the same reasons that special status plants are important. Urbanization, agriculture, and other human activities have greatly altered many of the natural plant communities on private land. Public lands are therefore critical to maintaining the diversity of natural plant communities and biological diversity in general (BLM 1992). Significant plant communities constitute relict (remnant) areas and may serve as comparison areas to assess public land health and analyze the impacts of human activities. These areas may also prove to be important for future scientific research.

In the RMP planning area, the only areas that have been inventoried for significant plant communities are the former Naval Oil Shale Reserve #1 and portions of the Colorado River and Roaring Fork River riparian corridors. There are 21 significant plant communities that have been identified on public land within the planning area. Eleven of these are within the Roan Plateau RMPA planning area and were discussed in the Roan Plateau RMP Proposed Plan/Final EIS (BLM 2006a). The discussion below includes only those communities found outside of the Roan Plateau RMPA planning area.

The CNHP ranks each species and community based on its rarity throughout its range and within the state. Global rarity ranks (G) refer to a species'/communities' rarity throughout its range; state rarity ranks (S) refer to a species'/communities' rarity throughout the state of Colorado.

- G/S1: Critically imperiled; usually 5 or fewer occurrences or with few remaining individuals;
- G/S2: Imperiled; usually between 5 and 20 occurrences; or many individuals in fewer occurrences;
- G/S3: Vulnerable; usually between 20 and 100 occurrences; or many individuals in fewer occurrences;
- G/S4: Common; usually >100 occurrences;
- G/S5: Very common; demonstrably secure under present conditions; and
- G/SU: Status uncertain.

Rio Grande cottonwood/skunkbrush. (G2/S2). A low-elevation riparian community on an old oxbow of the Colorado River near the West Rifle exit from I-70.

Quaking Aspen/Rocky Mountain maple (G2/S1S2). Upper Bear Creek, east of Lookout Mountain. Aspen/maple forests have been documented from a few scattered locations in the mountains of Colorado (CNHP 1999). In the planning area, the plant association occurs on the Roan Plateau and in upper Bear Creek, south of the Colorado River.

Balsam poplar woodland (GU/S2). A narrow riparian community, approximately 2.5 miles long by 30 to 60 feet wide, along upper Eby Creek. Tree cover is balsam

poplar, with clumps of Douglas-fir. Shrubs consist of river birch, red-osier dogwood, and thin-leaf alder. The occurrence includes both public and private property.

Rocky Mountain juniper/Mountain mahogany (G2/S2). Milk Creek drainage north of Wolcott. A high-elevation juniper woodland associated with mountain mahogany. The community occupies an estimated 300 acres and includes both public and private lands. The occurrence is in good condition, with few weeds noted. Only one occurrence in the planning area.

Rocky Mountain juniper/red-osier dogwood (G4/S2) (two sites). An unusual riparian woodland of Rocky Mountain juniper with an understory of red-osier dogwood. Relatively common throughout the west but uncommon in Colorado. Documented from only two occurrences in the planning area, both on the Colorado River, one just north of Jack Flats and the other one mile upstream of Stifel Creek. The Jack Flats occurrence is a relict site with only older-age class Rocky Mountain junipers. The Stifel Creek occurrence is a mixed age class stand, small but healthy.

Water birch/mesic grasses (G3/S2). Spring on east side Derby Mesa. A riparian shrubland of birch and grasses. Only one occurrence in the planning area. One mile long by 15 to 30 feet wide.

Basin big sagebrush/Basin wildrye (G2/S1). Spring on east side Derby Mesa. A plant association that is relatively rare throughout its range, with very few occurrences in Colorado. This association seems to occur in small patches in mesic or seep areas that are moist enough to support basin wildrye but not moist enough for truly riparian species. One-half mile long by 30 to 50 meters.

Water birch/mesic forbs (Betula occidentalis/mesic forbs) (G3/S2). Colorado River east of the Rodeo Grounds, between Blue Hill and the Catamount Bridge. A small spring-fed riparian community.

Buffaloberry shrubland (G3G4/S1). Along Colorado River immediately downstream of the town of Burns. Good example of this community type, but a small stand (about 40 meters by 15 meters). This is the only stand documented within the RMP planning area.

Indicators

According to the Colorado Standards for Public Land Health, the primary indicators that special status species and their habitats are being maintained or enhanced are that all the indicators associated with healthy plant and animal communities are present, that there are stable and increasing populations of endemic and protected species in suitable habitat, and that suitable habitat is available for recovery of endemic and protected species.

Trends

As discussed above, many of the special status plants have suffered either declines in numbers of individuals or numbers of populations or destruction or impairment of habitat, which puts the long-term viability of these species at risk. Loss of habitat or decline in habitat conditions have resulted from many management actions, such as historic overgrazing, exploration and development of natural gas and oil shale resources, unrestricted OHV activity, and residential development. Periodic drought has also contributed to mortality of some special status plants and reduced the quality of habitat in some areas, further stressing populations of these species. The BLM has implemented some management actions to protect or enhance existing habitat, but most special status plant species continue to remain at levels that are biologically insecure. Further inventory and monitoring of these populations will facilitate timely and focused management responses to factors that may affect them.

Forecast

No ACECs have been designated to protect any special status plant species within the RMP planning area. Pending approval of the Roan Plateau Proposed RMPA, the Anvil Points ACEC would fully encompass one occurrence of the Parachute penstemon and two sites of the DeBeque milkvetch and would partially incorporate two sites of the Roan Cliffs blazing star. The East Fork Parachute ACEC would protect three locations of significant plant communities and one site of the Roan Cliffs blazing star. Trapper/Northwater Creek and Magpie Gulch ACECs would each incorporate one significant plant community. The future of most of the special status plant species depends on the degree to which their occupied and potential habitat and the habitat necessary for supporting the ecosystem processes that sustain these species can be maintained and kept in good condition. The 1999 final supplemental EIS provided an NSO stipulation to listed and candidate plants outside of the Roan Plateau, which includes the Uinta Basin hookless cactus, the DeBeque phacelia, and one small site of Parachute penstemon. Pending approval of the Roan Plateau Proposed RMPA, an NSO protection would be granted to the larger population of Parachute penstemon within the GSFO planning area. The remaining sensitive plant species would be given CSU protection unless precluded by an existing oil and gas lease. In practice, most CSU stipulations have, at best, only managed to avoid direct loss of existing plants but without protecting potential habitat or the full suite of ecosystem processes.

3.1.8 Wildland Fire Ecology and Management

The GSFO FMP focuses on wildland fire suppression and prescribed fire and mechanical fuels treatments. The wildland fire suppression season generally runs from mid-May through mid-September, while prescribed fires are usually planned for before and after the wildland fire season, depending on weather conditions. Prescribed burning can be used to meet resource objectives, such as stimulation of plant growth, improved wildlife habitat, changes in species composition, or reduction in amounts of fuels and slash. Prescribed burning windows are narrow, so mechanical treatments are another alternative.

Fire Management Categories

Public lands will be managed under one of four fire management categories for the purposes of wildland fire and prescribed vegetation management. The descriptions of Categories A to D are based on BLM IM No. 2002-034 (11/15/2001), Clarification of Fire Management Categories and RMP-Level Decisions, and H-1601-1 - Land Use Planning Handbook (Appendix C, Part I, Subpart J, Page 9).

“A” – FMUs: Areas where fire is not desired at all

General description: This category includes areas where mitigation and suppression is required to prevent direct threats to life or property. It also includes areas where fire never played a large role in the development and maintenance of the ecosystem or, because of human development, fire can no longer be tolerated without significant loss or where fire return intervals are very long.

Fire mitigation considerations: Emphasis should be focused on those actions that will reduce unwanted ignitions and threats to life, property, and natural and cultural resources.

Fire suppression considerations: Emphasis should be placed on prevention, detection, and rapid suppression response and techniques. Virtually all wildland fires would be suppressed, and no fire is prescribed unless the management ignited fire (burnout) is for the sole purpose of reducing an immediate threat to firefighter or public health and safety.

Fuel treatment considerations: Nonfire fuel treatments should be employed. Unit costs for prescribed fire would be too prohibitive to implement efficiently. Pile burning of mechanically removed vegetation is acceptable.

“B” – FMUs: Areas where unplanned wildland fire is not desired because of current conditions

General description: Fire plays a natural role in the function of the ecosystem, but these are areas where an unplanned ignition could have negative effects unless/until some form of mitigation takes place. Sagebrush ecosystems, for example, can fall into this category because of encroachment of cheatgrass or a prolonged lack of fire, which leads to large monotypic stands of sagebrush that will not burn as they historically would have.

Fire mitigation considerations: Emphasize prevention/mitigation programs that reduce unplanned ignitions and threats to life, property, and natural and cultural resources.

Fire suppression/use considerations: Fire suppression is usually aggressive.

Fuel treatment considerations: Fuel hazard reduction as a major means of mitigating potential risks and associated loss are priority. Fire and nonfire fuels treatments are used to reduce the hazardous effects of unplanned wildland fire. Restorative

treatments may consist of multiple nonfire treatments before the use of fire will be considered. Unit costs for prescribed fire are high and require stringent mitigation and contingencies. Concurrently, achieve fire protection and resource benefits, when possible.

“C” – FMUs: Areas where wildland fire is desired, but there are significant constraints that must be considered for its use

General description: Areas where significant ecological, social, or political constraints must be considered. These constraints could include air quality, threatened and endangered species considerations (effect of fire on survival of species), or wildlife habitat considerations.

Fire mitigation considerations: Programs should reduce unwanted fire ignitions and resource threats.

Fire suppression/use considerations: Ecological/resource constraints may be applied. These constraints, along with human health and safety, are used in determining the appropriate suppression tactic on a case-by-case basis by the incident commander and subunit agency administrator. Areas in this category would generally receive lower suppression priority in multiple wildfire situations than would areas in “A” or “B” fire management zones.

Fuel treatment considerations: Fire and nonfire fuels treatments may be used to ensure constraints are met or to reduce any hazardous effects of unplanned wildfire. Significant prescribed fire activity would be expected to help attain desirable resource/ecological conditions. Prescribed fire for hazard/fuel reduction are of a lower priority than in “B” zones. Prescribed fire unit costs are low to moderate and are generally not complex. Concurrently, achieve fire protection and resource benefits, when possible.

“D” – FMUs: Areas where wildland fire is desired, and there are few or no constraints on its use

General description: Areas where unplanned and planned wildfire may be used to achieve desired objectives, such as to improve vegetation, wildlife habitat, or watershed conditions.

Fire mitigation considerations: Implement programs that reduce unwanted human-caused ignitions, as needed.

Fire suppression/use considerations: These areas offer the greatest opportunity to take advantage of the full range of options available for managing wildfire under the appropriate management response. Naturally occurring fires under prescribed conditions are permitted to run their course where approved fire management action plans or prescribed fire plans exist. Health and safety constraints will apply. Resource use considerations similar to those described for Category C may be identified if

needed to achieve resource objectives. Areas in this category would be the lowest suppression priority in a multiple fire situation.

Fuel treatment considerations: There is generally less need for hazard fuel treatment in this category. Prescribed fire for fuel hazard reduction is not a priority, except where there is an immediate threat to public health and safety. But if treatment is necessary, both fire and nonfire treatments may be used. Prescribed fire to obtain desired resource/ecological condition is appropriate. See **Table 3-15**.

Table 3-15
Fire Management and Vegetation Treatment Summary by Category

		Wildland Fire Management			Vegetation Treatments	
		Suppression Priority	Suppression Strategy	Wildland Fire Use Strategy *	Prescribed Fire	Mechanical/Chemical/Hand/Other
A FMU	Fire not desired at all.	Generally high.	Aggressive suppression.	No.	No, except pile burning of mechanically removed vegetation.	Yes.
B FMU	Unplanned wildland fire not desired.	Generally high.	Aggressive suppression.	No.	Yes, fuel hazard reduction to mitigate risks a priority.	Yes.
C FMU	Wildland fire desired; must consider significant constraints.	Generally moderate.	Appropriate suppression responses.	No	Yes, fuel hazard reduction lower priority than “B” zones; used to attain desirable resource conditions.	Yes.
D FMU	Wildland fire desired; few or no constraints.	Generally low.	Appropriate suppression responses.	Yes, naturally occurring fires under prescribed conditions .	Yes, used to attain desirable resource conditions; fuel hazard reduction is generally not a priority.	Yes.

FMU Prioritization

In the event of multiple wildland fire ignitions or limited resources/funding, priorities *within* fire management categories were also considered. The rationales for establishing priorities are derived from national, state, and local guidance. The

relative ranking was established using a rating system of low, moderate, and high for the following:

- Wildland fire suppression;
- Wildland fire use;
- Fuels treatment;
- Emergency stabilization and rehabilitation; and
- Community assistance/protection.

Wildland fire suppression prioritization: With consideration for NFP and RMP direction, each FMU was assessed for several key factors, including the threat to human life and public safety, property/improvements on or near public lands, municipal watersheds, historic/cultural resources, and natural values. For the Upper Colorado River FMU, areas designated as high priority for suppression are at a greater risk for loss of life and property from wildland fire. Areas designated as moderate and low generally have less concentrated WUI areas but could affect resource values sensitive to unplanned wildland fire. Note: Regardless of the category (A-D) or priority ranking, wildland fires threatening human life and property will always receive the highest priority for fire suppression. Once people are assigned to an incident, these human resources become the highest value to be protected.

Wildland fire suppression prioritization: With consideration for NFP and RMP direction, each FMU was assessed for several key factors, including the threat to human life and public safety, property/improvements on or near public lands, municipal watersheds, historic/cultural resources, and natural values. For the Upper Colorado River FMU, areas designated as high priority for suppression are at a greater risk for loss of life and property from wildland fire. Areas designated as moderate and low generally have less concentrated WUI areas but could affect resource values sensitive to unplanned wildland fire. Note: Regardless of the category (A-D) or priority ranking, wildland fires threatening human life and property will always receive the highest priority for fire suppression. Once people are assigned to an incident, these human resources become the highest value to be protected.

Wildland Fire Use Prioritization: On public lands managed by the GSFO, there are two FMUs where wildland fire may be used to accomplish specific, pre-stated resource management objectives. These FMUs are D-140-01 Roan Plateau and D-140-02 Bull Gulch/Castle Peak/Hack Lake.

FMU D-140-02 Bull Gulch/Castle Peak/Hack Lake was rated as higher because of the presence of WSAs. The GSFO is required to maintain the wilderness character of each WSA until a final decision is made by Congress as to whether it becomes part of the National Wilderness Preservation System or is released from WSA status and made available for other uses. The general standard for this management is that the suitability of these lands for preservation as wilderness must not be impaired.

Fuels Treatment Prioritization: As with suppression, each FMU was assessed for several key factors, including the threat to human life and public safety, property/improvements on or near public lands, municipal watersheds, historic/cultural resources, and natural values. These factors all contribute to the ranking process for fuels treatments. FMUs designated as high priority for fuels treatments have the greatest concerns for public safety, protecting property/investments, protecting municipal water supplies, and protecting historic/cultural resources and natural values.

Emergency Stabilization and Rehabilitation Prioritization: As with fuels treatment prioritization, each FMU was assessed for several key factors, including the threat to human life and public safety, property/improvements on or near public lands, municipal watersheds, historic/cultural resources, and natural values. FMUs designated as high priority for ESR have the greatest concerns for public safety, protecting property/investments, protecting municipal water supplies and protecting natural values.

Community Assistance/Protection Prioritization: As with ESR prioritization, each FMU was assessed for several key factors, including the threat to human life and public safety, property/improvements on or near public lands, municipal watersheds, and findings from WUI hazard assessments. FMUs designated as high priority for community assistance and protection have the greatest concerns for public safety, protecting property/investments, and protecting municipal water supplies.

Fire is an inherent component of ecosystems and historically has had an important role in the A FMU. Lightning starts 88 percent of all fires, which account for approximately half of the acres burned. In the eastern portion of the RMP planning area, where BLM- and USFS-managed lands intermingle, approximately 40 percent of the fires are human caused. Careless smoking, vehicle exhaust, escaped agricultural burning, and unattended campfires account for most of the human-caused fires. Equipment usage is also responsible for starting some fires. See **Table 3-16**.

Fires within the GSFO RMP planning area are both naturally occurring and used as a management tool. Naturally occurring fires are widely distributed in terms of frequency and severity. Large-acreage fires burned in the area in the last half of the nineteenth century and the beginning of the twentieth century. Historically, the area has displayed a moderate to high frequency of fires, averaging 58 fires and burning an average of 1,289 acres per year (26-year period, 1980-2005).

Types of Vegetation Susceptible to Fire

Fire intervals in spruce/fir forests are variable, ranging from decades to hundreds of years, with the longer intervals being more typical. Due to the long fire return interval, wildland fire suppression activities in this vegetation type have not significantly changed the composition, structure, and function of these forests. In the east end of the RMP planning area (Castle Peak), the high elevation fir-spruce are exhibiting fuel accumulations, stocking levels, canopy closures, and insect activity

that suggest they are nearing the time in their cycle that stand replacement may occur.

Table 3-16
Summary of Prioritization by FMU

Fire Management Unit	Acres	Wildland Fire Suppression	Wildland Fire Use	Emphasis on Fuels Treatment?	Emphasis on ESR	Community Assistance/Protection
A-140-01 Mount Logan Foothills	3,762	Low	No	Low	Low	Low
A-140-02 New Castle Watershed	6,629	High	No	High	High	Moderate
A-140-03 Glenwood Springs Debris Flow	5,933	High	No	High	High	High
A-140-04 Rifle Municipal Watershed	768	High	No	Moderate	High	Moderate
A-140-05 Dry Lake Penstemon Study Area	377	Low	No	Low	Low	Low
A-140-06 East Eagle	1,641	High	No	High	High	High
A-140-07 Blue Hill ACEC	3,722	Moderate	No	Moderate	Low	Low
B-140-01 East Rifle Creek	17,147	Low	No	Moderate	High	Moderate
B-140-02 1-70 Corridor West of Glenwood Springs	93,116	High	No	High	High	High
B-140-03 Roaring Fork Valley	46,171	High	No	High	High	High
B-140-04 Thompson Creek/Eagle Mountain	6,560	Moderate	No	Moderate	Moderate	Moderate
B-140-05 Eagle Valley	81,074	High	No	High	High	High
B-140-06 Bocco Mountain/Siloam Springs	7,216	Low	No	Low	Low	Moderate
B-140-07 King Mountain/Black Mountain	39,466	Low	No	High	Low	Moderate
C-140-01 West of Glenwood Springs	86,567	Moderate	No	Moderate	Moderate	Moderate
C-140-02 Roan Cliffs	11,252	Moderate	No	Moderate	Moderate	Moderate
C-140-03 Upper Colorado	99,978	Moderate	No	Moderate	Moderate	Moderate
C-140-04 Deep Creek	4,531	Low	No	Low	High	Low
D-140-01 Roan Plateau	27,878	Low	Moderate	Low	Moderate	Low
D-140-02 Bull Gulch/Castle Peak/Hack Lake	22,794	Low	High	Low	High	Low

- Current fire research on the aspen forests in the southwestern part of Colorado indicates historical mean fire intervals of 18 to 48 years. Other studies indicate that substantial uncertainty remains with regard to fire intervals and fire intensities in aspen forests. The naturally cool, moist environment associated with these forests makes them relatively fire resistant, so most fires quickly subside. Under very dry conditions, high-intensity fires occur, particularly in stands with high amounts of ground fuels and a heavy conifer component.
- Infrequent, light surface fires characterize pinyon-juniper woodlands, with fire return intervals greater than 25 years. Unpublished research of pinyon-juniper sites in Mesa Verde National Park in southwestern Colorado indicates long fire return intervals for stand-replacing events and indicates that when these events occur the fires tend to be large and very intense.
- Fire history and effects in closed-canopy oak shrublands are speculative because fires rarely leave visible evidence, such as fire scars. Given that the area has an annual period of hot dry weather, an abundance of ignition sources exist in these shrublands, and frequent fires occur in adjacent communities, it seems unlikely that fires were rare. Gamble oak and other brush species will sprout from root collars after a stand-replacing event.

Range of Potential Fire Behavior

Fires are typically categorized on the basis of period of occurrence, size class, regime, and condition class. The fire season for the GSFO RMP planning area normally extends from late April to early November. The most critical fire conditions for the RMP planning area begin as early as May and can last until widespread fall moisture occurs.

Over the past decade, the large majority of wildfires in the RMP planning area have been less than 300 acres. From 1980 to 2005, 98.8 percent of the wildfires that occurred within the RMP planning area were Size Class A (0.25 acre), B (0.25 to 9.99 acres), C (10 to 99 acres), and D (100 to 299 acres) incidents (**Table 3-17**). Only 1.2 percent of the wildfires could be categorized as one of the other three size classes: E, 300 to 999 acres; F, 1,000 to 4,000 acres; and G, 5,000+ acres.

**Table 3-17
Fire Occurrence (Size and Acreage), 1980 to 2005**

Size Class	A	B	C	D	E	F	G
Number of fires	1,199	219	56	13	10	6	1
Number of acres	102	361	1,815	1,971	5,425	11,617	12,209

Table 3-18
Fire Regimes within the RMP Planning Area
(calculated only on federal lands within the GSFO)

Fire Regime Class	Acres	Percent
I (0-35 year frequency and low to mixed severity-surface fires most common)	85,552	15%
II (0-35 year frequency and high severity-stand replacement fires)	49,770	9%
III (35-100+ year frequency and mixed severity)	93,585	16%
IV (35-100+ year frequency and high severity-stand replacement fires)	154,531	27%
V (200+ year frequency and high severity-stand replacement fires)	174,563	31%
Unclassified (water, barren, and alpine/tundra)	11,232	2%

Table 3-19
Condition Class Definitions and Acreages (calculated only on federal lands within the GSFO planning area boundary)

Condition Class	Fire Regime Example Management Options
Condition Class 1 Acres: 99,139 17 percent of GSFO planning area	Fire regimes are within a historical range, and the risk of losing key ecosystem components is low. Vegetation attributes (species composition and structure) are intact and functioning within a historical range. Where appropriate, these areas can be maintained within the historical fire regime by treatments such as fire use.
Condition Class 2 Acres: 407,106 72 percent of GSFO planning area	Fire regimes have been moderately altered from their historical range. The risk of losing key ecosystem components is moderate. Fire frequencies have departed from historical frequencies by one or more return intervals (either increased or decreased). This results in moderate changes to one or more of the following: fire size, intensity and severity, and landscape patterns. Vegetation attributes have been moderately altered from their historical range. Where appropriate, these areas may need moderate levels of restoration treatments, such as fire use and hand or mechanical treatments, to be restored to the historical fire regime.
Condition Class 3 Acres: 49,308 9 percent of GSFO planning area	Fire regimes have been significantly altered from their historical range. The risk of losing key ecosystem components is high. Fire frequencies have departed from historical frequencies by multiple return intervals. This results in dramatic changes to one or more of the following: fire size, intensity, severity, and landscape patterns. Vegetation attributes have been significantly altered from their historical range. Where appropriate, these areas may need high levels of restoration treatments, such as hand or mechanical treatments, before fire can be used to restore the historical fire regime.

Characterization

The fuel structure in the GSFO planning area is gradually changing due to management practices and incursion of nonnative annual grasses, primarily cheatgrass (*Bromus tectorum*). In areas where fuels are continuous, fires spread readily and rapidly during the height of the average fire season. Much of this area is grouped typically in fire regime 2 and 3 (sagebrush), but many of the pinyon and juniper

stands have much older stand characteristics, which often have heavier fuel accumulations and burn with stand replacement fire behavior. Many areas exist where sparse fuels and other natural barriers limit fire spread; most are dry sites where the vegetation is of a moderate to old age class distribution. Cheatgrass has significantly increased from historically inhabiting scattered pockets to becoming a dominant fine fuel component intermixed with sagebrush and pinyon-juniper stands.

The moderate to long return fire interval, fire exclusion and other management practices, and increased human use and incursion into these areas have rendered many of the forested areas in peril of large severe wildland fires. The hazard component varies across the RMP planning area from very low to very high. Mature stands of oak brush inhabit much of the steeper slopes above 6,500 feet.

Engelmann spruce (*Picea engelmannii*). This species is very fire sensitive and generally is killed even by low-intensity fires. Contributing to this species' sensitivity to fire are its thin bark, shallow rooting pattern, resinous bark, low-growing branches, tendency to grow in dense stands, moderately flammable foliage, and heavy lichen growth.

Subalpine fir (*Abies bifolia*). Subalpine fir cohabitates sites within the subalpine zone with Engelmann spruce. These species occur on cool moist sites at higher elevations, ranging from 9,000 to 11,000 feet. Spruce is a co-climax species that probably will never be completely replaced on the site by fir. Fir is more shade-tolerant than spruce and reproduces by layering, as well as by seeds. Subalpine fir may dominate sites in terms of tree numbers after a disturbance by insects (spruce beetle) due to mortality in Engelmann spruce. Over time, the longevity of spruce will return it to dominance on the site. Spruce may live for 700 to 800 years if undisturbed. Lodgepole pine may be a seral stand component at lower elevations on some sites.

Lodgepole pine (*Pinus contorta* var. *latifolia*). The percentage of closed-cone and open-cone lodgepole individuals within stands varies considerably throughout the Rocky Mountains. This allows lodgepole to regenerate following both high- and low-intensity fires. High intensity fires (greater than 140° F) are necessary to open serotinous cones and release the seeds. In the absence of wind or slope conditions, low-intensity fires with low rates of spread are common in lodgepole due to the sparse understory. It is also difficult to initiate spread to the crowns because they are elevated well above the ground. Lodgepole stands become more flammable as they age because of the buildup of woody debris typically caused by insects and disease.

Aspen (*Populus tremuloides*). Fire plays a major role in the establishment and maintenance of aspen stands. In some locations, aspen represents climax vegetation; in many areas, however, it is a seral species that depends on major disturbances for regeneration. Fire frequency in stands of aspen, mixed conifer, and spruce is 70 to 200 years. In some low-elevation aspen/bunchgrass communities, a shorter interval may be common. Research indicates that fire frequencies of 100 to 300 years are necessary for the regeneration of many aspen communities.

Gambel oak or oakbrush (*Quercus gambelli*). Gambel oak is extremely fire tolerant and generally sprouts vigorously from stem bases or from underground lignotubers and rhizomes following fire. Fire promotes root sprouting and the formation of buds on rhizomes and seldom kills oaks. Recovery time varies with fire severity, climatic factors, and site characteristics.

Sagebrush. Sagebrush fire return intervals are difficult to determine because the plants are typically entirely consumed by fire, which leaves no scars as evidence to determine historical fire regimes. Until recently, the extent and dates of fires have not been recorded, and post-fire succession has not been studied in detail. However, site productivity affects the fire behavior and frequency in these sagebrush stands. Sites with higher productivity (more grass and forbs understory) will carry fire more easily and more frequently than sites with low productivity. Sagebrush communities in the RMP planning area are dominated by Wyoming big sagebrush, mountain big sagebrush, subalpine sagebrush, or basin big sagebrush. Collectively, all four sagebrush communities make up about 16 percent of public lands within the GSFO.

Wyoming big sagebrush. The absence of fire has taken these communities out of their fire return interval. The trend in the RMP planning area is for sagebrush stands to become dense and unproductive, outcompeting the grasses in the understory and supporting a high ratio of dead or decadent sagebrush. In these areas with long intervals since the last fire, Utah junipers, and to some extent, pinyon pines, often become established in these Wyoming big sagebrush sites.

Basin big sagebrush. Basin big sagebrush often increases in density and cover with livestock overgrazing and with long intervals between fires. Prescribed fires or mechanical or chemical treatment may be employed to increase structural diversity in the sagebrush community and to increase cover and density of grasses, forbs, or sprouting shrubs.

Mountain big sagebrush. The fire return interval in mesic mountain big sagebrush sites with abundant grass and forb cover is more frequent than other sagebrush sites, roughly 25 to 30 years. Mountain big sagebrush can increase in canopy cover without periodic fire, disease, or other disturbance. Canopy cover on areas that have not had disturbance for several decades can reach between 40 and 50 percent (Winward 2004).

Clearly the vegetation types and ecosystems in existence today are a direct result of fire and its defining role in the landscape. Currently, within the high elevation alpine landscape as well as the mid-elevation spruce-fir, lodgepole pine, and aspen vegetation types, fire is still within its historic range of variability. That condition is changing and will continue to do so within the next 50 to 100 years. As human development and recreation use impinge on these fire regimes, increased ignition risks and the concern for protecting economic values will substantially affect fire management activities in these areas. As these vegetation types continue to age, fuel loadings will increase, resulting in a larger number or percentage of high intensity

stand-replacement fires. These fires will be difficult if not impossible to control with existing fire management resources.

Analysis completed and summarized in the historic range of variability report (Appendix D) indicates a changing and variable fire occurrence since European settlement of western Colorado. Before settlement, the BLM estimates that there were approximately 450 fires ignited each year, burning approximately 20 to 100 acres annually, with a large fire of 5,000 to 10,000 acres occurring every decade or so. It is likely that about 10 percent of the annual ignitions ever burned to a level that would consume significant acreages and reach a size that was detectable by inhabitants of the area during that period. Therefore, one can assume that an average of 45 fires burned annually, with an annual average burned of 766 acres (an average of all years, including estimated large fires). From 1971 until 1995, the rates of detected and suppressed fires remains similar at around 45; however, the acreage has risen by 161 percent to 1,236 acres burned annually.

In many locations where fires normally occurred at lower elevations, the suppression of fires have prevented any substantial fire spread to the mid- and upper-elevation zones. This has led to the increase in shrub biomass accumulation and subsequent creation of a ladder-fuel profile, which increases spread potential into the closed canopies of the forested stands. At the mid- to upper elevation ranges, aspen stands that have not incurred a low-intensity fire for many years are now being replaced through succession by conifers, thus creating a more flammable fuel profile. Within the upper elevation conifer forests, the lack of fire, coupled with insect and disease epidemics, has led to increased fuel loadings in the form of downed woody debris. The lack of fire coupled with relatively older age classes has created vast areas of highly flammable fuels, which burn intensely and for long durations once they are ignited.

In most cases, the lower elevation Type I fire regimes, including the Gambel oak and sagebrush-grass vegetation types, are now or will shortly be outside of their historic range of variability for fire. This can be attributed to the general public's demand for aggressive fire protection. Current suppression resources are rapid, efficient, and highly mobile at the local, state, and federal levels and have effectively removed fire from these habitat types. Although prescribed fire has been effective in reducing crown height and biomass in some areas, most of the prescribed burns have not been located in urban interface areas. Increasing development of private lands, combined with aggressive fire suppression activities, will only continue to limit fire's role in these regimes.

Fuels Management

The GSFO is using a combination of prescribed burning and mechanical treatment to enhance and rejuvenate mountain shrub and pinyon-juniper communities in the RMP planning area. Prescribed burning increases plant diversity at the species and landscape level, helps rehabilitate ecosystem functions and processes, reduces the

accumulation of hazardous fuels, and can increase quality of available forage through the release of nutrients.

In December of 2002, the GSFO prepared “Proposed Areas for the BLM Wildland Urban interface Projects in the Roaring Fork Valley.” These assessments identified critical areas of concern within the GSFO that needed hazardous fuels reduction mitigation treatments, including Midland Avenue, Four Mile, Cattle Creek, Red Hill, and Sopris/Prince Creek (BLM 2002b).

The GSFO also prepared an assessment of WUI in the Central Zone, which included I-70, Light Hill, El Jebel, Lookout Mountain, New Castle, Harvey Gap, Cedar Hills, and Oak Meadows. The Crystal River Assessment of Wildland-Urban Interface Sites (BLM 2003a) included land around Potato Bill Creek. The prioritization of hazardous fuels management units (FMU) can assist land managers in focusing future efforts toward the areas of highest concern from both an ecological and fire management perspective. Currently, the Upper Colorado River FMU fuels program is collaborating with Colorado State Forest Service, the White River National Forest, Garfield, Pitkin, and Eagle Counties, along with their Fire Protection Districts to identify fuels treatment projects around jurisdictional boundaries. A visual depiction of fuels reduction projects can be found by looking at the following maps in **Appendix E**: Upper Colorado River Interagency Fire Management Unit Completed Fuels Reduction Projects, Upper Colorado River Interagency Fire Management Unit 2007 Planned Fuels Reduction Projects, and Upper Colorado River Interagency Fire Management Unit Fuels Reduction Projects 3 Year Plan (2007, 2008, 2009).

Prescribed burns averaged 1,000 acres a year from 2003-2006, including Roaring Fork and Deer Pen. The current prescribed fire program is still evolving to successfully reintroduce fire in the mountain/shrub and juniper woodland communities. Collaboration with Colorado State Forest Service, CDOW, White River National Forest, Colorado State Smoke Division, county governments and communities, and private landowners is an ongoing process to educate and receive program support.

Mechanical fuels treatment have averaged 400 acres a year from 2003 to 2006. Future projects include East Sopris, Prince Creek, Oak Meadows, Eagle Ranch, and Sky Legend. It is an appropriate management tool in the WUI and is often combined with pile burning for fuels reduction. The main focus is to work with the Community Wildfire Protection Plans on identified areas where new development is happening in the WUI. In the RMP planning area, ownership is intermixed, and oil and gas development is on the rise. The Upper Colorado River fuels program is working with industry and resource specialists to plan ahead of the development by writing mitigation measures into the NEPA documents.

National BLM Special Status Species Policy

It is national policy to:

- Conserve federally listed and proposed threatened or endangered species and the habitats on which they depend, and
- Ensure that actions requiring authorization or approval by the BLM are consistent with the conservation needs of special status species and do not contribute to the need to list any special status species, either under provisions of the ESA or other provisions of this policy.

The terms conserve and conservation in this national policy and pursuant to the ESA are defined as the use of all methods and procedures necessary to improve the status of federally listed species and their habitats to a point where the provisions of the ESA are no longer necessary.

Fire management planning and activities on site-specific projects should consider the following where ESA species occur:

- Recovery or conservation plans and activities that promote species recovery in the GSFO;
- Terms and conditions of consultation with the USFWS, NOAA Fisheries, and CDOW to promote species recovery in the GSFO; and
- Where and how fire management activities can conserve special status species, especially ESA-listed proposed and candidate species.

The Wilderness Act of 1964

The Wilderness Act provisions apply to all fire management activities undertaken on wilderness lands. The Wilderness Act states that “...measures may be taken as may be necessary in the control of fire...” The act also generally prohibits motorized equipment or mechanized transport in designated wilderness areas; however it allows them “as necessary to meet minimum requirements for the administration for the area for the purposes of this act.” Fire and fuels management actions will meet the nonimpairment mandate for WSAs. In WSAs fire and fuels management will strive to avoid unnecessary impairment that would affect the suitability toward wilderness designation of these areas. The ultimate goal would be to allow fire to play its natural role in these ecosystems.

3.1.9 Cultural and Heritage Resources

Current Condition

For the past 30 years various cultural projects, both large and small, have been conducted in the GSFO planning area. The number of inventories completed and cultural resources identified continue to expand as a result of continued development, particularly in oil and gas. The increases in recreation uses by the public and facilities have also fueled the need for cultural resource inventories. Range, fuel reduction, and wildlife projects have also increased, requiring cultural resource inventories in the 25 years since the RMP was signed. The total amount of BLM land inventoried within the planning area is 91,615 acres, or 13.7 percent of

BLM lands. For convenience, three landscape units have been identified within the GSFO planning area, the Eagle Unit, the Roaring Fork Unit, and the Lower Colorado Unit (Landscape Units map, **Appendix E**).

Within the Eagle Unit, cultural inventories have been conducted covering approximately 41,114 (29,145 BLM) acres. Approximately 1,342 cultural resources have been identified, 248 for which are considered historic properties, eligible or potentially eligible for listing on the NRHP.

Within the Roaring Fork Unit, cultural inventories have been conducted covering approximately 12,333 (6,675 BLM) acres. Approximately 321 cultural resources have been identified, 127 of which are historic properties eligible or potentially eligible for listing on the NRHP.

Within the Lower Colorado Unit, excluding the Roan Plateau, cultural inventories have been conducted covering approximately 45,082 (30,615 BLM) acres. Approximately 1,311 cultural resources have been identified, 289 of which are historic properties eligible or potentially eligible for listing on the NRHP.

Cultural resources include prehistoric and historic archaeological and architectural structures, features, and objects, as well as Native American traditional cultural and religious properties. Prehistoric properties include lithic scatters, quarries, temporary camps, extended camps, wickiups, hunting/kill/butchering sites, processing areas, tree scaffolds, eagle traps, vision quest sites, caves, rock art panels, trails, and isolated finds. Historic properties include homesteads, trails and roads, oil shale extraction and production facilities, irrigation ditches, reservoirs, mining sites, corrals, line camps, cabins, trash scatters, aspen art, and isolated finds. Together these properties represent human use of the area by Native Americans and Euro-American cultures, covering a time frame from the Paleo-Indian period (11,500 BC) through the present.

During previous consultation, the Ute Tribes have indicated that the GSFO is part of their ancestral homeland, thereby increasing the potential of traditional cultural properties and sacred sites. At present, the Ute Tribes have identified several sacred/religious sites and special use areas.

Indicators

Cultural resources are manifested by discovery of exposed artifacts, features, and/or structures that are 50 years of age or older with the exemption of Cold War sites which can date from the 1970's. All together these resources are represented by sites, landscapes, or places of traditional use.

Trends

The condition of cultural resources varies considerably as a result of the diversity of terrain, geomorphology, access, visibility, and past and current land use patterns. Adherence to Section 106 of the National Historic Preservation Act (NHPA) and

the BLM policy of avoiding cultural resources provides for the continued identification and preservation of cultural resource sites. However, the absence of research-based inventories has led to an understanding of the cultural resources based only on where disturbance has occurred or is planned, rather than where sites are likely to occur. Additionally, due to limited site monitoring and protection, site conditions are considered to be declining. Because cultural resources are manifested by discovery of exposed artifacts, features, and/or structures, they are easily disturbed by natural elements such as wind and water erosion, natural deterioration, and decay, animal and human intrusion, and development and maintenance activities. Indications of active vandalism or collecting (unauthorized digging and “pothunting”) have been observed in limited instances in the past, which is a legal offense under the Archaeological Resources Protection Act (ARPA).

The Ute tribes have indicated that the GSFO is part of their ancestral homeland, thereby increasing the potential of traditional cultural properties and sacred sites. At present, there are several locations identified as traditional use area, sacred and/or religious sites by the Ute tribes. Other known vision quest sites, eagle traps, and wickiup locations could be of interest

Forecast

Cultural resources are known to be deteriorating from a variety of causes. Collectively, these agents have adversely affected many known and undiscovered cultural resources. This trend will likely continue due to the continued development of private lands adjacent to BLM lands, the increased use by recreationalists, development for energy, mining, communication, and other associated activities that require the use of Federal lands.

3.1.10 Paleontological Resources

Paleontological resources constitute a fragile and nonrenewable scientific record of the history of life on earth. BLM policy is to manage paleontological resources for scientific, educational, and recreational values and to protect or mitigate these resources from adverse impacts. To accomplish this goal, paleontological resources must be professionally identified and evaluated, considering paleontological data as early as possible in the decision making process. Paleontological resources are managed according to the BLM 8270 Handbook and BLM Manual for the Management of Paleontological Resources and any appertaining interim information memoranda and information bulletins (IBs).

Current Conditions

The ROI for paleontological resources is composed of the RMP planning area. Paleontological resources are integrally associated with the geologic rock units (i.e., formations and some members) in which they are located. Details of these associations are provided in **Appendix B**, Glenwood Springs Field Office Geologic Units and Sensitivity Rankings. If extensive survey or excavation on a certain formation in one geographic area results in significant paleontological resources, surveys or excavations throughout the extent of the formation could produce fossil

material as well. The geographic extent of the GSFO area contains 78 named formations at the surface, 20 of which are known to contain fossils (Armstrong 1994), but with differing potentials to contain significant fossils. Caution must be exercised when comparing fossils to rock units. The information contained in **Appendix B** reflects only the amount of paleontological work conducted in certain areas, and other areas may also contain fossils but may have not been examined and evaluated (Armstrong and Wolney 1989). The potential for paleontological resources is noted through the use of the following three condition definitions, as described in the BLM 8270 Handbook.

Classification

Classification is a ranking of areas according to their potential to contain vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils. These rankings are used in land-use planning, as well as to identify areas that may warrant special management or special designation, such as ACECs. Public lands may be classified based on their potential to contain such fossils, using the following criteria:

Condition 1—Areas that are known to contain vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils. Consideration of paleontological resources will be necessary if the field office review of available information indicates that such fossils are present in the area.

Condition 2—Areas with exposures of geological units or settings that have high potential to contain vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils. The presence of geologic units from which such fossils have been recovered elsewhere may require further assessment of these same units where they are exposed in the area of consideration.

Condition 3—Areas that are very unlikely to produce vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils based on their superficial geology, igneous or metamorphic rocks, extremely young alluvium, colluvium, or aeolian deposits, or the presence of deep soils. However, if possible it should be noted at what depth bedrock may be expected in order to determine if fossiliferous deposits may be uncovered during surface-disturbing activities.

Either Condition 1 or Condition 2 may trigger formal analysis of existing data before authorizing land-use actions involving surface disturbance or transfer of title. Condition 3 suggests that further paleontological consideration is generally unnecessary. This determination should be recorded in the planning or NEPA document to aid in assessing and mitigating impacts on individual land-use actions occurring within the framework of the land-use plan. Classifications should be developed by the field office in consultation with the Regional Paleontologist.

Paleontological localities are areas of known paleontological resources with defined boundaries, usually associated with excavation and data recovery efforts. A comprehensive paleontological inventory has not been carried out for the RMP

planning area nor GSFO; nevertheless, government, academic, and private industry personnel have studied paleontological resources in various contexts, but principally in relation to surface-disturbing development. At least 40 groups and institutions from the 1850s to present have collected fossils in the RMP planning area (Armstrong and Wolny 1989), and many of these have collected in the GSFO area. In that time, over 1,000 paleontological localities have been documented for the RMP planning area region. Fossils recovered from these localities represent a diverse array of plants, invertebrates, and vertebrates. Scientific activity has occurred during the past several years and there are currently active paleontological use permits issued for the BLM-administered land within the RMP planning area and GSFO area.

Indicators

Paleontological resources are indicated by both the presence of and potential for these resources.

Trends and Forecast

The current trend of paleontological resource use permits and scientific activity is likely to continue or increase slightly in the future. Clearances and monitoring of surface-disturbing activities, land tenure adjustments, and scientific research are anticipated to be the primary means of identifying paleontological localities.

3.1.11 Wilderness Characteristics

The BLM will complete a review of BLM-administered public lands within the GSFO to determine whether or not they possess one or more wilderness characteristics (naturalness and outstanding opportunities for solitude and for primitive and unconfined recreation).

Citizens Proposed Wilderness for BLM Lands

In 1994, Colorado conservationists presented to BLM a bound volume entitled “*Conservationists’ Wilderness Proposal for BLM Lands*” that included the compilation of numerous citizen wilderness inventories and the area-by-area justification for the statewide Citizens’ Wilderness Proposal. The 1994 Citizens’ Wilderness Proposal included six areas within the GSFO RMP planning area: Bull Gulch, Castle Peak, Deep Creek, Flat Tops Addition, Maroon Bells-Snowmass Addition, and Thompson Creek.

In 1994, 2001, and in 2007, citizen’s groups presented BLM with a compilation of numerous citizen wilderness inventories and area-by-area justifications for “citizens wilderness proposals” for BLM lands. Currently, the proposal includes 8 areas within the GSFO RMP planning area: Castle Peak, Bull Gulch, Pisgah Mountain, Flat Tops Addition, Deep Creek, Thompson Creek, Maroon Bells-Snowmass Wilderness Addition, and the Grand Hogback.

The Roan Plateau was included in a proposal. Being newly acquired lands, wilderness inventories were conducted in the Roan Plateau RMPA planning area under the

general inventory and planning authority of Sections 201 and 202 of FLPMA. Refer to the Roan Plateau Proposed RMPA and Final EIS, August 2006.

Table 3-20 identifies the seven proposed wilderness areas and acreages within the Glenwood Springs RMP planning area. The Citizen's Wilderness Proposal Areas (08/01) map (**Appendix E**) also shows this information.

Table 3-20
Citizens Proposed Wilderness for BLM Lands

Proposal Name	Conservationists' Recommendation (in BLM GSFO acres)
Bull Gulch	15,155
Castle Peak	16,263
Deep Creek	4,418
Flat Tops Addition (Hack Lake)	3,542
Grand Hogback	11,681
Maroon Bells-Snowmass Addition(Eagle Mt.)	316
Roan Plateau	40,454
Pisgah Mountain	15,679
Thompson Creek	8,248
TOTAL	115,226

Under the authority of 43 USC 1712 (Sec. 202 of FLPMA), the BLM has discretion to manage lands to protect and maintain wilderness characteristics and character. The BLM will continue to manage public lands according to existing land use plans in the event new information (e.g., in the form of new resource assessments, wilderness inventory areas or citizens proposals) is considered in this land use planning effort.

3.1.12 Visual Resources

Background on Visual Resource Management

The BLM's VRM system is a way to identify and evaluate scenic values to determine the appropriate levels of management. VRM is a tool to identify and map essential landscape settings to meet public preferences and recreational experiences today and into the future. The BLM's VRM system helps to ensure that actions taken on the public lands today will benefit the visual qualities associated with the landscapes described above, while protecting these visual resources for adjacent communities in the future.

VRM management classes are assigned for all BLM public lands based on an inventory of visual resources and management consideration for other land uses. VRM inventory consists of a scenic quality evaluation, sensitivity level analysis, and a delineation of distance zones. Based on these three factors, BLM lands are placed

into one of four visual resource inventory classes. These inventory classes represent the relative value of the visual resources:

Class I Objective: To preserve the existing character of the landscape. The level of change to the characteristic landscape should be very low and must not attract attention;

Class II Objective: To retain the existing character of the landscape. The level of change to the characteristic landscape should be low;

Class III Objective: To partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate; and

Class IV Objective: To provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high.

GSFO VRM classes were assigned in the 1984 RMP and are shown on the Visual Resources map (**Appendix E**) and are described in **Table 3-21**.

The BLM's VRM system is a planning tool that helps to ensure that actions taken on the public lands today will benefit the visual qualities associated with the landscapes described above, while protecting these visual resources for adjacent communities in the future. The current Visual Resource Classes prescribed in the 1984 RMP for GSFO's RMP planning area are insufficient to be used as a planning tool because of

Table 3-21
Summary of Visual Resource Management Classes from the 1984 RMP

Class	Acres	Percent of Resource Area
Class I	13,470	2
Class II	225,106	40
Class III	149,112	26
Class IV	176,690	31
Class V	1,664	1

data inconsistencies and because they are outdated. The revised RMP will need to address BLM guidance, which requires that all WSAs be managed as VRM Class I areas.

Characterization

The landscape type is diverse and consists of foothills, mountains, plateaus, mesas, canyons, and broad and narrow river valleys. Vegetation types vary from lowland sagebrush, grasslands, and scrub oak and pinyon and juniper forests to aspen and spruce in the higher elevations. Some of the streams and rivers flowing through and

adjacent to GSFO public lands include the Colorado, Eagle, Roaring Fork Rivers, Deep Creek, Thompson Creek, Sweetwater Creek, the Elk Creeks, Rock Creek, Egeria Creek and Abrams Creek. Several prominent features within the landscape are in the resource area, such as the Roan Cliffs and Anvil Points, the Hogbacks, Castle Peak, Deep Creek Canyon, Bull Gulch, Thompson Creek, the East Fork of Parachute Creek, and Thompson Creek.

The GSFO RMP planning area surrounds Parachute, Rifle, Silt, New Castle, Glenwood Springs, Dotsero, Gypsum, Eagle, Carbondale, El Jebel/Basalt and is bisected by some of Colorado's busiest highway corridors (I-70 and Highways 82, 131, and 13). Visual quality has been a concern to most residents in the GSFO RMP planning area. The location of GSFO-managed public lands and their proximity to communities and key transportation corridors, the combined effects of scenic quality, the high degree of sensitivity, and visual accessibility have resulted in 40 percent of the GSFO being managed as VRM Class II. The current VRM classes were chosen to emphasize scenic quality along I-70, Highways 82 and 131, and the Colorado River Road. Deep Creek, Thompson Creek, and Bull Gulch were proposed for special management to protect their outstanding scenic qualities.

Trends

Public lands in the GSFO are highly fragmented. The landscape is experiencing a high degree of human modification due to urban development (and its associated infrastructure and uses) and from energy development.

Management of multiple resources on public lands can alter scenic resources. With an increased amount of urban development throughout the resource area on adjacent private lands, increased management activities are also occurring on public lands. Growing pressure is being placed on the visual resources as a result of such activities as oil and gas extraction, fire management, utility corridors, roads and trails, communication sites, pipelines, livestock grazing, and water tanks. Public concern is also on the rise regarding preservation of visual and scenic quality for open space and scenic backgrounds in residential areas and for recreational uses. Most gas development has taken place in the western portion of Garfield County, which has modified the landscape into a more industrialized setting.

In response to increasing concerns from local communities, the current condition of visual resources is being assessed for the major transportation corridors, population centers, and other scenic viewsheds to answer how BLM should manage these sensitive viewsheds and corridors.

Tourism also plays a major role in the economy of western Colorado, and much of the GSFO RMP planning area is viewed en route to or from major tourist destination areas, such as Vail and Aspen. As the state's population grows, more visitors will be attracted to public lands for recreation in natural landscapes. In addition, a high demand is being placed on scenic resources near population centers.

Visual Resource Assessment

A VRM assessment for GSFO is being conducted for key transportation corridors and other sensitive viewsheds in coordination with adjacent communities and other local, state, and federal agencies. This assessment will look at viewsheds that have been deemed important throughout the RMP planning area to ensure that the plan looks at what communities and other local, state, and federal agencies deem as being visually and aesthetically important through a data gathering exercise. In addition, current VRM Classes from the 1984 RMP has data defects and will be updated within those sensitive viewshed to ensure that VRM class boundaries reflect “real world” conditions. The assessment will be incorporated into the planning process.

3.1.13 Cave and Karst Resources

Current Conditions

Numerous caves exist within the GSFO RMP planning area, although the exact number is not yet known. Members of the caving community have a wide range of scientific and practical knowledge of the caves and their unique environments. The GSFO has a working relationship and cooperative agreement with Colorado Cave Survey to cooperate on issues and management of caves on BLM public lands. Most of the work has been surrounding the Anvil Points Claystone Cave complex and in the development and implementation of the LaSunder Cave Plan, completed in 2006.

Most caves managed by the GSFO are found within limestone deposits and are said to be pristine in condition, to have unique or unusual numbers of formations, and to contain significant cultural values. Most of the caves identified by the caving community would meet the significance criteria set forth in the Federal Cave Resources Protection Act, 1988.

Indicators

Colorado Cave Survey monitors the LaSunder Cave according to indicators set forth in the LaSunder Cave Plan. No other cave within the GSFO has indicators or a monitoring plan.

Trends and Forecast

BLM public lands within the planning area are experiencing a large increase in visitation due to the population growth within the area. With that increased population trend the forecast is for increased visitation and exploration to many caves. While BLM does not “market”, publish, or release information regarding cave locations to the general public, un-managed cave use could result in damage to fragile and sensitive resources. Additional coordination and partnership efforts with Colorado Cave Survey and other Grotto Groups will need to be prioritized to ensure protection and appropriate management for cave resources within the GSFO.

3.2 RESOURCE USES – CURRENT CONDITIONS AND CHARACTERIZATION

Public Land Health

Background

In response to public concern about management of livestock grazing on western public lands, the BLM in 1991 began a review to determine how it could improve rangeland management and began developing new regulations for livestock grazing administration. Title 43 CFR Section 4180 requires the state directors, in consultation with Resource Advisory Councils, to develop rangeland health standards for lands within their jurisdiction. This includes assessing and evaluating rangeland health. Interim guidance to implement these regulations was provided in Washington Office IM No. 2000-153 (Standards Assessment Procedures and Guidance). The BLM has agreed to work with the Resource Advisory Councils to expand these rangeland health standards so that public land health standards are relevant to all ecosystems, not just rangelands, and that they apply to all actions, not just livestock grazing (Manual Handbook H-1601-1 Land Use Planning).

The Secretary of the Interior approved the Standards for Public Land Health and Guidelines for Livestock Grazing Management for BLM offices within Colorado on February 3, 1997. The Colorado Standards for Public Land Health (Appendix A) describe conditions needed to sustain public land health and relate to all uses of the public lands. The standards are applied on a landscape scale and relate to the potential of the landscape for the following resources:

- Standard 1: Upland Soils;
- Standard 2: Riparian Systems;
- Standard 3: Plant and Animal Communities;
- Standard 4: Special Status Species; and
- Standard 5: Water Quality.

The Guidelines for Livestock Grazing Management are the management tools, methods, strategies, and techniques (e.g., BMPs) designed to maintain or achieve healthy public lands, as defined by the standards.

Glenwood Springs Field Office

Field offices are expected to conduct local assessments and to follow the developed guidelines. Information specific to each BLM field office is used to evaluate whether or not standards are achieved.

The GSFO divided its RMP planning area into 13 discrete landscapes, within which the standards are assessed. The landscape boundaries were delineated based on US Geological Service (USGS) fifth-field hydrologic units, geographic boundaries, allotment boundaries, and other administrative boundaries.

The GSFO staff systematically assesses and evaluates numerous sites within each landscape to determine if the standards for rangeland health are being achieved within that landscape. The sites are selected so that each grazing allotment within the landscape contains at least one assessment site. The number of sites to be assessed within each allotment depends on the size, complexity, and topography of the allotment. Each of the major ecological sites in the watershed is sampled, with greater emphasis being placed on those ecological sites that provide the most livestock and wildlife forage. Each stream within the watershed is also assessed. The assessment methods are largely qualitative and are not intended to be used for monitoring. The assessments are intended to be a snapshot of current site conditions and to serve as the basis for developing any necessary changes in management and any future monitoring studies.

Results of GSFO Landscape Health Assessment Reports

Seven of the 13 landscapes within the RMP planning area have a completed LHA Report and Determination Document. One landscape has had the fieldwork portion of the assessment completed, and the Report and Determination Document are being developed. The status of the 13 GSFO LHA landscapes is shown in **Table 3-22**, below. For those landscapes with completed LHA reports, the table also summarizes whether each of the five standards was met or not and identifies associated concerns by allotment.

The standards were met for most of the landscapes that have been assessed. Those allotments or portions of landscapes that did not meet all of the five standards generally failed to meet Standard 2 (riparian systems), Standard 3 (healthy plant and animal communities), or Standard 4 (threatened, endangered, and special status species). The allotments and standards that were not met and their indicators are part of the resource discussions that follow.

Table 3-22
Summary of Landscape Health Assessments

Landscape: Battlement Mesa

Status: LHA completed in 2000 (5 allotments)

Allotment List: Alkali Creek Common, Alkali Gulch, Battlement Creek Common, Dry Creek Pete and Bill, Upper Wallace Creek

Standard 1: M Soils were in acceptable condition on a landscape scale. A few site-specific problems with soil conditions were noted, but these were attributed primarily to road runoff.

Standard 2: M Riparian systems were either properly functioning or functioning-at-risk with an upward trend.

Standard 3: M/NM The condition of the vegetative communities was the most widespread problem noted in this landscape. Nearly half of the observation sites in this assessment were rated at risk or nonfunctional. Much of the sagebrush and woodland sites on the Battlement Mesa landscape are not achieving the standards for healthy lands. The poor condition sites are concentrated along the northwest portion of the landscape in the Alkali Creek Common and Alkali Gulch allotments. The lower elevations of the Dry Creek-Pete and Bill and Battlement Creek Common allotments are also in unsatisfactory condition.

Standard 4: M Current habitat conditions within the Battlement Mesa Landscape area appear suitable for those special status species which are known or likely to occur there. Although site-specific areas are not achieving Standard 3, the landscape as a whole appears to provide enough quality habitat to sustain the limited number of special status species likely occurring in the area. No special status plant species occur here.

Standard 5: M Water quality was adequate to meet or exceed Colorado state water quality standards.

Landscape: Burns to State Bridge

Status: LHA conducted in 2006 (18 allotments) – Analysis in progress)

Allotment List: Albertson, Antelope Creek, Cabin Gulch, Castle Ind, Catamount Common, Deer Pen, Domantle, H&H Individual, Hasting, Luark, Newcomer, Piskey, River/Catamount, Spring Creek, State Bridge, Strubi A Nick, Tepee Creek, West Castle

Landscape: Deep Creek

Status: LHA planned in 2008

Landscape: Eagle River South

Status: LHA completed in 2002 (15 allotments)

Allotment List: Bellyache, Bellyache Ridge, Brush Creek, Eagle River, East Hardscrabble, Falk, Horse Mountain, North Bellyache, Red Canyon 2, Red Hill Common, Salt Creek/Bellyache, Salt Creek Forest, Squaw Creek, West Hardscrabble, Wolcott Isolated Tract

Standard 1: M Overall, soils were at least marginally meeting the standard, except for one small allotment (Brush Creek) that had lack of adequate ground cover and biological soil crusts and had numerous water flow patterns and pedestaling. In North Bellyache and West Hardscrabble, unrestricted OHV activity was causing loss of ground cover and excessive erosion. Lack of vegetative cover, elevated water flow patterns, and gullyng was a concern in an old sagebrush treatment that was seeded to crested wheatgrass.

Table 3-22
Summary of Landscape Health Assessments *(continued)*

Standard 2: M/NM Sixteen of the 19 stream reaches met the standard. Upper Alkali Creek, McHatten Creek, and Third Gulch had issues with bank damage, heavy browsing on woody riparian species, or dominance of the riparian area by invasive nonnative species. Some of these issues have been addressed by adding additional livestock water in the uplands.

Standard 3: M/NM Most of the higher elevation, more mesic sites had good species diversity and cover. In the lower elevations, and adjacent to residential development, more concerns were noted. However, only Brush Creek and East Hardscrabble had deficiencies sufficient to be considered not meeting the standard as a whole. In low elevation sagebrush parks, where big game concentrate in the winter, heavy browsing of shrubs resulted in poor vigor and even some mortality. Many sagebrush parks are old and dominated by even-aged class shrubs. Pinyon-juniper encroachment was widespread, and herbaceous cover and diversity was lacking. Some old crested wheatgrass seedings were still largely dominated by crested wheat and sagebrush with poor vegetative diversity and cover and lack of biological soil crusts. High density OHV activity has created habitat fragmentation issues in some areas.

Standard 4: M/NM Conditions in most of the landscape appeared suitable for sustaining viable populations of special status species. Portions of the Red Hill Common and West Hardscrabble allotments were mapped as historic habitat for sage-grouse, which used to inhabit these lands but have not been seen in many years. Primary issues related to sage-grouse include habitat fragmentation, juniper encroachment, lack of forbs, and cheatgrass invasion. Standard 4 for sage-grouse was not being met on these allotments. Standard 4 was also not met for Harrington's penstemon on West Hardscrabble allotment due to OHV impacts.

Standard 5: M All waters in the assessment area appear to be meeting the standards for water quality established by the State of Colorado. Water quality Standard 5 is being met on surface waters.

Landscape: King Mountain

Status: LHA planned in 2011

Landscape: North Eagle

Status: LHA completed in 2003 (14 allotments)

Allotment List: Blowout grazing plan, Bocco Mountain, Castle, Diamond J, East Castle, East Castle Individual, Eby Creek, Greenhorn, Hells Hole, Pocket, Upper Cottonwood, Ute Creek, West Castle Individual, and Wolcott

Standard 1: M Of the 54 upland sites visited, 46 were meeting the Standard and eight were considered to be at risk or meeting the standard but with problems noted. These sites generally exhibited signs of soil erosion, as evidenced by water flow patterns and plant pedestaling. These sites also had more bare ground than expected for the range site and a lack of biological soil crusts and litter to protect the site from erosion.

Standard 2: M All stream reaches were in properly functioning condition, except 0.1 mile of lower Muddy Creek, that was FAR with an upward trend. Beaver dams had blown out and created some bank erosion and downcutting.

Standard 3: M The landscape as a whole was meeting the healthy plant and animal communities' standard. Of the 54 sites visited, 42 were meeting the standard, 11 were meeting them but with problems noted, and one was considered not meeting the standard. The upper elevations of the landscape (aspen and conifer stands and Thurber fescue meadows) were generally in the best condition, with diverse and dense vegetative growth. Most sites that had land health concerns were in

Table 3-22
Summary of Landscape Health Assessments *(continued)*

the lower elevations of Bocco Mountain, Blowout, and Greenhorn allotments. Some of the lower elevation sagebrush parks had been brush beat and seeded to crested wheatgrass in the 1960s, 1970s, or 1980s. Some of these treatments continue to be heavily dominated by crested wheatgrass, with few other native perennial grasses or forbs. Of untreated sagebrush sites, more than half are dominated by old decadent sagebrush, with poor recruitment or with varying degrees of pinyon-juniper encroachment. In two former pinyon-juniper woodcutting areas, cheatgrass is now common.

Standard 4: M/NM Habitat conditions appear to be met on this landscape for most special status species. Harrington's penstemon is prevalent throughout much of the landscape, and most populations were flourishing. However, in some areas with pinyon-juniper encroachment, heavy OHV activity or areas seeded to crested wheatgrass, Harrington's penstemon was being affected. For sage-grouse, although habitat within the landscape is limited, it is still some of the best remaining sage-grouse habitat in northern Eagle County. Regardless, sage-grouse are experiencing local and rangewide declines. Although most of sites within mapped sage-grouse habitats were meeting Standard 3, a combination of habitat condition, fragmentation, recreation and human use issues, loss of habitat, and fire suppression was negatively affecting sage grouse on a landscape scale. Five allotments were not meeting Standard 4.

Standard 5: M Water quality parameters measured in the landscape, while very limited, do not show any violations of the water quality standards established to protect the classified uses. Virtually all waters in the assessment area appear to be meeting the standards for water quality established by the State of Colorado.

Landscape: Rifle Creek

Status: LHA completed in 2001 (30 allotments)

Allotment List: Andgee, Brosius Gulch, Brush Creek Common, Bowen Isolated Tract, Cedar Mountain, Chirp, Coal Mine, Doak, Doodlebug, Elk Park Common, George Creek, Government Creek Common, Government Creek Isolated, Graham, Harris Gulch, Hayden, Horse Mountain, Hubbard Mesa, Lundgren/Hogback, Magpie Creek, Middle Rifle, Morrow, North Hogback, Rees, Rifle Gap, southwest Rifle Creek, Simpson & Nichols, Watts, Webster Park (part), Wittwer

Standard 1: M In general, soils were meeting the standard within the landscape, with the exception of Brosius Gulch and Hubbard Mesa. On these two allotments, compaction, water flow patterns, lack of microbiotic crusts except in protected areas, and less vegetative cover and more bare ground than desired were severe enough that the soils standard was not being met. OHV activity and livestock grazing were the primary factors contributing to not meeting the standard on the Hubbard Mesa allotment. On Brosius Gulch, fire suppression and possibly historic grazing contributed to the poor conditions.

Standard 2: M Eighty-two percent of stream reaches (16.8 miles) were meeting the standard, while 18 percent of reaches (3.6 miles) were not. Stream reaches that were not meeting the standard were in Doobdlebug Gulch and portions of Government Creek. Causal factors included OHV activity, livestock trailing, and natural causes.

Standard 3: M/NM Of the 71 upland sites visited, 48 were found to be meeting Standard 3 and 23 sites were not meeting the standard. The following six allotments were considered not to be meeting the standard: Hubbard Mesa, Government Creek, Simpson & Nichols, Andgee, Brosius Gulch, and Wittwer. Most of the sagebrush ecological sites were in a late seral stage, with poor productivity and little evidence of reproduction. Shrubs are heavily to severely hedged and exhibit low vigor. Many

Table 3-22
Summary of Landscape Health Assessments *(continued)*

sites had moderate to advanced encroachment of pinyon or juniper trees. Few native herbaceous plants occur under the sagebrush or low-elevation pinyon-juniper canopies. Cheatgrass was dominant on several sagebrush and pinyon-juniper sites.

Standard 4: M/NM Standard 4 was being met across the landscape for those species with potential habitat in the area. Although site-specific areas were not currently achieving Standard 3, the landscape as a whole appeared to provide sufficient suitable habitat to support the limited number of individuals likely to occur. Suitable Colorado cutthroat trout habitat is present in several streams, but the species is lacking or declining due to competition with nonnative salmonids.

Standard 5: M The water quality parameters measured on the Rifle Creek assessment area, while very limited, do not show a violation of the water quality standards established to protect the classified uses. All waters on the assessment area appear to be meeting the standards for water quality established by the State of Colorado.

Landscape: Rifle to Glenwood North

Status: LHA planned in 2007

Landscape: Rifle to Glenwood South

Status: LHA planned in 2009

Landscape: Rifle West

Status: LHA completed in 2004 (16 allotments)

Allotment List: Beaver Creek, Beaver Mamm, Callahan Mountain, Cottonwood Gulch, County Line, Crawford & Kerlee, Hoaglund, Kelly Gulch, Porcupine Comm, Riley Gulch, Sharrard Park, Smith Gulch, Spruce Gulch, Starkey Gulch, Webster Park (part), Wheeler Gulch

Standard 1: M The Rifle West watershed is meeting Standard 1 for healthy soils on a site-by-site basis. However, across the watershed there were areas where accelerated soil erosion was identified. In particular, Riley Gulch and Cottonwood Gulch have experienced accelerated soil erosion from adjacent roads.

Standard 2: M/NM Of the 14 stream reaches assessed, all were meeting the standard, other than lower Riley Gulch and lower Cottonwood Gulch. Road encroachment on these two stream reaches had caused increased sedimentation, a headcut and decreases in riparian vegetation.

Standard 3: M/NM On a site-specific basis, 20 sites were meeting Standard 3, seven were not meeting Standard 3, and nine were considered to be meeting the standard but with problems identified. Most of the sites that were not meeting were found in the County Line and Smith Gulch Allotments. Current livestock grazing was a causal factor for the County Line allotment not meeting the standard; historic livestock grazing contributed to Smith Gulch not achieving the standard. Cheatgrass has become a dominant component of the lower-elevation south-facing slopes of the landscape, with a corresponding loss of native perennial grasses and forbs. Sagebrush communities dominated by old, age-class decadent sage and encroaching pinyon and juniper are also common land health concerns in this landscape. Fire return intervals outside of the normal range, along with fire suppression and big game grazing, contributed to these land health concerns.

Habitat fragmentation, loss of habitat, reduction in habitat quality, and increased human use associated with natural gas exploration and development resulted in a failure to meet Standard 3 or a trend away from meeting Standard 3 on approximately 16,500 additional acres of public land.

Standard 4: M Standard 4 is presently being met for all special status species within the landscape, but

Table 3-22
Summary of Landscape Health Assessments *(continued)*

expanding natural gas development will likely further reduce potential habitat and habitat quality and usability over time, which may lead to overall population declines.

Standard 5: M While the limited data collected by the BLM do not show a violation of the water quality standards established to protect the classified uses, observations indicate accelerated erosion, creating elevated sediment loading within the assessment area. Most serious problems were observed in Riley Gulch and lower Cottonwood Gulch, with most sediment introduced from improperly installed or maintained culverts and road management associated with natural gas development. Additionally, the listing of the mainstem and tributaries of the Colorado River for selenium indicates Standard 5 is not being met on some surface waters. The assessment indicates Smith Gulch, Kelly Gulch, upper Riley Gulch, south fork Starkey Gulch, upper Hayes Gulch, Cottonwood Creek, upper Cottonwood Gulch, Beaver Creek, and Porcupine Creek (7.5 miles total) are meeting Standard 5; lower Cottonwood Gulch, lower Riley Gulch, and the Colorado River (4.1 miles total) are not.

Landscape: Roan Cliffs

Status: LHA completed in 1999 (5 allotments)

Allotment List: Clough/Alber, East Fork Common, JQS Common, Mahaffey Summer, Old Mountain

Standard 1: M Upland soils were mostly in excellent condition on all five livestock grazing allotments in the assessment area. Soil problems were found at only four sites, and these were minor and confined to very small areas. Upland soils on the remainder of the sites were in excellent condition, with good vegetative cover and no signs of soil movement, soil pedestaling, flow patterns, or rills.

Standard 2: M All but two sites were either PFC or functioning-at-risk with an upward trend. Virtually all streams showed improvement since the 1994 PFC assessment, but livestock grazing distribution continues to be a concern.

Standard 3: M In general, plant communities were healthy and productive, but many vegetative communities were in mid- to late-seral stage, and age-class diversity could be improved. Kentucky bluegrass was present on more than a quarter of the sites, but it rarely dominated. Houndstongue was reported at over two-thirds of the sites. Many aspen stands were decadent. Wildlife populations, except Colorado River cutthroat trout, were healthy and productive.

Standard 4: M/NM Standard 4 was not being met on 10 miles of streams, due to the declining Colorado River cutthroat trout population. Nonnative brook trout appear to be outcompeting native Colorado River cutthroat trout, leading to poor survivability of first-year cutthroats. Standard 4 was not being met on a small population of Parachute penstemon, a candidate species for listing. The population has declined significantly in the last 10 years. Cause of the decline is not evident, but livestock grazing does not appear to be a factor.

Standard 5: M Surface waters on the Roan Cliffs appear to be meeting the standards for water quality established by the State of Colorado. None of the values measured show a violation of the water quality standards established to protect the classified uses.

Landscape: Roaring Fork

Status: LHA planned in 2010

Landscape: Sweetwater to Burns

Status: LHA completed in 2005 (7 allotments)

Table 3-22
Summary of Landscape Health Assessments *(continued)*

Allotment List: Bull Gulch Common, Horse Creek, Irrigated Land Trail, Red Dirt, River Common, Trail Gulch, Willow Creek

Standard 1: M Standard 1 for soils was being met across the landscape. There were a few areas where accelerated erosion was noted, but not to the degree where the standard was not considered to be met.

Standard 2: M All the riparian areas within the landscape were meeting Standard 2.

Standard 3: M All individual assessment sites were meeting Standard 3 for healthy plant and animal communities, however some watershed-wide concerns were noted. The primary concern was the condition of some sagebrush communities. Many stands are old, decadent, and heavily hedged due to repeated and prolonged browsing by wintering wildlife. Lack of recruitment of young sagebrush plants is also a concern. The condition of the herbaceous understory was pretty good overall, but several sites had a poor diversity or cover of grasses and forbs, and some small areas of cheatgrass were noted. Decades of fire suppression and climatic conditions favorable to woodland species has led to the encroachment of pinyon and juniper trees into sagebrush communities, which are contributing to the reduction in quality and quantity of sagebrush habitat. Although these sites are still meeting the standards, some type of treatment to remove the trees will be necessary in the near future to sustain land health.

Standard 4: M/NM Most of the landscape was meeting Standard 4 for threatened, endangered, and special status species. Portions of the Trail Gulch allotment contain mapped habitat for greater sage-grouse, which is in decline locally, and few birds have been seen in this landscape in recent years. A combination of habitat fragmentation, OHV use, other recreational uses, residential development, powerlines, pinyon-juniper encroachment from fire suppression, and browse decadence resulting from drought and heavy big game use, were all affecting sage-grouse use of the habitat. For this reason, this allotment was considered not to be meeting Standard 4.

Standard 5: M Available data indicate the poorer quality waters within the assessment area are generally related to the Eagle Valley Evaporite geologic formation rather than land use. Waters flowing through this formation are naturally saline, with elevated calcium and sulfate levels. Soils have a moderate to very high erosion potential, producing elevated sediment levels during runoffs. While there have been issues identified with elevated sediment and salinity within a portion of the assessment area, current data and investigation do not indicate any problems with management. Existing water quality data indicate Standard 5 was being met.

If livestock grazing is a significant factor in failing to meet a standard, the BLM, with involvement of the interested parties, is required to prescribe actions that ensure progress toward meeting the standard within two years. Actions may include changing the length of grazing use, the season of use, the numbers of AUMs, and other such adjustments.

If landscapes are not meeting a standard due to activities other than grazing (e.g., OHV, recreation), the BLM must use more of a cooperative collaborative approach

to addressing land health concerns. There is no official policy or mandate that sets timeframes or outcomes for managing these activities to meet land health standards.

3.2.1 Energy and Minerals

Energy is discussed in three separate subsections to describe fluid and nonfluid minerals: leasable, locatable, and mineral materials.

- **Leasable minerals** includes oil and gas;
- **Locatable minerals** include stratabound gold, copper-gold deposits, diamonds, gems, semiprecious stones, limestone, zeolite, uranium, bentonite, gypsum, and titaniferous magnetite. Locatable minerals can be located and claimed under the Mining Act of 1872; and
- **Mineral materials** include sand and gravel, limestone aggregate, building stone, moss rock, cinders (clinker), clay, decorative rock, and petrified wood. Mineral materials are sold or permitted under the Mineral Materials Sale Act of 1947.

Leasable Minerals

Leasable minerals are governed by the Mineral Leasing Act of 1920, as amended, which authorized specific minerals to be disposed of through a leasing system.

Oil and Gas

The Energy Policy and Conservation Act Amendments of 2000, Public Law 106-469, directed the USDI to inventory oil and natural gas resources beneath federal lands. The act also directed the Department of Interior to identify the extent and nature of any restrictions to their development. Executive Order 13212 (May 18, 2001), stated that "...agencies shall expedite their review of permits and take other action as necessary to accelerate the completion of [energy-related projects] while maintaining safety, public health, and environmental protections. The agencies shall take such actions to the extent permitted by law and regulation, and where appropriate." As a result, the Departments of the Interior, Agriculture, and Energy released a report, *Scientific Inventory of Onshore Federal Lands' Oil and Gas Resources and Reserves and the Extent and Nature of Restrictions or Impediments to their Development* (referred to as the "Energy Policy Conservation Act Inventory"), in January 2003. Based on the Energy Policy Conservation Act Inventory, the BLM designated seven Energy Policy Conservation Act Focus Areas to concentrate BLM efforts and resources to meet the President's National Energy Policy. The BLM is integrating the results of the Energy Policy Conservation Act Inventory into RMPs and reasonably foreseeable development scenarios. The NSO Stipulations (1999 EIS) Draft map (**Appendix E**) shows areas within the planning area that have no surface occupancy.

Coal

Characterization

The most important factor relating to development of the coal is the presence of geologic formations which contain coal. Other important factors include ease of access, development and production costs, and market demand. Historically, some mining occurred on coal leases. The Grand Hogback Field is the only area of public land considered to have potential for coal mining. The in-place coal resource is estimated at approximately 1.6 billion tons. There are no currently authorized coal leases, but former leases were located near Harvey Gap, Thompson Creek, and the Coal Basin areas. The most recent mining operation was the Mid-Continent Coal Basin Mines, which closed in 1991. Currently, there are no leases or development activities for coal, oil shale, geothermal resources, and nonenergy leasable minerals. Based on historical activity and the nature of the deposit, coal is not expected to be commercially developed over the next 20 years.

Oil Shale

Characterization

The most important factor relating to development of oil shale is the presence of geologic formations that contain oil shale deposits. Other important factors include ease of access, development and production costs, and market demand.

Outside the Roan Plateau RMPA planning area, there is only limited acreage underlain by prospectively valuable oil shale deposits. The oil shale lands are in the Battlement Mesa Area south of the Colorado River and just west of the town of Parachute. This represents a tiny fraction of the oil shale resource in the Piceance Basin. The only oil shale leasing activity in the Basin was the recent issuance of research and development lease tracts in Rio Blanco County. Based on historical activity and the nature of the deposit, oil shale is not expected to be commercially developed over the next 20 years.

Oil and Gas Profile for the GSFO

There are five USGS-identified total petroleum systems and 20 assessment units that extend into the Piceance Basin. The western portion of the GSFO (including the Grand Hogback) is the Piceance Basin, which is the eastern half of a greater geologic basin known as the Uinta-Piceance Basin. Most of the hydrocarbon production in the GSFO is natural gas, with very little associated oil, natural gas liquids, and water. The gas production is from the Tertiary Wasatch and Cretaceous Mesaverde Group formations. Current oil and gas leases are shown in the Oil and Gas Leases map in **Appendix E**.

Western Portion of the GSFO

The oil and gas development activity in the GSFO is concentrated on the western 22 percent, in the area west of the Grand Hogback, where the high potential for the occurrence and development of oil and gas resources is found. Most of these lands

are either already leased or being addressed through the separate planning process for the Roan Plateau. Of the 127,335 acres of BLM mineral estate in this high potential area that is not within the Roan Plateau RMPA planning area, 95 percent has been leased. Most of the unleased land outside of the Roan Plateau RMPA planning area is along the Grand Hogback, with a few small scattered parcels elsewhere. The 73,602-acre Roan Plateau RMPA planning area contains 57,491 unleased acres, which are addressed in the Roan Plateau RMPA (approved in 2007).

The total USFS mineral estate within the high potential areas of the Glenwood Springs planning area is 231,729 acres. Currently 117,191 acres are leased, and the remaining acres available for lease are 114,538 acres. (Leasing decisions on National Forest lands are addressed through National Forest planning and are not addressed in this planning effort.)

Additional leasing may occur in the area of the USGS Hanging Wall Assessment Unit (Grand Hogback), which is sparsely leased in the northern part of the play. Almost all of the areas mapped as medium, low, and no known potential for the occurrence of oil and gas are unleased.

Eastern Portion of the GSFO

The eastern 78 percent of the GSFO (east of the Grand Hogback) consists of the Eagle Basin, the White River Uplift, and mountain ranges to the south and east. Due to the low potential for the economic occurrence of oil and gas resources, no USGS oil and gas assessment has been completed for this area. The Eagle Basin is primarily a Pennsylvanian-age depositional basin in a structurally complex area. This basin has relatively low potential for the discovery of significant gas, based on available well data (subsurface data) and surface data. The basin has very low potential for discovery of economic oil accumulations due to very high thermal maturity of most Paleozoic rocks and the presence of only small areas containing younger rocks with oil source beds. There are some noncompetitive leases north of Gypsum, which is classified as a low potential area.

Future Development

Development within the GSFO will continue in the areas that are being developed. Infill drilling and step out drilling will be the major portion of future activity. Although drilling of proven reserves will continue, much interest is being shown by industry for the technically recoverable resources identified by the USGS and displayed in the Energy Policy Conservation Act study. These interests are for the coalbed natural gas plays and for the Niobrara play. It is estimated that 99 percent of the drilling will occur in the area identified as high potential for the occurrence of oil and gas resources. Approximately one percent of future drilling will occur in areas of medium and low potential, and no drilling activity is predicted in the areas identified as no known potential. The area within the Roan Plateau that will be leased in the future will be drilled based on constraints addressed in the Roan Plateau RMPA. The Roan Plateau RMPA planning area has significant reserves and will certainly produce gas. Most of the existing wells are on fee minerals, with an increase on BLM minerals

occurring presently and projected to increase in the near future. Industry will continue to drill heavily on fee minerals and as they drill out the fee mineral estate a significant increase of drilling on federal mineral estate will occur. This will also happen as a result of the BLM leasing lands within the Roan Plateau RMPA planning area that currently are not leased. Increased drilling will also occur on USFS lands since only half of the available lands for leasing are leased. It is projected that much of the USFS drilling will occur in the later half of the life of this plan.

There are 28 units and participating areas with the GSFO boundary, all of which are in the area that is classified as high potential for the occurrence of oil and gas. The units are all south of I-70 and involve 259,600 acres of land, regardless of mineral estate and surface ownership. In fact much of the divided area is on the White River National Forest. When the Roan Plateau RMPA planning area is leased it will be divided as well. In the future some units may contract as reservoirs become depleted or the known reservoir boundary is defined as a smaller area within the unit.

Unitization

There are 28 units and participating areas with the GSFO boundary, all in the area that is classified as high potential for the occurrence of oil and gas (Oil and Gas Leases and Occurrence Potential map, **Appendix E**). The units are all south of I-70 and involve 259,600 acres of land regardless of mineral estate and surface ownership. In fact much of the divided area is on the White River National Forest. The proposed RMPA for the Roan Plateau RMPA planning area includes a unitization approach for the 34,758 acres on top of the plateau.

Communitization

Communitization (pool respective mineral interests) is used extensively within the GSFO. There are 128 communitization agreements involving more than 44,746 acres. They mainly communitize gas production from the Mesaverde/Williams Fork, but some agreements communitize gas production from other formations, such as the Wasatch Formation and the Cozzette Member of the Iles Formation. All of the agreements are within the area classified as high potential for the occurrence of oil and gas.

Spacing

Current State of Colorado spacing requirements is 40 acres (600-foot setbacks from lease line) for wells greater than 2,500 feet deep but can be increased or decreased depending on geology and reservoir characteristics. The Colorado Oil and Gas Conservation Commission uses the term default spacing, with modification occurring through cause orders. These adjustments are meant to maximize production of the resource while minimizing surface disturbance and expense. In the case involving production from the Williams Fork Formation, 10-acre spacing has been justified and approved. Currently the Wasatch Formation is being drained of gas on 160-acre spacing. New spacing regulations will be necessary to accommodate new drilling and production techniques. Future production from previously undeveloped plays, such as the Niobrara, may also require spacing changes. Tight

sands, compartmental geology, and reservoir characteristics may increase the demand for tighter spacing in the future in reservoirs other than the Williams Fork. The Oil and Gas Well Locations Spring, 2007 (COGCC) map in **Appendix E** shows the location of wells throughout the GSFO.

Summary of Resource Uses

Locatable Minerals

Locatable minerals (metallic and nonmetallic) are those that are open to mining claim location under the 1872 Mining Law. The primary locatable minerals under jurisdiction of the GSFO include metals and nonmetals of gypsum, limestone, vanadium and uranium, gold, silver, lead, and copper. Numerous mining claims exist, but the only significant mining activity is associated with gypsum mining claims.

Gypsum—An active gypsum mine is just north of the town of Gypsum. The surface mine produces about 600,000 tons per year to supply the nearby wallboard plant. The mine has operated since 1990 on patented mining claims, but the active pit is nearly mined out. Development has started on the new mine area which is on unpatented mining claims. The company holds numerous mining claims and periodically conducts exploration to expand the proven reserves area.

Limestone—Locatable limestone was mined from a quarry above Glenwood Springs from about 1956 to 1991. Over the years, the limestone was used primarily for refining sugar products, in coal-fired power plants, and in a rock dust plant for coal dust suppression in Mid-Continent Coal Company's mine near Redstone. The coal mine was closed in 1991, including the rock dust plant, and a locatable market no longer exists. Minor quantities of lower grade limestone fines are sold for acid neutralization for mill tailings reclamation. However, a recent Interior Board of Land Appeals decision determined that the limestone fines are a common variety and not subject to location.

Uranium and Vanadium—Historically, uranium activity occurred in the vicinity of the Grand Hogback. The uranium deposits are in the Entrada Sandstone in the Rifle Creek district, but the uranium and vanadium ore grades are lower than average grades found in the Morrison Formation in the Uravan Mineral Belt. Only two small underground mines (Rifle and Garfield Mines) were listed by the Colorado Geological Survey as being active in 1978, which was during the last major period of significant uranium activity. The mines are closed and reclaimed, and no new exploration or mining proposals have been submitted, although the price of uranium (yellowcake) has dramatically increased since 2005.

Other Locatables—The BLM processed a notice in 2005 for exploratory drilling of the copper mineralization near Copper Spur. No information is available on the results of the drilling, but the claimant did not submit the required annual claim filing for the 2007 assessment year, which would indicate that the operator has no current

interest in developing any copper resource. The only gold placer activity is sporadic recreational gold panning and dredging along the Colorado River.

Characterization

The factors relating to locatable mineral development are based on the geologic formation and presence of mineralization, access to the deposit, ore grade and quantity, development and mining costs, market demand, and other factors. Preliminary analysis of these factors show that the only significant locatable mining activities projected over the next 20 years would be for gypsum, based on maintaining a supply for the wallboard plant. Although mining claims exist on locatable-grade limestone, a mine would have to be developed to offer a potential source of limestone for locatable end uses, such as rock dust or power plant stack gas reduction. No attempts have been made to restart the mine since it was closed 15 years ago. Although the price of uranium, gold, and copper have risen in recent years, there is little current interest in developing any ore deposits for these minerals.

Characterization—Mineral materials (salables) include sand and gravel and construction materials that are sold or permitted under the Mineral Materials Act of 1947. The primary mineral materials under jurisdiction of the GSFO include scoria (volcanic cinders), limestone, decorative rock, fill material, and sand and gravel. The activity is primarily limited to small to medium size sales for commercial and residential uses. Mineral materials are sold at fair market value or through free use permits to government agencies.

The most important factor relating to mineral material development geologic formations and exposures containing deposits of mineral materials. Other important factors include access, development and mining costs, and market demand. Preliminary analysis of these factors shows that the only significant mineral material activity projected over the next 20 years is a continuation of the cinders operation on a similar scale. Demand for decorative rock and sand and gravel should increase slightly based on growth in residential and commercial construction.

Volcanic Cinders—The cinder mining operation near Dotsero has been seasonally active for many years. It consists of mining and screening volcanic cinders, which are used at a nearby site for making cinder blocks. This operation typically uses about 6,000 tons of cinders each year.

Limestone—There are two limestone quarries located Glenwood Springs, both designated as community pits. Historically, most of the limestone was mined and processed for locatable minerals markets. Currently, only small quantities of lower grade stockpiled limestone removed and sold for acid neutralization during mill tailings reclamation. This material is considered to be common variety based on a recent Interior Board of Land Appeals decision. There is some demand to use the stockpiled limestone for roadbase material for maintaining the access roads to the area.

Decorative Rock—Decorative rock, including moss rock, flagstone, and boulders, is available from Copper Spur, West Rifle Creek, East Rifle Creek, Cattle Creek, and Big Alkali Creek.

Fill/borrow Material—Jack Flats and Battlement contain material suitable for fill.

Sand and Gravel—The Sheep Gulch common use area supplies small quantities of sand and gravel material. In Fiscal Year 2006, total sales of 22 cubic yards were reported.

Geothermal—Currently, there are no leases or development activities for geothermal resources or nonenergy leasable minerals. Based on the presence of hot springs, approximately 254 square miles have been identified as prospectively valuable for geothermal energy, most of which is under the jurisdiction of the GSFO. No geothermal leases have been issued to date. Six lease applications were filed at various times in different areas (including South Canyon, Dotsero, and USFS lands), but all applications were rejected or denied.

Nonenergy Leasables—Based on the presence of evaporate-bearing rocks, approximately 130,000 acres in the Eagle Valley area have been identified as prospectively valuable for potassium (sylvite). The other principal evaporate that is considered leasable is sodium (halite). No commercial extraction and only minimal exploratory drilling has occurred for these minerals. The most recent data was from a 1990 exploration drill hole for a potential potash zone just north of Gypsum, but the analysis showed only trace amounts of potassium.

Characterization—The most important factor relating to development of the nonenergy minerals is the presence of geologic formations that contain nonenergy minerals. Geothermal energy development is related to the presence of geothermal features and associated geologic formations and structures. Other important factors include ease of access, development and production costs, and market demand. Based on historical activity and the nature of the deposit, nonenergy mineral resources are not expected to be developed commercially over the next 20 years. Similarly, given the past history of geothermal leasing interest, it is unlikely that geothermal resources will be developed commercially over the next 20 years.

3.2.2 Livestock Grazing Management

Current Level of Use (including the Roan Plateau RMPA planning area)

Approximately 552,007 acres of the BLM lands within the GSFO are within grazing allotment boundaries, which are managed in accordance with the 1984 RMP (Range Allotments map, **Appendix E**). Unallotted acreage includes small isolated parcels not included within existing allotment boundaries and areas within allotment boundaries that have no permitted livestock grazing. Allotments are an outgrowth of the grazing districts and permitting system established to manage livestock grazing in these districts by the 1934 Taylor Grazing Act. The livestock that graze on GSFO-

managed lands are primarily cattle but also include sheep and some domestic horses. The relative numbers of these kinds of livestock have not varied much over the last ten years.

Allotments/AUMs

There are 254 allotments in the GSFO RMP planning area. In addition to public land, these allotments may contain other federal lands (e.g., National Forest Service land), state land, and private land. Of these allotments, 192 are permitted for livestock grazing, and 62 allotments are vacant. There are 147 permits authorizing grazing on these allotments. Total active preference (permitted use) is 44,762 AUMs, and there are 19,163 AUMs in suspension. Total permitted numbers change frequently due to conversions of the class of livestock and changes in allotment or livestock management. The allotments are used for grazing cattle (88 percent of the allotments), sheep and cattle (five percent of the allotments), or sheep (seven percent of the allotments). Four of these allotments also have horse permits.

There were 32 vacant allotments in 1983, 23 of which have remained vacant, three were included in other allotments, one was split into two allotments, and four were allotted a total of 411 AUMs. There are currently 62 vacant allotments.

There are 133 Section 3 permits and 14 Section 15 permits. Section 3 allotments are those within a grazing district, as provided in the Taylor Grazing Act. Section 15 allotments are those outside a grazing district. All Section 15 allotments in the GSFO are in Routt County. Section 15 permits account for only 2,247 of the total 44,779 AUMs permitted in the GSFO RMP planning area. The 1984 (Revised 1988) RMP reported 37,488 AUMs in use and initially allocated 37,852. Projected allocation expected after vegetation manipulation practices was 50,594 AUMs. **Table 3-23** provides allotment and grazing use data for all allotments currently permitted for grazing use.

Allotment Management Plans

Twenty-four allotments have AMP's implemented. Sixteen are in the Improve category, three are in the maintain category, and five are in the custodial category. Improve category allotments have priority in completing AMP's but due to new resource issues and increased focus in some areas, AMP's have been established for lower priority allotments.. Allotments 8218, 8219, 8220, 8221, and 8501 were closed due to land exchanges. Many of these allotments have received increased focus due to new resource issues lead to change in level of management intensity..

Colorado Standards for Public Land Health

The Colorado Standards for Public Land Health and Guidelines for Livestock Grazing Management, effective 1997, expected resource conditions for soils, riparian systems, upland vegetation, wildlife habitat, threatened and endangered species, and water quality (BLM 1997). Public Land Health and Guidelines are implemented through LHAs, determination documents, EAs, permit renewals, and other permit changes. These standards not only pertain to impacts associated with livestock

grazing, but also to other rangeland impacts from such activities as recreation, development activities, wildlife grazing and wild horse management. Sustainable livestock grazing and desired rangeland condition requires the collective management of forage, water, soil and livestock by the BLM and the livestock owners and operators. An interdisciplinary approach ensures effective management of the multiple resource values and uses in the GSFO RMP planning area.

Management practices for livestock grazing have been focused on achieving land health standards and meeting objectives for other resources (for example, vegetation and soils) established for allotments. This has been accomplished by better conformance with the guidelines for livestock management, such as changing the duration of grazing use, season of use, reducing animal units, and improving grazing distribution. Reducing the duration of grazing use and improving livestock distribution are generally the key to meeting rangeland objectives, particularly those associated with riparian areas. Grazing management has been improved by a variety of actions, such as adjustments in grazing permits (including the addition of terms and conditions designed to maintain or improve riparian zones and wetlands, utilization and trampling limits, herding and riding requirements, and placing salt and supplemental feed away from riparian zones), construction of water developments and pasture fencing, and ensuring compliance with maintenance of range improvements and grazing permits.

Table 3-23
Grazing Allotment Summary

Allotment Name	Allotment Number	Auth No	BLM Acres	Private Acres	Private Aums 2	Active Use Aums 2	%PL 3	Permit Type 1	Mgmt 4	AMP 5	Livestock	Livestock Number	On Date	Off Date
ALBERTSON	8653	507689	1934			53	100	15	C		C	52	5/1/2001	5/31/2001
ALBERTSON	8653	507679	1934			133	100	15	C		C	33	6/1/2006	10/1/2006
ALKALI CREEK	8214	507713	1136			130	100	3	M		C	52	6/1/2002	8/15/2002
ALKALI CREEK COMMON	8130	507593	2895			141	100	3	I		C	93	5/1/1987	6/15/1987
ALKALI CREEK COMMON	8130	507549	2895			60	100	3	I		C	40	5/1/1989	6/15/1989
ALKALI GULCH	8131	507586	1183			80	100	3	C		S	200	3/16/2005	5/15/2005
ALKALI GULCH	8131	507586	1183			80	100	3	C		S	200	12/17/1987	2/15/1988
ANTELOPE CREEK	8661	507684	3821			324	100	15	I		C	107	5/1/1989	7/31/1989
BADLANDS	8318	507640	645			75	100	3	C		C	30	6/1/1987	8/15/1987
BAMBI	8669	507675	2071			92	100	15	C		C	112	10/1/1999	10/25/1999
BAMBI	8669	507675	2071			22	100	15	C		C	112	6/25/1999	6/30/1999
BARR	8109	507541	85			4	100	3	C		C	4	5/25/1987	6/25/1987
BATTLEMENT CREEK COM	8124	507593	2550			20	100	3	M		C	5	6/16/1987	10/15/1987
BATTLEMENT CREEK COM	8124	507597	2550			80	100	3	M		C	53	5/1/1987	6/15/1987
BATTLEMENT CREEK COM	8124	507593	2550			122	100	3	M		C	100	5/10/1987	6/15/1987
BEARWALLOW & JOLLEY	8208	507562	2747	2476	4703	109	36	3	I		C	272	9/28/2000	10/31/2000
BEARWALLOW & JOLLEY	8208	507562	2747	2476	4703	196	36	3	I		C	272	5/15/2000	7/14/2000
BEAVER CREEK	8113	507550	462	879	333	41	11	3	I		C	73	5/12/1987	10/14/1987
BEAVER MAMM	8104	500157	4144			228	100	3	I	A	C	45	5/15/2004	10/15/2004
BEAVER MAMM	8104	500001	4144			400	100	3	I	A	C	79	5/15/2001	10/15/2001
BELLYACHE	8734	507583	533	289	183	18	9	3	C	A	C	100	5/10/2000	7/9/2000
BENTON	8654	507696	1499			161	100	15	M		C	114	5/20/2002	7/1/2002
BLACK MOUNTAIN	8662	507685	947			52	100	15	I		C	13	6/1/1990	9/30/1990
BLOWOUT GRAZING PLAN	8643	507512	20010			276	100	3	I	A	S	1000	10/20/2001	11/30/2001
BLOWOUT GRAZING PLAN	8643	507512	20010			256	100	3	I	A	S	1000	5/8/2002	6/15/2002
BOCCO MTN	8730	507583	3967			179	100	3	I	A	S	1700	5/16/2000	5/31/2000
BOCCO MTN	8730	507583	3967			111	100	3	I	A	S	1690	9/1/2000	9/10/2000
BOILER CREEK	8210	507562	2492			142	100	3	I		C	96	6/1/2000	7/15/2000
BOWEN ISOLATED TRACT	18004	501964	198	720	666	35	5	3	C		C	200	6/16/2006	9/30/2006

Table 3-23
Grazing Allotment Summary *(continued)*

Allotment Name	Allotment Number	Auth No	BLM Acres	Private Acres	Private Aums 2	Active Use Aums 2	%PL 3	Permit Type 1	Mgmt 4	AMP 5	Live-stock	Livestock Number	On Date	Off Date
BRUSH CREEK	8503	507628	108	529	3	8	73	3	C		C	22	6/1/1987	6/15/1987
BRUSH CRK COMMON	18012	507623	3850			320	100	3	I		C	314	5/21/2005	6/20/2005
BULL GULCH COM	8625	500219	10847			84	100	3	M		C	41	7/1/2005	8/31/2005
BULL GULCH COM	8625	500219	10847			183	100	3	M		Y	90	7/1/2005	8/31/2005
BULL GULCH COM	8625	500219	10847			179	100	3	M		C	80	7/26/2004	10/1/2004
BULL GULCH COM	8625	507603	10847			201	100	3	M		C	100	5/1/2005	6/30/2005
BWJ FOREST	8229	507562	363			40	27	3	I	A	C	105	7/15/2000	8/26/2000
CABIN GULCH	8731	507583	3240			158	100	3	I	A	S	1200	5/15/2000	6/3/2000
CABIN GULCH	8731	507583	3240			181	100	3	I	A	S	1200	10/10/2000	11/1/2000
CALLAHAN MTN COMMON	8919	507512	1631	214	19	26	59	3	C		C	44	5/16/2006	6/15/2006
CALLAHAN MTN COMMON	8919	501855	1631			72	100	3	C		S	1000	11/20/1997	11/30/1997
CANTLEY HOMESTEAD	8402	507618	331			16	100	3	C		C	50	6/21/1997	6/30/1997
CANYON CK	8228	507667	728			73	100	3	M		Y	48	8/1/2001	9/15/2001
CANYON CREEK	8207	507586	1396	1090	223	16	39	3	M		C	20	7/16/1987	9/15/1987
CANYON CREEK	8207	507586	1396	1090	223	64	39	3	M		S	1000	6/16/1987	7/10/1987
CANYON CREEK	8207	507586	1396	1090	223	64	39	3	M		S	1000	9/6/1987	9/30/1987
CASTLE IND	8609	500015	1263			175	100	3	C		C	144	5/6/2006	6/11/2006
CATAMOUNT COMMON	8619	500015	6656			490	100	3	M		C	196	8/1/2001	10/15/2001
CATAMOUNT COMMON	8619	507507	6656			522	100	3	M		C	126	6/12/2006	10/15/2006
CATTLE CREEK DRIVE	8302	507546	642	605	633	181	50	3	I		C	200	7/8/2001	8/31/2001
CEDAR MTN	18006	507623	10361			161	100	3	I		C	79	10/25/2005	12/25/2005
CEDAR MTN	18006	507623	10361			222	100	3	I		C	218	5/16/2005	6/15/2005
CERISE	8340	507539	682	239	22	108	70	3	I		C	38	6/1/2006	10/1/2006
CLOUGH-ALBER	18909	507542	5323	643	137	547	80	3	I		S	1000	6/20/2003	10/1/2003
CLOUGH-ALBER	18909	507621	5323			537	100	3	I		C	134	6/16/2002	10/15/2002
COPPER SPUR	8668	507692	3464			212	100	15	C		C	43	5/19/2000	10/15/2000
CORYELL	8307	507570	73	97	80	19	19	3	C		C	600	6/1/2000	6/5/2000
COTTON WOOD	8301	507546	202	3209	2560	79	3	3	M		C	750	6/16/1995	9/30/1995
COTTONWOOD CR. ETC.	8506	507512	5274	1912	192	83	60	3	I		S	1000	5/10/2001	5/30/2001
COTTONWOOD CR. ETC.	8506	507512	5274	1912	192	110	60	3	I		S	1000	11/2/2001	11/29/2001

Table 3-23
Grazing Allotment Summary *(continued)*

Allotment Name	Allotment Number	Auth No	BLM Acres	Private Acres	Private Aums 2	Active Use Aums 2	%PL 3	Permit Type 1	Mgmt 4	AMP 5	Live-stock	Livestock Number	On Date	Off Date
COTTONWOOD CR. ETC.	8506	507512	5274	1912	192	109	60	3	I		S	750	5/10/2001	6/15/2001
COTTONWOOD CREEK	8508	507661	824	1358	268	80	23	3	I		C	65	5/1/1990	10/10/1990
COTTONWOOD GULCH	8924	507624	9605	2514	111	132	86	3	C		C	180	5/11/1991	6/5/1991
COUEY 1	8115	507544	147			2	100	3	C		C	2	10/16/1987	11/15/1987
COUEY 1	8115	507544	147			2	100	3	C		C	2	5/1/1987	5/31/1987
COUEY 2	8118	507544	87	516	332	17	5	3	M		C	87	6/20/1987	10/19/1987
CRAWFORD AND KERLEE	8916	507529	775	2286	20	8	25	3	C		C	20	5/1/1987	6/15/1987
CROWN	8335	500227	2557			294	100	3	I		C	94	6/16/2000	9/18/2000
CROWN COMMON	8334	507600	2066			51	100	3	I		C	38	5/16/2001	6/25/2001
CROWN COMMON	8334	500216	2066			10	100	3	I		C	10	5/16/1987	6/15/1987
CROWN COMMON	8334	500027	2066			40	100	3	I		C	30	5/16/1987	6/25/1987
CROWN COMMON	8334	507611	2066			93	100	3	I		C	69	5/16/1995	6/25/1995
CROWN COMMON	8334	507538	2066			148	100	3	I		C	110	5/16/1993	6/25/1993
CROWN IND	8337	507526	1620			90	100	3	I		Y	62	5/15/1997	6/27/1997
CROWN IND	8337	507526	1620			145	100	3	I		C	100	5/15/1997	6/27/1997
CRYSTAL RIVER	8342	507546	3962	628	73	257	83	3	I		C	200	5/15/1995	6/30/1995
CRYSTAL RIVER	8342	507546	3962	628	73	120	83	3	I		C	146	9/16/1995	10/15/1995
DEAN GULCH	8107	507514	1039			127	100	3	M		C	28	6/16/1987	10/31/1987
DEER PEN	8616	507515	7962			900	100	3	I		C	449	5/1/2004	6/30/2004
DELANEY	8216	507548	388	237	61	60	50	3	M		C	34	6/15/2004	9/30/2004
DERBY RIDGE	8618	507669	366	1329	80	26	33	3	C		C	20	6/1/1993	9/30/1993
DIAMOND FLATS	8323	507592	1700			5	100	3	I		C	10	10/1/1986	10/15/1986
DIAMOND FLATS	8323	507518	1700			153	100	3	I		C	101	5/16/1986	6/30/1986
DIAMOND FLATS	8323	507518	1700			100	100	3	I		C	66	5/16/1994	6/30/1994
DOAK	18005	507544	404	1119	308	63	16	3	M		C	85	6/1/1987	10/18/1987
DODO	18025	507552	2175	408	8	18	69	3	M		C	25	5/15/1987	6/15/1987
DOMANTLE	8733	507583	154	408	467	32	12	3	M	A	S	2700	6/1/2000	6/15/2000
DOMANTLE	8733	507583	154	408	467	32	12	3	M	A	S	2700	10/1/2000	10/15/2000
DOODLEBUG	8905	507693	947			54	100	3	M		C	53	5/16/1999	6/15/1999
DOYAL	8315	507554	83			10	100	3	C		C	10	5/16/1987	6/15/1987

Table 3-23
Grazing Allotment Summary *(continued)*

Allotment Name	Allotment Number	Auth No	BLM Acres	Private Acres	Private Aums 2	Active Use Aums 2	%PL 3	Permit Type 1	Mgmt 4	AMP 5	Live-stock	Livestock Number	On Date	Off Date
DRIVEWAY COM	8338	507538	156			9	100	3	C		C	7	5/16/1987	6/25/1987
DRIVEWAY COM	8338	507600	156			3	100	3	C		C	45	6/24/1995	6/25/1995
DRIVEWAY COM	8338	507611	156			49	100	3	C		C	36	5/16/1993	6/25/1993
DRIVEWAY COM	8338	507538	156			27	100	3	C		C	20	5/16/1995	6/25/1995
DRIVEWAY COMMON	8308	507570	992	4	0	296	100	3	I		C	600	6/24/2000	7/8/2000
DRIVEWAY-THREE MILE	8324	507518	779	586	230	110	32	3	I	A	C	168	7/1/1986	8/31/1986
DRY CK PETE & BILL	8125	507593	7271			120	100	3	I		C	118	10/1/2007	10/31/2007
DRY CK PETE & BILL	8125	507564	7271			21	3	3	I		C	21	10/1/2007	10/31/2007
DRY CK PETE & BILL	8125	507593	7271			178	3	3	I		C	118	5/1/2007	6/15/2007
DRY CK PETE & BILL	8125	507564	7271			54	100	3	I		C	36	5/1/1988	6/15/1988
DRY HOLLOW RES GULCH	8127	507625	6916			44	100	3	I	A	C	90	6/1/1987	6/15/1987
DRY HOLLOW RES GULCH	8127	507662	6916			10	100	3	I	A	C	10	6/1/1987	6/30/1987
DRY HOLLOW RES GULCH	8127	507544	6916			69	100	3	I	A	C	140	6/1/1987	6/15/1987
DRY HOLLOW RES GULCH	8127	507641	6916	124	15	140	90	3	I	A	C	315	6/1/1987	6/15/1987
DRY HOLLOW RES GULCH	8127	507530	6916			36	100	3	I	A	C	73	6/1/1987	6/15/1987
DRY HOLLOW RES GULCH	8127	507544	6916			229	100	3	I	A	C	57	6/16/1987	10/15/1987
DRY HOLLOW RES GULCH	8127	507580	6916			141	100	3	I	A	C	285	6/1/1994	6/15/1994
DRY HOLLOW RES GULCH	8127	507712	6916			96	100	3	I	A	C	195	6/1/1987	6/15/1987
DRY PARK	8352	507546	766			26	18	3	M		C	110	6/1/1998	7/10/1998
DRY PARK	8352	507546	766			20	18	3	M		C	110	9/15/1998	10/15/1998
E SUNNYSIDE	8610	507651	87	100	23	18	43	3	C		Y	100	6/1/1987	6/13/1987
E. HARDCRABBLE	8502	500031	8018			879	100	3	I		C	581	5/6/2002	6/20/2002
EAST CASTLE	8601	507583	9479			2342	100	3	M	A	S	2120	6/1/2000	11/15/2000
EAST DIVIDE COMMON	8105	507625	13779			79	100	3	I	A	C	80	6/1/1987	6/30/1987
EAST DIVIDE COMMON	8105	507625	13779			39	100	3	I	A	C	80	10/1/1987	10/15/1987
EAST DIVIDE COMMON	8105	507670	13779			116	100	3	I	A	C	235	10/1/1987	10/15/1987
EAST DIVIDE COMMON	8105	507670	13779			364	100	3	I	A	C	369	6/1/1998	6/30/1998
EAST DIVIDE COMMON	8105	507614	13779			182	100	3	I	A	C	369	10/1/1998	10/15/1998
EAST DIVIDE COMMON	8105	507614	13779			233	100	3	I	A	C	236	6/1/1987	6/30/1987
EAST FORK COM	18910	501855	8461			694	100	3	I	A	C	173	6/16/1987	10/15/1987

Table 3-23
Grazing Allotment Summary *(continued)*

Allotment Name	Allotment Number	Auth No	BLM Acres	Private Acres	Private Aums 2	Active Use Aums 2	%PL 3	Permit Type 1	Mgmt 4	AMP 5	Live-stock	Livestock Number	On Date	Off Date
EAST FORK COM	18910	507676	8461			176	100	3	I	A	C	44	6/16/1991	10/15/1991
EAST FORK COM	18910	507601	8461			48	100	3	I	A	C	12	6/16/1996	10/15/1996
EAST FORK COM	18910	507593	8461			381	100	3	I	A	C	95	6/16/2006	10/15/2006
EAST FORK COM	18910	507671	8461			449	100	3	I	A	C	112	6/16/1987	10/15/1987
EAST FORK COM	18910	507610	8461			345	100	3	I	A	C	86	6/16/2000	10/15/2000
EAST FORK COM	18910	507621	8461			449	100	3	I	A	C	112	6/16/2002	10/15/2002
EBY CRK	8638	507540	1780			112	100	3	I		C	100	5/24/1993	6/26/1993
EGERIA PARK	8650	500016	167			25	100	15	C		C	25	6/1/2001	6/30/2001
ELK CREEK	8663	507687	2348			20	100	15	C		C	25	8/4/2004	8/27/2004
ELK CREEK	8663	507687	2348			53	100	15	C		C	25	6/1/1988	8/3/1988
ELK PARK COMMON	18032	507623	2678			204	100	3	I		C	200	5/16/2005	6/15/2005
FALK	8723	500031	71			9	100	3	C		C	16	5/15/2005	5/31/2005
FENDER	8329	500265	906			66	100	3	M		C	100	5/1/1987	5/20/1987
FENDER IND	8339	500265	566			75	100	3	I		C	54	5/21/1987	7/1/1987
GATES	8656	507678	164			13	100	15	C		C	13	6/1/1987	6/30/1987
GOULD	8306	507570	253			158	100	3	M		C	600	6/6/2000	6/13/2000
GOVERNMENT CREEK COM	18039	507587	7567			138	100	3	I		S	1500	2/2/2007	2/15/2007
GOVERNMENT CREEK COM	18039	507693	7567			222	100	3	I		C	218	5/16/1999	6/15/1999
GOVERNMENT CREEK ISO	18023	500186	80	61	28	2	12	3	C		C	50	5/15/1997	5/24/1997
GOVERNMENT CREEK ISO	18023	500186	80	61	28	2	12	3	C		C	50	10/1/1997	10/10/1997
GRAHAM	18014	507704	201			26	100	3	M		C	7	6/16/1987	10/7/1987
GRASS MESA	8112	507561	996	1360	453	9	15	3	I		C	40	7/1/1990	8/15/1990
GRASS MESA	8112	507561	996			49	100	3	I		C	32	5/15/1987	6/30/1987
GREENHORN	8641	500015	11237			147	100	3	I		Y	95	5/8/1997	6/23/1997
GREENHORN	8641	507716	11237			226	100	3	I		C	140	5/8/2006	6/25/2006
GREENHORN	8641	500015	11237			24	100	3	I		C	9	6/26/2006	9/15/2006
GREENHORN	8641	507716	11237			147	100	3	I		C	95	5/8/1997	6/23/1997
HACK CREEK	8632	507502	5105			250	100	3	I		C	100	7/14/1997	9/27/1997
HACK CREEK	8632	507697	5105			222	100	3	I		Y	95	7/6/1997	9/14/1997
HACK CREEK	8632	507502	5105			64	100	3	I		C	30	7/12/1997	9/14/1997

Table 3-23
Grazing Allotment Summary *(continued)*

Allotment Name	Allotment Number	Auth No	BLM Acres	Private Acres	Private Aums 2	Active Use Aums 2	%PL 3	Permit Type 1	Mgmt 4	AMP 5	Live-stock	Livestock Number	On Date	Off Date
HAFF RANCH	8317	507582	1374			204	100	3	C		C	230	6/5/1997	7/1/1997
HAFF RANCH	8317	507582	1374			113	100	3	C		C	230	10/1/1997	10/15/1997
HARRIS GULCH	18013	507647	2238	432	62	381	90	3	I	A	C	165	6/15/1996	8/31/1996
HARRIS GULCH	18013	507534	2238	432	62	180	90	3	I	A	C	78	6/15/2001	8/31/2001
HARRIS PARK	8209	507527	2643	360	185	124	41	3	I		C	205	6/1/2000	7/15/2000
HAYDEN	8015	507534	167			15	100	3	M		C	6	6/15/1996	8/31/1996
HAYDEN	8015	507647	167			8	100	3	M		C	3	6/15/2001	8/31/2001
HELLS HOLE	8735	507583	527	181	107	34	24	3	C	A	C	28	5/16/2000	10/15/2000
HOAGLUND	8123	507581	301	284	3	17	85	3	C		C	10	6/1/1987	7/31/1987
HOGBACK COMMON	18026	502901	1977			50	100	3	I	A	C	37	5/15/2007	6/24/2007
HOGBACK COMMON	18026	507631	1977			43	100	3	I	A	C	63	5/15/1987	6/4/1987
HOGBACK COMMON	18026	502901	1977			61	100	3	I	A	S	300	6/15/2007	7/15/2007
HOGBACK COMMON	18026	502901	1977			194	100	3	I	A	S	950	5/15/2007	6/14/2007
HOPKINS	8312	507582	240	223	79	30	28	3	C		Y	38	7/16/1997	10/10/1997
HORN	8659	507681	2167			248	100	15	C		C	41	5/1/1987	10/31/1987
HORSE CREEK	8631	507697	10026			243	100	3	C		C	100	5/1/1997	7/13/1997
HORSE CREEK	8631	507697	10026			59	100	3	C		C	100	9/28/1997	10/15/1997
HORSE MTN	18018	507623	4208			346	100	3	I		C	277	5/15/2005	6/21/2005
HORSE MTN	18018	507623	4208			94	100	3	I		C	50	10/25/2005	12/20/2005
HORSE MTN.	8719	507726	286	4016	526	40	8	3	C		C	110	6/1/2001	10/15/2001
HUBBARD MESA	18903	507531	6760			61	100	3	I		C	60	5/16/1993	6/15/1993
HUBBARD MESA	18903	507587	6760	2359	301	301	50	3	I		S	1500	4/1/2007	5/31/2007
JACKSON	18008	507532	322			30	100	3	C		C	20	6/16/1989	7/31/1989
JACKSON GULCH	18046	507614	1837			148	100	3	I		C	150	5/16/1987	6/14/1987
JEWELL	18036	500144	479			9	100	3	C		C	9	4/15/1997	5/15/1997
JQS COMMON	18908	500228	10457			401	100	3	I	A	C	114	6/16/1991	9/30/1991
JQS COMMON	18908	500087	10457			559	100	3	I	A	C	159	6/16/2000	9/30/2000
JQS COMMON	18908	507607	10457			844	100	3	I	A	S	1200	6/16/1993	9/30/1993
JQS COMMON	18908	507632	10457			1361	100	3	I	A	C	387	6/16/2001	9/30/2001
KAMM MESA	8101	500092	748	2415	1344	50	4	3	I		C	1230	5/10/1987	6/9/1987

Table 3-23
Grazing Allotment Summary *(continued)*

Allotment Name	Allotment Number	Auth No	BLM Acres	Private Acres	Private Aums 2	Active Use Aums 2	%PL 3	Permit Type 1	Mgmt 4	AMP 5	Live-stock	Livestock Number	On Date	Off Date
KELLY GULCH	8921	500161	1677	351	50	72	59	3	C		S	580	10/20/2004	11/20/2004
KING MOUNTAIN	8666	507690	3990	5001	1185	147	11	15	I		C	330	6/10/2000	10/10/2000
KISSEL	18003	507631	967			44	100	3	C		C	70	6/1/1988	6/19/1988
LIGHT	8331	507599	1020	1849	136	17	37	3	M		H	8	5/7/2000	10/30/2000
LIGHT	8331	507599	1020	1849	136	82	37	3	M		C	50	5/20/2000	9/30/2000
LOOKOUT MTN	8313	507714	3322	2912	547	118	35	3	M		S	900	5/5/2000	6/30/2000
LOOKOUT MTN	8313	507714	3322	2912	547	184	35	3	M		S	1400	9/25/2000	11/20/2000
LOWER COFFEE POT	8649	507512	12703	3013	616	38	80	3	I		S	600	9/24/1996	10/5/1996
LOWER COFFEE POT	8649	507512	12703			213	100	3	I		S	810	9/24/1996	11/2/1996
LOWER COFFEE POT	8649	507512	12703	3013	616	11	5	3	I		S	810	9/24/1996	11/2/1996
LOWER COFFEE POT	8649	507512	12703			112	100	3	I		S	810	5/10/1996	5/30/1996
LOWER COFFEE POT	8649	507512	12703	3013	616	53	25	3	I		S	1000	5/10/1996	6/10/1996
LOWER COFFEE POT	8649	507512	12703	3013	616	117	80	3	I		S	600	5/10/1996	6/15/1996
LOWER COFFEE POT	8649	507512	12703	3013	616	4	5	3	I		S	810	5/31/1996	6/15/1996
LOWER COFFEE POT	8649	507512	12703	3013	616	46	25	3	I		S	1000	10/1/1996	10/28/1996
LUARK	8672	507686	823			7	100	15	I		C	15	10/1/2004	10/14/2004
LUARK	8672	507686	823	667	84	70	45	15	I		C	128	5/20/2004	6/25/2004
LUARK	8672	507686	823			7	100	15	I		C	15	5/7/2004	5/20/2004
LUNDGREN-HOGBACK	18017	507623	957			122	100	3	I		C	65	10/25/2005	12/20/2005
MAGPIE CREEK	18901	507531	2083	726	189	56	23	3	I		C	60	6/16/1993	10/17/1993
MAHAFFEY SUMMER	8913	507624	1908	5073	1060	510	38	3	I		C	400	7/6/1991	10/15/1991
MCBRIDE	8354	507505	649	410	540	111	17	3	M		C	150	6/1/2000	10/10/2000
MCKEEN CREEK	8636	507718	368			103	100	3	C		C	260	10/1/2002	10/12/2002
MIDDLE MAMM COM	8128	507544	1232			29	100	3	M		C	29	6/1/1987	6/30/1987
MIDDLE MAMM COM	8128	507712	1232			28	100	3	M		C	28	6/1/1994	6/30/1994
MIDDLE MAMM COM	8128	507641	1232			103	100	3	M		C	112	6/3/1987	6/30/1987
MIDDLE RIFLE	18011	507623	1467	162	51	60	54	3	I		C	22	5/16/2005	10/15/2005
MONIGER RIDGE 1	8644	507718	388	611	449	34	7	3	C		C	490	6/1/2002	6/30/2002
MONIGER RIDGE 2	8646	507642	375	345	64	27	30	3	C		C	20	5/16/1995	9/30/1995
MOONEY	8635	500142	224	330	71	30	30	3	C		C	25	5/16/2004	9/15/2004

Table 3-23
Grazing Allotment Summary *(continued)*

Allotment Name	Allotment Number	Auth No	BLM Acres	Private Acres	Private Aums 2	Active Use Aums 2	%PL 3	Permit Type 1	Mgmt 4	AMP 5	Live-stock	Livestock Number	On Date	Off Date
MORROW	28019	507606	717			36	100	3	M		C	18	8/1/2002	9/30/2002
MT. SOPRIS	8344	507618	862	972	247	22	12	3	I		C	183	5/25/1997	6/23/1997
MT. SOPRIS	8344	507715	862	972	247	12	12	3	I		C	102	5/25/1997	6/23/1997
N THOMPSON CRK COM	8348	507715	3260	3252	398	25	50	3	I		C	217	10/10/1997	10/16/1997
N THOMPSON CRK COM	8348	507547	3260	3252	398	81	50	3	I		C	330	6/1/1987	6/15/1987
N THOMPSON CRK COM	8348	507547	3260	3252	398	23	50	3	I		C	92	6/1/2000	6/15/2000
N THOMPSON CRK COM	8348	507592	3260	3252	398	14	50	3	I		C	120	10/10/1997	10/16/1997
N THOMPSON CRK COM	8348	507611	3260	3252	398	26	50	3	I		C	268	10/10/1998	10/15/1998
N THOMPSON CRK COM	8348	507592	3260	3252	398	15	50	3	I		C	155	10/10/1987	10/15/1987
N THOMPSON CRK COM	8348	500227	3260	3252	398	10	50	3	I		C	90	10/10/2000	10/16/2000
N THOMPSON CRK COM	8348	507658	3260	3252	398	66	50	3	I		C	268	6/1/1998	6/15/1998
N THOMPSON CRK COM	8348	507658	3260	3252	398	38	50	3	I		C	155	6/1/1987	6/15/1987
N THOMPSON CRK COM	8348	507618	3260	3252	398	11	50	3	I		C	92	10/10/2000	10/16/2000
N THOMPSON CRK COM	8348	500227	3260	3252	398	38	50	3	I		C	330	10/10/1987	10/16/1987
N THOMPSON CRK COM	8348	507611	3260	3252	398	22	50	3	I		C	90	6/1/2000	6/15/2000
N. BELLYACHE	8712	507615	2755			183	100	3	I		C	180	5/16/1987	6/15/1987
NEWCOMER	8617	507515	87	510	2	4	60	3	C		C	6	5/15/2004	6/14/2004
NORTH KING MOUNTAIN	8604	507724	4108			293	100	15	M		Y	330	7/20/2001	8/15/2001
NORTH KING MOUNTAIN	8604	507724	4108			282	100	15	M		Y	330	6/15/2001	7/10/2001
OATES	8103	507509	1203			38	100	3	C		S	125	5/1/1987	6/15/1987
OLD MOUNTAIN	8914	501988	1309			270	100	3	I		C	175	7/15/2007	8/30/2007
ONION RIDGE	8647	507706	7435			24	100	3	I	A	C	245	9/29/2004	10/1/2004
ONION RIDGE	8647	507706	7435			451	100	3	I	A	C	245	5/16/2004	7/10/2004
PARADISE CREEK	8212	507586	2572	441	204	102	50	3	M		S	1000	10/1/1987	10/31/1987
PARADISE CREEK	8212	507586	2572	441	204	102	50	3	M		S	1000	5/16/1987	6/15/1987
PINEY	7577	507616	648	320	248	24	15	3	C		S	800	9/18/2004	10/18/2004
PINEY	7577	507616	648	320	248	19	15	3	C		S	600	5/15/2004	6/15/2004
PINEY CREEK	8701	507616	250	2720	45	12	50	3	C		C	120	6/20/2004	6/25/2004
PINEY CREEK	8701	507616	250	2720	45	10	50	3	C		S	500	6/15/2004	6/20/2004
PINEY CREEK	8701	507616	250	2720	45	10	50	3	C		S	500	9/20/2004	9/25/2004

Table 3-23
Grazing Allotment Summary *(continued)*

Allotment Name	Allotment Number	Auth No	BLM Acres	Private Acres	Private Aums 2	Active Use Aums 2	%PL 3	Permit Type 1	Mgmt 4	AMP 5	Live-stock	Livestock Number	On Date	Off Date
PINEY CREEK	8701	507616	250	2720	45	12	50	3	C		C	120	9/25/2004	9/30/2004
PISKEY	8606	507507	10630	1558	30	431	94	3	I		C	179	5/15/2001	7/31/2001
PITMAN	8117	507620	1134	381	37	8	80	3	M		C	10	11/1/1987	11/30/1987
PITMAN	8117	507620	1134	381	37	73	80	3	M		C	20	6/16/1987	10/31/1987
PITMAN	8117	507620	1134	381	37	60	80	3	M		C	50	5/1/1987	6/15/1987
POLE CR & COTTONWOOD	8126	507717	952			117	100	3	M		C	115	5/16/1998	6/15/1998
PORCUPINE COMMON	8119	507609	1928			72	100	3	I		C	15	5/7/2001	9/30/2001
PORCUPINE COMMON	8119	507632	1928	295	44	167	84	3	I		C	195	5/16/1991	6/15/1991
PORCUPINE COMMON	8119	507632	1928	295	44	33	84	3	I		C	11	6/16/1987	9/30/1987
PORCUPINE COMMON	8119	500001	1928	295	44	29	84	3	I		C	70	10/1/1991	10/15/1991
PORCUPINE COMMON	8119	507632	1928			41	100	3	I		C	10	5/10/1987	9/10/1987
POTATO BILL	8347	507655	244	593	68	16	19	3	C		C	42	8/16/1996	10/15/1996
PRECTEL	8311	507570	77	573	55	24	30	3	C		C	600	6/20/2000	6/23/2000
PRETTI-ROBERTS	18029	507622	1838			242	100	3	C		S	800	1/1/1988	2/15/1988
PRETTI-ROBERTS	18029	507629	1838			153	100	3	C		C	150	5/16/1987	6/15/1987
PRINCE CK	8341	507655	2133	189	69	284	98	3	I		C	200	5/16/1996	6/28/1996
RED CANYON 1	8349	500236	601			22	100	3	C		C	41	6/1/1994	6/16/1994
RED CANYON 1	8349	500236	601			8	100	3	C		C	41	10/10/1994	10/15/1994
RED DIRT	8626	507502	2949			15	100	3	C		Y	90	12/1/2002	12/5/2002
RED DIRT	8626	507502	2949			35	100	3	C		Y	66	5/28/1997	6/12/1997
RED HILL COM	8507	507672	12467			271	100	3	I		C	179	5/10/2006	6/24/2006
RED HILL COM	8507	507672	12467			151	100	3	I		C	100	5/10/2003	6/24/2003
RED HILL COM	8507	507566	12467			38	100	3	I		C	25	5/6/1990	6/20/1990
RED HILL COM	8507	507522	12467	40	93	1	1	3	I		C	30	7/5/1993	7/15/1993
RED HILL COM	8507	507522	12467	40		65	100	3	I		C	43	5/10/2003	6/24/2003
RED HILL COM	8507	507672	12467			104	100	3	I		C	69	5/10/1993	6/24/1993
RED HILL COM	8507	507661	12467	40	93	1	1	3	I		C	75	4/1/1993	4/17/1993
RED HILL COM	8507	507672	12467	40	93	1	1	3	I		C	120	10/5/1993	10/15/1993
RED MOUNTAIN	18028	507631	969			43	100	3	C		C	82	5/26/1999	6/10/1999
REES	18907	507508	3200	3648	681	238	37	3	I		C	416	10/15/1987	11/30/1987

Table 3-23
Grazing Allotment Summary *(continued)*

Allotment Name	Allotment Number	Auth No	BLM Acres	Private Acres	Private Aums 2	Active Use Aums 2	%PL 3	Permit Type 1	Mgmt 4	AMP 5	Live-stock	Livestock Number	On Date	Off Date
REES	18907	507508	3200	3648	681	162	37	3	I		C	416	5/1/1987	6/1/1987
RILEY GULCH COM	8920	507529	1359			115	100	3	I		C	76	5/1/1988	6/15/1988
RILEY GULCH COM	8920	507653	1359			30	100	3	I		C	26	5/12/1987	6/15/1987
RIVER COMMON	8615	507502	3885			25	100	3	C		C	25	5/1/1991	5/31/1991
RIVER COMMON	8615	507501	3885			13	100	3	C		C	13	5/1/1997	5/31/1997
RIVER-CATAMOUNT	8605	507515	1453			76	100	3	C		C	50	5/1/2006	6/15/2006
ROBERTS	8027	507629	135	111	3	22	88	3	C		S	120	12/1/1987	1/1/1988
RYDEN	18024	507631	1390	884	25	88	78	3	I		C	75	5/1/1987	6/15/1987
S MCKEEN CREEK	8637	507718	41	1563	95	5	5	3	C		C	260	10/1/2002	10/12/2002
SALT CREEK FOREST	8722	500031	741			29	100	3	C	A	C	23	6/16/2005	7/23/2005
SALT CREEK-BELLYACHE	8721	500031	4369			12	100	3	I		C	50	10/16/2002	10/22/2002
SALT CREEK-BELLYACHE	8721	500031	4369			240	100	3	I		C	456	6/1/2002	6/16/2002
SCOTT	8106	507638	978			102	100	3	M		C	103	5/15/1987	6/13/1987
SCUTTER GULCH	18037	507694	447	469	16	16	50	3	C		S	300	5/1/1987	5/16/1987
SHIDELER	8111	507712	159			6	100	3	C		C	4	10/1/1987	11/15/1987
SHIDELER	8111	507641	159			6	100	3	C		C	4	10/1/1994	11/15/1994
SHIDELER IND	8116	507641	87			4	100	3	C		C	4	5/16/1994	6/15/1994
SHIDELER IND	8116	507712	87			4	100	3	C		C	4	5/16/1987	6/15/1987
SIMPSON & NICHOLS	18022	507654	475	161	140	43	24	3	M		C	38	5/20/1987	10/10/1987
SKEEN	8227	507638	160	1594	329	25	7	3	C		C	140	8/16/1991	10/31/1991
SMITH 1	8108	507563	254	287	476	98	17	3	M		C	118	5/15/1995	10/10/1995
SMITH GULCH	8922	507586	2374			134	100	3	C		S	970	3/1/2005	3/21/2005
SMITH GULCH	8922	507586	2374			102	100	3	C		S	970	2/13/2005	2/28/2005
SPRING CREEK	8614	507603	5007			79	100	3	I		C	151	5/7/2004	5/22/2004
SPRING CREEK	8614	507603	5007			70	100	3	I		C	151	10/1/1994	10/14/1994
SPRING CREEK	8614	507603	5007			3	100	3	I		H	5	5/7/2004	5/22/2004
SPRUCE GULCH COMMON	8121	507632	1715	1277	212	113	38	3	I		C	196	5/16/1987	6/30/1987
SPRUCE GULCH COMMON	8121	507516	1715	1277	212	9	38	3	I		C	25	10/1/1987	10/30/1987
SPRUCE GULCH COMMON	8121	507632	1715	1277	212	51	80	3	I		C	14	5/15/1987	9/30/1987
STARKEY GULCH	8917	507653	247	397	38	5	12	3	C		C	42	5/1/1988	5/31/1988

Table 3-23
Grazing Allotment Summary *(continued)*

Allotment Name	Allotment Number	Auth No	BLM Acres	Private Acres	Private Aums 2	Active Use Aums 2	%PL 3	Permit Type 1	Mgmt 4	AMP 5	Live-stock	Livestock Number	On Date	Off Date
STATE BRIDGE	8706	507616	5903	8703	3444	236	100	3	I		S	1160	5/15/2004	6/14/2004
STATE BRIDGE	8706	507616	5903	8703	3444	229	100	3	I		S	1160	9/15/2004	10/14/2004
STATE BRIDGE	8706	507616	5903	8703	3444	21	100	3	I		C	21	5/15/2004	6/14/2004
STRUBI A NICK	8665	507689	204			30	100	15	M		C	10	7/1/1990	9/30/1990
SUNNYSIDE	8613	507501	669	2560	77	25	25	3	C		C	100	5/1/1991	5/31/1991
SUNNYSIDE IND	8611	507515	1848			98	100	3	C		C	136	5/10/2004	5/31/2004
SUTEY	8320	500251	715			39	100	3	M		C	40	6/1/1987	6/30/1987
SUTEY	8320	500251	715			12	100	3	M		H	3	6/1/1987	9/30/1987
SW RIFLE CREEK	18016	507647	1282			44	100	3	I		C	45	5/16/2001	6/14/2001
SW RIFLE CREEK	18016	507534	1282			107	100	3	I		C	108	5/16/1996	6/14/1996
THOMAS	8346	507711	997	1725	321	72	20	3	I		Y	195	5/16/2002	7/10/2002
THOMAS	8346	507711	997	1725	321	8	20	3	I		C	40	10/10/2002	11/10/2002
TRAIL GULCH	8642	507603	13194			320	100	3	I		C	120	5/7/2004	7/26/2004
UPPER COTTONWOOD	8639	500015	1125			43	100	3	I		C	28	5/8/1997	6/23/1997
UPPER COTTONWOOD	8639	500015	1125			61	100	3	I		C	38	5/8/2006	6/25/2006
UPPER COTTONWOOD	8639	507716	1125			13	100	3	I		C	5	6/26/2006	9/15/2006
UPPER COTTONWOOD	8639	507716	1125			43	100	3	I		Y	28	5/8/1997	6/23/1997
UPPER GARFIELD COM	8222	507713	4560			707	100	3	I	A	C	163	6/1/1997	10/10/1997
UPPER GARFIELD COM	8222	507619	4560			74	100	3	I	A	C	17	6/1/2000	10/10/2000
UPPER JACK SPRING	8645	507706	77			49	100	3	C	A	C	16	7/1/2004	10/1/2004
UPPER PLACE	8304	507546	41	1358	485	15	3	3	C		C	200	8/1/2006	10/15/2006
UPPER WALLACE COM	8129	507593	2189			60	100	3	M	A	C	121	6/1/2007	6/15/2007
UPPER WALLACE COM	8129	507593	2189			20	100	3	M	A	C	40	9/28/2007	10/2/2007
UPPER WALLACE COM	8129	507556	2189			45	100	3	M	A	C	22	4/15/2007	6/15/2007
UPPER WALLACE COM	8129	507556	2189			35	100	3	M	A	C	22	9/1/2007	10/18/2007
UTE CREEK	8707	507589	3106	2478	984	103	18	3	I		S	1900	5/11/1996	6/25/1996
UTE CREEK	8707	507589	3106	2478	984	2	18	3	I		H	5	10/1/1996	11/20/1996
UTE CREEK	8707	507589	3106	2478	984	115	18	3	I		S	1900	10/1/1996	11/20/1996
UTE CREEK	8707	507589	3106	2478	984	1	18	3	I		H	5	5/11/1996	6/25/1996
VASTEN HOMESTEAD COM	8336	507538	718			127	100	3	I		C	38	6/26/2001	10/5/2001

Table 3-23
Grazing Allotment Summary *(continued)*

Allotment Name	Allotment Number	Auth No	BLM Acres	Private Acres	Private Aums 2	Active Use Aums 2	%PL 3	Permit Type 1	Mgmt 4	AMP 5	Live-stock	Livestock Number	On Date	Off Date
VASTEN HOMESTEAD COM	8336	500216	718			77	100	3	I		C	20	6/16/1995	10/10/1995
VASTEN HOMESTEAD COM	8336	500027	718			38	100	3	I		C	10	6/16/1987	10/10/1987
W HARDSCRABBLE COM	8504	507672	16300			597	100	3	I	A	C	395	5/16/2000	6/30/2000
W HARDSCRABBLE COM	8504	507672	16300			5	100	3	I	A	C	10	10/16/2000	10/31/2000
W HARDSCRABBLE COM	8504	507566	16300			5	100	3	I	A	C	10	10/16/1993	10/31/1993
W HARDSCRABBLE COM	8504	507566	16300			5	100	3	I	A	C	10	10/16/2003	10/30/2003
W HARDSCRABBLE COM	8504	507522	16300			151	100	3	I	A	C	100	5/16/2003	6/30/2003
W HARDSCRABBLE COM	8504	507522	16300			194	100	3	I	A	C	128	5/1/1993	6/15/1993
W SUNNYSIDE	8612	507651	399	322	3	11	83	3	C		C	20	5/25/1987	6/14/1987
W SUNNYSIDE	8612	507651	399	322	3	11	83	3	C		C	100	10/12/1991	10/15/1991
W. BASALT MTN	8316	507558	1783			222	100	3	I		C	260	5/26/1998	6/20/1998
W. BASALT MTN	8316	507558	1783			26	100	3	I		C	260	10/16/1998	10/18/1998
WATTS	18021	507665	840	924	232	114	45	3	M		S	800	9/15/2001	11/1/2001
WATTS	18021	507665	840	924	232	73	45	3	M		S	800	6/1/2001	7/1/2001
WEAVER	18009	502902	6335			47	100	3	I		S	900	10/2/1988	10/9/1988
WEAVER	18009	502902	6335			253	100	3	I		S	875	5/10/2007	6/22/2007
WEBSTER PARK	18902	507542	7822	7051	2800	118	100	3	I		C	100	4/20/2003	5/25/2003
WEBSTER PARK	18902	507542	7822	7051	2800	15	100	3	I		C	5	7/1/2003	10/1/2003
WEST CASTLE	8620	507515	4524			204	100	3	M		C	200	8/1/2004	8/31/2004
WEST CASTLE	8620	507515	4524			204	100	3	M		C	200	7/1/2004	7/31/2004
WHEELER GULCH	8918	507653	550			6	100	3	C		C	4	4/16/2002	5/31/2002
WHELOCK IND LARGE	8607	507663	30	1279	289	25	8	3	C		C	79	11/1/2000	2/28/2001
WHELOCK IND LARGE	8607	507663	30	1279	289	2	8	3	C		C	10	11/16/2000	1/15/2001
WHITMAN	8102	501971	845			61	100	3	I		C	60	5/1/1993	5/31/1993
WILLOW CREEK	8629	507502	3316			26	100	3	C		C	30	9/15/1997	10/10/1997
WILLOW CREEK	8629	507502	3316			109	100	3	C		Y	95	6/1/1997	7/5/1997
WILLOW CREEK	8629	507502	3316			81	100	3	C		Y	95	9/15/1997	10/10/1997
WITTWER	8038	507673	80			4	100	3	C		C	4	5/1/1987	5/31/1987
WOLCOTT	8702	507616	3293			229	100	3	I		S	1160	9/15/2003	10/14/2003
WOLCOTT	8702	507616	3293			21	100	3	I		C	21	5/15/2003	6/14/2003

Table 3-23
Grazing Allotment Summary (*continued*)

Allotment Name	Allotment Number	Auth No	BLM Acres	Private Acres	Private Aums 2	Active Use Aums 2	%PL 3	Permit Type 1	Mgmt 4	AMP 5	Live-stock	Livestock Number	On Date	Off Date
WOLCOTT	8702	507616	3293			236	100	3	I		S	1160	5/15/2003	6/14/2003
WOLCOTT ISOLATED TR	8710	507590	136			18	100	3	C		C	45	9/20/2004	10/1/2004
WOLCOTT ISOLATED TR	8710	507590	136			22	100	3	C		C	45	6/25/2004	7/9/2004

1 Permit Type: Section 3 = Permit, Section 15 = Lease. Section 15 lands are outside of a grazing district.

2 The current authorized grazing or conservation use expressed in AUMs

3 %PL : Percent Public Land, determined by amount of AUM's allocated to private land within the allotment.

4 Mgmt : Management category for allotment. C = Custodial, M = Maintain, I = Improve

5 AMP : Allotment Management Plan. A designated system prescribed by the Range Management Specialist to manage grazing use.

Characterization

Trends in livestock grazing reflect changes in livestock species, in permittees and their perspectives, and in permitted use or season of use. Absentee ownership of base property associated with many of the allotments has increased, as has the number of permittees that do not rely on livestock grazing for their primary source of income. Changes in the types of permittees that run livestock on the RMP planning area have resulted in diversification of perspectives. Some permittees have shifted the focus of their management to habitat improvement for wildlife and recreation as an alternative source of income.

Changes in permitted use or season of use are in response to changes in rangeland condition, socioeconomics, and other factors. The condition of the land is due to a variety of factors, such as climate, wildlife, livestock, oil and gas development, recreational use, and increased population. Increased development and recreational demands are resource uses that are competing for resources that limit livestock grazing. If rangeland condition deteriorates, the BLM has the ability to reduce the number of permitted AUMs, to manage plant communities that provide forage and browse through vegetation treatments, to change the season of use, to require deferment and pasture rotations, and to install range improvements, such as fences, water pipelines, spring developments, and reservoirs. These range improvements often enable more intensive grazing systems and encourage better livestock distribution and grazing utilization, but they also require more management on the part of the grazing permittee. Range improvement and permittee involvement may become more crucial to sustain future resource demands. The BLM's traditional goal in managing livestock grazing is to provide sustainable habitat for livestock and other animals, which is likely to remain as the primary focus of the BLM's management of livestock.

Urbanization of rural areas within the GSFO has also caused conflicts with livestock grazing. New land owners are often unfamiliar with state livestock laws and associated fencing requirements. Conflicts develop when livestock authorized on public land drift onto private land. This is largely the result of public/private land boundaries that are not fenced or that are poorly fenced, or where fences have not been maintained. It is BLM policy not to fence, or be responsible for maintenance, on boundaries bordering public land. In most instances the BLM has determined that it is not in the public interest to construct these fences largely because it would not be practical or economical. As an example, due to the mixture of public and private land, the GSFO would require about 1,700 miles of boundary fence. At an average cost of \$3.50/foot, the fence would cost taxpayers \$31.4 million.

Rural-urban interface conflicts such as the one above have often forced ranchers to seek other areas for grazing. Livestock operations near more urban areas in the GSFO, such as Aspen, Glenwood Springs, Eagle, and Gypsum, have consequently diminished, as well as livestock use on public land surrounding these areas.

Increasing elk populations have also been an issue with many grazing permittees. Elk are often in direct competition with livestock for forage resources. Although most of the competition occurs on private land particularly during the winter, further increases in elk populations will likely increase forage competition on public lands. The level of concern varies among grazing permittees. Those who own land where concentrated elk use occurs typically express the most concern over distributional problems. On the other hand, many grazing permittees are engaged in guiding and outfitting activities as another source of income and do not express the same concern as their neighbors.

Increased gas development and activity in the western portion of GSFO RMP planning area has also increased conflicts with livestock operations on public lands. As new roads are constructed and use of existing roads increases, control of livestock has become more difficult.

Vegetation Manipulation

Vegetation has been manipulated by mechanical treatments and controlled burning. Vegetation manipulation projects have been used to improve allotment conditions and to reset seral status (move vegetation from late seral shrubs to early seral grasses and forbs) but are rarely used to increase active preference. There has been 14,810.5 acres of vegetation manipulation projects completed. These projects have helped to improve allotment conditions and to reset seral status, but they have been rarely used to increase active preference. Livestock, with high stocking rates and temporary fencing, could also be a valuable resource for brush control and vegetation manipulation with reduced costs.

Partners

The GSFO has established partnerships/collaboration with the Grand Junction District Grazing Board of Advisors, the CDOW's Habitat Partnership Program, and grazing permittees on range improvement projects and funding.

3.2.3 Recreation and Visitor Services

Recreation Management Areas

Special Recreation Management Areas

The RMP planning process identifies areas where recreation is the management focus. These SRMAs were traditionally areas that had higher recreation use or required extra recreation investment or where more intensive recreation management was needed. The 2005 revision of the BLM Handbook (H-1610 -1, Land Use Planning Handbook) amended the characteristics for identifying a SRMA. SRMAs are now areas identified in land use plans to direct recreation funding and personnel to fulfill commitments made to provide specific "structured" recreation opportunities (i.e., activity, experience, and benefit opportunities). SRMAs now must identify a distinct, primary recreation-tourism market (destination, community, or undeveloped), as well as a corresponding and distinguishing recreation management

strategy. Recreation settings or natural resource settings are prescribed as part of the land-use allocation decision. Subsequent implementing actions, as identified in the activity planning framework, are proactive and address management, marketing and visitor information, and monitoring and administration.

The GSFO currently has identified nine SRMAs (**Table 3-24, Appendix C**, Recreation Management, and the SRMAs and Recreation Sites and Special Management Designations maps, **Appendix E**). Most, except the Red Hill SRMA, were identified because of a singularly dominant activity-based recreation demand. However Appendix C of BLM Handbook (H-1610 -1, Land Use Planning Handbook) clarified that recognition of singularly dominant activity-based recreation demand of and by itself (e.g., heavy OHV use, river rafting, etc.), however great, generally constitutes insufficient rationale for the identification of new SRMAs.

Table 3-24
SRMAs in the GSFO

SRMA Name	Location	Acres
Bocco Mountain	Castle Peak area north of Wolcott	1,388
Bull Gulch	North of Dotsero, east of Colorado River	8,251
Deep Creek	North of Dotsero, west of Colorado River	2,406
Eagle River	Public land parcels between Wolcott and Eagle	639
Gypsum Hills	North of I-70, between Dotsero and Gypsum	16,931
Hack Lake	North of Sweetwater Lake, next to the Flat Tops Wilderness	3,337
Red Hill	Immediately north of Carbondale	3,092
Thompson Creek	Southwest of Carbondale, next to the White River National Forest	4,270
Upper Colorado River	Colorado River, between State Bridge and Dotsero	21,661

Extensive Recreation Management Areas

Anything not delineated as an SRMA is an extensive recreation management area (ERMA): public lands where recreation is unstructured and does not require intensive management or significant investments in trails or facilities. This type of undirected or “dispersed” recreation management affords visitors the opportunity to create their own adventure. Visitors receive little in the way of services or developed recreational facilities. Within ERMAs, recreation management is reactive and custodial, addressing visitor health and safety, resource protection and use and user conflicts.

Most public lands within the GSFO RMP planning area are managed as the GSFO ERMA, which is characterized by a diversity of natural resource settings and range of recreation opportunities (see RMP Map 9 and Appendix C).

Because recreation is not the primary management objective in ERMAs, the 2005 revision of the BLM Land Use Planning Handbook clarified that management within

all ERMA is focused on custodial implementation actions that address visitor health and safety, user conflict, resource protection issues, and maintaining appropriate activity participation. Implementation actions are not directed at maintaining or creating particular physical, social, or administrative natural resource setting prescriptions.

ERMA Management	SRMA Management
<i>Unstructured</i> —No identifiable market demand for structured recreation.	<i>Structured</i> —Tied to identified primary market demand for structured recreation (i.e., activities, experiences, and benefits and the maintenance of recreation setting character).
ERMA Objectives	SRMA Objectives
<i>Reactive and Custodial</i> —Directed at taking care of dispersed recreation-tourism activity.	<i>Proactive</i> —Directed at producing specific recreation opportunities and outcomes.

Recreation Demand

Public Land Visitors

North-central Colorado is a world-renowned destination for outdoor recreation enthusiasts. Recreation visitors to the GSFO RMP planning area come from three primary sources: national and international locations, the Denver metropolitan area and Front Range of Colorado, and locally. A recreation visitor survey is underway in cooperation with Arizona State University. Updated demographic information on visitation for the GSFO RMP planning area will be available in the fall of 2007.

National and International

Visitors from outside of Colorado come to the region from all over the US and from international locations. One reason is because the GSFO can be reached via an easy 90-minute drive from Denver on I-70. Visitors can also fly directly into major airports, including Eagle-Vail, Aspen, and Grand Junction.

Front Range

Visitors from the Denver metropolitan area come to the region because it is an easy to get to weekend getaway with a lot of diversity in outdoor activity offerings and recreation settings.

Resident Customers

Colorado’s population has grown significantly in the past 10 years, (Colorado State Demography Office 2007) and an increasing number of people are living near or seeking local public lands for a diversity of recreational opportunities characterized by the “mountain resort or outdoor lifestyle”. The region is truly a year-round place to live and work; as a result, public lands administered by the BLM are absorbing increasing recreational demand and use. The towns of Eagle, Gypsum, Glenwood Springs, Carbondale, Basalt, New Castle, Silt, and Rifle all have public lands bordering them that are used as “backyard” recreation areas by local residents.

Outside of the fall big game hunting seasons, when visitation is high everywhere, the greatest number of visitors to public land is on a daily basis near communities. This use continues to grow exponentially with the rapid growth in the communities themselves.

Second home owners also cite recreational amenities as the reason for purchasing a second home in the region. The 2004 Northwest Council of Governments Town of Eagle Community Survey (Town of Eagle 2007) indicated recreational amenities, trails, and open space were some of the top community values. More pedestrian paths and cross-country ski trails were the most requested recreational enhancements. The Pitkin County Community survey also noted similar results (Pitkin County 2004).

Use Figures

Recreation has become the predominant use of local public lands and national forests. Most public land use estimates and activity participation estimates depend entirely on field observations and professional judgment of the recreation staff and hence are not scientifically based. The 566,000 acres in the GSFO receive roughly 800,000 visits per year.

Parallel visitation can be found on the adjacent 2.3-million-acre White River National Forest. The USFS collects information about visitor satisfaction and use through the National Visitor Use Monitoring process. The White River National Forest received the most visits to any National Forest—9.7 million, 6.5 million of which were skier visits (USFS 2005).

Recreation Activities

Public lands within the GSFO offer a variety of outdoor recreation opportunities, including land-based, water-based, and snow sports. Typical recreational activities on public lands include camping, hiking, horseback riding, mountain biking, OHV riding/driving and cross-country skiing. Migrating and resident wildlife provide plentiful opportunities for hunting, photography, and wildlife observation. Renowned local rivers (Eagle, Colorado, and Roaring Fork), streams, and lakes offer boating and cold water fishing opportunities. The 2006-2007 visitor survey and small group discussions with residents, in cooperation with Arizona State University, will provide more information on public land visitation, activity participation and demand. Research information will be available in the Fall of 2007. Comprehensive trails and travel management including: motorized, mechanized, and non-mechanized travel; is discussed in Section 3.2.4. A summary table of predominant recreation activity opportunities can be found in **Appendix C**.

Recreation Supply

Natural Resource Recreation Settings

The characteristics of the landscape affect the activities and recreation opportunities (experience and beneficial outcomes) that can be realized by recreation participants.

By managing the natural resource recreation settings and the activities that occur within them, recreation managers create a range of natural resource settings and produce a variety of outcome (recreation experience and benefit) opportunities.

The ROS concept recognizes that the attainment of desired recreational experience and benefit outcome opportunities are actually produced by the physical, social, and administrative natural resource setting characteristics of a recreational area. The range of possible combinations of activities, settings, and probable experience opportunities can be represented in terms of a spectrum or continuum. This continuum of natural resource recreation setting characteristics is called the ROS. The contextual information provided by the ROS is both a descriptive tool and a prescriptive tool for recreation planning, management, and research (Clark and Stankey 1979). The GSFO RMP used ROS as a descriptive tool. Due to setting inconsistencies and the planning practices at that time all three components were merged into one ROS map emphasizing the physical setting. The 1984 ROS map, emphasizing the physical setting, can be found in **Appendix C**, Recreation Management.

In today's more multifaceted and complex natural landscapes, recreation planners have found it advantageous to maintain the distinctive differences between the physical, social & administrative setting components. The forth coming EIS will describe and depict the distinctive differences between the physical, social & administrative setting components and the resulting RMP will prescribe setting characteristics for each setting component within SRMAs. Detailed existing physical, social and administrative natural resource recreation setting maps (remoteness, contacts, and mechanized use attributes) and narrative setting matrices for GSFO SRMAs can be found in **Appendix C**, Recreation Management.

Physical Setting Character Trends

For general physical setting character trend comparisons with the 1984 ROS class map (**Appendix C**), an updated 2007 natural resource recreation settings map (**Appendix C**) depicting the existing physical classes was created based on the Natural Resource Recreation Setting Matrix for the remoteness characteristic (**Appendix C**).

The fundamental physical setting character trends for the GSFO RMP planning area are clear and predictable realizing the physical changes in the region. The acreage differences show that the physical urban setting class has expanded into the rural setting class due to the consequences of urban growth. More improved roads and more man-made developments can be attributed to causing a decrease in the physical middle country class and the dramatic increase in the physical front country setting class. Cumulatively over 23 years, the natural resource recreation settings (remoteness attribute) have generally become physically less-remote due to many factors including: gas development, urban growth, and mechanized/motorized use on public lands.

Because of the use of GIS analysis, the 2007 analysis is much more detailed than what was completed for the 1984 RMP. The 2007 map displays small “islands” or fragments of physical setting classes. In the 1984 analysis the islands were likely merged into the dominant setting class or not seen due to the scale of analysis. The displaying of these islands shows that even with the land use trends in the region, pockets of physical remoteness as defined by the backcountry setting class still exist. This knowledge may be helpful when discussing possible management alternatives in the upcoming EIS.

Social Setting Character Trends

Socially, the public lands within the GSFO are generally busier. This is especially true: 1) in areas of natural gas development, 2) near communities/developments and 3) around popular destinations like the Colorado River or the Eagle River. On weekends and in the evenings the sights and sounds of people are seemly everywhere in the more popular recreation areas.

Many upland areas (for example: western Castle Peak, Gypsum Hills area, Sheep Creek area, King Mountain, Cedar Mountain, Pisgah Mountain) receive low levels of visitation (especially weekdays) and offer uncrowded social settings. However, a four month biggame hunting season (August – November), with unlimited general elk licenses and many deer licenses, attracts many residents and non-resident hunters to public lands and the number of contacts with other visitors dramatically increases FO-wide.

With use levels growing the evidence of visitation is also increasing. Areas of alteration including: vehicles use, litter, man-made structures, tree damage, surface vegetation impacts, hardened campsites and compacted soils can be found in more and more places.

Administrative Setting Character Trends

Administratively the GSFO has had to: limit motorized use in many areas (i.e. motor vehicle closures), limit motorized use by season (i.e. winter closures), increase signing, increase field staff, increase visitor services, create brochures and maps for visitors and apply more rules and regulations; in order to maintain natural resource settings, direct recreation use and protect resources. Within some SRMAs and in urban-interface areas new issues such as: domestic animals, noise, visual aesthetics; are necessitating BLM to consider additional administrative remedies for recreation use. No individual user fees are charged on public lands within the GSFO.

Natural Resource Setting Character Forecast

Recognizing four key issues:

1. population growth,
2. changing public expectations and demand for outdoor recreation opportunities,

3. increased natural gas development, and
4. the fact that 80% of BLM public lands lie within one mile of private property;

all the natural resource setting trends are likely to continue. At the broadest level, the physical, social and administrative recreation character of BLM public lands is quickly changing from: less natural to more developed, from less crowded to more contacts with others, from less restrictive to more rules and regulations. These changes will impact the activity opportunities that can be offered and the recreation experience and benefit opportunities that can be produced by land managers and partners.

Recreation Management

Developed Recreation Facilities

Developed recreation sites and facilities have been constructed to enhance recreation opportunities, protect resources, manage activities, or reduce recreation use conflicts. These infrastructure developments range from: campgrounds to trailheads with a simple bulletin boards. The GSFO manages 19 day-use sites, all of which provide river access and 10 of which provide boat launches. The GSFO also manages 17 trailheads.

Although the BLM is upgrading recreation facilities as funding becomes available, many are still in need of renovation. In addition, any need for additional facilities is overshadowed by a shortfall in maintenance and rehabilitation funds for existing facilities and the high cost of construction. Developed recreation sites are maintained by BLM seasonal staff.

Developed Campgrounds

The GSFO manages seven developed campgrounds containing a total of 36 campsites (SRMAs and Recreation Sites map, **Appendix E**). Most of the developed campgrounds have basic infrastructure and few campsites, and receive relatively little use. Most need relatively little maintenance and experience few problems with vandalism and litter. An exception to this is Gypsum campground. Due to its proximity to I-70, it often is used for activities other than camping. People without permanent homes frequently live there while working in the area. Also, the campground is popular for late-night parties that result in vandalism and extreme amounts of litter.

The BLM has received numerous complaints about this situation and about recreationists' fears of using the day-use area because of the behaviors of people staying in the site. Since the opening of the nearby privately owned recreational vehicle park, recreational camping at the BLM's site has declined markedly. Evidence suggests that the private site provides a safer, cleaner, quieter, and more welcoming setting than the BLM site.

Two of the developed campgrounds collect fees, together totaling \$4,000 to \$5,000 and 1,000 to 1,300 visitor days per year. While the fees collected are used for maintenance, the maintenance costs far exceed the revenue collected.

River Recreation

Management

The GSFO has considerable management responsibilities on the Colorado River from State Bridge to Glenwood Canyon. From Glenwood Canyon to Parachute the GSFO only administers a few parcels of public lands along the Colorado River with the South Canyon Boat Launch being the most prominent for river access. While the GSFO manages a handful of developed recreation sites along the lower Eagle River below Avon, it does not manage large contiguous blocks of land. The GSFO also manages one site on the Roaring Fork River.

Use

On the Colorado River from State Bridge to Glenwood Canyon, use is light and primarily revolves around day-use activities. A number of characteristics naturally guide recreation use patterns. The proximity of the road and the railroad, along with numerous access points, limit solitude. The numerous areas of private land limit primitive camping opportunities. The distance from population centers limits day use. Natural turbidity limits the quality of fishing. While there is limited whitewater to challenge enthusiasts, sections of the river are hazardous enough to discourage many casual floaters. Consequently, this stretch of river receives five percent to ten percent of the use the Colorado River above State Bridge is experiencing. The developed sites, while basic, more than satisfy the recreational demand.

The BLM parcels on the lower Colorado (Glenwood Canyon to Parachute) are also adjacent to the interstate and to growing communities. While these parcels are mostly undeveloped, they are expected to experience demands similar to other public lands near urban communities.

The Eagle River receives moderate use during the six- to eight-week whitewater season. In other times of the year, river-related use is quite light, and facilities are adequate to satisfy recreation demand. However, these sites are adjacent to growing communities and I-70. Consequently, they are often used as urban-type parks by residents and travelers. Management challenges exist because these sites were not designed to meet the activity demands of these users. Additional infrastructure and maintenance resources will be required to meet the additional recreation demand created by residents and travelers.

Recreation Administration

Cooperative Management

Most developed local trail systems are cooperatively administered with communities/community groups. Each partner shares responsibility for the

development, administration, and maintenance local trail systems. Through these partnerships (for example, ECO Trails, Red Hill Council, Town of New Castle), the GSFO has been able to partially meet the local demand for trail-based recreation.

For the past four years OHV trails have been managed in cooperation with the Colorado State Parks State Trails Program. Grant funding has helped a seasonal work crew maintain trails, plan and build new trails, and provide information to OHV users. Without this cooperation, very little work would occur on GSFO OHV trails.

Special Recreation Permits

As authorized by 43 CFR 2932, there are four types of uses for which special recreation permits (SRP) are required: commercial use, competitive events, organized groups, and recreation use in special areas. The BLM can issue SRPs for noncommercial use in certain special areas, including rivers and backcountry and camping areas. Most SRPs issued by the GSFO are related to river and upland hunting outfitting. Very few permanent camps and facilities are authorized on BLM-administered lands, as most camps are on private lands.

There has been increased demand for SRPs on BLM-administered land within the GSFO RMP planning area over the past 20 years. There are currently 19 SRPs being issued for upland hunting, and those permits are issued on an area basis. The GSFO is not accepting applications for upland big game hunting SRPs because the GSFO is fully allotted by area. The GSFO is also not accepting applications for any SRPs for mountain lion hunting, due to the increase in complaints and conflicts, low reported use, quality of hunt concerns, and urban interface issues. The demands on law enforcement and the quantity of SRPs are meeting the demand. There are 38 SRPs being issued for river-related recreation. The GSFO is not issuing additional commercial SRPs on the Upper Colorado and Eagle Rivers due to lack of infrastructure and staffing limitations. Eleven commercial permits are held for activities such as trail rides, photography, jeep tours, kayak/canoe instruction, hot-air ballooning, and paragliding. Annually five to ten different groups are issued SRPs to conduct competitive events or organized group activities.

In summary, the GSFO administers an average total of 75 SRPs each year. No concessionaires are permitted within the GSFO RMP planning area. Demand for and the diversity of commercial and competitive SRPs is expected to continue.

The GSFO collects about \$25,000 to \$35,000 per year in SRP fees. Thirty to fifty percent of this revenue is expended in program administration, with the remainder spent on visitor services, monitoring, and maintenance.

Public Safety

As local communities grow and population densities increase next to BLM lands, wildland-urban public safety issues have arisen. Over the last 20 years the GSFO has implemented recreation use closures and restrictions under 43 CFR 8364.1 aimed at:

1) preventing sanitation, 2) littering, 3) protecting the safety of persons and property on private lands and 4) preventing resource damage from vehicle use. For example:

- In 2000 BLM GSFO closed Horseshoe Bend, along the Colorado River, to overnight camping because of long-term camping, trash and improper disposal of human waste (BLM 2000),
- In 1992 BLM GSFO closed the North Hardscrabble Access Road to camping, parking and the discharge of firearms (BLM 2002c).

Mineral Withdrawals

Mineral withdrawals have been done at the following recreation sites: Wolcott, Gypsum Campground/Horse Pasture/Community Complex, State Bridge/Windy Point, Catamount, and Lyons Gulch. The purpose of these withdrawals was to prevent conflicts with recreation use.

Accessibility

Participation in outdoor recreation can be restricted by age, disabilities, poor health, lack of appropriate facilities within an accessible distance, undesirable recreation settings, lack of information about recreation opportunities, poor transportation, or lack of convenience.

The BLM improves facilities to make them more accessible to people with disabilities, as well as provide better general public land access and information about recreation opportunities. All construction is reviewed for compliance with Uniform Federal Accessibility Standards and the Americans with Disabilities Act Guidelines. As newer Accessibility Guidelines for Outdoor Developed Areas become final, those standards will also be followed.

Recreation Marketing/Information/Education

Marketing and Tourism

Tourism drives most of the local economies in north-central Colorado (Eagle County 2007). Transportation and access to the mountain communities is a key factor from a planning and tourism standpoint. I-70 is a vital transportation corridor linking Denver International Airport, the Denver metropolitan area, and other Front Range population centers to the GSFO RMP planning area.

The GSFO RMP planning area is in Colorado's northwestern tourism region (Colorado Tourism Office 2002). Regional public land marketing has generally focused on hunting and motorized sports on the White River National Forest and other opportunities elsewhere in the region (Colorado Tourism Office 2002). BLM-administered public lands tend to be marketed indirectly or lumped in with opportunities on the White River National Forest. Outdoor recreation provides significant positive economic contributions to the local communities because hunters and snowmobile riders tend to locally purchase meals, food, fuel, sporting goods,

gifts, and lodging. The GSFO has not played an active role in marketing any public lands outdoor recreation.

Interpretation/Education

No formal education or interpretation program exists. Education and interpretation on recreational opportunities and land stewardship is mostly done through brochures, signs, and the GSFO Web site. The GSFO staff participates in school programs, attends user groups/club meetings, and participates in the City of Rifle hunter information tent.

Recreation Monitoring

Monitoring and Evaluation

The GSFO recreation staff and law enforcement officer monitor all forms of recreation activities and public use for user conflicts, recreation effects on natural and cultural resources, visitor health and safety issues, and conflicts with adjacent private landowners. In addition recreation staff monitors implementation of management actions and the attainment of management objectives.

3.2.4 Comprehensive Trails and Travel Management

Travel and transportation are an integral part of virtually every activity that occurs on BLM public lands: recreation, livestock management, wildlife management, management of commodity resources, ROW to private inholdings, maintenance of electronic sites, and management and monitoring of public lands. This section addresses public travel and access. The transportation section (3.2.7) addresses administrative access, management of commodity resources and products, and road maintenance.

Comprehensive trails and travel management is the proactive management of public access, natural resources, and regulatory needs to ensure that all aspects of road and trail system planning and management are considered. This includes resource management, road and trail design, maintenance, and recreation and nonrecreational uses of the roads and trails. Travel activities in this context incorporates access needs and the effects of all forms of travel, both motorized and nonmotorized.

Comprehensive trails and travel planning means providing clear specific direction on the proper levels of land and water access for all modes of travel. Travel management objectives serve as the foundation for appropriate travel and access prescriptions.

Regulation—43 CFR 8342.1 designation criteria state that “The authorized officer shall designate all public lands as either open, limited, or closed to off-road vehicles. All designations shall be based on the protection of the resources of the public lands, the promotion of the safety of all the users of the public lands, and the minimization of conflicts among various uses of the public lands.”

National Guidance—On a national level and in response to increasing demand for trails recreation on public lands, the BLM developed first an OHV strategy and then a mountain bike strategy. A Nonmotorized/Nonmechanized strategy is planned. These strategies emphasize that the BLM should be proactive in seeking travel management solutions that conserve natural resources while providing for ample recreation opportunities (BLM 2004c).

The BLM released the current version of the Land Use Planning Handbook (H-1601-1) in November 2000. Guidance for OHV designations in the land use planning process was incorporated into the Recreation Section (Appendix C, Section II C). As field offices implemented the guidance for RMP development, revision, or amendment, they identified a need to clarify how to implement the guidance in the recreation section and introduce refinements to the existing process. IM Number 2004-005, *Clarification of OHV Designations and Travel Management in the BLM Land Use Planning Process*, emphasized policy and provided clarification and additional guidance for travel management decisions that will be part of the GSFO RMP revision planning process (BLM-WO-IM-2004-005).

Modes of Travel—Visitors to public lands within the GSFO use roads and trails for a variety of recreational activities involving various modes of travel. Nonmechanized modes of travel include cross-country skiing, dog sledding, snowshoeing, horseback riding, hiking, boating, hang-gliding, para-gliding, and ballooning. Mechanized vehicles predominantly involve mountain bikes and specialized equipment such as mountain skateboards. Motorized travel includes standard passenger vehicles on maintained roads and OHVs on primitive roads and trails. OHVs include motorcycles, ATVs, jeeps, specialized 4x4 trucks, snowmobiles, and motor boats. The type and amount of use and the location of roads and trails influence physical, social, and administrative recreation setting and the overall quality of the recreation experience.

History of Existing Route System—Many roads within the GSFO were constructed to create access to public land improvements and projects for timber/vegetation management, gas/mineral development, range management, and various ROWs. Some of these roads are maintained by the permittee to maintain the improvement, such as a livestock/wildlife pond or fence. Numerous roads were not necessarily intended to be left behind or open for recreational use but have become popular routes for visitors engaged in mechanized/motorized recreation activities. The vast majority of mechanized/motorized routes were created or “pioneered” by public land users themselves. Open travel designations that permit cross-country mechanized and motorized use, high levels of use, and improvements in mechanized/motorized vehicle technology have allowed public land users to gain access to and through more terrain. The repeated passage of vehicles maintains these routes. Not designed but created, these routes are often rutted and eroded.

Travel Designations—In the early 1980s, in response to Presidential Executive Orders 11644 and 11989, the BLM began designating all public lands in one of three

OHV designation categories. Thus public lands within the GSFO RMP planning area were designated as open, limited to existing roads and trails, limited to designated roads and trails, and closed to OHV use. The GSFO has also designated three areas as temporarily closed in order to protect resources. Approximately 71 percent of the planning area is designated as open to OHV use, 24 percent is limited to existing or designated roads and trails, and five percent is closed including temporary closures (OHV Designation map, **Appendix E**). The designations are as follows:

- **Open**—Available for OHV travel without restriction, based on an analysis that determines there are no compelling resource protection needs, user conflicts, or public safety issues to warrant limiting cross-country travel.
- **Limited**—Designated as limited to either designated or existing roads and trails for the purpose of restricting OHV travel in order to protect resources. Restrictions may include the number or types of vehicles, time or season of use, use of existing roads and trails only, use of designated roads or trails, or licensed use only. The BLM may also impose other restrictions to protect resources.
- **Closed**—OHV travel is not allowed in areas designated as closed. Areas are closed in order to protect resources, ensure visitor safety, or reduce user conflicts.
- **Temporary**—Areas may be closed to OHV use temporarily in order to allow resources to recover or for other purposes.

Current Condition

The primary factors describing the condition of travel management within the planning area are as follows:

- The lack of comprehensive travel management that considers the relationship between various resources, access for authorized permittees, and recreation uses;
- The lack of planning for recreational experiences that preceded the construction of historic routes;
- Unauthorized uses emanating from designated routes causing impacts on other resources;
- Subdivision of private property creating new access points to public lands;
- Routes that are open to motorized use being accessible only to adjacent landowners; and
- Conflicts between recreational users.

In the current RMP, OHV designations were made solely to limit impacts by protecting resources, preventing recreation conflicts, and protecting public safety. Recent travel management plans for specific areas have been intended to manage

routes and route systems to provide specific recreation opportunities and experiences. However, this planning has focused on a relatively limited area. More than 70 percent of the Resource Area is open to OHV use. **Table 3-25** summarizes acres within the planning area that have restrictions on OHV travel.

Furthermore, even areas with designated routes usually do not have trails that were built with recreation experiences in mind. Most routes either follow historic nonrecreational routes (such as, grazing, mining, or administrative access) or were created by OHV users repeatedly driving cross-country. Usually in neither of these cases do the trails provide desirable recreation experiences. These routes—especially the user-created ones—are often unsustainable and cause resource damage. There are approximately 2,400 miles of routes in the Resource Area, for an average density of 2.7 miles of routes per square mile of land. Almost 90 percent of these routes are open to motorized travel. **Table 3-26** summarizes the types of the routes.

As is the case throughout the West, OHV use has increased dramatically on the Resource Area since the current RMP was written. Open lands that once did not experience impacts because of light use now commonly have impacts on natural and cultural resources, as well as significant recreation impacts.

The most popular OHV areas are Hubbard Mesa, Hardscrabble, Red Hill Gypsum McCoy, and Bocco Mountain. This use occurs nearly year long, and for many users the act of driving/riding is the primary reason for their recreation visit. Most of these visitors live within an hour's drive of the area and enjoy practicing their technical skills, using their equipment, and spending time with family and friends. During the autumn, most parts of the Resource Area experience a lot of OHV use from hunters. Much of this use is focused in the Castle Peak, Roan Plateau, and The Crown areas. These tend to be destination areas, with visitors coming from all parts of Colorado and from around the country.

Table 3-25
General Summary of GSFO Areas with Limitations (open areas not included)

Area	Open <i>(seasonal closure)</i>	Limited <i>(existing roads and trails)</i>	Limited <i>(designated roads and trails)</i>	Closed
King Mountain			17,517	
Castle Peak Travel Plan				
Gypsum Hills SRMA			16,930	
Bocco Mtn. SRMA			1,388	
Bull Gulch WSA				9,839
Castle Peak WSA				12,237

Table 3-25
General Summary of GSFO Areas with Limitations (open areas not included) (continued)

Area	Open <i>(seasonal closure)</i>	Limited <i>(existing roads and trails)</i>	Limited <i>(designated roads and trails)</i>	Closed
Hack Lake WSA				10
Hack Lake SRMA				3,336
Deep Creek WSA				2,406
Siloam Springs			5,529	
East Eagle			1,663	
Tenderfoot Gulch		3,964		
Red Hill Gypsum		14,520		
Fisher Creek				1,028
Red Hill Carbondale				3,104
The Crown	9,200			
Light Hill	3,797			
Sloane Peak				2,487
Thompson Creek				4,270
Glenwood Springs Debris Flow			5,932	
Sunlight Peak		1,707		
Center Mtn.		3,617		
Gibson Gulch		8,430		
East Elk Creek Watershed		4,821		
Ward Gulch		4,401		
Roan Plateau			53,471 <i>(pending)</i>	
Flatiron Mesa Watershed		767		
Total	12,997	42,227	175,977	38,707

Table 3-26
Types of Routes

Route Open To	Miles
Sedan (maintained roads)	219
High clearance/4wd	1,400
ATV	337
Motorcycle	153
Non motorized	240
Non mechanized	20
Total	2,369

In this table, the routes in each row are also open to all types of uses in the rows beneath.

In addition to heavier OHV use, increased urbanization on adjacent private lands has created additional nonmotorized use and new expectations for recreation experiences. Many of these users recreate on BLM lands because the lands are close to home and provide a convenient place to exercise, relieve stress, and allow users to spend an hour or two with family and friends. The new uses in these places include

“backyard” hiking, mountain biking, dog walking, rock climbing, and fly fishing. At times these uses and expectations conflict with the experiences desired by motorized users. Until recently, there has been very little demand—and consequently very few resources allocated for—nonmotorized recreation travel.

This type of use has been increasing in all of the public lands bordering municipalities. The towns of Parachute, Rifle, Silt, New Castle, Glenwood Springs, Carbondale, Basalt, Gypsum, and Eagle have all experienced great population growth. Subsequently, the public lands adjacent to them have the highest incidence of nonmotorized use. Mountain biking has become very popular on Lookout Mountain, Red Hill Carbondale, The Crown, East Elk Creek, the west end of Hardscrabble, and East Eagle. Casual hiking (as opposed to destination hiking) has become very popular on Light Hill, Sloane Peak, Red Hill Carbondale, Fisher Creek, Lookout Mountain, and the west end of Hardscrabble from Eagle Ranch subdivision. Recreational boating (either for whitewater kayaking/rafting or fly-fishing) occurs heavily on the Eagle River and is becoming heavier on the Upper Colorado River and the Colorado River below Glenwood Springs.

Correlated with the growth of communities is the subdivision of private lands adjacent to BLM parcels. Often BLM lands are isolated and provide limited public access. In these instances, enforcement of travel restrictions is difficult, and motorized trespass can frequently occur from adjacent private grounds. High-density subdivisions of these private lands has often changed this scenario. Usually the subdivision is designed to give public access to the BLM lands. A further result is that the new community can provide great stewardship to the adjacent lands, and often the greater access makes monitoring and managing by the BLM more efficient. Examples of this are found in the East Eagle area, the Light Hill area, and the Castle Valley area of New Castle.

Finally, increased transportation demands by nonrecreational uses (for example, oil and gas, grazing) has greatly affected recreation travel in some areas. Often recreation experiences can suffer when transportation systems for other uses are increased or created.

As a result of all of these factors, there is a need for comprehensive travel management of all recreation uses, and for close coordination with transportation planning for nonrecreational uses.

Characterization

OHV use is expected to continue to increase, especially in the Hubbard Mesa, Hardscrabble, Red Hill, Gypsum, McCoy, and Bocco Mountain areas. It will also likely increase in the western portion of the Resource Area, where new routes are developed for oil and gas production and new residents move to those areas. Use may become more concentrated in these areas as other places urbanize and motorized users look for areas with fewer recreation conflicts.

The unknown rate of growth of OHV use is due in part to the increased cost of the sport. As technology has increased, so too has the cost of equipment. An ATV or off-road motorcycle costs \$5,000 to \$8,000. A pickup truck, trailer, and hundreds of dollars of safety equipment are also needed. In short, a family may need to spend tens of thousands of dollars to enjoy this sport, which may limit the number of people who can participate. In addition, it is unknown how the future cost of gasoline will affect OHV use.

Nonmotorized use close to urbanizing areas will grow as population grows. It is expected that demand for hiking and mountain biking trails will increase adjacent to all of the municipalities in the Resource Area, as well as in areas close to major subdivisions outside of incorporated towns. Demand for floating and fishing access to the Eagle River and lower Colorado River is expected to increase also.

It is expected that subdivision of private property adjacent to BLM will continue. Continued collaboration between the BLM and municipalities/counties will help provide appropriate access during the subdivision design and valuable stewardship once the homes are occupied.

Construction of new routes for oil and gas development is expected to increase in the western portion of the RA. While OHV recreationists will likely use these routes, they likely will not be designed to optimize recreation experiences. The new routes may also conflict with existing OHV routes and current recreation experiences.

Colorado BLM's OHV Policy—Both Executive Order 11644 and the CFR (43 CFR Part 8340) require the BLM to designate all public lands as open, closed, or limited for OHV use. It is now Colorado BLM policy (CO-IM-2007-20) to restrict all OHV use within limited areas to designated routes. So instead of designating areas as limited to existing routes, the field offices will be tasked with identifying specific route designations, along with the accompanying modes of travel, as part of the RMP revisions.

There will be no motorized cross-country travel except in areas designated as open. Open areas will be limited to a size that can be realistically managed and geographically identifiable but large enough to offer a high quality motorized riding/driving opportunity for participants.

For areas in the limited and open categories, managers may also impose different kinds of limitations, including vehicle numbers, types, use times or seasons, permitted use, existing routes, designated routes, and other limitations necessary to meet management objectives.

3.2.5 Forestry

Current Conditions

The Field Office manages 17,905 acres of suitable commercial forest land within five designated forest management units: King Mountain, Black Mountain, Castle Peak, Seven Hermits and the Naval Oil Shale Reserve. Forest species managed on commercial forest land include: lodge pole pine, Douglas fir, Englemann spruce, subalpine fir and aspen. The primary commercial species is lodgepole pine, with some Douglas fir occasionally sold. The annual allowable harvest from suitable commercial forest lands is estimated at 1.8 million board feet. The harvest levels over the past five years have averaged less than 10,000 board-feet of forest products per year; significantly less than the estimated annual harvest. The recent low harvest levels coincide with a lack of forest management staffing at the Field Office. Forest resources have not been actively managed and minimum timber volume was sold during the same timeframe.

In addition to commercial forest lands, the Field Office manages another 82,407 acres of woodland consisting mainly of pinyon pine and juniper. The estimated annual allowable woodland harvest is 6,465 cords. Individuals cutting firewood for personal use represents the greatest demand on the woodland resource. The average annual firewood harvest for the past five years has been 650 cords or 10 percent of the estimated allowable woodland harvest level. The present demand for fuelwood has been steady and limited almost exclusively to pinyon-juniper.

Special forest products are sold by the individual item and include post, poles, Christmas trees and transplants. Post and pole sales have predominantly been for lodge pole pine and sales have varied annually depending on demand and availability. Seasonal Christmas tree harvesting by local residents is also a common use of the timber resource. The annual harvest of Christmas trees has decline over the past 10 years but demand has recently level off to approximately 160 trees a year. The harvest of transplants has been minimal reflecting public and commercial demand. Less than 10 transplants permits are sold annually with preference for aspen.

There are also uses of timber that do not include harvesting. These uses include hunting, wildlife viewing, hiking, sightseeing, and camping. Such activities are becoming increasingly important uses of woodlands.

Indicators

Current trends observed by BLM resource specialists show an increase in pinyon-juniper woodland encroachment onto other lands, an increase in shade-tolerant conifer species in aspen stands, and an increased fuel loading and stand stocking rate for other forest types. The rate of these changes has not been quantified. Lands on the Diamond Peak, Middle Mountains, and Douglas Mountain are considered suitable for timber harvest, and such uses might occur in the future.

Trends

Overall forest health for many conifer species within the resource area is on the decline. Aging forest and prolonged drought have created an ideal situation for increase mortality from insect and disease epidemics. Aging aspen stands are also experiencing a decline from drought, disease and encroachment from shade tolerant conifer species. The exception to this trend is relatively stable pinyon-juniper woodlands. Recent woodland inventories have shown an increase in pinyon-juniper woodland encroachment into rangelands. The rate of these changes has not been quantified.

Lodgepole pine type: The vast majority of trees are mature or overmature increasing the susceptibility to insects and diseases. The current trend is a significant decline in health. Lodgepole pine stands within the Black Mountain and King Mountain Forest Management Units are at greatest risk of a mountain pine beetle epidemic. There has been an increase in mountain pine beetle activity over the last four years in both management units.

Aspen type: Most aspen trees in the planning area are mature or overmature. The trend is increasing stand mortality due to a combination of factors. The average age of the stands is at or over the average life expectancy, and there is a corresponding lack of vigor. Another factor being considered is the extended drought and its effect on available groundwater. This may be affecting the ability of the trees to sprout and regenerate even after a disturbance, such as a fire or harvesting operation. Numerous fungi and other diseases are also common in aspen. The decline in aspen health and the lack of natural disturbance has led to competition and encroachment from shade tolerant conifer species.

Pinyon/juniper type: This timber type seems to be relatively stable at present. Trees are encroaching into adjacent sagebrush areas, primarily due to fire control measures that have prevented natural fires in the sagebrush and allowing the pinyon-juniper trees to become established. Areas in the southwest part of Colorado have recently experienced an outbreak of pinyon ips beetle (*Ips confusus*) and heavy mortality in pinyon and juniper, believed to be due to the extended drought. Pinyon-juniper stands within the resource area could be susceptible to a similar epidemic.

Douglas-fir type: This type is most often found is generally found in steep north or north-east facing drainages at the middle elevations in the resource area and appears to be in slow decline. Most of the trees are mature or overmature and susceptible to insects and diseases. Douglas fir mortality has been observed in Naval Oil Shale Reserve Forest Management Unit and isolated stands northwest of Glenwood Springs attributed to endemic levels of Douglas fir beetles.

Mix conifer type: These stands are composed of a mix of Engelmann spruce and subalpine fir. Most Engelmann spruce are at or over maturity and are very susceptible to a beetle attack. The subalpine fir is susceptible to various diseases,

especially root rots. Climax stands in the Castle Peak and the Naval Oil Shale Reserve Forest Management Units are at greatest risk from insects and disease.

Market demand determines what types of forest products are sold each year. The sawlog market has decreased over the past fifteen years as there are fewer sawmills in the Colorado and southern Wyoming to process the logs. The timber supply has been exceeding overall demand locally depressing market values. There has been a recent emphasis to develop a biomass industry and other markets for dead trees in Colorado to assist the salvage and rehabilitation of aging and dying forest.

The post and pole market has been up and down over the past ten years and is expected to remain unpredictable. Firewood demand has decreased significantly over the past fifteen years due to burning limitations and relatively cheap electric and natural gas prices. The fuelwood market and demand for domestic wood will guide the actual harvest of woodland products. The supply of firewood is expected to increase dramatically and exceed demand with the anticipated increase in forest mortality. It is assumed that the majority of fuelwood sold will transition from traditional pinyon-juniper to salvaging dead lodgepole pine. The demand for Christmas trees is expected to stay steady however with overall decreasing forest health the supply of good quality Christmas trees maybe limited.

Forecasts

The beetle epidemic in northern Colorado is part of a natural cycle. There is no threat of ecological collapse or loss of ecological function from an epidemic. Forest have adapted to disturbance as part of the ecosystem process. Short-term changes can be dramatic and sustancial, but forest are anticipated to regenerate and thrive again. Disturbance becomes problematic when it threatens the uses for which we manage the forest. Insect and disease epidemics are a huge disruption to subalpine ecosystems having significant effects that are likely to have management repercussions for a long time in the future. Large scale forest mortality will increase wildfire hazard and severity which could significantly alter water yield and quality, key wildlife habitat and impact local economies and infrastructure. Forest management activities will have profound shifts in age class structure, species diversity and the amount of live verses dead biomass; either remaining or potentially removed.

Forest health and timber stand improvement activities will continue to be emphasized. Forest activities will be designed to reduce the size and intensity of existing and imminent disease and insect epidemics and to reduce the hazard of large scale high intensity wildfires. The merchantability for sawlog products for the lodgepole pine affected by mountain pine beetle will continue to decline as the dead trees crack and begin to rot at the stump. An accelerated harvest program for five to ten years is needed to salvage the dead and dying lodgepole pine trees before their economical value is lost. The development of biomass and other markets for the dead trees will be critical so that transportation and handling costs remain reasonable

and economical. The continued feasibility to harvest and sell dead trees is essential to managing aging forest that is dying.

The forest health concern affects forested lands across multiple jurisdictions. There will continue emphasis to work cooperatively and collaboratively with other land management agencies, local governments and private land owners to address large scale landscape forest health issues. By working cooperatively we are able to share collective resources and improve project efficiency and effectiveness.

3.2.6 Lands and Realty

Current Conditions (includes Roan Plateau RMPA planning area)

Of 568,055 acres of the BLM-administered lands, approximately 561,496 (99 percent) are federally owned subsurface minerals. Additionally, there are approximately 206,763 acres of federally owned subsurface minerals under private and state surface lands. All of these lands are managed in accordance with the 1984 RMP (revised in 1988), the Oil and Gas Leasing and Development RMP (approved March 1999), and the Roan Plateau RMPA (approved June 2007). The Land Status map in **Appendix E** shows the land status by ownership in the GSFO.

BLM public lands are used for a wide variety of purposes. Major focus areas for the lands and realty program include land tenure adjustments, mineral estate, ROWs, and communication sites, which are further discussed below. Wind and solar renewable resource production is permitted by ROWs through the lands and realty program.

Acquisitions

Acquisitions via exchange, purchase of land and easements, or donations are important components of the BLM's land management strategy. The agency acquires land when it is in the public interest and consistent with the approved land use plans. The BLM's land acquisition program is designed to accomplish the following:

- Improve management of natural resources through consolidation of public, state trust, and other federal lands where agencies have compatible land management missions;
- Secure key property necessary to protect endangered species, promote biological diversity, increase recreational opportunities, enhance wildlife habitat, provide access to public waters and public land, and preserve archaeological and historical resources; and
- Implement specific acquisitions authorized by acts of Congress by acquiring minimal nonfederal lands or interests in lands.

Land Tenure Adjustments

The BLM classifies all of its public lands into three categories with regard to their potential for disposal or retention.

- Category I (Disposal)—Judged suitable for disposal by sale, usually because they are small isolated tracts that cannot be effectively manage;
- Category II (Exchange)—Managed for multiple use and cannot be sold but can be exchanged for other properties or made available for disposal under the terms of the Recreation and Public Purposes (R&PP) Act of 1926. Applications under this act are considered on a case-by-case basis. Applications under the Desert Land Entry Act or General Allotment Act of 1887 are rejected in Category II lands; and
- Category III (Retention)—Must be retained to satisfy a specific management requirement. Public land designated as a WSR or ACEC would be placed in this retention category.

The BLM may acquire land through exchange with other entities. In-holdings may be acquired if they become available for purchase or exchange. The BLM also occasionally receives donated land or interests in land where an entity elects not to receive the fair market value for the interests being conveyed.

The BLM's general sale authority for public land is Section 203 of FLPMA (1976); however, the agency does not offer much land for sale. FLPMA requires that public land be retained in public ownership, unless, as a result of land use planning, disposals of certain parcels are warranted. Also, tracts of land that are designated in BLM land use plans as potentially available for disposal are likely to be conveyed out of federal ownership through an exchange rather than a sale. Public land must be sold at not less than fair market value and must meet very specific sale criteria of FLPMA. Public land proposed for sale generally has low resource value.

The most recent exchange, the Ryan Land Exchange, authorizes the BLM dispose of 40 acres to Pitkin County. The Land Tenure map in **Appendix E** shows areas suitable for disposal as identified in the 1984 RMP.

Rights-of-way

The GSFO RMP planning area covers approximately 2,906,461 acres of federal, state, and private land in Eagle, Garfield, Pitkin, Rio Blanco, Mesa, and Routt Counties in central Colorado. Eighty percent of the GSFO public land borders private land. Therefore, authorizations to permit uses of public lands are in high demand, including intentional and unintentional trespass.

For enduring surface-disturbing uses of public lands that are not within the scope of the mining laws and regulations, the BLM issues leases, permits, and ROWs under the authority of Section 302 of FLPMA. Leases are used primarily for the benefit of local governments, special districts, or public groups, in accordance with the terms of the R&PP Act of 1926. In general, leases are for long-term land uses, while permits are used to authorize short-term land uses.

The most common form of authorization to permit uses of public lands by commercial, private, or governmental entities is the ROW, which is used to permit private and public roads that cross public lands, pipelines not within the boundaries of an oil and gas lease, public utilities, communications facilities, reservoirs, and a variety of other purposes. Some authorization to permit uses of public lands occurs through land use permits. They are authorized under 43 CFR § 2800 and 43 CFR § 2900 respectively.

It is the responsibility of the BLM to protect the public's best interest in regard to its managed lands. Over the years, individuals have built structures for various purposes (e.g., occupancy, commercial uses, recreational uses) with no regard for who actually owned the land on which they built. The GSFO is attempting to manage this problem through a program of detection, control, and abatement. While the inventory is not complete, there is a large number of trespasses that have already been identified.

Communication Sites

The 1984 GSRMP designated six areas (Monument Peak, Doghead Mountain, Sunlight Mountain [in conjunction with the White River National Forest], Bellyache Ridge, and Lookout Mountain) as communication sites and to prepare management plans. There are now 24 communication sites and many electricity and telephone corridors (above and below ground) that serve the public throughout the GSFO RMP planning area.

Beginning in 2007, individual site plans to designate current and future communication sites are being written based on priority (such as complexity and overload of users). The purposes of writing communication site plans are as follows:

- Selected management strategy;
- Location of new facilities and no build zones;
- Access requirements;
- Use of existing facilities, shared building/tower space;
- Multiple-use terms and conditions; and
- Areas closed or excluded from communication site development.

Designating sites provide direction for the following:

- Management direction/philosophy and objectives;
- Management constraints (technical limitations, noise floors, compatible uses);
- Electronic conflicts (frequencies and power);

- Environmental concerns (soil stability, earthquake, and avalanche hazards, threatened and endangered species, migratory birds, cultural and historical); and
- Site coverage and area served (population zones for rental purposes).

Several initiatives directed federal agencies to provide a high level of customer service to telecommunications carriers. These are as follows:

- 1995 President's Executive Memorandum, dated August 10, 1995, and states, "1. (a) agencies shall make available Federal government buildings and lands for the siting of mobile service antennas in accordance with: Federal, State, and local laws and regulations...;
- Telecommunications Act of 1996; and
- General Service Administration Bulletin 1997.

Utility Corridors

Section 368 of the Energy Policy Act of 2005, Public Law 109-58 (H.R. 6), enacted August 8, 2005, directs the Secretaries of Agriculture, Commerce, Defense, Energy, and the Interior to designate under their respective authorities corridors on federal land in 11 western states for oil, gas, and hydrogen pipelines and electricity transmission and distribution facilities. The West-wide Energy Corridor PEIS tentative approval date is August 2007.

The proposal includes a multi-modal (use) corridor following the I-70 corridor from Silt, running west. The other multi-modal corridor would be a north/south route following Highway 13.

Indicators

There are many utility ROWs throughout GSFO, and no new ROWs are anticipated.

Trends

The majority of utility (and associated facilities") ROWs have been in place well over 30 years. It is anticipated that the infrastructure would require replacement or upgraded technology.

Forecast

Corridors are preferred routes for transportation and transmission facilities. Identification of corridors does not preclude location of transportation and transmission facilities in other areas, if environmental analysis indicates that the facilities are compatible with other resource values and objectives. Further identification of corridors does not mandate that transportation and transmission facilities will be located there if they are not compatible with other resource uses, values, and objectives in and near the corridors or if the corridors are saturated. Each ROW application will be reviewed and analyzed using the environmental data which

exist for the area as a basis to determine compatibility with existing uses and resource values.

3.2.7 Transportation Facilities and Access

The BLM's transportation system represents one of the most critical assets to the accomplishment of the BLM's mission to manage the public lands. It affords entry for public access and provides the infrastructure that supports uses ranging from recreation to commercial activity and is the primary means of access to public lands under BLM GSFO jurisdiction.

Current Conditions

Federal, State, and County Roads

A network of federal, state, and county roads provides access throughout the GSFO RMP planning area. I-70 bisects the GSFO RMP planning area, bringing traffic to the region from throughout the US.

Traffic volumes on the road network are highly variable. The highest volume counts are found on major roadways in or near the largest communities. I-70 and state highways (Highway 82, Highway 13, Highway 131) carry the largest traffic volumes, followed by county roads.

BLM Roads

BLM roads provide public and administrative (agency and permittee) access to public lands, through public lands, and to in-holdings of private land within the GSFO RMP planning area. Reasonable administrative access is made available to persons engaged in valid uses, such as mining claims, mineral leases, livestock grazing, and recreation. Most use of BLM roads would be described as casual.

Related to transportation planning is travel management. Travel management (Section 3.2.4) is the identification, through RMP planning, of areas where foot, pack stock, and mechanized and motorized vehicle travel is appropriate, restricted, or not allowed, depending on resource objectives and use considerations. See travel management section (3.2.4) for comprehensive travel management.

Road System Maintenance

The BLM maintains roads under standards set forth in BLM 9100 Series Manuals and the GSFO RMP. Maintenance provides for resource protection, accommodation of users, and protection of the BLM's investment. The BLM has the road maintenance levels described in **Table 3-27**.

Appendix D, Glenwood Springs Field Office System Roads and Maintenance Levels, contains a list of BLM GSFO system roads and the maintenance level. The Transportation map (**Appendix E**), displays the locations of maintained roads. Road system maintenance has focused on maintaining major recreational access roads, which generally receive most of the traffic volume. The BLM engineering field office

annually maintains about 120 to 130 miles of road within the GSFO RMP planning area, depending on road conditions and funding availability. Approximately 120 miles are planned for Fiscal Year 2007. Road maintenance generally consists of blading or grading. It is usually performed in the summer or fall. Additional corrective maintenance or water drainage work (installation of culverts, drains, or other water management devices) is performed as needed, such as after periods of heavy rainfall. Snow is not removed.

Table 3-27
Road Maintenance Levels

Level 1	Assigned to roads where minimum maintenance is required to protect adjacent lands and resource values. These roads are no longer needed and are closed to traffic. The objective is to remove these roads from the transportation system.
Level 2	Assigned to roads where the management objectives require the road to be opened for limited administrative traffic. Typically, these roads are passable by high clearance vehicles.
Level 3	Assigned to roads where management objectives require the road to be open seasonally or year-round for commercial, recreational, or administrative access. Typically, these roads are natural or aggregate surfaced but may include low use bituminous surfaced road. These roads have a defined cross section with drainage structures (e.g., rolling dips, culverts, or ditches). These roads may be negotiated by passenger cars traveling at prudent speeds. User comfort and convenience are not considered a high priority.
Level 4	Assigned to roads where management objectives require them to be open all year (except that they may be closed or have limited access due to snow conditions) and which connect major administrative features (such as recreational sites, local road systems, administrative sites) to county, state, or federal roads. Typically, these roads are single or double lane, aggregate or bituminous surface, with a higher volume of commercial and recreational traffic than administrative traffic.
Level 5	Assigned to roads where management objectives require the road to be open all year and are the highest traffic volume roads of the transportation system.

Functional Road Classification Types for BLM System Roads

Based on BLM Manual, Section 9113, Roads, roads on BLM lands are classified based on the amount of traffic movement, into three classes: collector, local, and temporary resource roads. Collector roads (Level 4 or 5) generally provide access to large land tracts and are the major access routes into development areas with relatively high average daily traffic rates. They usually connect with or are extensions of public road systems and are operated to support long-term land uses. Local roads (Level 4 or 3) normally serve a smaller area and have lower traffic volumes than collector roads. They connect with collectors or public road systems. In mountainous terrain, local roads may be single-lane roads with turnouts. Resource roads (Level 2) generally are point access or spur roads that connect with local or collector roads and carry low traffic volumes.

Appendix C contains a list of BLM GSFO system roads and the maintenance level. The Transportation map (**Appendix E**), displays the locations of maintained roads.

Collector Roads (Level 4 or 5)—These BLM roads normally provide primary access to large blocks of land and connect with or are extensions of a public road system. They accommodate mixed traffic and serve many uses. They generally receive the highest volume of traffic of all roads in the BLM road system. User cost, safety, comfort, and travel time are primary road management considerations. Collector roads usually require application of the highest standards used by the BLM.

Local Roads (Level 4 or 3)—These BLM roads normally serve a smaller area than collectors and connect to collectors or public road systems. Local roads receive lower volumes, carry fewer traffic types, and generally serve fewer users. User cost, comfort, and travel time are secondary to construction and maintenance cost considerations. Low volume local roads in mountainous terrain, where operating speed is reduced by terrain, may be single-lane roads with turnouts. Environmental impacts are reduced because steeper grades, sharper curves, and lower design speeds than would be permissible on collector roads are allowable.

Resource Roads (Level 2)—These BLM roads are spur roads that provide point access and connect to local or collector roads. They carry very low volume and accommodate only one or two types of use. Use restrictions are applied to prevent conflicts between users needing the road and users attracted to the road. The location and design of these roads are governed by environmental compatibility and minimizing bureau costs with minimal consideration for user cost, comfort or travel time.

Gas Development-related Transportation Issues. Road capacity, maintenance, and safety issues from gas development-related traffic are an issue in the western part of the GSFO RMP planning area where gas resources are being developed. A short-term increase in the volume of both heavy and light traffic occurs during the construction, well drilling, and completion phases of developing gas resources. Temporary conflicts (including a potential for delays, dust, road degradation and increased vehicle safety) occur during the construction/drilling phase and recompletion/workover activities. County roads also are affected by heavy equipment use, fugitive dust, and traffic-related noise. All associated impacts are lower after gas wells are in operation because traffic levels drop.

Many existing unimproved roads have been repaired and improved to accommodate the increase traffic and heavy equipment. Many new roads have also been created to facilitate gas production by providing access to the many gas wells. These new roads across public lands are often only open to gas development personnel for administrative vehicle access.

Airports and Railroads. There are four public airports in the GSFO RMP planning area. Aspen-Pitkin County Airport is west of the Aspen, the Eagle County Regional Airport is between Eagle and Gypsum, the Glenwood Springs Municipal Airport is south of Glenwood Springs, and the Garfield County Regional Airport is south of Rifle.

The one major rail line that serves the GSFO RMP planning area is the Union Pacific, which enters the GSFO RMP planning area at State Bridge and follows the Colorado River west past DeBeque.

Trends and Forecast

Maintenance costs are rising and each year BLM maintains less miles of BLM Roads. With flat federal budgets and rising fuel and equipment costs for contractors it is likely that this trend will continue in the future.

3.2.8 Renewable Energy

Current Conditions

According to the Energy Policy Act of 2005, if there is potential for wind energy generation with a capacity of at least 10,000 megawatts of electricity, the BLM should approve these nonrenewable energy projects within 10 years. No applications have been received for wind energy test sites in the GSFO, nor have any applications for solar facilities been received. There has also been no interest in biomass or solar power energy within the GSFO.

According to the Energy Policy Act of 2005, the BLM is to facilitate environmentally responsible commercial development of solar energy projects on public lands and to use solar energy systems on BLM facilities where feasible. ROW applications for solar energy development projects will be identified as a high priority field office workload and will be processed in a timely manner.

According to USC 15855 (Grants to Improve the Commercial Value of Forest Biomass for Electric Energy, Useful Heat, Transportation Fuels, and Other Commercial Purposes), the Secretary concerned may make grants to any person in a preferred community that owns or operates a facility that uses biomass as a raw material to produce electric energy, sensible heat, or transportation fuels to offset the costs incurred to purchase biomass for use by such facility.

Trends

Applications for a ROW grant may be submitted for one of the following types of wind energy projects:

- A site-specific wind energy site testing and monitoring ROW grant for individual meteorological towers and instrumentation facilities with a term that is limited to three years;
- A wind energy site testing and monitoring ROW grant for a larger site testing and monitoring project area, with a term of three years that may be renewed, consistent with 43 CFR 2807.22 and the provisions of this IM beyond the initial three-year term; and

- A long-term commercial wind energy development ROW grant with a term that is not limited by the regulations, but usually in the range of 30 to 35 years.

Forecast

The demand for alternative energy-related ROWs should increase nationally, but within the GSFO the potential for biomass, wind and solar energy is low.

3.3 SPECIAL DESIGNATIONS – CURRENT CONDITIONS AND CHARACTERIZATION

3.3.1 Areas of Critical Environmental Concern

An ACEC is defined in FLPMA, Public Law 94-579, Section 103(a) as an area within the public lands where special management attention is required to protect and prevent irreparable damage to important historical, cultural, and scenic values, fish and wildlife and other natural systems or processes, and to protect life and safety from natural hazards. The BLM prepared regulations for implementing the ACEC provisions of FLPMA. These regulations are found at 43 CFR 1610.7-2(b).

Current ACECs will be reevaluated as part of the RMP revision process. This will determine if the relevant and important values of each ACEC are still present and require continued management attention, if threats of irreparable damage to these values have been identified, and if current management is sufficient to protect these values. Goals, standards, and objectives for each area will be identified, as well as general management practices and uses, including necessary constraints and mitigation measures (see BLM Manual 1613).

Current Condition

There are six ACECs within GSFO BLM-administered lands of the RMP planning area, totaling 25,013 acres (ACECs and Special Management Designations maps, **Appendix E**). The size of each area and the values it is designed to protect are listed in **Table 3-28**, below. The values for which these six ACECs were designated are still present and require continued management attention.

Table 3-28
ACECs in the Glenwood Springs Field Office

ACEC	Public Land Area (in acres)	Values
Deep Creek	2,470	Scenic quality
Bull Gulch	6,714	Scenic quality
Blue Hill Archaeological District	4,718	Archaeological values
Thompson Creek	4,286	Geological, ecological, cultural values and scenic quality and to provide for educational and primitive recreation.
Glenwood Springs Debris Flow Hazard Zone	6,675	Mud and Debris flow
Lower Colorado River Cooperative Management Area	150	Riparian and Wildlife values

Indicators

Management prescriptions that arise from an ACEC designation are determined at the time the designation is made and are designed to protect and preserve the values or serve the purposes for which the designation was made. In addition, ACECs are protected by the provisions of 43 CFR 3809.1-4(b)(3), which requires an approved plan of operations for activities (except casual use) under the mining laws. The EIS for the revised RMP will identify a reasonable range of alternatives that will include current management for these areas.

Trends and Forecast

Current uses are mostly recreational and include hiking, hunting, fishing, wildlife viewing, caving, horseback riding, photography, and camping. More recently new uses, such as mountain biking and rock climbing, are growing in certain areas.

Increased human use and surface-disturbing activities (particularly with climbing) pose a threat to the relevant and important values and preservation of the Thompson Creek ACECs primitive setting and relatively undisturbed condition. Travel management needs to address the sole motorized access route through the ACEC that was never closed in accordance with the 1984 RMP decision.

An increase in recreation uses along the Deep Creek ACEC has created evident campsites along the creek bottom, particularly within the first half mile. In addition motorized travel coming from the Onion Ridge open area continues to breach the nonmotorized designation within the Deep Creek ACEC along the northern boundary.

The Glenwood Springs Debris Flow Hazard Zone ACEC was affected by the 2003 Coal Seam Wildfire, but an extensive rehabilitation effort has restored soil stability on the hillsides around Glenwood Springs.

The Lower Colorado River Cooperative Management Area ACEC contains 150 acres of public land. In 2004, PFC assessment was conducted on five river parcels of public land (one of the parcels is under a title dispute. At the time of this AMS was prepared, the BLM is still investigating the title issue), from Rifle to Parachute within the Lower Colorado River Cooperative Management Area ACEC. The riparian areas for all five parcels (totaling three linear miles of riparian areas) were determined to be in PFC. Noxious weeds, such as Russian knapweed, tamarisk, and Canada thistle, were the only resource concerns listed on the assessment report.

3.3.2 Wilderness Study Areas

In 1964, Congress passed the Wilderness Act, thereby establishing a national system of lands for the purpose of preserving a representative sample of ecosystems in a natural condition for the benefit of future generations. Until 1976, most land considered for, and designated as, wilderness was managed by the NPS and USFS. With the passage of FLPMA in 1976, Congress directed the BLM to inventory, study, and recommend which public lands under its administration should be designated wilderness. Through this

process, Castle Peak, Bull Gulch, Hack Lake, and Eagle Mountain were identified as WSAs; Grand Hogback, Storm King, Thompson Creek, Pisgah Mountain did not qualify as WSAs.

Current Conditions

There are no congressionally designated wilderness areas within the GSFO RMP planning area. In 1991, BLM Colorado completed wilderness recommendations for 54 WSAs in the state. These recommendations were developed from the findings of a 15 year wilderness study process. The wilderness studies considered each area's resource values, present and projected future uses of the areas, public input, the manageability of the areas as wilderness, the environmental consequences of designating or not designating the areas as wilderness, and mineral surveys. Based on the review, 10,754 acres within three WSAs should be designated as part of the National Wilderness Preservation System (**Table 3-29**). A discussion of the current resource values and uses found in each WSA, identified in 1991, under the authority of Section 603 (c) of FLPMA, can be found in the Colorado BLM Wilderness Study Report.

Table 3-29
Wilderness Study Areas in the GSFO RMP Planning Area

Proposal Name	Acres Recommend for Wilderness*	Nonwilderness Acres*
Bull Gulch	10,414	4,586
Castle Peak	0	11,940
Eagle Mountain	330	0
Hack Lake	10	0
Total	10,754	16,526

Source: BLM 1991a

These four WSAs (depicted in the Special Management Designations map, **Appendix E**), established under the authority of Section 603(c) and 202 of FLPMA, are being managed to preserve their wilderness values according to the interim management policy and will continue to be managed in that manner until Congress either designates them as wilderness or releases them for other uses. Activities that would impair wilderness suitability are prohibited in WSAs. There are six primary provisions of FLPMA with regard to interim management of WSAs:

- WSAs must be managed so as not to impair their suitability for preservation as wilderness;
- Activities that are permitted in WSAs must be temporary uses that create no new surface disturbance nor involve permanent placement of structures;
- Grazing, mining, and mineral leasing uses that existed on October 21, 1976, may continue in the same manner and degree as on that date, even if this would impair wilderness suitability of the WSAs;

- WSAs may not be closed to appropriation under the mining laws to preserve their wilderness character;
- Valid existing rights must be recognized; and
- WSAs must be managed to prevent unnecessary or undue degradation.

Only Congress can designate the WSAs established under Section 603 of FLPMA as wilderness or release them for other uses. The status of the existing WSAs will not change as a result of the GSFO resource management planning process and revision of the RMP. A discussion of the current resource values and uses in each WSA can be found in the Colorado BLM Wilderness Study Report, volume four, pages 427-549, Grand Junction District Study Areas.

Should any of these WSAs be released from wilderness consideration by Congress and subsequently released from management under the interim management policy, subsequent planning documents will prescribe how these lands will be managed.

The following is a brief description of each WSA.

Bull Gulch WSA

The Bull Gulch WSA is in Eagle County 10 miles northwest of Eagle, Colorado.

Natural Values

- Diverse landscapes, including alpine zones, giving way to colorful canyons and cliffs along the Colorado River drainage;
- Outstanding geologic features of sedimentary and volcanic origins;
- Habitat for deer, elk, bobcat, Rocky Mountain bighorn sheep, mountain lion, potential habitat for lynx, prairie falcons, bald eagles, sage grouse;
- Outstanding scenery with colorful cliffs; and
- Elevations range from 6,400 feet along the Colorado River to 10,020 feet along the rim in the Black Mountain area.

Current Uses

- Hiking, hunting, camping, horseback riding, wildlife viewing, floatboating, fishing, photography;
- Cattle and sheep summer grazing with three permittees on two allotments; and
- Big game hunting/outfitting and commercial floatboating and fishing along the Colorado River on the western boundary.

Valid Existing Rights

- 636 acres are in split estate owned by the State of Colorado;

- Part of the WSA along the western boundary is under a power site withdrawal;
- No ROWs exist; and
- Seventeen water rights recorded (State Water Resources Division).

Management Prescriptions

- 14,364 acres are closed to OHV travel;
- 15,201 acres are WSA status, managed under interim management policy, and provide for semiprimitive nonmotorized recreation opportunities;
- 10,214 acres are designated as an ACEC for scenic values, unsuitable for utility and communication facilities;
- Land within the WSA is not available for leasing and contains no current leases;
- 10,436 acres are managed under Bull Gulch SRMA for diverse semiprimitive recreation opportunities; and
- Managed for VRM Class I.

Castle Peak WSA

The Castle Peak WSA is in Eagle County, approximately eight miles north of the town of Eagle.

Natural Values

- Subalpine Douglas-fir and spruce-fir forest, sagebrush ecosystems, and numerous aspen stands;
- Stream and lake riparian and aquatic habitat;
- Mountain scenery, Castle Peak geologic feature;
- Elk calving, black bear, deer, mountain lion habitat, prime goshawk habitat, potential habitat for Canada lynx; and
- Elevations range from 8,400 feet to 11,275 feet on Castle Peak.

Current Uses

- Hiking, hunting, camping, horseback riding, wildlife viewing, photography;
- Cattle and sheep summer grazing with three permittees on two allotments; and
- Big game hunting/outfitting and three commercial four-wheel drive tour operators on boundary roads of WSA.

Valid Existing Rights

- Water rights on five springs, one ditch, and one reservoir;
- 54 water rights recorded (State Water Resources Division); and

- No ROWs exist.

Management Prescriptions

- 12,237 acres are closed to OHVs;
- 12,237 acres are under WSA status, managed under interim management policy to provide for semiprimitive nonmotorized recreation opportunities;
- Lands in the WSA are not available for leasing and contain no current leases; and
- Managed for VRM Class II.

Eagle Mountain WSA (Maroon Bells-Snowmass Wilderness Addition)

The Eagle Mountain WSA is in Pitkin County, approximately eight miles west of Aspen.

Natural Values

- Steep rugged slopes including Eagle Mountain Peak which serves as a connection to the existing Maroon Bells-Snowmass Wilderness Area;
- Diverse vegetation cover, including aspen and spruce-fir forest and outcrops of sandstone formations;
- High scenic quality of the adjacent high mountain peaks in the Maroon Bells-Snowmass Wilderness area; and
- The elevation ranges from 8,280 feet up to a peak elevation of 9,937 feet.

Current Uses

- Hiking, hunting, wildlife viewing, camping; and
- Cattle summer grazing on one allotment.

Valid Existing Rights

- Eleven unpatented lode claims in the area;
- One water right recorded (State Water Resources Division); and
- No ROWs exist.

Management Prescriptions

- Livestock grazing on two allotments;
- 330 acres are open to OHV travel;
- 330 acres are under WSA status, managed under interim management policy;
- 330 acres are managed to provide for semiprimitive motorized recreation opportunities;
- Land within WSA is not available for leasing and contains no current leases; and

- Managed for VRM Class II.

Hack Lake WSA

The Hack Lake WSA is in Garfield County, approximately 22 miles northeast of Glenwood Springs. The WSA consists of two small parcels, totaling approximately 10 acres of BLM lands and federal minerals.

Natural Values

- Diverse vegetation encompassing the sagebrush zone up to the aspen and spruce-fir zone, with moist swamp areas and open grassy parks;
- High scenic quality of the adjacent cliffs of the Flat Tops Wilderness Area, panoramic views of distant mountain ranges;
- Surrounded by glacial moraine, steep rugged cliffs, and rocky outcrops;
- Includes aquatic and riparian habitat;
- Habitat for deer, elk, Rocky Mountain bighorn sheep, badger, blue grouse, beaver, and waterfowl and potential habitat for Canada lynx;
- Includes part of a historic Ute Trail; and
- Elevation ranges from 7,700 to 11,000 feet.

Current Uses

- Hiking, hunting, fishing, wildlife viewing, camping, horseback riding;
- Summer cattle grazing on two allotments; and
- Commercial horseback riding trips.

Valid Existing Rights

- Two water rights recorded (State Water Resources Division);
- No current oil and gas leases; and
- Closed to mineral material sales and is proposed for mineral withdrawal.

Management Prescriptions

- 3,100 acres are closed to OHV travel;
- 10 acres are in WSA status and managed under interim management policy;
- 10 acres are managed to provide for semiprimitive nonmotorized recreation opportunities under an SRMA;
- NSO stipulation is in place within SRMA for oil and gas development; and
- Managed for VRM Class II.

Characterization

According to WSA monitoring reports, no major impairment has occurred on any of the WSAs. Minimal vehicle violations and fire suppression activities were noted.

Recreational use and related impacts on naturalness and opportunities for solitude are continuing to increase within the Bull Gulch WSA, along the Colorado River, particularly at Jack Flats. Both permitted commercial and private floatboaters use this area frequently overnight due to the limited opportunities for camping along the river below Catamount.

Eagle Mountain (Maroon Bells-Snowmass Addition) has an open travel designation. Motorized and mechanized vehicles are not limited to existing routes, and cross-country travel is allowed. In order to protect the WSAs, consistent with the BLM's interim management policy for lands under wilderness review, alternatives must close the Eagle Mountain WSA (330 acres) to motorized and mechanized vehicle use, including snowmobiles and mountain bicycles, to be compatible with this objective. In addition, this would bring these lands in line with management of the adjacent Maroon Belles Wilderness.

Some travel violations continue to occur along the southern portions of the Bull Gulch WSA due to the open vegetation and topography. Several reclamation projects have occurred in Bull Gulch and Castle Peak WSAs since they were closed to motorized and mechanized uses under the Castle Peak Travel Management Plan. Based on this information, current management is successfully protecting the wilderness characteristics within all WSAs.

Citizens Proposed Wilderness for BLM Lands

In 1994, Colorado conservationists presented to BLM a bound volume entitled "*Conservationists' Wilderness Proposal for BLM Lands*" that included the compilation of numerous citizen wilderness inventories and the area-by-area justification for the statewide Citizens' Wilderness Proposal. The 1994 Citizens' Wilderness Proposal included six areas within the GSFO RMP planning area: Bull Gulch, Castle Peak, Deep Creek, Flat Tops Addition, Maroon Bells-Snowmass Addition, and Thompson Creek.

In 2001, based on new citizen inventories, the Citizens' Wilderness Proposal was expanded to include areas on the Grand Hogback and the Roan Plateau. Being newly acquired lands, wilderness inventories were conducted in the Roan Plateau RMPA planning area under the general inventory and planning authority of Sections 201 and 202 of FLPMA. Refer to the Roan Plateau RMPA and Final EIS, August 2006.

Table 3-30 identifies the seven proposed wilderness areas and acreages within the Glenwood Springs RMP planning area.

Under the authority of 43 USC 1712 (Sec. 202 of FLPMA), the BLM has discretion to manage lands to protect and maintain wilderness characteristics and character. The BLM will continue to manage public lands according to existing land use plans in the event new information (e.g., in the form of new resource assessments, wilderness inventory areas or citizens proposals) is considered in this land use planning effort

**Table 3-30
Citizens Proposed Wilderness for BLM Lands**

Proposal Name	Conservationists' Recommendation (in BLM GSFO acres)
Bull Gulch	15,155
Castle Peak	16,263
Deep Creek	4,418
Flat Tops Addition (Hack Lake)	3,542
Grand Hogback	11,681
Maroon Bells-Snowmass Addition(Eagle Mt.)	316
Roan Plateau	40,454
Pisgah Mountain	15,679
Thompson Creek	8,248
TOTAL	115,226

3.3.3 Wild and Scenic Rivers

Refer to the WSR Eligibility Report for the Glenwood Springs and Kremmling Field Offices on the Internet at http://www.blm.gov/rmp/co/kfo-gsfo/documents/FinalEligibilityReport_Mar2007.pdf. The Eligible Wild & Scenic River Segments map in **Appendix E** shows the eligible segments within the GSFO.

3.3.4 Backcountry Byways/National Trails

The Backcountry Byways & Scenic Drives are part of the National Scenic Byway system. Unlike most scenic byways, which are located on paved highways, backcountry byways focus on the out-of-the-way sights to be found on gravel, dirt, or paved roads. These are routes that may not be suitable for all vehicles. However, for those with appropriate vehicles, the backcountry byway program can offer an intimate view of a variety of areas, off the beaten path. National trails are officially established under the authorities of the National Trails System Act (16 USC 1241-51). There are several types: National scenic trails, National historic trails and National recreation trails.

The GSFO does not administer any Backcountry Byways as part of the National Scenic Byway system or National trails.

3.4 CURRENT SOCIAL AND ECONOMIC CONDITIONS AND CHARACTERIZATIONS

3.4.1 Social and Economic

Because of the high level of interest in the relationship between the management of public lands and the social and economic health of the local and regional economy, BLM has procured the services of a contractor to develop both the socio-economic baseline study for the RMP planning area and to conduct the analysis of impacts of the alternatives identified during the planning process.

The study and impact analysis will be incorporated into the RMP/Draft EIS at a later time and available on the RMP revision Web Site: <http://www.blm.gov/rmp/co/kfo-gsfo/index.htm> by fall of 2007.

However, in the fall and winter of 2006, The Keystone Center held 19 small group discussions with representatives of local governments in north-central Colorado. These discussions were held on behalf of the BLM as part of the pre-planning process in advance of the revision of the RMPs for the GSFO and the KFO. The interviews had 3 primary goals:

- To gather input from communities about their vision for the landscape and the benefits they seek from public lands.
- To set the stage for strategic planning options.
- To foster collaborative relationships in which information is continually shared and updated throughout the planning process.

The findings are available in a report titled “The North-Central Colorado Community Assessment Report for the Bureau of Land Management Glenwood Springs Field Office and Kremmling Field Office”. The report is available on the RMP revision Web Site: <http://www.blm.gov/rmp/co/kfo-gsfo/index.htm>.

Some general social-economic issues affecting public lands in the region the region include:

- Urbanization;
- Energy development;
- Transportation and commuting;
- Increased local and national demand on public lands for recreation, open space, and visual aesthetics;
- Increased impacts of public land visitors, especially OHVs, on natural and cultural resources;
- Changes in ecological conditions and reduced quality of wildlife habitat, (i.e. migration corridors and winter range conditions);
- Increased threat to communities from wildland fire;
- Changing demographics and economies; and
- Changes in ecological conditions.

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CHAPTER 4

MANAGEMENT OPPORTUNITIES / MANAGEMENT ADEQUACY

4.1 AIR QUALITY

Under FLPMA and the Clean Air Act, the BLM cannot conduct or authorize any activity that does not conform to all applicable federal, tribal, state, and local air quality laws, statutes, regulations, standards, and implementation plans.

Air pollution impacts regulations, standards, and implementation plans are administered by CDPHE-APCD. Colorado regulations require that proposed air pollutant emission sources—including dehydrators, separators, and natural gas compressors—undergo a permitting review. Therefore, CDPHE-APCD has the authority to review emission permit applications and to require emission permits, fees, and control devices before construction and operation. In addition, Section 116 of the Clean Air Act authorizes tribal, state, and local air quality regulatory agencies to establish air pollution control requirements more (but not less) stringent than federal requirements. Additional site-specific air quality analysis would be performed, and additional emission control measures, including Best Available Control Technology, may be required to protect air quality resources.

The revision of the Glenwood Springs RMP may need to update the objectives for air quality, describe the current condition of air resources within the GSFO RMP planning area, provide actions or limitations to manage air resources, conduct appropriate analysis of impacts on air quality, ensure conformance with Colorado's State Implementation Plan, and provide for collaboration on regional issues with local, state, and federal agencies.

4.2 GEOLOGY

The RMP revision process provides an opportunity to evaluate the need for geology-related objectives, allowable uses and management actions.

4.3 SOIL RESOURCES

Ability of Current Management Direction to Achieve Desired Conditions and Address Resource Demands

The following changes could be implemented in the revised RMP:

- Define reasonable exceptions to soil-related stipulations. For example, trail projects and other activities are or are not exempt from construction in NSO/NGD designated areas.
- Routt County and small portions of the planning area require soil surveying and subsequent GIS mapping. Collaborative projects with the NRCS should be pursued to assist in the mapping and soil survey effort.
- Continue to designate the Glenwood Springs Debris Flow Zone ACEC with specific language to address fuel reduction and applicable activities that do not disturb soils on a large scale.
- Reassess decisions made in the Roan Plateau RMPA and EIS to ensure adequate protection of soil resources.

See **Table 4-1**.

Table 4-1
Adequacy of Current Soils Management Direction and Options for Change

Planning Decision¹	Is Decision Responsive to Current Issues?	Remarks (Rationale)	Options for Change
Erodible soils and slopes greater than 30 percent CSU stipulation.	Yes	This CSU is presently protecting soils and improving water quality in most watersheds.	Generally address what proposed actions would be exempt and where no exception would be applied.
Steep slopes, slopes >50 percent NSO stipulation	No	Depending on management discretion, this NSO has been ignored for some uses, such as trails.	Generally address what proposed actions would be exempt and where no exception would be applied.
Manage soil resources to meet Colorado standards and guidelines.	Yes	Soil resources should continue to be protected.	No changes needed.

¹Roan Plateau RMPA is not covered in this table because the plan is not yet implemented.

GSFO Staffing

Current staffing has soil/air/water resources grouped in the 1010 program as a shared duty within the range program (1020). The 1010 duties would be better handled by a staff member who has greater expertise in geology and hydrology. By employing a hydrogeologist would allow the BLM to take advantage of his or her

expertise in a number of resources, including soils. In an atmosphere of continuing budget reductions and attrition in offices where the GSFO has relied on shared skills, it is imperative that management reevaluate workloads and match them with the best-equipped staff to execute the job. By combining backgrounds in logical skill sets (e.g., soil/water/air, geology, mining, and hydrology), the BLM will be better able to address resource needs while meeting mandated budget limitations. Due to a lack of staff attention in some of these programs (e.g., mining law) when new demands present themselves, greater attention is needed to address the demand.

Areas of Relative Ecological Importance to Guide Land Uses and Management

Outside of protection for soils that are classified for CSU, NSO, or NGD activities, there are no known ecologically important soils that warrant further protection.

4.4 WATER RESOURCES

Ability of Current Management Direction to Achieve Desired Conditions and Address Resource Demands

See Table 4-2.

**Table 4-2
Adequacy of Current Surface Water Resources Management Direction and Options for Change**

Current Planning Decision	Is the Decision Responsive to Current Issues?	Remarks (Rationale)	Options for Change
Maintain or improve water quality in the resource area.	Yes		
Identify the origins of water quality problems and take actions to correct them: Divide Creek; Horse, Willow, and Poison Creeks; Upper Colorado River; Milk and Alkali Creeks.	Yes	Actions have been completed. Several of these watersheds have been removed from the 303(d) and monitoring and evaluation lists.	
Increase water yield throughout resource area through forest management practices and vegetation manipulation for livestock and big game forage.	No	Outdated and no longer a desirable goal due to public and political controversy.	Remove objective from RMP.

Table 4-2
Adequacy of Current Surface Water Resources Management Direction and Options for Change
(continued)

Current Planning Decision	Is the Decision Responsive to Current Issues?	Remarks (Rationale)	Options for Change
Protect the municipal watersheds of Rifle and New Castle by limiting motorized vehicle travel to designated roads and trails, prohibiting vegetation manipulations and oil and gas surface facilities, and including in fire exclusion zone. Encourage the City of Rifle and the Town of New Castle to participate in on-sites, travel management or other management actions within their watersheds.	Yes	The boundaries of BLM lands within the municipal watersheds of Rifle and New Castle should be updated, as necessary.	If BLM land ownership within the municipal watersheds has changed, the management areas should be modified to reflect current status.
Manage debris flow hazard zones adjacent to Glenwood Springs by designating as an ACE, limiting motorized vehicles to existing roads and trails, prohibiting vegetation manipulations, timber harvesting, and oil and gas surface facilities, including in fire exclusion zone, and allowing light livestock grazing only.	Yes		
Protect erosion hazard areas by limiting motorized vehicle travel to existing roads and trails, and avoid unstable or potentially unstable areas when considering new ground disturbance.	No	Enforcement needed. Many of these areas are being degraded by illegal motorized activities.	Enforce erosion hazard areas. Improve/update travel management plan to reflect resource condition and demand. Improve road surfacing, stream crossings, cutbanks, and ditches, where necessary to reduce sedimentation and improve water quality.

Table 4-2
Adequacy of Current Surface Water Resources Management Direction and Options for Change *(continued)*

Current Planning Decision	Is the Decision Responsive to Current Issues?	Remarks (Rationale)	Options for Change
Establish public land health standards and indicators for soils, riparian areas, healthy plant and animal communities, threatened and endangered species, and water quality.	Yes	Provides a systematic method for assessing resource health. Need to deal with areas not meeting land health standards.	Require LHA results to be directly tied to livestock, recreation, or other program management, i.e., set time frame to address source(s) of problem.
Land Health Standard 5: The water quality of all water bodies located on or influenced by BLM lands will meet or exceed state water quality standards.	Yes	Need to recognize that upland and riparian vegetation, recreation, livestock grazing, wildlife, and other programs all influence water quality and quantity in a given watershed.	Require active management from resource programs contributing to water quality degradation (i.e., grazing, recreation, oil and gas).
Riparian and wetland zones, major river corridors, domestic watershed areas, debris flow hazard zones, steep slope areas, and ACECs will be protected with NSO stipulations on oil and gas leases.	Yes		BLM boundaries within domestic watershed areas should be redefined as necessary to protect these sensitive resources.
CSU stipulations will be issued for riparian and wetland zones and areas with erodible soils or steep slopes.	Yes		
Avoid aerial application of retardant or foam within 91 meters of any body of water, including lakes, rivers, streams, and ponds.	Yes		
Minimize sedimentation and salinity into the Colorado River and specified tributaries by minimizing vegetation loss, placing fire lines to minimize erosion, constructing water bars, and rehabilitation affected areas.	Yes		

Table 4-2
Adequacy of Current Surface Water Resources Management Direction and Options for Change *(continued)*

Current Planning Decision	Is the Decision Responsive to Current Issues?	Remarks (Rationale)	Options for Change
Minimize vegetation loss within 91 meters of fish-occupied drainages to create buffer for sediment control.	Yes		
Most of the top of the plateau will be designated as a Watershed Management Area and protected by SSR of more than 200 meters for surface disturbance and CSU restrictions, as needed.	Yes		
Stream segments found eligible for WSR designation would be protected by an SSR/CSU restriction stipulation until a suitability determination is made.	Yes		
Soils will be managed to meet Land Health Standards, with an NGD/NSO restriction for slopes steeper than 50 percent and an SSR/CSU restriction for areas with highly erodible soils on slopes steeper than 30 percent.	Yes		
Surface water will be managed to meet all state and federal water quality standards based on NGD/NSO, SSR/CSU restrictions and BMPs.	Yes	Cumulative effects from a landscape level need to be addressed.	
Ensure authorized activities comply with all applicable water quality standards and that objectives associated with management of the watershed management area are achieved.			

A full-time hydrologist in the GSFO would greatly benefit the resource and other BLM programs. Existing water resource management is piecemeal: a short-term

hydrologist in the Pilot office works only in the oil and gas program, the Grand Junction FO hydrologist assists with LHAs and EAs, and other staffers in the FO pick up various duties including water rights work and EAs. Pro-active program planning and guidance is lacking without a hydrologist in the office.

Current management is inadequate to address the many changes that have occurred in the GSFO over the past two decades. Top among these is the scope and unprecedented rate of oil and gas development, and the rapid expansion of the WUI. The impacts of natural gas development, observed in a cumulative and regional context, are extensive. Cumulative impacts in the areas of surface and subsurface water quality, wildlife, habitat fragmentation, air quality, vegetation loss, invasive plants, and other resources need to be identified, monitored, and addressed in management actions. The energy pilot office in Glenwood Springs may have the funding and resources to take a more comprehensive approach to energy development, in addition to permit work. Since the intent of the Energy Policy Act of 2005 and the pilot office is to increase domestic energy production and offer a smoother and timelier permit process for energy companies, there may be inherent conflict between the goals of energy production and impacts analysis.

BLM management actions work best when coordinated with federal, state, and local partners. Because the BLM requires oil and gas operators to obtain necessary permits from the state and local governments, this implies that the BLM can take appropriate action if operators do not comply with this requirement. The most common example for water is a stormwater permit from the State Water Quality Control Division. Though BLM has no enforcement authority on stormwater permitting, it can ensure that operators follow applicable environment laws and regulations by linking its permit process to applicable federal, state, and local permit requirements.

The BLM has the opportunity in the RMP revision to formally seek water rights to sustain programs, including livestock, wildlife, domestic, and recreation. No planning decisions for water rights were given in the existing RMP and amendments.

Management opportunities exist for the areas detailed below, based on current conditions and trends observed during LHAs.

Recreation—In the Eagle River Valley, lower elevation areas near the I-70 corridor are seeing a significant increase in OHV activity and mountain biking. The area just east of Eagle has numerous OHV trails crisscrossing the hillsides on fragile gypsum soil. Because of these erodible soils, this area was designated as an Erosion Hazard Zone in the 1984 RMP. Erosion, gullying, soil compaction, cryptobiotic crust destruction, and loss of vegetation cover are evident in areas around Brush Creek, East and West Hardscrabble, Salt Creek, and Bellyache. Other impacts of unregulated motorized activity over the landscape include loss of the more productive top soil and increased susceptibility to water and wind erosion. Illegal OHV use is causing a failure to attain land health standards for soils and vegetation in the Eagle River South landscape. It is clear that management actions are required

to return functionality to the landscape. Erosion hazard areas were granted special management status in the RMP, but enforcement is needed to implement this landscape protection. The BLM needs to develop a travel management plan that recognizes current impacts, particularly from motorized vehicles, on resources and begin to develop management options for meeting and improving land health. Changes to open vehicular access designations may be required and will need to be enforced.

Natural Gas Development— Water quality problems particularly evident in Riley Gulch and lower Cottonwood Gulch are related to sediment. Most sediment is produced from access roads, pipelines, well pad construction, and improperly installed or maintained culverts and other stream crossings. This is causing sediment input into streams. Natural gas development is also the cause of not meeting wildlife standards. Other natural gas-related issues identified in the Rifle West area resulted in the following management recommendations:

- BMPs need to be properly implemented and maintained per Colorado Water Quality Control Division Stormwater Management Plan;
- Roads that are susceptible to erosion need to be gravel topped; and
- Unused portions of pads, roads, pipelines, and other surface disturbances need to be reclaimed with a mix of native grasses, forbs, and shrubs to meet BLM reclamation policy.

The Wasatch-influenced and sparsely vegetated watersheds on the north side of the Colorado River generally have elevated sediment, salinity, bicarbonate, and sulfate in surface waters. This makes the area particularly susceptible to erosion and water quality pollution and, as such, should be managed with attention to detail in planning and implementing stormwater management practices.

Urban Development—A rapidly growing WUI is placing pressures on natural resources within the management area. Recreational use and demand should be addressed in a comprehensive travel management plan. Rapid growth and encroachment of communities onto public lands brings many challenges for the BLM. Among these are unprecedented growth of OHV use, motorcycling, mountain biking, and other recreational uses. Impacts on water quality and water flow result from these and other changes related to housing development and infrastructure creation. Eagle River Valley, especially north of the Eagle River, is experiencing dramatic growth. Development of private lands bordering BLM lands reduces the buffer between public and private. Also, landlocked private lands within federal land are being developed for residential housing, ranchettes, and commercial and industrial facilities. Both kinds of development are causing wildlife habitat fragmentation and increasing fire hazards (see below). Support infrastructure such as roads, powerlines, and water and sewage pipelines also bisect the landscape. Growth of Rifle, New Castle, and other towns along the Colorado River corridor is also expediting both authorized and illegal uses of public lands adjacent to this area.

Fire Suppression and Vegetation—A history of fire suppression on public lands is partly responsible for the current status of decadent shrubs with poor vigor, little regeneration, and encroachment of pinyon-juniper in many places within the resource area. The BLM needs to take an active approach to diversify plant communities, which will lead to improved soil conditions and water quality. Vegetation treatments, including prescribed burns and mechanical treatment, are needed to restore ecological integrity from decades of fire suppression policy. Urban development along and within public lands is increasing human-induced fire hazards, an issue that should be addressed in the RMP revision and FMP. Decadent vegetation is a problem in areas like Rifle West and the Eagle River Valley. A sustainable grazing program will also have a positive impact on vegetative health.

4.5 VEGETATIVE COMMUNITIES

Forests, Woodlands, and Rangelands

Ability of Current Management Direction to Achieve Desired Conditions and Address Resource Demands

The revised RMP should establish more specific and measurable objectives for vegetation resources that are based on desired vegetative condition, composition, cover, seral stages, and patch size.

There is currently no staff member whose primary responsibility is noxious weed management. At present, this is being addressed at a very minimal level by two staff members as collateral duties. One individual handles the County Cooperative Weed Agreements and the other individual addresses noxious weeds and invasive species sections in NEPA documents. There is insufficient staff to operate a proactive weed management program, which includes inventory, coordinated efforts at weed control, monitoring effectiveness of treatments, development of partnerships, leveraging federal funds via grant applications, and educating the public. Noxious weeds are a very real and growing problem in the GSFO, exacerbated in recent years by the degree of oil and gas development and recreational use. Without a staff position dedicated to weed management, the backlog in weed management continues to grow more severe, and, over time, resource conditions will continue to deteriorate.

Areas of Relative Ecological Importance to Guide Land Uses and Management

Areas of particular ecological importance provide habitat for federally listed or BLM sensitive species, such as lynx habitat, greater sage-grouse habitat, habitat for Uinta Basin hookless cactus, Parachute penstemon, DeBeque phacelia, and DeBeque milkvetch. In addition, there are vegetative communities or associations that are rare or outstanding examples of this community type. These significant plant communities should also receive special management to maintain their condition and extent.

**Table 4-3
Adequacy of Current Forest, Woodland, and Rangeland Management Direction and Options for Change**

Planning Decision	Is Decision Adequate or Implementable?	Remarks	Opportunities for Change
Provide approximately 57,933 AUMs of big game forage (the amount needed to meet CDOW big game population goals in 1988) to improve wildlife habitat conditions and to increase wildlife species diversity.	No	The BLM's responsibility is to maintain the health of the vegetative resource, not to provide a specific amount of forage. Very difficult to monitor this goal since it requires intensive data collection to assess forage production.	Focus management objectives on desired vegetative condition, composition, cover, seral stages, and patch size rather than forage produced.
Provide 56,885 AUMs of livestock forage to accommodate active livestock preference commensurate with meeting Colorado's Public Land Health Standards.	No	Same as above.	Same as above.
Manage all suitable commercial forest land and woodland to meet saw timber and fuel wood demand and maintain stand productivity.	Yes and no	Part of the BLM's mission is to provide resources to satisfy public demand, but this must be balanced with considerations for maintaining or improving forest health.	Reassess suitable commercial forest land and identify vegetative goals for this resource. Make timber sales available where needed to improve and maintain forest health.
Standard 3: Healthy productive plant and animal communities of native and other desirable species are maintained at viable population levels commensurate with the species and habitat potential. Plants and animals at both the community and population level are productive, resilient, diverse, vigorous, and able to reproduce and sustain natural fluctuations and ecological processes.	Yes	This is one of the Standards for Public Land Health in Colorado and provides the basis for a qualitative assessment of current conditions	Conduct long-term vegetative trend monitoring to support standards assessment and provide means of measuring progress toward or away from meeting standards.

Table 4-3
Adequacy of Current Forest, Woodland, and Rangeland Management Direction and Options for Change *(continued)*

Planning Decision	Is Decision Adequate or Implementable?	Remarks	Opportunities for Change
COAs may be attached to any oil and gas development activity. COAs establish common management practices to reduce the adverse impacts associated with oil and gas development and associated ROWs.	Yes and no	COAs are frequently attached to oil and gas permits and ROWs to protect the vegetative resource from adverse impacts and to address reclamation practices.	Develop new reclamation objectives and performance objectives. Improvement in the design and enforcement of COAs is needed. Develop BMPs and performance objectives that apply to all vegetation treatments and surface disturbances and allocate staff time to monitor and enforce these COAs and performance objectives.

Riparian and Wetlands

Ability of Current Management Direction to Achieve Desired Conditions and Address Resource Demands

PFC assessments/reassessments within the GSFO are generally in conjunction with landscapes scheduled for LHAs. The GSFO is under a 13-year schedule for completing LHAs for the entire field office. Current staffing and other workload priorities limit the GSFO’s capability to assess, reassess, and monitor other riparian areas outside of scheduled landscape. The issuance of BLM Riparian Area Management Policy, the subsequent release of the Riparian-Wetland Initiative for the 1990’s (BLM 1991b), and implementation of the Standards and Guidelines has resulted in management changes that allow the GSFO to improve or maintain riparian areas and wetland in a healthy state. As problems are identified through the LHA process and monitoring, the GSFO has been able to make necessary changes to correct these problems in many cases.

The 2002 RMP Evaluation Report did not specifically identify issues in riparian area and wetlands management that need attention in the revised RMP. See **Table 4-4**.

**Table 4-4
Adequacy of Current Riparian and Wetlands Resources Management Direction
and Options for Change**

Planning Decision	Is Decision Responsive to Current Issues?	Remarks (Rationale)	Options for Change
Designate the Lower Colorado River as an ACEC to protect important riparian and wildlife values.	No	There is very little public land within the section of the Colorado River identified as an ACEC. Why wasn't the rest of the river (upper Colorado) identified as well? There may be enough existing law, regulation, executive orders, and policy in place to protect riparian values.	Consider expanding the ACEC or eliminating the ACEC designation entirely.
Riparian habitat stipulations to be included in project design.			
Surface disturbance will be restricted in or near riparian areas.	Yes And No	Generally this is a good practice, but the language is a bit vague. Impacts on riparian areas can often be mitigated by proper reclamation without restricting surface disturbance.	Clarify language and provide for exceptions.
Fences should be constructed to minimize impact on significant riparian and aquatic habitat.	Yes	A good practice but why does this stipulation only apply to fences and to "significant" riparian habitat?	Colorado Livestock Grazing Management Guideline No. 5 covers this and applies to all range improvements.
Equipment will not be allowed to move up or down stream channels. Heavy equipment will cross stream channels only at designated or constructed crossings.	Yes And No	Generally a good practice, but some actions (e.g., reservoir construction) may require movement of heavy equipment up or down stream channels.	Provide for exceptions.
Fire retardant will not be dropped within 100 yards of any wetland riparian area. Drops of retardant will be made parallel to and not across drainages.	Yes And No	Generally a good practice but language is vague and possibly too restrictive. If this includes ephemeral drainages, retardant drops would be prohibited in most areas.	The Decision Record for the FMP may have amended this stipulation; if not, use the same wildland fire suppression protocols as stated in the GSFO FMP.

Table 4-4
Adequacy of Current Riparian and Wetlands Resources Management Direction and Options
for Change *(continued)*

Planning Decision	Is Decision Responsive to Current Issues?	Remarks (Rationale)	Options for Change
Fire lines, angular or perpendicular to a drainage, will not be allowed within 300 feet of a drainage to reduce soil movement into the drainage system.	No	Language is vague and possibly too restrictive. If this includes ephemeral drainages, fire lines would be prohibited in most areas.	The Decision Record for the FMP may have amended this stipulation; if not, use the same wildland fire suppression protocols as stated in the GSFO FMP.
If visitor use causes adverse impacts on critical riparian habitat, the visitor use will be reduced until the vegetation conditions are restored.	Yes and no	A good idea but impractical to implement. Visitor use may still increase regardless of any action(s) the BLM implements to reduce it.	Consider other means of reducing adverse impacts on riparian areas from visitor use.
NSO Stipulations (Appendix A): To maintain the proper function of riparian zones, activities associated with oil and gas exploration and development, including roads, transmission lines, and storage facilities, are restricted to an area beyond the outer edge of the riparian vegetation. An exception may be granted if the AO determines that the activity will cause no loss of riparian vegetation, or that the vegetation lost can be replaced within three to five years with vegetation of like species and age class; within the riparian vegetation, an exception is permitted for stream crossings, if an area analysis indicates that no suitable alternative is available.	Yes and No	The stipulation protects riparian areas and wetlands from impacts associated with oil and gas activities. The exception, "...vegetation lost can be replaced within three to five years with vegetation of like species and age class" may be too impractical. It is probably not that important to require like age class. There may be other activities to consider as an exception in addition to stream crossing.	Consider providing more flexibility and exceptions to this stipulation.
CSU stipulations will be issued for riparian and wetland zones. CSU Stipulations (Appendix A): Within 500 feet of the outer edge of the riparian or	Yes	The stipulation protects the wetland and riparian habitat values and ecological functions from impacts associated with oil and gas activities.	None.

Table 4-4
Adequacy of Current Riparian and Wetlands Resources Management Direction and Options
for Change *(continued)*

Planning Decision	Is Decision Responsive to Current Issues?	Remarks (Rationale)	Options for Change
wetland vegetation, activities associated with oil and gas exploration and development, including roads, pipelines, and well pads, may require special design, construction, and implementation measures, including relocation of operations beyond 200 meters, in order to protect the values and functions of the riparian and wetland zones.			
Major river corridors will be protected with a NSO stipulation on oil and gas leases within a half mile of either side of the high water mark (bank full stage) of six major rivers: Colorado, Roaring Fork, Crystal, Frying Pan, Eagle, and Piney. Certain exceptions apply.	Yes	The stipulation protects riparian areas and wetlands from impacts associated with oil and gas activities.	None.
Adopt standards for public land health and guidelines for livestock grazing management dated June 28, 1996.	Yes	The decision is consistent with the Decision Record and finding of no significant impact for Adoption of Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado, January 1997, and current grazing regulations 43 CFR 4180.	No options for changes at this time.

The revised RMP should identify desired outcomes for riparian areas and wetland resources (e.g., riparian function, desired plant communities, and seral stages). It should also identify site-specific vegetation management practices, such as grazing management strategies, vegetation treatments, and manipulation methods, to achieve desired plant communities as well as integrated vegetation management techniques

to rehabilitate weed infestations or otherwise control noxious and invasive weeds (BLM Handbook H-1601-1).

Areas of Relative Ecological Importance to Guide Land Uses and Management

Riparian areas are unique and the most productive and important ecosystems, accounting for approximately one percent of the public lands. Characteristically, riparian areas display a greater diversity of plant, fish, wildlife, and other animal species and vegetation structure than adjoining ecosystems. Healthy riparian systems filter out and purify water as it moves through the riparian zone, reduce sediment loads and enhance soil stability, provide micro-climate moderation when contrasted to extremes in adjacent areas, and contribute to groundwater recharge and base flow (BLM 1987).

The goal of riparian-wetland area management is to maintain, restore, improve, protect, and expand these areas so they are in proper functioning condition for their productivity, biological diversity, and sustainability. The overall objective is to achieve an advanced ecological status, except where resource management objectives, including PFC, would require an earlier successional stage. The goal is also to ensure aggressive riparian-wetland information, training and research programs as well as improved partnerships and cooperative management processes (BLM Manual 1737).

Numerous authorities exist for the protection and enhancement of riparian-wetland and include the ESA, the Taylor Grazing Act of 1934, the FLPMA, the Clean Water Act of 1977, the Emergency Wetlands Act of 1986, Executive Order 11990 (Protection of Wetlands), 43 CFR 4180 (Fundamentals of rangeland health), and the Decision Record for the Adoption of Standards and Guidelines in Colorado (BLM 1997).

All the above captures the relative ecological importance of riparian-wetland areas to guide land use and management.

4.6 FISH AND WILDLIFE HABITAT

Many of the management decisions related to fish and wildlife in the 1984 RMP can be categorized as decisions to collect additional data, to cooperate with other agencies, to provide/protect habitat for specific species or populations, or to improve habitats for particular species. Amendments to the RMP, such as the 1999 Oil and Gas Amendment, require protection of critical habitats for wildlife species. Big game management was the focal point of the 1984 RMP, and many nongame species were not addressed. The 2002 Glenwood Springs RMP Evaluation Report found major deficiencies in the RMP caused by changing and increasing land use demands (e.g., increased OHV use, oil and gas activity, urbanization), changes in laws, regulations, and BLM policies (e.g., no discussions of desirable vegetation conditions, invasive nonnative species, riparian management, threatened and endangered, and sensitive species). The report also found that past amendments to the plan still do not adequately cover these issues. Although some wildlife mitigation

measure have been effective in preventing significant impacts on wildlife and wildlife habitat, growing issues, such as fragmentation and reduced habitat quality from oil and gas, expanding subdivisions and human recreation, must be further examined.

As wildlife data are updated as part of the RMP revision process, the GSFO should determine if the new information results in needed modifications to management prescriptions. Management opportunities for the revised RMP could include identifying desired habitat conditions and population objectives for major habitat types that support a wide variety of game and nongame species. Priority species and habitats could also be designated, including special status species, and populations of fish or wildlife recognized as significant for at least one factor. Once this is determined, actions and area-wide use restrictions to achieve desired population and habitat conditions could be identified. Coordinating with other groups who are collecting regional data and using their data as a framework to interpret habitat provision/protection needs could enhance the BLM's responsiveness toward maintaining desired habitat conditions.

Aquatic Wildlife/Fisheries

Ability of Current Management Direction to Achieve Desired Conditions and Address Resource Demands

Based on the current condition and trends of the resources and the current demands on those resources, analyze the ability of current management direction to address resources and demands for use of the resources. Discuss field office(s) capacity in terms of staff, annual budget, and summary of workload ranked by subactivity and program elements.

Many of the management decisions related to fish and wildlife in the 1984 RMP can be categorized as decisions to collect additional data, to cooperate with other agencies, to provide/protect habitat for specific species or populations, or to improve identified stream reaches/habitats. Management direction of aquatic habitat is done through a combination of proactive projects and resource management. Amendments to the RMP, such as the 1999 Oil and Gas Amendment, provide direct and indirect protections of important habitats for aquatic species.

Recreational fishery use and cold water game species (primarily trout species) management was the focal point of the 1984 RMP, and many native, nongame species were not addressed. The 2002 Glenwood Springs RMP Evaluation Report found major deficiencies in the RMP caused by changing and increasing land use demands (e.g., increased OHV use, oil and gas activity, urbanization), changes in laws, regulations, and BLM policies (e.g., no discussions of desirable vegetation conditions, invasive nonnative species, riparian management, threatened and endangered and sensitive species). The report also found that past amendments to the plan do not adequately cover these issues. Although some mitigation measures have been effective in preventing significant impacts on fisheries and aquatic habitat,

growing issues such as increased road construction and use, increased recreation and OHV use, and other ground-disturbing activities must be further examined.

Current resource trends are difficult to determine, as long-term monitoring data is lacking. Most aquatic habitats are likely in a static/stable condition, while some aquatic habitats are in either an upward or downward trend, depending on site-specific issues. Until recently, management of aquatic resources was somewhat lacking in the RMP planning area. However, a newly hired fisheries biologist and increased base budget should help to better manage and address aquatic habitats. Stream segments that have not been sampled in several years and even decades can be sampled and baseline information obtained. Habitat improvement and restoration projects can be identified and implemented.

The GSFO will identify long-term monitoring stations in the Roaring Fork, Crystal, Fryingpan, and Piney watersheds to collect basic water quality, macroinvertebrates, channel cross sections, and aquatic species diversity, numbers, and locations to better assess current fisheries habitat and aid in identifying restoration opportunities.

Current management is shared as the CDOW and USFWS manages aquatic wildlife species and the BLM cooperates with these agencies to manage aquatic habitats on lands under its administration.

Areas of Relative Ecological Importance to Guide Land Uses and Management

If scoping has occurred, the management opportunities should begin to respond to issues identified through scoping.

There is now opportunity for more intensive management of aquatic habitats on BLM-managed lands. Where baseline data is lacking or outdated, new information can be obtained and sound management can be applied.

Partnership opportunities are varied and abundant. Potential cooperators include the CDOW, USFS, USFWS, USGS, Trout Unlimited, natural gas development companies, private land owners, as well as various local interest groups.

The most significant plan related to managing aquatic wildlife habitat adjacent to the RMP planning area is the recently completed White River National Forest's Forest Management Plan (USFS 2002). Most streams originate on the higher elevation National Forest-administered lands surrounding the RMP planning area. Where streams come off of USFS lands and onto BLM-administered lands, the result is numerous opportunities for cooperative management of aquatic habitats.

4.7 SPECIAL STATUS SPECIES

Numerous changes in designations and habitat regarding federally listed species have occurred since preparation of the 1984 RMP. In addition, new species have been identified as candidates for listing or as BLM sensitive. As a result, RMP decisions will need to be modified to reflect these changes and the management needed to

prevent adverse effects on listed or sensitive species or critical habitat that were not considered in the 1984 RMP. Big game management was the focal point of the 1984 RMP, and many special status species were not addressed. The 2002 Glenwood Springs RMP Evaluation Report found major deficiencies in the RMP caused by changing and increasing land use demands (e.g., increased OHV use, oil and gas activity, urbanization), changes in laws, regulations, and BLM policies (e.g., no discussions of desirable vegetation conditions, invasive nonnative species management, riparian management, threatened and endangered and sensitive species). The report also found that past amendments to the plan still do not adequately cover these issues. Although some wildlife mitigation measures on proposed development activities have been effective in preventing significant impacts on special status species and their habitat, growing issues, such as fragmentation and reduced habitat quality from oil and gas, expanding subdivisions, and human recreation, must be further examined.

The 1999 final supplemental EIS provided an NSO stipulation to protect federally listed and candidate and proposed species. This stipulation covered occupied habitat but may not have adequately covered potential or suitable habitat or the ecosystem processes needed to maintain the populations. A CSU stipulation was also adopted for the protection of BLM sensitive species and significant plant communities. Again, this stipulation may not cover all future populations that are discovered, new species that are listed as sensitive or potential habitat and ecosystem processes. In addition, very little of the RMP planning area has been surveyed for significant plant communities (G1, G2, or S1 or S2 communities), so protections for these communities in unsurveyed areas may be lacking.

Also, the GSFO should use the new resource information to provide the appropriate COAs on all permitted activities. Similar to vegetation management and fish and wildlife habitat management, management opportunities for the revised RMP could include identifying desired habitat conditions and population objectives for special status species and identifying priority species that require immediate intensive management. Once this is determined, actions and area-wide use restrictions needed to achieve desired population and habitat conditions could be identified.

The GSFO should implement Addendum 1 to the Colorado Protocol; Section 106 Requirements for Comprehensive Travel and Transportation Management Planning (2006), as part of the planning effort.

4.8 WILDLAND FIRE ECOLOGY AND MANAGEMENT

The Fire Management Plan for the GSFO is expected to continue to provide excellent guidance for wildland fire ecology and management. Document maintenance (updates) will be necessary to reflect changing fire management terminology and policy guidance.

4.9 CULTURAL AND HERITAGE RESOURCES

Ability of Current Management Direction to Achieve Desired Conditions and Address Resource Demands

When surface-disturbing activities, such as mineral development, range improvements, and recreation site development, threaten cultural resources, the cultural resources program provides support by evaluating cultural resource sites through Section 106 consultation. Relying on the reactive nature of Section 106 preserves resources from direct effects but also results in the decline of cultural sites due to natural deterioration, incidental damage, and vandalism. Additionally, there have been policy changes in the BLM cultural resource management program since completion of the 1988 RMP. Management guidance contained in BLM Manual 8130.13 is not present in the existing RMP. Additionally, allocation of cultural resource sites to use categories, as required in BLM Manual 8110.4, is ongoing, but most of the previously recorded sites have not been assigned to use categories. The existing RMP addresses a portion of the required components but is silent on several other key policy requirements. The 1989 RMP was developed before the Native American Graves Protection and Repatriation Act, the 1992 amendments to the National Historic Preservation Act of 1969, and Executive Order 13007, and it does not have specific resource management goals and actions that address these and other directives. Additionally, the National Programmatic Agreement between the BLM, Advisory Council on Historic Preservation and the National Council of State Historic Preservation Officers (1997), Colorado BLM/State Historic Preservation Officer Protocol (1998), and BLM Colorado Handbook Guidelines (currently being revised) all have helped streamline cultural resource procedures not covered in the 1988 RMP.

A Class I overview is being developed to comply with Manual H-1601-1, Manual Section 8110, and WO IM 202-101 and to update the current cultural resource GIS database. The overview will accomplish the following:

- Synthesize all of the previous archaeological and historical work;
- Outline the prehistory and history as currently understood;
- Identify data gaps in our knowledge;
- Develop management recommendations for site types; and
- Develop sensitivity maps (high, medium, low) based on the potential to find cultural resources by geographical area.

The information will be used to define and evaluate the nature and distribution of property types, the historic and prehistoric contexts of properties of special significance, the uses to which property types may be assigned, the threats to site integrity, and the strategies for resource management and protection.

Issues

- Increasing demand by oil and gas development has put cultural resources in jeopardy. Increased access to an area has been proven to increase the potential for vandalism and illicit collection.
- Increasing use and misuse of open travel management areas (TMAs) have also put cultural resources in jeopardy. Damage to historic properties along and between established trails has occurred in the Eagle planning area.

Opportunities

- To conduct comprehensive study of the Blue Hill Archaeological District and nominate to the National Register of Historic Places
- Use the RMP revision process to develop a proactive cultural resource management framework that incorporates changes in BLM policy and law and archaeological theory;
- Protect sites by developing and implementing additional stipulations on all new ground-disturbing activities based on assigned use categories to enhance cultural resource management decisions to protect cultural resources;
- Maintain or improve the cultural resource GIS database;
- Use the Class I effort to guide the cultural resources program and provide a framework for a Cultural Resources Management Plan. Develop high, medium, and low sensitivity areas for locating cultural resources, allocating cultural resources to use categories, and establishing criteria for management of sites yet to be identified. This Class I could also provide a framework for priority cultural resource areas or site types. This could allow managers to “know in advance how to respond to conflicts that arise between specific cultural resources and other land uses”;
- Salvage or mitigate additional cultural properties and features, such as subsistence or habitation structures, to provide needed data to fill in gaps in the cultural context within the FO. This data could increase the confidence level for management decisions involving cultural resources, as to whether the resource should be conserved or placed in the discard use category;
- Emphasize the importance of Geographic Area Plans and large block inventories early in the planning stages for project development, especially for energy development projects. These large inventories have greatly improved the ability of the developer/operator and the BLM to cooperate as to the best placement of facilities while protecting cultural resources;
- Continuing work with partners on research projects.
- Continuing consultation with Native American tribes to help redevelop traditional ties to the landscape and identify and protect sacred and traditional use areas.

4.10 PALEONTOLOGICAL RESOURCES

Past and current management practices have had little appreciable effect on paleontological resources. There have been no reported instances of damage to paleontological resources resulting from implementation of RMP management decisions. However, the paleontological resources management plan directed for development in the last RMP has not been developed. In addition, BLM policy for managing paleontological resources has not been updated since completion of the RMP. Changes in paleontological resources management policy and increases in paleontological resource data should be incorporated into the revised RMP. Decisions for inventory and management of paleontological resources could be determined based on fossil diversity, distribution, and reasons for their importance to science. Priority areas for inventory could be identified, along with future research needs. There is also opportunity to conduct comprehensive study of the Sharrard Park Paleontological Area and to nominate it as a National Natural Landmark.

4.11 WILDERNESS CHARACTERISTICS

See Sections 4.22, Areas of Critical Environmental Concern, 4.23, Wilderness Study Areas, 4.24, Wild and Scenic Rivers, and 4.25, Backcountry Byways/National Trails. The RMP revision will identify decisions that would protect or preserve wilderness characteristics outside of existing WSAs (naturalness, outstanding opportunities for solitude, and for primitive and unconfined recreation). See Land Use Planning Handbook H-1601-1, Appendix C, page 12.

4.12 VISUAL RESOURCES

BLM policy requires that the GSFO designate VRM management classes for all BLM-administered lands, based on inventory of visual resources and management considerations for other land uses. Visual resource values are to be managed in accordance with VRM objectives and used in the implementation of land use decisions.

Ability of Current Management Direction to Achieve Desired Conditions and Address Resource Demands

The landscape inventoried for visual resources in 1984 in the RMP planning area has undergone many changes on both public and private lands due to increased urbanization pressures and energy-related actions. As the state sees expected increases in both resident populations and in tourism, scenic values and visual open space will become more important. Current VRM objectives have been maintained in some areas, while other areas are experiencing land use modifications that are becoming moderate to evident. Sensitive viewshed preservation will continue to compete with other land use allocation decisions and management activities for urban development infrastructure needs, energy development, recreation uses, and other surface use activities.

A VRM assessment for GSFO RMP planning area is being conducted for key transportation corridors and other sensitive viewsheds in coordination with adjacent communities and other local, state, and federal agencies. This assessment will look at

viewsheds that have been deemed important throughout the RMP planning area to ensure that the plan looks at what communities and other local, state, and federal agencies deem as being visually and aesthetically important through a data-gathering exercise. In addition, current VRM Classes from the 1984 RMP has data defects and will be updated within those sensitive viewsheds to ensure that VRM class boundaries reflect real world conditions. The assessment will be available in the fall of 2007 and will be used as part of this planning process.

The planning process will reevaluate and assign VRM classes for all lands within the RMP planning area. While visual values will be considered, they do not establish management direction, final VRM objectives and boundaries will result from and reflect all resource allocation decisions made in the RMP planning area. For example some areas currently are experiencing impacts where the activities are not discretionary, such as valid existing rights. These impacts must be allowed, after due effort to minimize effects on visual values, to be consistent with those valid existing rights. This planning effort will weigh all resource allocation decisions so as not to create conflicts managing the very values that the management plan seeks to foster.

In accordance with the BLM Manual H-1601-1 Land Use Planning Handbook, VRM classes will need to correlate with recreation management objectives and prescriptions that have been set for recreation management zones in every SRMA.

The revised RMP will need to address BLM guidance, which requires that all WSAs be managed as VRM Class I areas. The WSAs within the GSFO are fragmented in management objectives and have VRM Classes within each unit ranging from VRM Class II to IV.

4.13 CAVE AND KARST RESOURCES

Ability of Current Management Direction to Achieve Desired Conditions and Address Resource Demands

Current management direction for all but the Anvil Points and LaSunder Caves within the GSFO RMP planning area is nonexistent. All remaining caves must be identified as part of this planning process as to whether they meet the significance criteria mandated in the Federal Cave Resources Protection Act of 1988, and in accordance with the BLM's Land Use Planning Handbook, H-1601-1.

For each designated significant cave, planners need to consider whether or not an administrative designation (e.g., ACEC) is needed to provide adequate protection for significant cave resources (see III. Special Designations). Many of the known caves are within Deep Creek ACEC. Anvil Points Cave is protected under an NSO stipulated in the 1999 Oil and Gas SEIS and under the Roan Plateau RMPA and EIS (BLM 2006a).

For those caves that are not within a current ACEC, management objectives and setting prescriptions must be set for each designated significant cave. Management

objectives will need to be outcome based (i.e., not facility- or project-based). Setting prescriptions should specify conditions needed to facilitate achievement of the management objectives.

As Colorado's population increases, public land visits and recreational use is rising within the GSFO RMP planning area. An increase in visitation to caves is also likely. With that comes concerns regarding public safety and preservation of the caves fragile resources and scientific and research values. The need for planning and more active management continues to escalate.

Currently Colorado Cave Survey and the BLM GSFO have a cooperative management agreement in place to carry out the LaSunder Cave Plan and other cave activities on BLM-managed land within the GSFO RMP planning area.

Opportunities exist to continue to work together with the Colorado Cave Survey and local grottos to maintain and improve cave resources on public lands and to seek and use the skills, knowledge, and expertise in the Colorado Cave Survey to plan, develop, and implement cave management and conservation efforts.

4.14 ENERGY AND MINERALS

Existing management is generally adequate to achieve objectives for minerals management. However, the RMP revision process should serve to resolve resource conflict and management inconsistencies and incorporate BMPs and best available technology in minerals development. The RMP revision should also address the availability of the oil shale resource for leasing.

Coal

The RMP revision process provides an opportunity to re-evaluate objectives and management practices related to coal resources. Changes in technology, resource development potential, designation status of lands and resources, and BMPs should be addressed in the revised RMP.

Oil Shale

The RMP revision process provides an opportunity to re-evaluate objectives and management practices related to oil shale resources. Changes in technology, resource development potential, designation status of lands and resources, and BMPs should be addressed in the revised RMP.

Fluid Minerals

Existing management is adequate to achieve objectives for minerals management. However, the RMP revision process should serve to resolve resource conflict and management inconsistencies and incorporate BMPs and best available technology in minerals development. The following are management issues related to minerals development (fluids and solids) within BLM-administered lands of the RMP planning area that need to be addressed in the revised RMP:

- Coalbed methane development has not been addressed in previous plans. Resource development potential, drilling, operational requirements, spacing, and conflict with other uses should be addressed in detail in the revised RMP. Requirements for production water disposal in each area and possibly from each producing interval (if constituents are different) should also be addressed.
- Most of the high potential area has been leased. As a result, new lease stipulations will not be very effective since so little acreage in this area is available for lease. Most of the existing leases will be held by production or will have continued diligence performed on them in order to keep the leases, since they are so valuable.
- In areas of high erosion potential, reclamation has generally taken more time than specified in the lease or COA. The revised RMP should address this issue to minimize resource impacts.
- Conventional and unconventional oil and gas well drilling and completion in areas where there is the potential for oil shale development should be addressed in the revised RMP. Oil shale potential areas may be affected if improper casing length and cementation is used during well drilling and completion to isolate the oil shale intervals.
- Current lease stipulations and COAs for oil and gas development should be reviewed to ensure they are consistent with resource management objectives.
- Air quality in the western 22 percent of the resource area is deteriorating for a variety of reasons, one of which is the increased oil and gas activity. Much of the poorer air quality is due to fugitive dust from oil and gas vehicle traffic. The Revised RMP should address air quality mitigation in the high potential area, such as washing vehicles that are being driven from federal leases and imposing unit boundaries regardless of surface ownership. Paving roads and performing more frequent dust abatement measures should also be considered.

Locatable Minerals and Mineral Materials

Existing management is generally adequate to achieve objectives for minerals management. However, the RMP revision process should serve to resolve resource conflict and management inconsistencies and incorporate BMPs and best available technology in minerals development. The RMP revision should also address the availability of the oil shale resource for leasing.

In areas rated as medium, low, and no known potential, other resource values should take precedence over oil and gas exploration and development. Since these areas are not leased, new lease stipulations can be identified for possible future leasing. These areas can be managed for resource values other than oil and gas leasing and development.

4.15 LIVESTOCK GRAZING MANAGEMENT

The Ability of Current Management Direction to Achieve Desired Conditions and Address Resource Demands (the 2002 RMP Evaluation Report) did not specifically identify issues in rangeland management that need attention in the revised RMP. However, several modifications and updates to existing livestock grazing management could be included in the revised RMP, such as the following:

- As necessary, develop Allotment Management Plans, or activity plans designed to serve as the functional equivalent of Allotment Management Plans, as part of the permit renewal process;
- There are 62 allotments not in use that should be visited to determine whether they should remain available for grazing, combined into adjacent allotments, or considered unsuitable for livestock grazing;
- Should allotments become vacant, they could be used as common area relief allotments when forage is not available in scheduled allotments due to wildfire, vegetation treatments, or drought;
- Allotment management categories (improve, maintain, and custodial), which have not been changed since the 1984 (Revised 1988) RMP, should be updated;
- A policy should be developed on how livestock will be managed with increasing oil and gas activity to reduce conflicts;
- Big game and livestock should be managed to reduce conflicts with forage resources;
- Methods or processes should be used to reduce conflicts between livestock operations on public lands and adjacent development on private land;
- Season-long grazing has generally, but not always, been found to be the most detrimental to upland vegetation and riparian areas. One method to reduce season-long grazing, decrease the duration of grazing use, and improve grazing distribution is to combine allotments to form several pastures that could be used under rotational grazing strategies. This has seldom been done in the GSFO because it would result in more common use allotments which are often difficult to manage due to conflicts amongst permittees;
- There are many unassigned allotments that could be included in other adjacent allotments. They could be combined with or without increasing AUMs on the existing allotment depending on their suitability for grazing. Consolidating some of these allotments could make management easier.

Range Improvements— Maintenance of range improvements should be assigned thru the use of COOP Agreements or Range Improvement Permits. If the FO has situations where maintenance has not been assigned, the FO could make this a priority and complete the needed documentation and have permittees sign these agreements. If permittees fail to sign agreements then proposed decisions should be issued to resolve the maintenance situations. See **Table 4-5**.

4. Management Opportunities/Management Adequacy (Livestock Grazing Management)

Staffing— Current permanent staffing for the GSFO range program includes three rangeland management specialists and one range technician. Collateral duties (riparian areas, wetlands, and weeds) are assigned to two rangeland management specialists. Shifts in workload priority (e.g., grazing permit renewal, LHA) have hampered the capability of the range staff to focus on other important work, such as compliance, monitoring, allotment management plan preparation/implementation, and range improvements. Generally, the staff is stretched thin during the field season (May to October) when such work as monitoring, compliance, trespass investigation, and LHA is at its peak. Seasonal help during the field season has helped increase the staff's capability, but funding to hire seasonal employees has been sporadic. Increased oil and gas development and associated conflicts with livestock grazing have also reduced the capability of the range staff.

**Table 4-5
Adequacy of Current Livestock Grazing Management Direction and Options for Change**

Planning Decision	Is Decision Responsive to Current Issues?	Remarks (Rationale)	Options for Change
To provide 56,885 AUMs of livestock forage commensurate with meeting public land health standards.	No and yes	The 56,885 AUM figure reflects active preference at the time of the original RMP. Presently, active preference is 44,762 AUMs and is probably more reflective of a desired stocking level. Providing forage commensurate with meeting public land health standards adequately addresses Decision Record and finding of no significant impact for Adoption of Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado, January 1997.	Maintaining active livestock preference is still important for the stability of livestock operations; however, the AUM figures should be revised or eliminate the figure and just state “provide sufficient forage to accommodate active livestock preference.” Additional forage from veg manipulation will be first allocated to wildlife. If wildlife forage needs are already being met, then additional forage may be give first to livestock.
Intensively manage the following allotments: Garfield Unit 8009, 8017, 8018, 8026, 8039, 8046, 8105, 8106, 8107, 8213, 8218, 8219, 8220, 8221, 8222, 8908, 8909, 8910.	No	Priorities for intensive management change over time in response to monitoring, LHAs, etc.	The decision should be more flexible to adapt to changes.

Table 4-5
Adequacy of Current Livestock Grazing Management Direction and
Options for Change *(continued)*

Planning Decision	Is Decision Responsive to Current Issues?	Remarks (Rationale)	Options for Change
<p>Roaring Fork Unit 8334, 8335, 8336, 8341, 8342. Eagle-Vail Unit 8501, 8502, 8504, 8506, 8734. Castle Peak Unit 8601, 8606, 8616, 8619, 8620, 8639, 8641, 8642, 8643, 8730, 8731, 8732, 8733, 8735. King Mountain Unit 8506.</p>	No	<p>The AUM figure was based on inaccurate and outdated Soil and Vegetation Inventory Method data, as well as wildlife forage requirements.</p>	<p>Allocation decisions should be based on monitoring or documented field observations consistent with the fundamentals of rangeland health. This better reflects current grazing regulations 43 CFR 4110 and 4180. If an allocation figure needs to be stated, it should reflect current active preference and adjusted based on monitoring or documented field observations monitoring.</p>
<p>Allocate additional forage produced through vegetation manipulation on wildlife winter range first to big game to meet existing use and then to livestock up to active preference.</p>	No	<p>The 27,000-acre figure was determined from range site potential and soil suitability and adjusted according to livestock forage goal by allotment. The accuracy of the data used for the acreage determination provided only an estimate of 27,800-acres. The figure also does not reflect the amount of manipulation that would be required for other</p>	<p>Vegetation manipulation should be targeted at meeting resource objectives and not be focused on a specific acreage figure.</p>

Table 4-5
Adequacy of Current Livestock Grazing Management Direction and
Options for Change *(continued)*

Planning Decision	Is Decision Responsive to Current Issues?	Remarks (Rationale)	Options for Change
Make 756 AUMs on 24 unallotted allotments available for livestock use.	No	<p>reasons (e.g., fuels management).</p> <p>A number of these allotments are not feasible for grazing due to steep slopes, lack of water, or lack of fencing. In some cases they could be combined with adjacent allotments with no increase in forage or reserved for temporary use (relief pastures when forage is not available in scheduled pastures due to wildfire, vegetation treatments, or drought). 24 unallotted allotments was also a figure used at the time of the original RMP. This figure has since increased to 62.</p>	Determine whether allotments with no permitted use should remain available for grazing, combined into adjacent allotments, considered unsuitable for livestock grazing, or used for relief pastures.
Any increases in forage due only to improved grazing management will be allocated to livestock.	No	The decision is too inflexible.	Other options should be considered such as use of increased forage for wildlife.
Manage the grazing program to meet Colorado Standards and Guidelines.	Yes	<p>The decision is consistent with the Decision Record and finding of no significant impact for Adoption of Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado, January 1997 and current grazing regulations 43 CFR 4180.</p>	No options for changes at this time.

4.16 RECREATION AND VISITOR SERVICES

Ability of Current Management Direction to Achieve Desired Conditions and Address Resource Demands

General issues facing recreation managers include:

- Rapid regional population growth
- Changing population demographics (US Census Bureau 2002).
- Increasing dispersed recreation use, both summer and winter.
- Popularity of public lands as a “backyard” recreation destination for local communities.
- Adjacent private lands and in-holdings.
- Economic and social value of recreation and tourism.
- Citizen desire for a greater role in the management of their public lands.
- Budget allocations, which are flat or decreasing despite aging facilities and increasing demands.
- Technological advances, such as ATVs and mountain bikes, as well as better outdoor equipment and clothing.
- Integrating recreation use with sustainable management of other resources.

Based on the issues above, the GSFO does not currently have the capacity in terms of staff, law enforcement, annual budget, or existing recreation facilities (including trails) to adequately manage future resident recreation demand alone.

Opportunities to Manage Differently and Administer the Land/People Differently

Special Recreation Management Areas

The GSFO currently has 9 SRMAs (**Table 3-25**). The GSFO needs to review existing SRMA designations to ensure compliance with H-1601-1 - Land Use Planning Handbook guidance. In particular the Gypsum Hills SRMA was identified in the Castle Peak travel management plan as an SRMA. However recognition of singularly dominant activity-based recreation demand (OHV use), of and by itself constitutes insufficient rationale for the identification of an SRMA. In addition no structured recreation opportunities, which characterize SRMAs, have been documented and no user/partner interest exists to complete a SRMA implementation plan.

Although identified before 2005, the Red Hill SRMA is being managed for a community recreation-tourism market. The Red Hill SRMA has targeted outcome objectives and corresponding prescribed setting conditions. The other SRMAs were identified because they; had higher recreation use, required extra recreation investment or where more intensive recreation management was needed. As per the

revised BLM Handbook - H-1610 -1 Land Use Planning Handbook, the GSFO must identify a distinct, primary recreation-tourism market (destination, community or undeveloped) as well as a corresponding recreation management strategy for the remaining SRMAs. If no distinct, primary recreation-tourism market can be identified then the administrative identification of an SRMA should be removed.

The GSFO is required to identify new SRMAs during the land use planning process. Where recreation demand from a recreation-tourism market requires maintenance of setting character and/or production of associated activity, experience, and benefit opportunities/outcomes, the area should be identified and managed as an SRMA, rather than being custodially managed as an ERMA. Public lands surrounding the Towns of Eagle, Gypsum, Glenwood Springs (South Canyon), New Castle and Carbondale (The Crown) along with additional lands in the Castle Peak area need to be reviewed to determine if a distinct, primary recreation-tourism market requiring a corresponding and distinguishing recreation management strategy exists. In areas the BLM and partners determine that recreation demand from a recreation-tourism market exists the GSFO will need to identify new SRMAs.

Natural Resource Setting Prescriptions

In the 1984 RMP, the six ROS classes were used by managers as descriptors that provided a general overview of the experience, setting and activity opportunities included in each class, whether the area had a management objective emphasizing recreation or another resource. The assigned opportunity class was a point of departure from which the managers could develop a more precise prescriptions for each class based on specific conditions encountered in field operations. Especially in the Glenwood Springs ERMA, the adopted ROS setting classes were descriptive for what existed in 1984, the ROS classes not viewed as a prescription to maintain a particular ROS class through the life of the plan (see RMP Appendix C). During implementation, the ROS setting classes were used to illustrate the effects of proposed management actions on the adopted setting class, not guide the authorization of the management actions themselves.

As per the H-1601-1 - Land Use Planning Handbook, for SRMAs, the GSFO must prescribe recreation setting character conditions necessary to produce or maintain recreation opportunities and facilitate the attainment of targeted recreation experiences and beneficial outcomes.

Recreation Management

Developed Campgrounds and Day Use Sites—The current situation at Gypsum campground is unsustainable and unacceptable, and the BLM does not have the staff resources to correct it. Options being considered include private management of the campground or converting it into a day-use only site.

Infrastructure in developed sites could be redesigned to accommodate the recreation demands of the growing Hispanic populations. Hispanic recreation activity demands follow cultural traditions that make nature and family-oriented “gathering” activities

popular (National Recreation and Park Association 2007). Multi-lingual signage and large-group sites could help prevent resource damage and conflicts with other users.

Cooperative Management—Current and predicted budget and staffing levels highlight the need to work more cooperatively with recreation-tourism partners. BLM GSFO, partners and communities have the opportunity to move beyond simple trail partnerships to cooperatively share resources, funding, staff and expertise to:

1. appropriately direct activities such as climbing, boating, and camping/picnicking;
2. manage existing developed recreation sites of Gypsum/Community Pit/Horse Pasture/Lava Flow, Wolcott, Wingo, and New Castle river site along the Eagle River, Roaring Fork River and Lower Colorado River to enhance the community's use of public land open spaces and facilities;
3. designate, construct and manage public shooting ranges
4. improve on-the-ground law enforcement capabilities aimed at reducing: illegal dumping, abandoned vehicles, hazmat sites, and other public health and safety related issues; and
5. establish safety zones adjacent to town boundaries where the discharge of firearms for all purposes would be prohibited.

Recreation Administration

Special Recreation Permits—Currently the SRP system limits the number of commercial operators on the upper Colorado and Eagle Rivers, but does not prescribe minimum or maximum visitor use days for each permittee. Using a Limits of Acceptable Change process, the BLM could determine the optimum number of permittees and whether or not minimum and maximum commercial visitor days should be established.

Consistency and Coordination with Other Plans—Outside of the Red Hill SRMA, most “close to town” public lands are still custodially managed to offer a variety of dispersed recreational activities. Communities seeking to: 1) diversify their economies through recreation tourism or 2) desiring to create social/community recreation benefits will need to support the GSFO with: staff time, law enforcement, funding, and facility development to accommodate increases in visitation.

Opportunities exist in the Eagle-Gypsum area, the Glenwood Springs area (South Canyon) the Carbondale area, and the New Castle area for the BLM to further administrative coordination with the communities and other partners (for example, the Red Hill Council) to improve the quality and quantity of structured recreation opportunities. Additional opportunities for enhancing administrative coordination exist on heavily used public lands in the Silt and Rifle areas.

Supplementary Rules—Pursuant to 43 CFR 8365.1-6 (Supplementary Rules), 43 CFR 8364.1 (Closure and restriction orders), and 8341.2 (Special rules) the BLM GSFO needs to work with communities and partners to establish appropriate recreation use regulations that protect natural resources (i.e. operation of motor vehicles, seasonal recreation use restrictions, camping) and provide for the safety of visitors and property (i.e. discharge of firearms, fires) on public lands adjacent to communities.

Mineral Withdrawals—All lands within SRMAs could be considered for withdrawal from mineral development. This would prevent conflicts with recreational use.

Recreation Marketing/Information/Education

The BLM GSFO has opportunities to better achieve The BLM's Priorities for Recreation and Visitor Services (BLM 2003b), a service delivery plan for delivering benefits to the American people and their communities, specifically for: 1) connecting the visitor to natural and cultural resources, through enhanced interpretation, education and information; 2) improving the accuracy, appearance and consistency of visitor information; and 3) emphasizing and improving outdoor ethics and stewardship through education.

Marketing—Recreation and tourism are big business and significant economic drivers, identified as one of the top three industries within all 12 western states. Outdoor recreation, nature, adventure and heritage tourism are the fastest growing segments of the travel and tourism industry, and the BLM open spaces have it all (BLM 2003b).

BLM GSFO and partners marketing/information/educations actions must be sympathetic to sensitive biological resources, susceptible cultural resources, local interests/needs and political realities. The “shotgun marketing approach” where we market all SRMAs for the simple fact that they are SRMAs is not being responsible. The GSFO has the opportunity to:

- Work with tourism groups to better prepare visitors before they arrive with appropriate information, user ethics and user expectations.
- Explain to BLM personnel and partners the difference between “match-up marketing” (Matching up people and the (activities/experiences/benefits) they desire, to areas where those opportunities (activities/experiences/benefits) are being provided) and “promotional marketing.”
- Determine the recreation-tourism markets and market strategies for SRMAs then work with our partners to communicate with that audience.
- Help partners direct use to recreation areas where: the land, infra-structure (personnel, facilities, trails, etc), recreation providers (outfitters, off-site

businesses, etc), and communities are able to accommodate people and desire to accommodate people.

Tourism—Future recreation demand for outdoor recreation opportunities found on public lands presents a possibility for tourism to increase its contribution to the stability of the local and regional economy. The GSFO could work more actively with local communities to promote appropriate local recreation opportunities.

Visitor Service Information—There is a need for multicultural (Hispanic) interpretation/signing/(low impact camping, public land ethics, solitude, etc.) and a need to provide administration or marketing regarding recreation opportunities for those populations.

Recreation Monitoring

Critical to making recreation decisions is the need for a tracking and evaluating: visitor use, the condition of resources, and public demand. Apart from financial considerations, the monitoring challenge is dealing with the: logistic problems with the size of the area, number of access points, relative ease of accessibility from private lands, the overall amount of visitor use, the wide ranging types of visitor activities, the lack of recreation objectives in current planning documents and the amount of resources available to monitor use all make monitoring easier said than done.

Realizing these difficulties, the BLM GSFO still has opportunities to better achieve The BLM's Priorities for Recreation and Visitor Services (BLM 2003b) specifically in relation to: 1) improving the accuracy and consistency of BLM's visitor use data; 2) developing recreation experience/benefit attainment and visitor service satisfaction measures, and conduct surveys to support DOI/BLM output and outcome measures, evaluate performance and allocate resources; 3) developing social and environmental monitoring indicators and standards geared toward benefits-based management; and 4) monitoring the effectiveness of management and marketing actions implemented to deliver prescribed setting conditions and to produce the targeted experience and quality of life outcomes.

The key to improving the GSFO's recreation monitoring is developing a well thought-out monitoring framework during the RMP revision for SRMAs (BLM 2005) and addressing monitoring strategies in-depth in SRMA implementation plans. The GSFO will also need to consider recreation monitoring of: visitor health and safety, user conflict and resource protection for ERMAs (BLM 2005).

Limits of Acceptable Change—A widely used management-monitoring technique in recreation is Limits of Acceptable Change (LAC). LAC utilizes indicators with prescriptive standards based on the recreation objectives to define acceptable limits. If the standards (acceptable limits) are exceeded the managing partners then make pre-determined management changes that will bring concerns such as: 1) visitor impacts to natural/cultural resources, 2) the physical, social and administrative

natural resource recreation setting prescriptions or 3) the visitor's attainment of recreation outcomes back within acceptable standards. Administration of the Eagle River, Upper Colorado River, and Red Hill SRMAs could especially benefit from implementing a LAC process.

4.17 COMPREHENSIVE TRAILS AND TRAVEL MANAGEMENT

Travel management in Colorado (BLM 2004c) will be as follows:

- Comprehensive—Managers need to look at more than just OHVs to include all motorized and nonmotorized travel that occurs on public lands;
- Multifunctional—Broader participation from all functions from within the BLM is essential;
- Collaborative—Travel plans should be accomplished in a collaborative industry and community-based process;
- Outcome-based—Travel systems should be designed for transportation outcomes; and
- Implemented—Travel management implementation should be accomplished in a holistic approach that provides clear direction for access and recreation opportunities, while protecting sensitive areas. This includes signs, maps, education, maintenance, construction, reconstruction, planning, field presence, law enforcement, and monitoring.

Ability of Current Management Direction to Achieve Desired Conditions and Address Resource Demands

Management Adequacy

Based on the current population growth trends demand, the GSFO does not have the capacity in terms of staff, law enforcement, annual budget, or travel routes to adequately manage future travel demands.

Management Opportunities

As described in **Table 4-6**, four primary opportunities for change exist for travel management, as follows:

1. Update TMAs by changing the designation of TMAs from open to limited to designated routes;
2. Design a system of appropriate and sustainable routes that help achieve land use planning objectives and protect resources;
3. Design route systems that are fun, that provide challenge for different skill levels, that are multimodal when possible, and that have loops;
4. Comprehensive travel management planning should address all resource use aspects (such as recreational, traditional, casual, agricultural, commercial, and educational) and accompanying modes and conditions of travel on the public

4. Management Opportunities/Management Adequacy (Comprehensive Trails and Travel Management)

lands, not just motorized or OHV activities. Acceptable modes of access and travel for each TMA should be identified. In developing these areas, the following will be considered:

- A. Consistency with all resource program goals and objectives,
- B. Primary travelers,
- C. Objectives for allowing travel in the area,
- D. Setting characteristics that are to be maintained (including recreation opportunity system and VRM settings),
- E. Primary means of travel allowed to accomplish the objectives and to maintain the setting characteristics,
- F. Choosing and developing individual roads and trails, rather than simply using inherited roads and trails. Most existing roads and trails on public lands were created over time, rather than being planned and constructed for specific activities or needs. Instead of a decision making process to decide which individual roads and trails should be closed or left open, consider a broader range of possibilities for management of individual roads and trails, including reroutes, reconstruction or new construction, and closures, and
- G. Determining needs for new public access points and working with communities and landowners to establish and manage those access points.

**Table 4-6
Adequacy of Current Travel Management Direction and Options for Change**

Planning Decision	Is Decision Responsive to Current Issues?	Remarks (Rationale)	Options for Change
Adopt ROS management classes.	Yes	While population and recreation use have both increased, the patterns have largely followed those identified in the 1984 RMP, with some exceptions in areas designated as WSA.	Some semiurban areas could be expanded to reflect population growth. The King Mountain and Castle Peak WSA areas could be changed from semiprimitive nonmotorized to either semiprimitive motorized or primitive. This would reflect both current conditions and expressed public desires.
Designate OHV travel areas as follows: 70 percent open, 4 percent closed, and 26 percent limited to existing/designated trails.	No	Increased OHV use and proliferation of user-created routes have caused resource damage, recreation conflicts, and public safety concerns.	Limit OHV use to designated routes in almost all areas. Close 38,707 acres to OHV use to reflect recently developed travel management plans.

Table 4-6
Adequacy of Current Travel Management Direction and Options for Change *(continued)*

Planning Decision	Is Decision Responsive to Current Issues?	Remarks (Rationale)	Options for Change
			Implement comprehensive travel management to include not only recreational use but also other resources and resource uses.
Designate an area near Parachute for intensive motorized vehicle use.	Yes	This type of use fills a public demand and should be accommodated if impacts on resources can be avoided.	Designate the Hubbard Mesa area as open to OHV use.

4.18 FORESTRY

Forests and woodlands within the RMP planning area have become more susceptible to disease, insects, and population encroachment. Much of this is due to factors such as drought and modification of the natural fire regime from past fire suppression strategies. Similar to rangelands, management direction for forest and woodland resources could be changed to focus on identifying desired plant community objectives, prioritizing areas that require intensive management, and identifying management actions needed to achieve desired conditions. For example, the revised RMP could identify areas at risk from insects, disease, and conversion of forest type that require revised management actions and land use restrictions.

The RMP analysis should: 1) evaluate of long-term silvicultural program, 2) reevaluate biomass and utilization, 3) assess (as part of the inventory) forest health, and 4) look at at historic plans and see if they are adequate/what can be learned. The RMP should address: 1) increasing the annual harvest to reduce backlog of untreated lands and 2) monitoring of current practices.

4.19 LANDS AND REALTY

Land actions constitute resource allocations, and, as such, are made through a variety of means but generally fall into five broad categories: use authorizations, disposal actions, acquisitions, exchanges, and withdrawals. Each proposal or application for a lands action is considered on a case-by-case basis and is either authorized or rejected.

The primary objective for the lands and realty program in the GSFO is to provide the public with the land it needs for ROWs, land use permits, leases, and land tenure adjustments. The secondary objective is to provide support to other programs to

protect and enhance the resources. The final goal of these objectives is a balance between land use and resource protection that best serves the public.

Many of the management decisions related to lands and realty in the GSFO can be categorized as being driven by growth and urbanization and the interface between private land owners and the demand public lands needed for the facilities (e.g., access roads, communication sites, FLPMA pipelines, and utility corridors) to support the fast-growing infrastructure.

Although land exchanges and other land tenure adjustment actions completed by the GSFO conform with the 1984 RMP, recent community meetings have expressed that local communities and local governments would like the BLM to retain all public land, as these lands tend to be open space surrounded by private lands. Land tenure adjustments in the GSFO should be reviewed on a case-by-case basis and include community involvement.

Communication Sites

Utility Corridors—Based on the information and analyses developed in the PEIS, each agency would amend its respective land use plans by designating a series of energy corridors effective on signing of the record(s) of decision. Lands within the GSRMP that would be affected by the West-Wide Energy Corridor are Eagle, Rio Blanco, and Garfield Counties. The result would be designated corridors on federal lands designed to accommodate multiple infrastructure projects, including transmission lines and gas, oil, and hydrogen pipelines. Not later than two years after the date of enactment of this act (August 2007), the Secretary of the Interior in consultation with the Federal Energy Regulatory Commission, states, tribal or local units of governments as appropriate, affected utility industries, and other interested persons, should consult with each other and incorporate the designated corridors into the relevant agency land use and RMPs or equivalent plans (automatically amend land use plans for all federal public lands).

4.20 TRANSPORTATION FACILITIES AND ACCESS

Transportation linear features on BLM Lands comprise one of the most significant issues facing the BLM and are the focus of a concentrated investment of BLM resources to adequately identify, categorize, designate, operate, and maintain. The Roads and Trails Terminology Team, a joint effort between the National Recreation and Visitor Services Group, WO-250 (Recreation) and Protection and Response Group, WO-360 (Engineering) within the BLM, was chartered to address BLM's approach to management of transportation-related linear features on public lands. The Roads and Trails Terminology Report noted nine key recommendations under 3 objectives that were approved for implementation BLM-wide (BLM 2006b).

Objective 1—Establish Terms and Definitions for Transportation Linear Features

1. Recommendation - Standardize the terms used for transportation assets within the BLM as “Road,” “Primitive Road,” and “Trail.”

2. Recommendation - Shift “Maintenance Levels” to “Maintenance Intensity” and simplify the standards for consistency across all linear features.

Objective 2—Determine Appropriate Minimum National Data Standards and Electronic Storage Location for Linear Feature Data

3. Recommendation - Develop and formalize through published guidance the required minimum national data standard for all linear features that comprise the BLM transportation system assets.
4. Recommendation - Utilize the Facility Asset Management System as the BLM’s official database for the management of transportation system assets.
5. Recommendation – Develop a Minimum National Data Standard for linear disturbances (asset) that incorporates national data requirements from Recreation and Engineering and provides a consistent set of guidance to the Field.

Objective 3—Develop a Strategy to Align the Inventory and Management of Transportation Linear Features between Resource Management Programs

6. Recommendation - Recognize the Facility Asset Management System initial inventory as the BLM’s transportation system.
7. Recommendation – Implement a BLM-wide policy that requires any change in the BLM’s network of designated routes to occur through the land-use planning process or through subsequent implementation or activity level plans and EAs.
8. Recommendation - Standardize policy guidance for transportation planning to facilitate a consistent approach and process across the BLM.
9. Recommendation - The BLM should develop policy guidance to identify, track, monitor, prioritize, and fund the removal of unwanted transportation linear disturbances.

The GSFO will need to accomplish several tasks during the RMP revision related to meeting the objectives of the “The Roads and Trails Terminology Report. For example:

1. The BLM GSFO will need to amend our classification system from “Maintenance Levels” to “Maintenance Intensity”. The implementation of primary transportation asset categories provides an opportunity to review and enhance current standards for determining maintenance levels, managed use standards, and other descriptive information utilized to describe and report on the BLM’s assets. The new “Maintenance Intensity” levels include four primary “Maintenance Intensity” levels that allow for removal, low, medium, and high maintenance intensities irrespective of the type of route (road, primitive road, or trail) (BLM 2006b). Maintenance Intensities provide

a range of objectives and standards, from “identification for removal” through frequent and intensive maintenance.

Maintenance Intensities provide consistent objectives and standards for the care and maintenance of BLM routes based on identified management objectives. Maintenance Intensities must be consistent with land-use planning management objectives (for example, natural, cultural, recreation setting, and visual). Maintenance Intensities provide operational guidance to field personnel on the appropriate intensity, frequency, and type of maintenance activities that should be undertaken to keep the route in acceptable condition and provide guidance for the minimum standards of care for the annual maintenance of a route. Maintenance Intensities do not describe route geometry, route types, types of use or other physical or managerial characteristics of the route. Those items are addressed as other descriptive attributes to a route.

Level 0

Maintenance Description: Existing routes that will no longer be maintained and no longer be declared a route. Routes identified as Level 0 are identified for removal from the Transportation System entirely.

Maintenance Objectives:

- No planned annual maintenance
- Meet identified environmental needs
- No preventive maintenance or planned annual maintenance activities

Maintenance Funds: No annual maintenance funds

Level 1

Maintenance Description: Routes where minimum (low intensity) maintenance is required to protect adjacent lands and resource values. These roads may be impassable for extended periods of time.

Maintenance Objectives:

- Low (Minimal) maintenance intensity
- Emphasis is given to maintaining drainage and runoff patterns as needed to protect adjacent lands. Grading, brushing, or slide removal is not performed unless route bed drainage is being adversely affected, causing erosion.
- Meet identified resource management objectives
- Perform maintenance as necessary to protect adjacent lands and resource values
- No preventive maintenance

- Planned maintenance activities limited to environmental and resource protection
- Route surface and other physical features are not maintained for regular traffic

Maintenance Funds: Maintenance funds provided to address environmental and resource protection requirements. No maintenance funds provided to perform preventive maintenance.

Level 2

Reserved for possible future use.

Level 3

Maintenance Description: Routes requiring moderate maintenance due to low volume use (e.g., seasonally or year-round for commercial, recreation, or administrative access). Maintenance Intensities may not provide year-round access but are intended to generally provide resources appropriate to keep the route in use for the majority of the year.

Maintenance Objectives:

- Medium (Moderate) maintenance intensity
- Drainage structures will be maintained as needed. Surface maintenance will be conducted to provide a reasonable level of riding comfort at prudent speeds for the route conditions and intended use. Brushing is conducted as needed to improve sight distance when appropriate for management uses. Landslides adversely affecting drainage receive high priority for removal; otherwise, they will be removed on a scheduled basis.
- Meet identified environmental needs
- Generally maintained for year-round traffic
- Perform annual maintenance necessary to protect adjacent lands and resource values
- Perform preventive maintenance as required to generally keep the route in acceptable condition Planned maintenance activities should include environmental and resource protection efforts, annual route surface
- Route surface and other physical features are maintained for regular traffic

Maintenance Funds: Maintenance funds provided to preserve the route in the current condition, perform planned preventive maintenance activities on a scheduled basis, and address environmental and resource protection requirements.

Level 4

Reserved for possible future use.

Level 5

Maintenance Description: Routes for high (Maximum) maintenance due to year-round needs, high volume traffic, or significant use. Also may include routes identified through management objectives as requiring high Intensities of maintenance or to be maintained open on a year-round basis.

Maintenance Objectives:

- High (Maximum) maintenance intensity
- The entire route will be maintained at least annually. Problems will be repaired as discovered. These routes may be closed or have limited access due to weather conditions but are generally intended for year-round use.
- Meet identified environmental needs
- Generally maintained for year-round traffic
- Perform annual maintenance necessary to protect adjacent lands and resource values
- Perform preventive maintenance as required to generally keep the route in acceptable condition
- Planned maintenance activities should include environmental and resource protection efforts, annual route surface
- Route surface and other physical features are maintained for regular traffic

Maintenance Funds: Maintenance funds provided to preserve the route in the current condition, perform planned preventive maintenance activities on a scheduled basis, and address environmental and resource protection requirements.

2. The BLM GSFO will need to recognize and update the Facility Asset Management System. The Facility Asset Management System will represent the “baseline” for the GSFO’s current transportation system and comprises the designated roads and trails within the BLM. Formal recognition of the Facility Asset Management System as the baseline will provide consistency between all BLM Programs.
3. The BLM GSFO will need to implement a BLM-wide policy that requires any change in the BLM’s inventory of designated roads, primitive roads, and trails to occur through the formal evaluation and designation process through one of four events:

- ROD for an RMP/EIS or an Amendment or Revision of a RMP/EIS.
- Decision Record for an Activity Plan, Plan Amendment/ EA.
- Federal Register Notice Action (under the authority of 43 CFR 8341.2, 8364.1, 8365.1-6, or 9268.3) that has a follow-up land-use planning action and associated NEPA action.
- Management decision of appropriate routes in an area that has been designated “open” to OHV use.

4.21 RENEWABLE ENERGY

Ability of Current Management Direction to Achieve Desired Conditions and Address Resource Demands

Current management direction has been adequate to allow for authorization of renewable resources. There has not been a demand for these authorizations in the GSFO.

4.22 AREAS OF CRITICAL ENVIRONMENTAL CONCERN

Ability of Current Management Direction to Achieve Desired Conditions and Address Resource Demands

Current management direction for three designated ACECs (Lower Colorado River Cooperative Management Area, Blue Hill Archaeological District, and G. S. Debris Flow Hazard Zone) has been sufficient to protect the identified resource values associated with those areas. However, three designated ACECs (Deep Creek, Thompson Creek, and Bull Gulch) are in need of more specific management direction. These areas are experiencing new and increased recreation uses that were not addressed in the 1984 RMP. These new uses—climbing, mountain biking, paint ball, geo-caching—are potentially threatening resource values. Travel management needs to be addressed for motorized and mechanized vehicles both within and on lands adjacent to the ACECs to address ongoing travel related issues. More specific management prescriptions need to be developed through the RMP planning process, or separate management plans with specific ACEC objectives need to be prepared to protect resources and reduce user conflicts.

In “Faults, Fossils, and Canyons, Significant Geologic Features on Public Lands in Colorado, 1989,” the state of Colorado’s Natural History Program (BLM Final EIS for 1984 RMP) and the BLM Geologic Advisory Group have identified three areas as deserving special management attention. These recommendations were based on specific guidelines and criteria and focused on sites of national or statewide significance. The three areas identified within the GSFO RMP planning area were the Dotsero Crater, the McCoy Fan Deltas, and the Gypsum Cliffs. The McCoy Fan Delta is experiencing an increased amount of motorcycle use that could damage the exposed Pennsylvanian fan deltas. Portions of the Dotsero Crater are being mined as a “saleable” for cinder block. The Gypsum Cliffs are being managed under VRM Class II objectives and to date have incurred no significant damage. These three

areas (as well as any newly proposed areas) need to be looked at in this RMP revision to determine if the associated resource values meet ACEC criteria and whether special management attention is needed to preserve those values.

The 2002 Glenwood Springs RMP Evaluation Report recommended that the Lower Colorado Cooperative Management Area ACEC should be reevaluated to determine whether or not it should be dropped from ACEC designation due to the difficulty in managing its minimal and scattered public land acreage. One value associated with this ACEC is the presence of two endangered fish species, the Colorado pikeminnow and razorback sucker. The scattered BLM lands along and within the Colorado River and within the 100-year floodplain, are identified as designated critical habitat for these two fish. Given the endangered status of these two fishes are protected under the ESA. Thus any federal activity or activity authorized or funded by federal entities is subject to Section 7 consultation where impacts of proposed activities may affect these fish or their habitat. Given their protection under federal law, ACEC designation provides no additional protection to these fish; the absence of the ACEC designation for these scattered lands would not preclude continued protection for these native fishes or their habitat. It also acknowledges that many of the implementation (activity) plans that were committed to in the RMP have not been completed; this includes the ACEC plans. Since none the ACECs have been formally withdrawn from mineral entry as identified in the 1984 RMP, the potential for mineral entry in all of the ACECs could further threaten ACEC values. The report mentioned new opportunities for designation that have emerged from the increased cultural inventoried areas and special status plant species identification. The report also identified a need to keep a monitoring log for ACECs.

As part of the RMP revision process, the current ACECs will be evaluated to determine maintenance of relevant and important values and whether ACEC designation is still necessary to protect these values. Management prescriptions for these areas will also be reviewed to ensure they can protect the identified relevant and important values. In addition to the reevaluation of ACECs, public and internal proposals to designate additional ACECs will be evaluated through the RMP revision process.

4.23 WILDERNESS STUDY AREAS

Ability of Current Management Direction to Achieve Desired Conditions and Address Resource Demands

The current management of the four WSAs in the RMP planning area has been adequate to protect the wilderness characteristics of those areas. However, increased urbanization and associated recreation uses have created some problem areas. Increased OHV and mechanized uses throughout the Glenwood Springs RMP planning area has begun to threaten wilderness characteristics within three of the WSAs. The revised RMP will need to address this issue through continued restoration and rehabilitation efforts within and adjacent to the Bull Gulch and Castle Peak WSAs. In addition, the open travel designation within the Eagle

Mountain WSA will need to be changed to closed, which will prohibit mechanized and motorized uses. These management decisions are in order to continue to protect the wilderness characteristics of the WSAs in accordance with BLM interim management policy.

The revised RMP will need to address BLM guidance, which requires that all WSAs be managed as VRM Class I areas.

Since none the WSAs have been formally withdrawn from mineral entry as identified in the 1984 RMP, the potential for mineral entry in the all the WSAs could further threaten Wilderness characteristics. The RMP revision gives the GSFO the opportunity to review mineral entry status.

4.24 WILD AND SCENIC RIVERS

Ability of Current Management Direction to Achieve Desired Conditions and Address Resource Demands

Refer to the WSR Eligibility Report for the Glenwood Springs and Kremmling Field Offices on the Internet at http://www.blm.gov/rmp/co/kfo-gsfo/documents/FinalEligibilityReport_Mar2007.pdf.

As part of the RMP revision, Suitability determinations will be made on segments found to be “Eligible” per Section 5(d)(1) of the WSRs Act of 1968.

4.25 BACKCOUNTRY BYWAYS/NATIONAL TRAILS

The GSFO does not administer any Backcountry Byways as part of the National Scenic Byway system or National trails.

4.26 SOCIAL AND ECONOMIC FEATURES

Because of the high level of interest in the relationship between the management of public lands and the social and economic health of the local and regional economy, BLM has procured the services of a contractor to develop both the socio-economic baseline study for the RMP planning area and to conduct the analysis of impacts of the alternatives identified during the planning process.

The study and impact analysis will be incorporated into the RMP/Draft EIS at a later time and available on the RMP revision Web site: <http://www.blm.gov/rmp/co/kfo-gsfo/index.htm> by fall of 2007.

However, in the fall and winter of 2006, The Keystone Center held 19 small group discussions with representatives of local governments in north-central Colorado. These discussions were held on behalf of the BLM as part of the pre-planning process in advance of the revision of the RMPs for the GSFO and the KFO. The interviews had 3 primary goals:

- To gather input from communities about their vision for the landscape and the benefits they seek from public lands.

4. Management Opportunities/Management Adequacy (Social and Economic Features)

- To set the stage for strategic planning options.
- To foster collaborative relationships in which information is continually shared and updated throughout the planning process.

The findings are available in a report titled “The North-Central Colorado Community Assessment Report for the Bureau of Land Management Glenwood Springs Field Office and Kremmling Field Office”. The report is available on the RMP revision Web site: <http://www.blm.gov/rmp/co/kfo-gsfo/index.htm>.

Some general social-economic issues affecting public lands in the region the region include:

- Urbanization;
- Energy development;
- Transportation and commuting;
- Increased local and national demand on public lands for recreation, open space, and visual aesthetics;
- Increased impacts of public land visitors, especially OHVs, on natural and cultural resources;
- Changes in ecological conditions and reduced quality of wildlife habitat, (i.e. migration corridors and winter range conditions);
- Increased threat to communities from wildland fire;
- Changing demographics and economies; and
- Changes in ecological conditions.

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CHAPTER 5

CONSISTENCY/COORDINATION WITH OTHER PLANS

5.1 COUNTY/CITY PLANS

Larimer County - Guidelines for Revegetation of Disturbed Areas

Grand County - Erosion and Sediment Control for Construction Activities Guidance Handbook, 2005

5.2 STATE AGENCY PLANS

Colorado Division of Wildlife Strategic Plan

Middle Park Habitat Partnership Plan

North Park Habitat Partnership Plan

Greater Sage-grouse Conservation Plan, Middle Park, Colorado

North Park Greater Sage-grouse Conservation Plan

Northern Eagle/Southern Routt Greater Sage-grouse Conservation Plan

Colorado Division of Wildlife Data Analysis Unit Plans

Conservation Assessment of Greater Sage-grouse and Sagebrush Habitats

Greater Sage-grouse Comprehensive Conservation Strategy

North American Mule Deer Conservation Plan

Mule Deer Conservation: Issues and Management Strategies

5.3 OTHER FEDERAL AGENCY PLANS

Arapaho National Wildlife Refuge Comprehensive Conservation Plan

BLM National Sage-grouse Strategy

5.4 COOPERATING AGENCIES

A *Cooperating Agency* is any federal, state, or local government agency or Indian tribe that enters into a formal agreement with the lead federal agency to assist in the

development of an environmental analysis. On November 30, 2006, the BLM mailed letters to local, state, federal, and tribal representatives inviting them to participate as cooperating agencies for the Glenwood Springs and Kremmling Field Offices RMP (Table 5-1). The status of each agency or tribe as of July 5, 2007 is provided below.

Table 5-1
Cooperating Agency Participation

Agency	Accepted	Declined	Did not Respond
Garfield County Board of County Commissioners	X		
Eagle County Board of County Commissioners	X		
Pitkin County Board of County Commissioners	X		
Routt County Board of County Commissioners		X	
Mesa County Board of County Commissioners	X	pending	
Grand County Board of County Commissioners	X		
Jackson County Board of County Commissioners	X		
Summit County Board of County Commissioners			X
Larimer County Board of County Commissioners			X
Town of New Castle	X		
Town of Rifle	X		
Town of Parachute	X		
Town of Silt	X		
Town of Gypsum	X		
Town of Eagle	X		
City of Glenwood Springs	X		
Town of Carbondale	X		
Town of Basalt	X		
Town of Kremmling	X		
Town of Hot Sulfur Springs	X		
Town of Granby	X		
Town of Walden		X	
Colorado Department of Natural Resources	X		
USDA Forest Service - Arapaho/Roosevelt NF		X	
USDA Forest Service – White River NF		X	
USDA Forest Service – Medicine Bow/Routt NF		X	
NRCS – Kremmling Field Office		X	
NRCS – Walden Field Office		X	
Southern Ute Indian Tribe			X
Ute Mountain Indian Tribe			X
Eastern Shoshone Tribe			X
Northern Arapaho Tribe			X
Northern Ute Indian Tribe			X
Arapaho National Wildlife Refuge		X	
US Fish and Wildlife Service	X		

CHAPTER 6

SPECIFIC MANDATES AND AUTHORITY

The foundation of public lands management is in the mandates and authorities provided in laws, regulations, and executive orders. BLM's planning process (as described in 43 CFR 1600) is authorized and mandated through two important laws: the Federal Land Policy and Management Act of 1976 and the National Environmental Policy Act of 1969. In addition to these acts, several other acts, IMs, information bulletins (IBs), manuals, and handbooks give direction and authority to the BLM. The following are some of the documents that direct the management of public lands and resources.

6.1 LAWS, REGULATIONS, AND ORDERS

- American Indian Religious Freedom Act (49 USC 47125 et seq.)
- Appropriations Act of 1952, McCarran Amendment
- Archaeological Resources Protection Act of 1979, as amended (16 USC 470)
- Classification of Multiple Use Act of September 1964, in accordance with 43 CFR 2400
- Clean Air Act, as amended (42 USC 7418)
- Colorado River Basin Salinity Control Act of 1974
- Endangered Species Act of 1973, as amended (16 USC 1531 et seq.)
- Federal Cave Resources Protection Act of 1988 (16 USC 4301 et seq.)
- Federal Land Policy Management Act of 1976 (43 USC 1701 et seq.)
- Federal Water Pollution Control Act (commonly referred to as the Clean Water Act), as amended (33 USC 1251-1387)
- Fish and Wildlife Coordination Act (16 USC 661 et seq.)
- Healthy Forests Restoration Act of 2003
- Historic Sites Act of 1935 (16 USC 461)

- Migratory Bird Conservation Act of 1979 (16 USC 715)
- Mining and Mineral Policy Act of 1970 (30 USC 181 et seq.)
- National Historic Preservation Act, as amended (16 USC 470)
- Onshore Oil and Gas Leasing Reform Act of 1987 (30 USC 181 et seq.)
- Public Rangelands Improvement Act of 1978 (43 USC 869 et seq.)
- Recreation and Public Purposes Act of 1926, as amended (43 USC 869 et seq.)
- Surface Mining Control and Reclamation Act of 1977 (30 USC 1201 et seq.)
- Taylor Grazing Act of 1934 (43 USC 315)
- Water Resources Development Act of 1974
- Wild and Scenic Rivers Act, as amended (16 USC 1271 et seq.)
- Wilderness Act, as amended (16 USC 1131 et seq.)
- Executive Order 11288 (water quality management and pollution abatement plans)
- Executive Order 11644 (Use of Off-Road Vehicles on the Public Lands)
- Executive Order 11738 (Enforce the Clean Air Act and the Clean Water Act in the Procurement of Goods, Materials, and Services)
- Executive Order 11987 (Exotic Flora and Fauna)
- Executive Order 13007 (Indian Sacred Sites)
- Executive Order 13084 (Consultation and Coordination with Indian Tribal Governments)
- National Ambient Air Quality Standards (40 CFR 50.4-50.12)

6.2 INSTRUCTION MEMORANDUMS, INFORMATION BULLETINS, MANUAL SECTIONS, HANDBOOKS, AND TECHNICAL NOTES

- IM 78-410 (Protection of Wetlands and Riparian Areas)
- IM 78-523 (Compliance with BLM Interim Floodplain Management Procedures)
- IM 87-261 (Implementation of the Riparian Area Management Policy)
- IM 99-085 (Federal Multi-Agency Source Water Agreement)
- IM 99-123 (Reporting to the Colorado River Salinity Control Forum)
- IM 2002-174 (Oil and Gas Leasing Stipulations)
- IM 2003-127 (Integration of the Energy Policy and Conservation Act Inventory Results into Land Use Planning and Energy use Authorizations)

- IM 2003-158 (Memorandum of Understanding (MOU) between BLM and the Animal and Plant Health Inspection Service Addressing the Management of Grasshoppers and Mormon Crickets)
- IM 2003-226 (Fire Program Analysis System – Development of Fire Management Objectives)
- IM 2004-005 (Clarification of OHV Designations and Travel Management in the BLM Land Use Planning Process)
- IM 2005-006 (Solar Energy Development Policy)
- IM 2005-008 (Black-tailed, White-tailed, and Gunnison Prairie Dog Conservation Update)
- Colorado IM 2007-020 (Comprehensive Travel Management Planning and OHV Designations)
- IB 98-116 (Clean Water Action)
- IB 2002-101 (Cultural Resource Information)
- IB 2003-074 (Sample Filing Plan for Land Use Planning Records)
- IB 2003-113 (The Manager’s Role in the Land Use Planning Process)
- BLM-M-1601 (Land Use Planning)
- BLM-M-1613 (Areas of Critical Environmental Concern)
- BLM-M-4180 (Rangeland Health Standards)
- BLM-M-6800 (Special Status Species Management)
- BLM-M-7150 (Provides guidance in the conduct of maintenance of water utilization and development, water quality, water yield and timing, and water rights)
- BLM-M-8100 (Cultural Resource Management)
- BLM-M-8270 (Paleontological Resource Management)
- BLM-M-8340 (OHV Management)
- BLM-H-1601 (Land Use Planning)
- BLM-H-1790 (NEPA Handbook)
- BLM-H-2200 (Land Exchanges)
- BLM-H-4180-1 (Wilderness Inventory and Study Procedures)
- BLM-H-8410-1 (Visual Resource Inventory)
- BLM-H-9214-1 (Prescribed Fire Management)
- Technical Notes 346: Erosion condition classification system
- Technical Notes 364: 1980-82 salinity status report: results of Bureau of Land Management studies on public lands in the Upper Colorado River Basin

- Technical Notes 369: Considerations in rangeland watershed monitoring
- Technical Notes 373: Diffuse-source salinity Mancos shale terrain
- Technical Notes 405: A framework for analyzing the hydrologic conditions of watersheds

6.3 APPLICABLE COLORADO STATE LAWS AND REGULATIONS

Water Quality—Colorado Department of Public Health and Environment, Water Quality Control Commission

- Regulation No. 39 Colorado River Salinity Standards. Adopted May 6, 1980, amended 1982, 1997;
- Regulation No. 42 Site Specific Water Quality Classifications and Standards For Groundwater;
- Colorado Water Quality Control Act;
- Regulation No. 41 The Basic Standards for Groundwater;
- Regulation No. 93- Section 303(d) List Water Quality Limited Segments Requiring TMDLs. adopted 3/24/2006;
- Regulation No. 94- Colorado's Monitoring and Evaluation List, adopted 3/2006;
- Regulation 31- The Basic Standards and Methodologies for Surface Water (amended 8/8/05, effective 12/31/05 and 12/31/07);
- Regulation 33 - Classifications and Numeric Standards for Upper Colorado River Basin and North Platte River (Planning Region 12) and tables (amended 1/9/06, effective 3/2/06);
- Regulation 38 - Classifications and Numeric Standards South Platte River Basin, Laramie River Basin, Republican River Basin, Smoky Hill River Basin and tables (amended 8/14/06, effective 9/30/06);
- Primary Drinking Water Regulations - 5 CCR 1003-1 (amended 1/19/05, effective 3/30/05).

Water Rights—Colorado Division of Water Resources

- Colorado Revised Statutes- Title 37- Water and Irrigation

6.4 MEMORANDA AND AGREEMENTS

- Master MOU with USFWS dated December 1986
- The rangeland programmatic memorandum of agreement among BLM, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers

- The federal coal management programmatic memorandum of agreement among BLM, Office of Surface Mining, DOI, USGS, and the Advisory Council on Historic Preservation
- Interagency MOU between the BLM and USDA in 1995 (60F26045-48, 5/16/1995)

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CHAPTER 7

GLOSSARY

Activity plan. A type of implementation plan (see *Implementation plan*); an activity plan usually describes multiple projects and applies best management practices to meet land use plan objectives. Examples of activity plans include interdisciplinary management plans, habitat management plans, recreation area management plans, and grazing plans.

Actual use. The amount of AUMs consumed by livestock based on the numbers of livestock and grazing dates submitted by the livestock operator and confirmed by periodic field checks by the BLM.

Air pollution. The contamination of the atmosphere by any toxic or radioactive gases and particulate matter as a result of human activity.

Allotment. An area of land in which one or more livestock operators graze their livestock. Allotments generally consist of BLM lands but may also include other federally managed, state-owned, and private lands. An allotment may include one or more separate pastures. Livestock numbers and periods of use are specified for each allotment.

Amendment. The process for considering or making changes in the terms, conditions, and decisions of approved RMPs or management framework plans. Usually only one or two issues are considered that involve only a portion of the planning area.

Analysis of the management situation (AMS). Assessment of the current management direction. It includes a consolidation of existing data needed to analyze and resolve identified issues, a description of current BLM management guidance, and a discussion of existing problems and opportunities for solving them.

Animal Unit Month (AUM). The amount of forage necessary for the sustenance of one cow or its equivalent for a period of one month.

Areas of critical environmental concern (ACEC). Areas within the public lands where special management attention is required (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards (from H-6310-1, Wilderness Inventory and Study Procedures).

Assets. Term utilized to describe roads, primitive roads, and trails that comprise the transportation system. Also the general term utilized to describe all BLM constructed “Assets” contained within the Facility Asset Management System.

Atmospheric deposition. Air pollution produced when acid chemicals are incorporated into rain, snow, fog or mist and fall to the earth. Sometimes referred to as “acid rain” and comes from sulfur oxides and nitrogen oxides, products of burning coal and other fuels and from certain industrial processes. If the acid chemicals in the air are blown into areas where the weather is wet, the acids can fall to earth in the rain, snow, fog, or mist. In areas where the weather is dry, the acid chemicals may become incorporated into dust or smoke.

Back country byways. Vehicle routes that traverse scenic corridors using secondary or backcountry road systems. National backcountry byways are designated by the type of road and vehicle needed to travel the byway.

Beneficial outcomes. Also referenced as “recreation benefits”; improved conditions, maintenance of desired conditions, prevention of worse conditions, and the realization of desired experiences.

Big game. Indigenous, ungulate (hoofed) wildlife species that are hunted, such as elk, deer, bison, bighorn sheep, and pronghorn antelope.

Candidate species. Taxa for which the US Fish and Wildlife Service has sufficient information on their status and threats to propose the species for listing as endangered or threatened under the ESA, but for which issuance of a proposed rule is currently precluded by higher priority listing actions. Separate lists for plants, vertebrate animals, and invertebrate animals are published periodically in the Federal Register (BLM Manual 6840, Special Status Species Manual).

Casual use. Activities that involve practices that do not ordinarily disturb or damage the public lands, resources, or improvements and, therefore, do not require a ROW grant or temporary use permit (43 CFR 2800). Also, any short-term noncommercial activity that does not damage or disturb the public lands, their resources, or improvements and that is not prohibited by closure of the lands to such activities (43 CFR 2920). Casual use generally includes collecting geochemical, rock, soil, or

mineral specimens using hand tools, hand panning, and nonmotorized sluicing. It also generally includes use of metal detectors, gold spears, and other battery-operated devices for sensing the presence of minerals, and hand battery-operated dry washers. Casual use does not include use of mechanized earth-moving equipment, truck-mounted drilling equipment, suction dredges, motorized vehicles in areas designated as closed to off-road vehicles, chemicals, or explosives. It also does not include occupancy or operations where the cumulative effects of the activities result in more than negligible disturbance.

Clean Air Act (CAA) of 1963 and amendments. Federal legislation governing air pollution control.

Closed Area. An area where off-highway vehicle use is prohibited. Use of off-highway vehicles in closed areas may be allowed for certain reasons; however, such use shall be made only with the approval of the authorized officer.

Collaborative partnerships. Refers to people working together, sharing knowledge and resources, to achieve desired outcomes for public lands and communities within statutory and regulatory frameworks.

Community recreation-tourism market. A community or communities dependent on public lands recreation or related tourism use, growth, or development. Major investments in facilities and visitor assistance are authorized within SRMAs where the BLM's strategy is to target demonstrated community recreation-tourism market demand. Here, recreation management actions are geared toward meeting primary recreation-tourism market demand for specific activity, experience, and benefit opportunities. These opportunities are produced through maintenance of prescribed natural resource or community setting character and by structuring and implementing management, marketing, monitoring, and administrative actions accordingly.

Comprehensive Travel Management. The proactive interdisciplinary planning; on-the-ground management and administration of travel networks (both motorized and non-motorized) to ensure public access, natural resources, and regulatory needs are considered. It consists of inventory, planning, designation, implementation, education, enforcement, monitoring, easement acquisition, mapping and signing, and other measures necessary to provide access to public lands for a wide variety of uses (including uses for recreational, traditional, casual, agricultural, commercial, educational, and other purposes).

Condition class (fire regimes). Fire regime condition classes are a measure describing the degree of departure from historical fire regimes, possibly resulting in alterations of key ecosystem components, such as species composition, structural stage, stand age, canopy closure, and fuel loadings. One or more of the following activities may have caused this departure: fire suppression, timber harvesting,

livestock grazing, introduction and establishment of exotic plant species, introduced insects or disease, or other management activities.

Conditions of approval. Conditions or provisions (requirements) under which an application for a permit to drill or a sundry notice is approved.

Conservation agreement. A formal signed agreement between the US Fish and Wildlife Service or National Oceanographic and Atmospheric Administration-Fisheries and other parties that implement specific actions, activities, or programs designed to eliminate or reduce threats to, or otherwise improve the status of, a species. Conservation agreements can be developed at a state, regional, or national level and generally include multiple agencies at both the state and federal level, as well as tribes. Depending on the types of commitments the BLM makes in a conservation agreement and the level of signatory authority, plan revisions or amendments may be required before the conservation agreement is signed or subsequently in order to implement the conservation agreement.

Conservation strategy. A strategy outlining current activities or threats that are contributing to the decline of a species, along with the actions or strategies needed to reverse or eliminate such a decline or threats. Conservation strategies are generally developed for species of plants and animals that are designated as BLM sensitive species or that have been determined by the US Fish and Wildlife Service or National Oceanographic and Atmospheric Administration-Fisheries to be federal candidates under the ESA.

Council on Environmental Quality (CEQ). An advisory council to the President of the US established by the National Environmental Policy Act of 1969. It reviews federal programs to analyze and interpret environmental trends and information.

Critical habitat. An area occupied by a threatened or endangered species “on which are found those physical and biological features (1) essential to the conservation of the species, and (2) which may require special management considerations or protection.”

Deferred rotation. Rotation grazing with regard to deferring pastures beyond the growing season, if they were used early the prior year, or that have been identified as needing deferment for resource reasons.

Designated roads and trails. Specific roads and trails identified by the BLM (or other agency) where some type of motorized vehicle use is appropriate and allowed, either seasonally or year-long (from H-1601-1, BLM Land Use Planning Handbook).

Desired outcomes. A type of land use plan decision expressed as a goal or objective.

Destination recreation-tourism market. National or regional recreation-tourism visitors and other constituents who value public lands as recreation-tourism destinations. Major investments in facilities and visitor assistance are authorized within SRMAs where the BLM's strategy is to target demonstrated destination recreation-tourism market demand. Here, recreation management actions are geared toward meeting primary recreation-tourism market demand for specific activity, experience, and benefit opportunities. These opportunities are produced through maintenance of prescribed natural resource setting character and by structuring and implementing management, marketing, monitoring, and administrative actions accordingly.

Disposal. Transfer of public land out of federal ownership to another party through sale, exchange, Recreation and Public Purposes Act of 1926, Desert Land Entry or other land law statutes.

Easement. A right afforded a person or agency to make limited use of another's real property for access or other purposes.

Eligibility. Qualification of a river for inclusion into the National WSR System through the professional judgment that it is free flowing and, with its adjacent land area, possesses at least one river-related value considered to be outstandingly remarkable (from M-8351, BLM WSR Policy and Program).

Endangered species. Any species that is in danger of extinction throughout all or a significant portion of its range (BLM Manual 6840, Special Status Species Manual).

Environmental impact statement (EIS). A detailed statement prepared by the responsible official in which a major federal action that significantly affects the quality of the human environment is described, alternatives to the proposed action are provided, and effects are analyzed (from BLM National Management Strategy for OHV Use on Public Lands).

Evaluation (plan evaluation). The process of reviewing the land use plan and the periodic plan monitoring reports to determine whether the land use plan decisions and National Environmental Policy Act of 1969 analysis are still valid and whether the plan is being implemented.

Extensive recreation management area (ERMA). A public lands unit identified in land use plans containing all acreage not identified as a SRMA. Recreation management actions within an ERMA are limited to only those of a custodial nature.

Federal Land Policy and Management Act of 1976 (FLPMA). Public Law 94-579, October 21, 1976, often referred to as the BLM's "Organic Act," which provides most of the BLM's legislated authority, direction policy, and basic management guidance (from BLM National Management Strategy for OHV Use on Public Lands).

Fire suppression. All work activities connected with fire extinguishing operations, beginning with discovery of a fire and continuing until the fire is completely out.

Fluid minerals. Oil, gas, coal bed natural gas, and geothermal resources.

Functioning at risk. Riparian-wetland areas that are in functional condition, but that have an existing soil, water, or vegetation attribute that makes them susceptible to degradation.

Geographic information system (GIS). A system of computer hardware, software, data, people, and applications that capture, store, edit, analyze, and display a potentially wide array of geospatial information.

Goal. A broad statement of a desired outcome; usually not quantifiable and may not have established timeframes for achievement.

Grazing plan. A concisely written program of livestock grazing management, including supportive measures, if required, designed to attain specific management goals in a grazing allotment. A grazing plan is prepared in consultation with the permittee(s), lessee(s), and other affected interests. Livestock grazing is considered in relation to other uses of the range and to renewable resources, such as watershed, vegetation, and wildlife. A grazing plan establishes seasons of use, the number of livestock to be permitted, the range improvements needed, and the grazing system.

Grazing preference. A superior or priority position against others for the purpose of receiving a grazing permit or lease.**Guidelines.** Actions or management practices that may be used to achieve desired outcomes, sometimes expressed as BMPs. Guidelines may be identified during the land use planning process, but they are not considered a land use plan decision unless the plan specifies that they are mandatory. Guidelines for grazing administration must conform to 43 CFR 4180.2.

Habitat. An environment that meets a specific set of physical, biological, temporal, or spatial characteristics that satisfy the requirements of a plant or animal species or group of species for part or all of their life cycle.

Herd management area. Public land under the jurisdiction of the BLM that has been designated for special management emphasizing the maintenance of an established wild horse or burro herd.

Implementation decisions. Decisions that take action to implement land use planning; generally appealable to Interior Board of Land Appeals under 43 CFR 4.410.

Implementation plan. An area or site-specific plan written to implement decisions made in a land use plan. Implementation plans include both activity plans and project plans.

Intermittent stream. An intermittent stream is a stream that flows only at certain times of the year when it receives water from springs or from some surface sources such as melting snow in mountainous areas. During the dry season and throughout minor drought periods, these streams will not exhibit flow. Geomorphological characteristics are not well defined and are often inconspicuous. In the absence of external limiting factors, such as pollution and thermal modifications, species are scarce and adapted to the wet and dry conditions of the fluctuating water level.

K factor. A soil erodibility factor used in the universal soil loss equation that is a measure of the susceptibility of soil particles to detachment and transport by rainfall and runoff. Estimation of the factor takes several soil parameters into account, including soil texture, percent of sand greater than 0.10 millimeter, soil organic matter content, soil structure, soil permeability, clay mineralogy, and coarse fragments. K factor values range from .02 to .64, the greater values indicating the highest susceptibilities to erosion.

Late Season. Late summer or fall grazing.

Land classification. When, under criteria of 43 CFR 2400, a tract of land has the potential for retention for multiple use management or for some form of disposal or for more than one form of disposal. The relative scarcity of the values involved and the availability of alternative means and sites for realization of those values will be considered. Long-term public benefits will be weighed against more immediate or local benefits. The tract will then be classified in a manner that will best promote the public interest.

Land tenure adjustments. Ownership or jurisdictional changes. To improve the manageability of the BLM lands and their usefulness to the public, the BLM has numerous authorities for repositioning lands into a more consolidated pattern, disposing of lands, and entering into cooperative management agreements. These land pattern improvements are completed primarily through the use of land exchanges but also through land sales, through jurisdictional transfers to other agencies, and through the use of cooperative management agreements and leases.

Land use allocation. The identification in a land use plan of the activities and foreseeable development that are allowed, restricted, or excluded for all or part of the planning area, based on desired future conditions (from H-1601-1, BLM Land Use Planning Handbook).

Land use plan. A set of decisions that establish management direction for land within an administrative area, as prescribed under the planning provisions of FLPMA; an assimilation of land use plan level decisions developed through the planning process outlined in 43 CFR 1600, regardless of the scale at which the decisions were developed. The term includes both RMPs and management framework plans (from H-1601-1, BLM Land Use Planning Handbook).

Land use plan boundary. The geographic extent of a resource management plan or management framework plans.

Land use plan decision. Establishes desired outcomes and actions needed to achieve them. Decisions are reached using the planning process in 43 CFR 1600. When they are presented to the public as proposed decisions, they can be protested to the BLM Director. They are not appealable to Interior Board of Land Appeals.

Lease. Section 302 of the Federal Land Policy and Management Act of 1976 provides the BLM's authority to issue leases for the use, occupancy, and development of public lands. Leases are issued for purposes such as a commercial filming, advertising displays, commercial or noncommercial croplands, apiaries, livestock holding or feeding areas not related to grazing permits and leases, native or introduced species harvesting, temporary or permanent facilities for commercial purposes (does not include mining claims), residential occupancy, ski resorts, construction equipment storage sites, assembly yards, oil rig stacking sites, mining claim occupancy if the residential structures are not incidental to the mining operation, and water pipelines and well pumps related to irrigation and nonirrigation facilities. The regulations establishing procedures for processing these leases and permits are found in 43 CFR 2920.

Lek. An assembly area where birds, especially sage-grouse, carry on display and courtship behavior.

Limited Area. An area restricted at certain times, in certain areas, and/or to certain vehicular use. These restrictions may be of any type but can generally be accommodated within the following categories: Numbers of vehicles; types of vehicles; time or season of vehicle use; permitted or licensed use only; use on existing roads and trails; use on designated roads and trails; and other restrictions.

Locatable minerals. Minerals subject to exploration, development, and disposal by staking mining claims as authorized by the Mining Law of 1872, as amended. This includes deposits of gold, silver, and other uncommon minerals not subject to lease or sale.

LU project lands. Privately owned submarginal farmlands incapable of producing sufficient income to support the family of a farm owner and purchased under Title III of the Bankhead-Jones Farm Tenant Act of July 22, 1937. These acquired lands became known as land utilization projects and were subsequently transferred from jurisdiction of the US Department of Agriculture to the US Department of the Interior. They are now administered by the BLM.

Mineral. Any naturally formed inorganic material, solid or fluid inorganic substance that can be extracted from the earth, any of various naturally occurring homogeneous substances (as stone, coal, salt, sulfur, sand, petroleum, water, or natural gas) obtained usually from the ground. Under federal laws, considered as

locatable (subject to the general mining laws), leasable (subject to the Mineral Leasing Act of 1920), and salable (subject to the Materials Act of 1947).

Mineral entry. The filing of a claim on public land to obtain the right to any locatable minerals it may contain.

Mineral estate. The ownership of minerals, including rights necessary for access, exploration, development, mining, ore dressing, and transportation operations.

Mineral materials. Materials such as sand and gravel and common varieties of stone, pumice, pumicite, and clay that are not obtainable under the mining or leasing laws but that can be acquired under the Materials Act of 1947, as amended.

Mining claim. A parcel of land that a miner takes and holds for mining purposes, having acquired the right of possession by complying with the Mining Law and local laws and rules. A mining claim may contain as many adjoining locations as the locator may make or buy. There are four categories of mining claims: lode, placer, millsite, and tunnel site.

Monitoring (plan monitoring). The process of tracking the implementation of land use plan decisions and collecting and assessing data necessary to evaluate the effectiveness of land use planning decisions.

Multiple use. The management of the public lands and their various resource values so that they are used in the combination that will best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to changing needs and conditions; the use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources, including recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historical values; and harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output (FLPMA) (BLM Manual 6840, Special Status Species Manual).

National Wild and Scenic Rivers System. A system of nationally designated rivers and their immediate environments that have outstanding scenic, recreational, geologic, fish and wildlife, historic, cultural, and other similar values and are preserved in a free-flowing condition. The system consists of three types of streams: (1) recreation—rivers or sections of rivers that are readily accessible by road or railroad and that may have some development along their shorelines and may have undergone some impoundments or diversion in the past; (2) scenic—rivers or

sections of rivers free of impoundments with shorelines or watersheds still largely undeveloped but accessible in places by roads; and (3) wild—rivers or sections of rivers free of impoundments and generally inaccessible except by trails, with watersheds or shorelines essentially primitive and waters unpolluted.

Nonfunctional Condition. Riparian-wetland areas that clearly are not providing adequate vegetation, landform, or woody debris to dissipate energies associated with flow events, and thus are not reducing erosion, improving water quality, etc.

Objective. A description of a desired outcome for a resource. Objectives can be quantified and measured and, where possible, have established timeframes for achievement.

Off-highway vehicle (off-road vehicle). Any motorized vehicle capable of, or designated for travel on or immediately over land, water or other natural terrain, excluding: (1) any non-amphibious registered motorboat; (2) any military, fire, emergency, or law enforcement vehicle while being used for emergency purposes; (3) any vehicle whose use is expressly authorized by the authorized officer, or otherwise officially approved; (4) vehicles in official use; and (5) any combat or combat support vehicle when used for national defense.

Open Area. An area where all types of vehicle use is permitted at all times, anywhere in the area subject to the operating regulations and vehicle standards set forth in 43 CFR 8341 and 8342.

Outstandingly Remarkable Values. Values among those listed in Section 1(b) of the Wild and Scenic Rivers Act of 1968: “scenic, recreational, geological, fish and wildlife, historical, cultural, or other similar values....” Other similar values that may be considered include ecological, biological, or botanical.

Ozone. A faint blue gas produced in the atmosphere from chemical reactions of burning coal, gasoline, and other fuels and chemicals found in products such as solvents, paints, and hairsprays.

Perennial stream. A stream that flows continuously. Perennial streams are generally associated with a water table in the localities through which they flow.

Permit long. Grazing for the duration of the permitted time with care taken not to overuse the resource.

Permitted use. The forage allocated by, or under the guidance of, an applicable land use plan for livestock grazing in an allotment under a permit or lease and expressed in AUMs (43 CFR § 4100.0-5) (from H-4180-1, BLM Rangeland Health Standards Manual).

Prevention of significant deterioration (PSD). An air pollution permitting program intended to ensure that air quality does not diminish in attainment areas.

Primitive and unconfined recreation. Nonmotorized, nonmechanized (except as provided by law), and undeveloped types of recreational activities. Bicycles are considered mechanical transport, so their use is not considered primitive and unconfined recreation (from H-6310-1, Wilderness Inventory and Study Procedures).

Primitive Road. A linear route managed for use by four-wheel drive or high-clearance vehicles. Primitive roads do not normally meet any BLM road design standards.

Proper Functioning Condition for Lentic Areas. A riparian-wetland areas are functioning properly when adequate vegetation, landform, or debris is present to: dissipate energies associated with wind action, wave action, and overland flow from adjacent sites, thereby reducing erosion and improving water quality; filter sediment and aid floodplain development; improve flood-water retention and ground-water recharge; develop root masses that stabilize islands and shoreline features against cutting action; restrict water percolation; develop diverse ponding characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterbird breeding, and other uses; and support greater biodiversity.

Proper Functioning Condition for Lotic Areas. A riparian-wetland area is considered to be in proper functioning condition when adequate vegetation, landform, or large woody debris is present to:

- dissipate stream energy associated with high waterflow, thereby reducing erosion and improving water quality;
- filter sediment, capture bedload, and aid floodplain development;
- improve flood-water retention and ground-water recharge;
- develop root masses that stabilize streambanks against cutting action;
- develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses;
- support greater biodiversity.

Public land. Land or interest in land owned by the US and administered by the Secretary of the Interior through the BLM without regard to how the US acquired ownership, except lands located on the Outer Continental Shelf and land held for the benefit of Indians, Aleuts, and Eskimos (from H-1601-1, BLM Land Use Planning Handbook).

Reasonable foreseeable development scenario. The prediction of the type and amount of oil and gas activity that would occur in a given area. The prediction is based on geologic factors, past history of drilling, projected demand for oil and gas, and industry interest.

Recreation and Public Purposes (R&PP) Act of 1926. Provides for the lease and sale of public lands determined valuable for public purposes. The objective of the R&PP Act is to meet the needs of state and local government agencies and nonprofit organizations by leasing or conveying public land required for recreation and public purpose uses. Examples of uses made of R&PP lands are parks and greenbelts, sanitary landfills, schools, religious facilities, and camps for youth groups. The act provides substantial cost-benefits for land acquisition and provides for recreation facilities or historical monuments at no cost.

Recreation experiences. Psychological outcomes realized either by recreation-tourism participants as a direct result of their on-site leisure engagements and recreation-tourism activity participation or by nonparticipating community residents as a result of their interaction with visitors and guests within their community or interaction with the BLM and other public and private recreation-tourism providers and their actions.

Recreation management zones. Subunits within a SRMA managed for distinctly different recreation products. Recreation products are composed of recreation opportunities, the natural resource and community settings within which they occur, and the administrative and service environment created by all affecting recreation-tourism providers, within which recreation participation occurs.

Recreation niche. The place or position within the strategically targeted recreation-tourism market for each SRMA that is most suitable (i.e., capable of producing certain specific kinds of recreation opportunities) and appropriate (i.e., most responsive to identified visitor or resident customers), given available supply and current demand, for the production of specific recreation opportunities and the sustainable maintenance of accompanying natural resource or community setting character.

Recreation opportunities. Favorable circumstances enabling visitors' engagement in a leisure activity to realize immediate psychological experiences and attain more lasting, value-added beneficial outcomes.

Recreation opportunity spectrum. One of the existing tools for classifying recreation environments (existing and desired) along a continuum, ranging from primitive, low-use, and inconspicuous administration to urban, high-use, and a highly visible administrative presence. This continuum recognizes variation among various components of any landscape's physical, social, and administrative attributes. Resulting descriptions of existing conditions and prescriptions of desired future conditions define recreation setting character.

Recreation setting character conditions. The distinguishing recreational qualities of any landscape, objectively defined along a continuum, ranging from primitive to urban landscapes, expressed in terms of the nature of the component parts of its physical, social, and administrative attributes. These recreational qualities can be both

classified and mapped. This classification and mapping process should be based on variation that either exists (for example, setting descriptions) or is desired (for example, setting prescriptions) among component parts of the various physical, social, and administrative attributes of any landscape. The recreation opportunity spectrum is one of the tools for doing this.

Recreation settings. The collective distinguishing attributes of landscapes that influence and sometimes actually determine what kinds of recreation opportunities are produced.

Recreation-tourism market. Recreation and tourism visitors and local residents who affect local governments and private sector businesses and the communities or other places where these customers originate (local, regional, national, or international). Based on analysis of supply and demand, land use plans strategically identify primary recreation-tourism markets for each special recreation management area—destination, community, or undeveloped.

Resource management plan (RMP). A land use plan as prescribed by the Federal Land Policy and Management Act that establishes, for a given area of land, land-use allocations, coordination guidelines for multiple-use, objectives, and actions to be achieved.

Rest rotation. Grazing rotation that rests pastures that have been grazed early the prior year or that have been identified as needing rest for resource reasons.

Revision. The process of completely rewriting the land use plan due to changes in the planning area affecting major portions of the plan or the entire plan.

Right-of-way (ROW). Public lands authorized to be used or occupied for specific purposes pursuant to a right-of-way grant, which are in the public interest and which require ROWs over, on, under, or through such lands.

Riparian area. A form of wetland transition between permanently saturated wetlands and upland areas. Riparian areas exhibit vegetation or physical characteristics that reflect the influence of permanent surface or subsurface water. Typical riparian areas include lands along, adjacent to, or contiguous with perennially and intermittently flowing rivers and streams, glacial potholes, and the shores of lakes and reservoirs with stable water levels. Excluded are ephemeral streams or washes that lack vegetation and depend on free water in the soil.

Road. A linear route declared a road by the owner, managed for use by low-clearance vehicles having four or more wheels, and maintained for regular and continuous use.

Rock art. Petroglyphs (carvings) or pictographs (painting) used by native persons to depict their history and culture.

Rotation. Grazing rotation between pastures in the allotment for the permitted time.

Routes. Multiple roads, trails and primitive roads; a group or set of roads, trails, and primitive roads that represents less than 100 percent of the BLM transportation system. Generically, components of the transportation system are described as “routes.”

Scenic byways. Highway routes that have roadsides or corridors of special aesthetic, cultural, or historical value. An essential part of the highway is its scenic corridor. The corridor may contain outstanding scenic vistas, unusual geologic features, or other natural elements.

Season of use. The time during which livestock grazing is permitted on a given range area, as specified in the grazing lease.

Setting character. The condition of any recreation system, objectively defined along a continuum, ranging from primitive to urban in terms of variation of its component physical, social, and administrative attributes.

Special recreation management area (SRMA). A public lands unit identified in land use plans to direct recreation funding and personnel to fulfill commitments made to provide specific, structured recreation opportunities. Both land use plan decisions and subsequent implementing actions for recreation in each SRMA are geared to a strategically identified primary market—destination, community, or undeveloped.

Special status species. Includes proposed species, listed species, and candidate species under the ESA; also, state-listed species and BLM State Director-designated sensitive species (BLM Manual 6840, Special Status Species Management).

Split season. Removing livestock from the allotment and returning them later in the year within the permitted time.

Standard. A description of the physical and biological conditions or degree of function required for healthy, sustainable lands (e.g., land health standards). To be expressed as a desired outcome (goal).

State implementation plan. A detailed description of the programs a state will use to carry out its responsibilities under the Clean Air Act. State implementation plans are collections of the regulations used by a state to reduce air pollution.

Threatened species. Any species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range (BLM Manual 6840, Special Status Species Management).

Total maximum daily load. An estimate of the total quantity of pollutants (from all sources: point, nonpoint, and natural) that may be allowed into waters without exceeding applicable water quality criteria.

Traditional cultural property. a property that derives significance from traditional values associated with it by a social or cultural group, such as an Indian tribe or local community. A traditional cultural property may qualify for the National Register of Historic Places if it meets the criteria and criteria exceptions at 36 CFR 60.4. See National Register Bulletin 38.

Transportation Linear Features. “Linear features” represents the broadest category of physical disturbance (planned and unplanned) on BLM land. Transportation related linear features include engineered roads and trails, as well as user-defined, non-engineered roads and trails created as a result of the public use of BLM land. Linear features may include roads and trails identified for closure or removal as well as those that make up the BLM’s defined transportation system.

Transportation System. The sum of the BLM’s recognized inventory of linear features (roads, primitive roads, and trails) formally recognized, designated, and approved as part of the BLM’s transportation system.

Travel Management Areas. Polygons or delineated areas where a rational approach has been taken to classify areas open, closed or limited, and have identified and/or designated a network of roads, trails, ways, and other routes that provide for public access and travel across the planning area. All designated travel routes within travel management areas should have a clearly identified need and purpose as well as clearly defined activity types, modes of travel, and seasons or timeframes for allowable access or other limitations (BLM Manual H1601-1 Land Use Planning Handbook).

Undeveloped recreation-tourism market. National, regional, or local recreation-tourism visitors, communities, or other constituents who value public lands for the distinctive kinds of dispersed recreation produced by the vast size and largely open, undeveloped character of their recreation settings. Major investments in facilities are excluded within special recreation management areas where the BLM’s strategy is to target demonstrated undeveloped recreation-tourism market demand. Here, recreation management actions are geared toward meeting primary recreation-tourism market demand to sustain distinctive recreation setting characteristics; however, major investments in visitor services are authorized both to sustain those distinctive setting characteristics and to maintain visitor freedom to choose where to go and what to do—all in response to demonstrated demand for undeveloped recreation.

Valid existing rights. Any lease established (and valid) before a new authorization, change in land designation, or in regulation.

Visibility (air quality). A measure of the ability to see and identify objects at different distances.

Visitor day. Twelve visitor hours that may be aggregated by one or more persons in single or multiple visits.

Visitor use. Visitor use of a resource for inspiration, stimulation, solitude, relaxation, education, pleasure, or satisfaction.

Visual resource management classes. Define the degree of acceptable visual change within a characteristic landscape. A class is based on the physical and sociological characteristics of any given homogeneous area and serves as a management objective. Categories assigned to public lands are based on scenic quality, sensitivity level, and distance zones. Each class has an objective that prescribes the amount of change allowed in the characteristic landscape (from H-1601-1, BLM Land Use Planning Handbook).

The four classes are described below:

- **Class I** provides for natural ecological changes only. This class includes primitive areas, some natural areas, some wild and scenic rivers, and other similar areas where landscape modification activities should be restricted.
- **Class II** areas are those areas where changes in any of the basic elements (form, line, color, or texture) caused by management activity should not be evident in the characteristic landscape.
- **Class III** includes areas where changes in the basic elements (form, line, color, or texture) caused by a management activity may be evident in the characteristic landscape. However, the changes should remain subordinate to the visual strength of the existing character.
- **Class IV** applies to areas where changes may subordinate the original composition and character; however, they should reflect what could be a natural occurrence within the characteristic landscape.

Volatile organic compounds. Chemicals that produce vapors readily at room temperature and at normal atmospheric pressure. Volatile organic compounds include gasoline, industrial chemicals such as benzene, solvents such as toluene and xylene, and tetrachloroethylene (perchloroethylene, the principal dry cleaning solvent).

Wild, scenic, or recreational. The term used for what is traditionally shortened to wild and scenic rivers. Designated river segments are classified as wild, scenic, or recreational but cannot overlap (from M-8351, BLM WSR Policy and Program).

Wild river. Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and unpolluted. These represent vestiges of primitive America.

Scenic river. A river or section of a river that is free of impoundments and whose shorelines are largely undeveloped but accessible in places by roads.

Recreational river. Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

Way. Roadlike feature used by vehicles having four or more wheels but not declared a road by the owner and which receives no maintenance to guarantee regular and continuous use.

Wild and scenic study river. Rivers identified in Section 5 of the Wild and Scenic Rivers Act of 1968 for study as potential additions to the National Wild and Scenic Rivers System. The rivers will be studied under the provisions of Section 4 of the act (from M-8351, BLM WSR Policy and Program).

Wilderness. A congressionally designated area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, that is protected and managed to preserve its natural conditions and that (1) generally appears to have been affected mainly by the forces of nature, with human imprints substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least 5,000 acres or is large enough to make practical its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historic value. The definition contained in Section 2(c) of the Wilderness Act of 1964 (78 Stat. 891) (from H-6310-1, Wilderness Inventory and Study Procedures).

Wilderness characteristics. Wilderness characteristics include size, the appearance of naturalness, outstanding opportunities for solitude, or a primitive and unconfined type of recreation. They may also include ecological, geological, or other features of scientific, educational, scenic, or historical value. However Section 2(c) of the Wilderness Act of 1964 has been updated by IM-2003-195, dated June 20, 2003. Indicators of an area's naturalness include the extent of landscape modifications, the presence of native vegetation communities, and the connectivity of habitats. Outstanding opportunities for solitude or primitive and unconfined types of recreation may be experienced when the sights, sounds, and evidence of other people are rare or infrequent, in locations where visitors can be isolated, alone or secluded from others, where the use of the area is through nonmotorized, nonmechanical means, and where no or minimal developed recreation facilities are encountered.

Wilderness study area. A designation made through the land use planning process of a roadless area found to have wilderness characteristics, as described in Section 2(c) of the Wilderness Act of 1964 (from H-6310-1, Wilderness Inventory and Study Procedures).

Wildland fire. Any fire, regardless of ignition source, that is burning outside of a prescribed fire and any fire burning on public lands or threatening public land resources, where no fire prescription standards have been prepared (from H-1742-1, BLM Emergency Fire Rehabilitation Handbook).

CHAPTER 8

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Table 8-1
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CHAPTER 9

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APPENDIX A

UPDATED DECISION GUIDANCE

(BLM HANDBOOK H-1601-1, APPENDIX C)

RESOURCES

Air

Identify desired outcomes and area-wide criteria or restrictions in cooperation with the appropriate air quality regulatory agency that apply to direct or authorized emission-generating activities, including the Clean Air Act's requirements for compliance with:

1. Applicable National Ambient Air Quality Standards (Section 109)
2. State Implementation Plans (Section 110)
3. Control of Pollution from Federal Facilities (Section 118)
4. Prevention of Significant Deterioration, including visibility impacts to Mandatory Federal Class I Areas (Section 160 et seq.)
5. Conformity Analyses and Determinations (Section 176(c))

Soil and Water

- Identify desired outcomes (including standards or goals under the Clean Water Act).
- Identify watersheds or specific soils that may need special protection from the standpoint of human health concerns, ecosystem health, or other public uses.
- For riparian areas, identify desired width/depth ratios, stream-bank conditions, channel substrate conditions and large woody material characteristics.
- Identify area-wide use restrictions or other protective measures to meet Tribal, state and local water quality requirements.

- Identify measures, including filling for water rights under applicable state or Federal permit procedures, to ensure water availability for multiple use management and functioning, healthy riparian and upland systems.

Vegetation

- Identify desired outcomes for vegetative resources, including the desired mix of vegetative types, structural stages and landscape and riparian functions; and provide for native plant, fish and wildlife habitats and livestock forage.
- Desired outcomes (goals and objectives) may be established at multiple scales.
- Identify areas of ecological importance and designate priority plant species and habitats, including special status species and populations of plant species recognized as significant for at least one factor such as density, diversity, size, public interest, remnant character, or age.
- Identify the actions and area-wide use restrictions needed to achieve desired vegetative conditions.
- NOTE: Reference materials for establishing desired outcomes for vegetative resources include:
 1. National Range and Pasture Handbook (1997): Natural Resources Conservation Service (USDA – NRCS) Methodology of Vegetation inventory, Monitoring, Analysis and Management of Grazing Lands.
 2. Interpreting Indicators of Rangeland Health: BLM Technical Reference 1734-6.
 3. Ecological Site Inventory: BLM Technical Reference 1734-7.
 4. Rangeland Health Standards: H-4180-1.
 5. Website examples of ecological site descriptions (use Internet Explorer): <http://www.esis.sc.egov.usda.gov>, <http://www.nm.nrcs.usda.gov/technical/fotg/section-2/ESD.html>, <http://www.mt.nrcs.usda.gov/technical/ecs/range/ecosites/>
- In areas where Healthy Forests Restoration Act authorities are to be used:
 - Identify old growth forest stands or describe a process for identifying old growth forest stands in the land use plan based on the structure and composition characteristic of the forest type.
 - Provide management direction to maintain, or contribute toward the restoration of, the structure and composition of old growth forest stands in areas where these authorities will be used.
 - This management direction should consider the pre-fire exclusion old growth conditions characteristic of the forest type, taking into account the contribution of the stand to landscape fire adaptation

and watershed health, and retaining the large trees contributing to old growth structure.

Fish and Wildlife

- Designate priority species and habitats, in addition to special status species, for fish or wildlife species recognized as significant for at least one factor such as density, diversity, size, public interest, remnant character, or age.
- Identify desired outcomes using BLM strategic plans, state agency strategic plans, and other similar sources.
- Describe desired habitat conditions and/or population for major habitat types that support a wide variety of game, non-game, and migratory bird species; acknowledging the states' roles in managing fish and wildlife, working in close coordination with state wildlife agencies, and drawing on state comprehensive wildlife conservation strategies.
- Identify actions and area-wide use restrictions needed to achieve desired population and habitat conditions while maintaining a thriving natural ecological balance and multiple-use relationships

Special Status Species

- Identify desired outcomes, strategies, restoration opportunities, use restrictions and management actions to conserve and recover special status species.
- Desired outcomes may incorporate goals and objectives from recovery plans and conservation strategies or identify ecologically important areas or scarce, limited habitats.
- Goal and objectives may be species or habitat specific and can be established at multiple scales (i.e. fine, mid and broad) to fully understand the context of the larger landscape.
- Given the legal mandate to conserve threatened or endangered species and BLM's policy to conserve all special status species, land use planning strategies, desired outcomes and decisions should result in a reasonable conservation strategy for these species
- Land use plan decisions should be clear and sufficiently detailed to enhance habitat or prevent avoidable loss of habitat pending the development and implementation of implementation-level plans. This may include identifying stipulations or criteria that would be applied to implementation actions.
- Land use plan decisions should be consistent with BLM's mandate to recover listed species and should be consistent with objectives and recommended actions in approved recovery plans, conservation agreements and strategies, MOUs and applicable biological opinions for threatened and endangered species.

Wildland Fire Management

- Fire management strategies must recognize the role of wildland fire as an essential ecological process and natural change agent.
- Fire management strategies must result in minimum suppression costs, considering firefighter and public safety, benefits, and values to be protected; consistent with resource objectives.
- Fire management decisions (goals and objectives, and allowable uses and management actions) must reflect that the protection of human life is the single, overriding priority. Other priorities (protecting human communities and community infrastructure, other property and improvements, and natural and cultural resources) are based on the values to be protected, human health and safety, and costs of protection.
- Consistent with these principles, identify landscape-level fire management goals and objectives, which would be achieved through allowable uses and management actions.
- Use fire regime/condition class methodology to identify desired wildland fire conditions.
- Wildland fire management goals and objectives must be closely coordinated with vegetation management goals and objectives.
- Identify allowable uses and management actions to achieve the fire management goals and objectives, and support the goals and objectives for vegetation, wildlife, and other resources.
- As part of identifying allowable uses, identify the geographic areas that are suitable for wildland fire use, provided conditions are appropriate. Also, identify the geographic areas where wildland fire use is not appropriate due to social, economic, political, or resource constraints (e.g., WUI areas); and where suppression action would be taken.
- As part of identifying management actions to achieve goals and objectives, identify the types of fuels management or vegetation management treatments (e.g.; mechanical, biological, and chemical treatments and prescribed fire) that would be implemented.
- Allowable uses and management actions include the identification of restrictions on fire management practices (including both wildfire suppression and fuels management) needed to protect natural or cultural resource values. Restrictions may be structured to allow flexibility to apply restrictions on a seasonal or annual basis, based on resource conditions, weather factors, and operational capability.
- Establish landscape-scale fire management priorities or provide criteria that will guide more site-specific priorities at the fire management plan level.

Cultural Resources

- Identify special cultural resource restrictions that may affect the location, timing or method of development or use of other resources in the planning area.
- Identify site-specific use restrictions from cultural resources currently being actively managed.
- Identify area-wide criteria for recognizing potential cultural resource conflicts, such as geographic characteristics of sacred sites, historic properties, or cultural landscapes (springs, ridges, peaks, caves, and rock shelters, for example).
- Consider these restrictions and criteria in all proposed land and resource use decisions.
- Identify measures to pro-actively manage, protect, and use cultural resources, including traditional cultural properties.
- The scope and scale of cultural resource identification are much more general and less intensive for land use planning than for processing site-specific use proposals. Instead of new, on-the-ground inventory, the appropriate identification level for land use planning is a regional overview:
 1. A compilation and analysis of reasonably available cultural resource data and literature.
 2. A management-oriented synthesis of the resulting information that includes priorities and a strategy for accomplishing needed inventory.
- If land use decisions, however, are more specific in terms of impacts, they may require a more detailed level of identification of the scope and nature of cultural resources during land use planning.
- RMPs will include at least the following two goals:
 1. Identify, preserve, and protect significant cultural resources and ensure that they are available for appropriate uses by present and future generations.
 2. Seek to reduce imminent threats and resolve potential conflicts from natural or human-caused deterioration, or potential conflict with other resource uses by ensuring that all authorizations for land use and resource use will comply with the NHPA Section 106.
- All cultural properties in the RMP area, whether already recorded or projected to occur on the basis of existing-data synthesis, including cultural landscapes, will be allocated to the uses listed in **Table A-1**, Cultural Use Allocations and Management Actions, according to their nature and relative preservation value. These use allocations pertain to cultural resources, not to areas of land.

**Table A-1
Cultural Use Allocations and Management Actions**

Use Allocation	Management
a. Scientific use	Permit appropriate research, including date recovery
b. Conservation for future use	Propose protective measures/designations 1
c. Traditional use	Consult with Tribes determine limitations 1
d. Public use	Determine permitted use 1
e. Experimental use	Determine nature of experiment
f. Discharged from management	Remove protective measures

1. Safeguards against incompatible land and resource uses may be imposed through withdrawals, stipulations on leases and permits, design requirements, and similar measures which are developed and recommended by an appropriately staffed IDT.

Paleontology

Identify criteria or use restrictions to ensure that:

- (a) Areas containing, or that are likely to contain, vertebrate or noteworthy occurrences of invertebrate or plant fossils are identified and evaluated prior to authorizing surface-disturbing activities;
- (b) Management recommendations are developed to promote the scientific, educational and recreational uses of fossils; and
- (c) Threats to paleontological resources are identified and mitigated as appropriate

Wilderness Characteristics

- Identify decisions to protect or preserve wilderness characteristics (naturalness, outstanding opportunities for solitude, and outstanding opportunities for primitive and unconfined recreation).
- Include goals and objectives to protect the resource and management actions necessary to achieve these goals and objectives. For authorized activities, include conditions of use that would avoid or minimize impacts to wilderness characteristics.

Visual Resources

(under Recreation and Visitor Services p. 15 and Comprehensive Trails and Travel Management p.17)

Under Recreation

- Visual resource management classes need to be correlated with the recreation management objectives and setting prescriptions that have been set for each Recreation Management Zone (RMZ) delineated.

Under Comprehensive Trails and Travel Management

- In developing travel management areas, consider the following:

- d). setting characteristics that are to be maintained (including recreation opportunity system and VRM settings).

RESOURCE USES

Coal

- The land use plan is the chief process by which public land is reviewed to assess whether there are areas suitable for leasing or unsuitable for all or certain types of coal mining operations under Section 522(b) of the Surface Mining Control and Reclamation Act.
- Identify the following consistent with the goals and objectives for natural resources within the planning area:
- Unleased coal lands that are acceptable for further consideration for coal leasing and development and those that are not.
- Areas unsuitable for surface mining of coal (43 CFR 1610.7-1) under the criteria set forth in 43 CFR 3461.5.
- For acceptable lands, areas suitable for development by all mining methods or by only certain stipulated mining methods, such as surface or underground mining (see 43 CFR 3461).
- Any special conditions that must be met during more detailed planning, lease sale, or post-lease activities, including measures required to protect other resource values (see 43 CFR 3461).
- An estimate of the amount of coal recoverable by either surface or underground mining operations or both (43 CFR 3420.1-4(d)). Only those areas that have development potential may be identified as acceptable for further consideration for leasing.
- Areas that have development potential for coal leasing according to the screening process outlined in 43 CFR 3420.1-4(e)(1-4).
- Areas to be withdrawn from further consideration for leasing to protect other resource values and land uses that are locally, regionally or nationally important or unique and that are not included in the unsuitability criteria discussed in 43 CFR 3461.5.

Fluid Minerals (Oil and Gas, Tar Sands, and Geothermal Resources)

- Areas open to leasing, subject to existing laws, regulations, and formal orders; and the terms and conditions of the standard lease form.
- Areas open to leasing, subject to moderate constraints such as seasonal and controlled surface use restrictions. (These are areas where it has been determined that moderately restrictive lease stipulations may be required to mitigate impacts to other land uses or resource values).
- Areas open to leasing, subject to major constraints such as no-surface-occupancy stipulations on an area more than 40 acres in size or more than

.25 mile in width. (These are areas where it has been determined that highly restrictive lease stipulations are required to mitigate impacts to other lands or resource values. This category also includes areas where overlapping moderate constraints would severely limit development of fluid mineral resources.)

- Areas closed to leasing. (These are areas where it has been determined that other land uses or resource values cannot be adequately protected with even the most restrictive lease stipulations; appropriate protection can be ensured only by closing the lands to leasing.) Identify whether such closures are discretionary or nondiscretionary; and if discretionary, the rationale.
- Resource condition objectives that have been established and specific lease stipulations and general/typical conditions of approval and BMPs that will be employed to accomplish these objectives in areas open to leasing.
- For each lease stipulation, the circumstances for granting an exception, waiver, or modification. Identify the general documentation requirements and any public notification associated with granting exceptions, waivers, or modifications.
- Whether the leasing and development decisions also apply to geophysical exploration.
- Whether constraints identified in the land use plan for new leases also apply to areas currently under lease.
- Long-term resource condition objectives for areas currently under development to guide reclamation activities prior to abandonment.

(Note: A plan-level decision to open the lands to leasing represents BLM's determination, based on the information available at the time, that it is appropriate to allow development of the parcel consistent with the terms of the lease, laws, regulations, and orders, and subject to reasonable conditions of approval. When applying leasing restrictions, the least restrictive constraint to meet the resource protection objective should be used.)

Locatable Minerals

- For lands that are open to the location of lode, placer, and mill claims, the claimant has statutory authority under the mining laws to ingress, egress and development of those claims. This authority means that those areas open to mineral entry for the purposes of exploration or development of locatable minerals cannot be unreasonably restricted.
- Identify the following consistent with the goals and objectives of locatable mineral exploration and development in concert with the protection of natural resources within the planning area:
 - Areas recommended for closure to the mining laws for locatable exploration or development (that must be petitioned for withdrawal).

- Any terms, conditions, or other special considerations needed to protect other resource values while conducting activities under the operation of the mining laws.

Mineral Materials

- Identify the following consistent with the goals and objectives for the exploration, development, and disposal of mineral materials in concert with the protection of natural resources within the planning area:
 - Areas open or closed to mineral material disposal.
 - Any terms, conditions, or other special considerations needed to protect resource values while operating under the mineral materials regulations.

Livestock Grazing

- Identify lands available or not available for livestock grazing (see 43 CFR 4130.2(a)), considering the following factors:
 - Other used for the land;
 - Terrain characteristics;
 - Soil, vegetation, and watershed characteristics;
 - The presence of undesirable vegetation, including significant invasive Weed infestations; and
 - The presence of other resources that may require special management or protection, such as special status species, special recreation management areas (SRMAs), or ACECs.
- Decisions identifying lands available, or not available, for livestock grazing may be revisited through the amendment or revision process if the grazing preference or permit on those lands has been voluntarily relinquished, or if there are outstanding requests to voluntarily relinquish the grazing preference or permit.
- If an evaluation of Land Health Standards identifies and allotment or group of allotments where Land Health Standards cannot be achieved under any level or management of livestock use, then decisions identifying those areas as available for livestock grazing need to be revisited.
- For lands available for livestock grazing, identify on an area-wide basis both the amount of existing forage available for livestock (expressed in AUMs) and future anticipated amount of forage available for livestock with full implementation of the land use plan while maintaining a thriving natural ecological balance and multiple-use relationships. The land use plan needs to describe how these public lands will be managed to become as productive as feasible for livestock grazing, including a description of possible grazing management practices such as grazing systems, range improvements (including land treatments), changes in seasons of use and/or stocking rates.

In addition, identify guidelines and criteria for future allotment specific adjustments in the amount of forage available for livestock, season of use, or other grazing management practices.

Recreation and Visitor Services

- Identify special recreation management areas (SRMAs).
- Each SRMA has a distinct, primary recreation-tourism market as well as a corresponding and distinguishing recreation management strategy.
- For each SRMA selected, determine whether that primary market-based strategy will be to manage for a:
 - Destination recreation-tourism market;
 - Community recreation-tourism market; or
 - Undeveloped recreation-tourism market.
- The determination needs to be stated in the plan.
- Describe the market that corresponds to that specific recreation management strategy (who they are and where they are located).
- Divide recreation areas that have more than one distinct, primary recreation market into separate SRMAs.
- For each SRMA identified, delineate discrete recreation management zone (RMZ) boundaries.
- Each RMZ has four defining characteristics – it:
 - Serves a different recreation niche within the primary recreation market.
 - Produces a different set of recreation opportunities and facilitates the attainment of different experiences and benefit outcomes (to individuals, households and communities, economies, and the environment).
 - Has distinctive recreation setting character.
 - Requires a different set of recreation provider actions to meet the strategically-targeted primary recreation market demand.
- To address these four variables within each RMZ, make the following land-use allocation decisions:
 - Identify the corresponding recreation niche to be served;
 - Write explicit recreation management objectives for the specific recreation opportunities to be produced and outcomes to be attained (activities, experiences, and benefits);
 - Prescribe recreation setting character conditions required to produce recreation opportunities and facilitate the attainment of both

recreation experiences and beneficial outcomes, as targeted above (the recreation opportunity spectrum (ROS) is one of the existing tools for describing existing setting character and prescribing desired setting character); and

- Briefly describe the activity planning framework that addresses recreation management, marketing, monitoring, and administrative support actions (i.e. visitor services, permits and fees, recreation concessions, and appropriate use restrictions) necessary to achieve explicitly-stated recreation management objectives and setting prescriptions.
- Visual resource management classes need to be correlated with the recreation management objectives and setting prescriptions that have been set for each RMZ delineated.
- Anything not delineated as an SRMA is an extensive recreation management area (ERMA). Therefore, actions within ERMAs are generally implemented directly from land use plan decisions and do not require activity-level planning. Land use plan decisions must, therefore, include recreation management objectives for all ERMAs. Consider addressing visitor health and safety, user conflict and resource protection issues in particular through these recreation management objectives. However, land use plan decisions for ERMAs need to also identify implementing recreation management, marketing, monitoring, and administrative support actions of the kinds listed for SRMAs under implementation decisions listed below because no follow-up implementation decisions at the activity plan level are required for ERMAs. *(NOTE: if recreation demand (i.e. from an undeveloped recreation-tourism market) requires maintenance of setting character and/or production of associated activity, experience, and benefit opportunities/outcomes, the area should be identified and managed as an SRMA, rather than being custodially managed as an ERMA.)*
- Implementation decisions that need to be made for ERMAs:
 - Recreation management (of resources, visitors, and facilities, such as developed recreation sites, roads, and trails, and recreation concessions).
 - Recreation marketing (including outreach, information and education, promotion, interpretation, environmental education; and other visitor services).
 - Recreation monitoring (including social, environmental, and administrative indicators and standards).
 - Recreation administration (regulatory; permits and fees, including restrictions where necessary and appropriate; recreation concessions; fiscal; data management; and customer liaison).
- Recognition of singularly dominant activity-based recreation demand of and by itself (i.e. heavy off-highway vehicle use, river rafting, etc.) however great,

generally constitutes insufficient rationale for the identification of an SRMA and the subsequent expenditure of major recreation program investments in facilities and/or visitor assistance. This does not mean that the expenditure of substantial custodial funding is unwarranted when circumstances require it, but such expenditures should be geared to take care of the land and its associated recreation-tourism use and not to provide structured recreation opportunities which characterize SRMAs.

Comprehensive Trails and Travel Management

- Delineate travel management areas and designate off-highway vehicle management areas.
- Comprehensive travel management planning should address all resource use aspects (such as recreation, traditional, casual, agricultural, commercial, and educational) and accompanying modes and conditions of travel on the public lands, not just motorized or off-highway vehicles activities.
- In the RMP, travel management areas (polygons) should be delineated.
- Identify acceptable modes of access and travel for each travel management area (including over-land, over-water, over-snow and fly-in access [remote airstrips and float planes]).
- In developing these areas, consider the following:
 - consistency with all resource program goals and objectives;
 - primary travelers;
 - objectives for allowing travel in the area;
 - setting characteristics that are to be maintained (including recreation opportunity system and VRM settings); and
 - primary means of travel allowed to accomplish the objectives and to maintain setting characteristics.
- All public lands are required to have **off-highway vehicle area designations** (see 43 CFR 8342.1). Areas must be classified as open, limited, or closed to motorized travel activities. Criteria for open, limited, and closed to motorized travel activities. Criteria for open, limited, and closed area designations are established in 43 CFR 8340.0-5(f), (g) and (h), respectively.
- For areas classified as limited, consider a full range of possibilities, including travel that will be:
 - Limited to types or modes of travel, such as foot, equestrian, bicycle, motorized, etc.
 - Limited to existing roads and trails,
 - Limited to time or season of use,
 - Limited to certain types of vehicles (i.e. OHVs, motorcycles, etc.)

- Limited to licensed or permitted vehicles or users,
 - Limited to BLM administrative use only, or other types of limitations.
- In addition, provide specific guidance about the process for managing motorized vehicle access for authorized, permitted or otherwise approved vehicles for those specific categories of motorized vehicle uses that are exempt from a limited designation (see CFR 8340.0-5(a)(1-5).
- At a minimum, the travel management area designation for wilderness study areas (WSAs) must be limited to ways and trails existing at the time the area became a WSA. Open areas within WSAs are appropriate only for sand dune or snow areas designated as such prior to October 21, 1976. Existing roads, ways and trails must be fully documented and mapped. This applies to both motorized and mechanized transport (see Interim Management Policy and Guidelines for Lands Under Wilderness Review H-8550-1(I)(B)(11) for mechanized transport). In addition, future designations may be made for a WSA if it is released from study.
- Except as otherwise provided by law, congressionally designated wilderness areas are statutorily closed to motorized and mechanized use. These areas should be shown in the land use plans along with the acreage affected.

Implementation Decisions

- (Note: These types of decisions are normally not made as part of the RMP Revision process. However, the new LUP planning guidance requires that we make the following travel management implementation decisions to the extent practical.)
- Complete a defined travel management network (system of areas, roads and/or trails) during the development of the land use plan, to the extent practical. If it is not practical to define or delineate the travel management network during the land use planning process, a preliminary network must be identified and a process established to select a final travel management network. Possible reasons for not completing the final network might be size or complexity of the area, controversy, incomplete data, or other constraints.
- For those areas where the final travel management network is to be deferred in the RMP, then the RMP should document the decision-making process used to develop the initial network, provide the basis for future management decisions, and help set guidelines for making road and trail network adjustments throughout the life of the plan. The identification of the uncompleted travel management networks should be delineated in the land use plan and the following tasks completed for each area:
 - Produce a map of a preliminary road and trail network.
 - Define short-term management guidance for road and trail access and activities in areas or sub-areas not completed.

- Outline additional data needs, and a strategy to collect needed information.
- Provide a clear planning sequence, including public collaboration, criteria and constraints for subsequent road and trail selection and identification.
- Provide a schedule to complete the area or sub-area road and trail selection process.
- Identify any easements and rights-of-ways (to be issued to the BLM or others) needed to maintain the preliminary or existing road and trail network.
- For those areas where the final travel management network **is to be completed** in the RMP, the RMP should establish a process to identify specific areas, roads and/or trails that will be available for public use, and specify limitations placed on use. Products from this process will include:
 - A map of roads and trails for all travel modes.
 - Definitions and additional limitations for specific roads and trails (defined in 43 CFR 8340.0-5(g)).
 - Criteria to select or reject specific roads and trails in the final travel management network, add new roads and trails and to specify limitations.
 - Guidelines for management, monitoring, and maintenance of the system.
 - Indicators to guide future plan maintenance, amendments, or revisions related to travel management network.
 - Needed easements and rights-of-ways (to be issued to the BLM or others) to maintain the existing road and trail network providing public land access.

Forestry

- Identify characteristics (indicators) to describe healthy forest conditions (i.e. desired outcomes) for forest/woodland types found within the planning area (also see I(C), Vegetation).
- Identify the suite of possible management actions (including appropriate harvest, reforestation, and forest development methods), and associated BMPs, that can be applied to meet desired outcomes.
- Identify areas that are available and have the capacity for planned, sustained-yield timber harvest or special forest product harvest. A probable sale quantity (PSQ) should be determined, if possible, for those areas determined to be available for harvest. The PSQ is the allowable harvest level that can be maintained without decline over the long term if the schedule of harvests and regeneration are followed. PSQ recognizes a level of uncertainty in meeting

the determined level; this uncertainty is typically based on other environmental factors that preclude harvesting at a particular time (for example, because of watershed or habitat concerns). A PSQ is not a commitment to offer for sale a specific level of timber volume every year.

Lands and Realty

Identify the following consistent with the goals and objectives for natural resources within the planning area:

- Lands for retention (43 CFR 2400), proposed disposal, or acquisition (based on acquisition criteria identified in the land use plan; FLPMA Section 205(b)) (Oregon Natural Resources Council, 78 IBLA 124 (1983)). Lands are to be retained in Federal ownership; unless it is determined that disposal of a particular parcel will serve the national interest (FLPMA Section 102(a) (1)). Land use plans should avoid prescribing the method of disposal, acquisition, or property interest to be acquired.
- Lands or interest in lands that are available for disposal under a variety of disposal authorities provided they meet the criteria outlined in FLPMA. Lands available for disposal must be identified by parcel or by specific areas (on a map or by legal description).
- Lands available for disposal under the Federal Land Transaction Facilitation Act of 2000 (FLTFA). The FLTFA amended FLPMA to allow retention by the BLM of receipts received from sale of land or interests in land under Section 203 of FLPMA or conveyance of mineral interest under Section 209(b) of FLPMA provided a land use plan was completed prior to July 25, 2000. The FLTFA does not apply to lands identified for disposal after July 25, 2000.
- Proposed withdrawal areas including existing withdrawals to be continued, modified, or revoked (including how the lands would be managed if the withdrawal were relinquished and an opening order issued) (see 43 CFR 2300).
- Land Classifications under Section 7 of the Taylor Grazing Act of 1934, as amended (43 USC 315f). The procedures applicable to Section 7 outlined in 43 CFR 2400 must be followed. The following actions require classification: Recreation and Public Purposes Act sales and leases, agricultural entries and state grants. To the extent that the land use planning procedures pursuant to 43 CFR 2400, the latter procedures shall be followed and applied. The analysis that supports classification decisions is normally the same analysis utilized in the land use planning/NEPA process to make decisions concerning the disposal or retention of public lands. For any classification decision made through the land use plan, initiate the classification decision requirements (i.e. proposed and initial decisions required under 43 CFR 2400) at the time the decision document is issued for the land use plan.

- Where, and under what circumstances, authorizations for use, occupancy, and development (such as major leases and land use permits) may be granted (see 43 CFR 2740, 2912, 2911, and 2920, respectively).
- Existing and potential development areas for renewable energy projects (i.e. wind and solar), communication sites and other uses.
- Right-of-way avoidance and exclusion areas (areas to be avoided but may be available for location of right-of-ways with special stipulations and areas which are not available for location of right-of-ways under any conditions).
- Terms and conditions that may apply to right-of-way corridors or development areas, including BMPs to minimize environmental impacts and limitations on other uses which would be necessary to maintain the corridor and right-of-way values.

Transportation Facilities

Identify land areas available or suitable for transportation facilities. Identify types of transportation facilities that are appropriate for the planning area. Identify limitations, if any, on the types or locations of facilities for specified areas.

Identify the area(s) having in-place transportation facilities that should be removed. Identify road repair, road rehabilitation, road construction, and maintenance standards appropriate to specific areas. Identify limitations, if any, on road repair road rehabilitation, road construction, and maintenance actions. Identify limitations, if any, on road density (i.e. miles/section) for specific areas.

Renewable Energy (under Lands section)

Existing and potential development areas for renewable energy projects (i.e. wind and solar), communication sites and other uses.

SPECIAL DESIGNATIONS

ACECS (Administrative Designations)

Designate ACECs and identify goals, standards and objectives for each area, as well as general management practices and uses, including necessary constraints with mitigation measures (also see BLM Manual 1613). This direction should be specific enough to minimize the need for subsequent ACEC management plans. ACECs must meet the relevance and importance criteria in 43 CFR 1610.7-2(a) and must require special management (43 CFR 1601.0-5(a)) to:

- Protect the area and prevent irreparable damage to resources or natural systems.
- Protect life and promote safety in areas where natural hazards exist.
- Designate research natural areas and outstanding natural areas as types of ACECs using the ACEC designation process.

Wilderness Study Areas (Administrative Designations)

Manage WSAs under the interim management policy (H-8550-1) until they are designated wilderness or released by Congress. Identify management direction for WSAs should they be released from wilderness consideration by Congress.

Other Administrative Designations

- Designate BLM Scenic or Back County Byways. Detailed procedural guidance for nomination and designation of BLM byways, as well as other byway designations occurring on BLM lands (such as All American Roads, National Scenic Byways, State Scenic Byways, Forest Scenic Byways, and similar) can be found in Handbook 8357-1: Byways, 12/17/93.
- Designate national recreation trails, Watchable Wildlife viewing sites, wild horse and burro ranges, or other BLM administrative designations.

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APPENDIX B

GLENWOOD SPRINGS FIELD OFFICE GEOLOGIC UNITS AND SENSITIVITY RANKINGS

The following are geologic formations and some members as listed on the Tweto 1979 Geologic Map of Colorado for the GSFO Area. The condition sensitivity classification rankings for paleontological resources are determined from several sources, including published and unpublished files, from some paleontologists' knowledgeable of the area, from Jim Wilkinson's, Bruce Fowler's, and Fred Conrath's BLM work and knowledge of the fossils of the area, and from input from Harley Armstrong, BLM Regional Paleontologist for Colorado.

FOSSILS AND FORMATIONS

Glenwood Springs Field Office

The geology of the KFO spans a time of roughly 1.8 billion years. From youngest to oldest, the following is a list of major rock units and some of the fossils that have been found in the KFO:

The Geology of the GSFO spans a time of roughly 1.8 billion years. From youngest to oldest, the following is a list of major rock units and some of the fossils that have been found in the GSFO:

Q, Quaternary - Mammoth rib, Bison

Condition 2

Q, Modern Alluvium - Modern Bison (buffalo)

Condition 3

Q, Gravels and Alluviums - Mammoth rib

Condition 2

Q, Older Gravels and Alluviums - None known

Condition 2

Q, Eolian Deposits - None known

Condition 2

Q, Glacial Drift of Pinedale and Bull Lake - None known

Condition 2

Q, Older Glacial Drift - None known

Condition 2

Q, Landslide Deposits - None known

Condition 2

Q, Ancient Alluvium - None known

Condition 2

Tbb, Basalt Flows and Associated Tuff, Breccia and Conglomerate of

Late-Volcanic Bimodal Suite (Age 3.5-26 m.y.) - Ram's horn(?)

Condition 2

Tbbi, Basaltic Intrusive Rocks Related to Basalt Flows - None known

Condition 3

Tbr, Rhyolitic Intrusive Rocks and Flows - None known

Condition 3

Taf, Ash-Flow Tuff of Main Volcanic Sequence - None known

Condition 3

Tpl, Pre-Ash Flow Andesitic Lavas, Breccias, Tuffs and

Conglomerates - None known

Condition 3

Tmi, Middle Tertiary Intrusive Rocks - None known

Condition 3

Tbp, Browns Park - None known

Condition 2

TKi, Laramide Intrusive Rocks - None known

Condition 3

Tu, Uinta - None known

Condition 2

Tb, Bridger Formation, Lower Part - None known

Condition 2

Tg, Green River - Fossil insects (over 100 species), plants, gar and other fish, turtles, and crocodilians (with gastroliths [stomach stones])

Condition 2

Tgp, Green River (Parachute Creek Member) - Fossil insects (over 100 species), plants, gar and other fish, turtles, and crocodilians (with gastroliths)

Condition 1

Tgl, Green River (Lower Part) - Some fossil insects and plants

Condition 2

Tw, Two, Wasatch (Debeque) - Archaic mammals including horses, primates, artiodactyls (deer-like, even-toed), other perissodactyls (odd-toed), pantodonts, creodonts, carnivores, marsupials, multituberculates, insectivores, rodents, condylarths, and others; gar and other fish; lizards; turtles; crocodilians; birds; freshwater clams, gastropods (snails), and other invertebrates; petrified wood, leaves, and other plant fragments; algal heads (stromatolites)

Condition 1

Mz, MzPz, Mesozoic - Various Mesozoic rocks have produced plant, invertebrate, and vertebrate fossils (as below)

Condition 2

Two, Ohio Creek - None known

Condition 2

Kmv, Mesaverde Group, Undivided - None known

Condition 2

Kmvu, Mesaverde Group, Upper Part - None known

Condition 2

Kh, Hunter Canyon - None known

Condition 2

Kmgs, Mount Garfield - None known

Condition 2

Kw, Williams Fork - None known

Condition 2

Kmvl, Mesaverde Group, Lower Part - None known

Condition 2

Ki, Iles - None known

Condition 2

Ksc, Kmgs Sego Sandstone - None known

Condition 2

Kp, Pierre Shale, Undivided - None known

Condition 2

Km, Mancos Shale - Large fossil fish (Xiphactinus), and a mosasaur(marine reptile)

Condition 2

Kmfm, Kfd, Frontier Sandstone - None known

Condition 2

Kc, Colorado Group - None known

Condition 2

Kmfm, Kfd, Mowry Shale - None known

Condition 2

Kd, Dakota Sandstone - None known

Condition 2

Kd, Dakota Group - None known

Condition 2

Kdp, Purgatoire - None known

Condition 2

Jm, Jmr, Jmre, Morrison - Various dinosaurs (Camarasaurus, Diplodocus, Barosaurus, Allosaurus, and one other)

Condition 1

Jmr, Jmre, Ralston Creek - None known

Condition 2

Jmse, Summerville - None known

Condition 2

Jmc, Jmce, Curtis - None known

Condition 2

Jme, Jmse, Jmce, Entrada Sandstone - None known

Condition 2

JTRg, Glen Canyon - None known

Condition 2

JTRgc, Glen Canyon Group - None known

Condition 2

TRkc, Kayenta Sandstone - None known

Condition 2

TRkc, TRwc, Wingate Sandstone - None known

Condition 2

TRkc, TRwc, TRc, TRPcs, Chinle - Dinosaur and other tracks, lungfish burrows, and various small crocodile-like reptiles

Condition 1

TRPcp, Moenkopi - None known

Condition 2

MzPz, Paleozoic - Various fossils, including plants, invertebrates, and vertebrates

Condition 2

TRPs, State Bridge - Invertebrates, including brachiopods and vertebrates

Condition 1

Pc, Cutler - None known

Condition 2

PPennw, PPennwm, Weber Sandstone - None known

Condition 2

PPennwm, Maroon - None known

Condition 2

Pennh, Hermosa - None

Condition 3

Pennee, Evaporitic Facies - None known

Condition 3

Penne, Eagle Valley - None known

Condition 3

Pennm, Pennmb, Minturn - Various fossil invertebrates, including trilobites, corals, trace fossils, crinoids, brachiopods, and other marine invertebrates, and conodonts

Condition 2

Pennb, Pennmb, Pennmbe, Belden - Fossil tracks?

Condition 2

MCamb, MDO, MD, MDCamb, MdCamb, Leadville Limestone - Algal layers, oolites, and mixed invertebrate skeletal packstones from an intertidal environment

Condition 2

MD, MDCamb, Gilman Sandstone - None known

Condition 2

MD, MDCamb, Dyer Dolomite - Brachiopod bivalves, algal layers, and others

Condition 2

MD, MDCamb, Parting Sandstone - None known

Condition 2

DO, Fremont - None known

Condition 2

DO, Harding - None known

Condition 2

DOCamb, DO, Manitou Limestone - Trilobites, brachiopods, cephalopods, and bryozoans

Condition 2

OCamb, MCamb, Dotsero - Stromatolites

Condition 2

OCamb, MCamb, Cambs, Peerless - None known

Condition 2

OCamb, MCamb, MDCamb, Cambs, Sawatch Quartzite - None known

Condition 2

Xb, Metamorphic Rocks (Biotitic Gneiss, Schist, and Migmatite) - None known

Condition 3

Xb, Biotitic Gneiss, Schist, and Migmatite - None known

Condition 3

Xfh, Felsic and Hornblendic Gneisses - None known

Condition 3

Yg, Granitic Rocks of 1400 m.y. Age Group - None known

Condition 3

Xg, Granitic Rocks of 1700 m.y. Age Group - None known

Condition 3

**YXg, Granitic Rocks of 1400 and 1700 m.y. Age Groups - Taylor River Region
- None known**

Condition 3

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APPENDIX C

RECREATION MANAGEMENT

Table C-1
Predominant Recreation Activity Opportunities by Special Recreation Management Areas

Activity	Upper Colorado River	Eagle River	Bocco Mountain	Gypsum Hills	Red Hill * (Carbondale)	Bull Gulch	Deep Creek	Hack Lake	Thompson Creek
Walking/ hiking					•	•	•	•	•
Backpacking						•	•	•	•
Biking					•				
Horseback Riding					•			•	•
Camping	•					•		•	
Hunting				•		•	•	•	•
Driving for Pleasure				•					

Table C-1
Predominant Recreation Activity Opportunities by Special Recreation Management Areas (Continued)

Activity	Upper Colorado River	Eagle River	Bocco Mountain	Gypsum Hills	Red Hill * (Carbondale)	Bull Gulch	Deep Creek	Hack Lake	Thompson Creek
Motorcycling			•	•					
ATV/OHV Driving				•					
Boating	•	•							
Fishing	•	•					•	•	
Photography	•					•	•	•	•
Other									

* Targeted as per Red Hill SRMA Objectives

Table C-2
Recreation Opportunity Settings for Special Recreation Management Areas

	Upper Colorado River	Eagle River	Bocco Mountain	Gypsum Hills	Red Hill (Carbondale)	Bull Gulch	Deep Creek	Hack Lake	Thompson Creek
PHYSICAL — Land & Facilities: Character of the natural landscape									
Remoteness	Front Country	Rural	Middle Country Front Country	Middle Country Front Country	Front Country Rural	Back Country Middle Country	Back Country Middle Country Front Country	Back Country Middle Country Front Country	Back Country Middle Country
Naturalness	Middle Country Front Country Rural	Front Country Rural	Middle Country Front Country	Middle Country Front Country	Back Country Middle Country Front Country	Primitive	Primitive Back Country	Primitive Back Country Middle Country	Primitive Back Country Middle Country

Table C-2
Recreation Opportunity Settings for Special Recreation Management Areas (Continued)

	Upper Colorado River	Eagle River	Bocco Mountain	Gypsum Hills	Red Hill (Carbondale)	Bull Gulch	Deep Creek	Hack Lake	Thompson Creek
Facilities	Back Country Middle Country Front Country	Middle Country Front Country Rural	Back Country Middle Country	Back Country Middle Country	Back Country Middle Country	Primitive Back Country	Back Country	Back Country Middle Country	Back Country Middle Country Front Country
SOCIAL — Visitor Use & Users: Character of recreation-tourism use									
Contacts	Primitive Back Country Middle Country	Middle Country Front Country Rural	Back Country	Back Country	Back Country Middle Country Front Country	Primitive	Primitive	Primitive	Primitive Back Country Middle Country
Group Size	Back Country Middle Country Front Country	Middle Country Front Country	Back Country	Back Country	Back Country Middle Country	Primitive	Primitive	Primitive	Back Country Middle Country Front Country
Evidence of Use	Back, Middle & Front Country, Rural	Middle Country Front Country Rural	Middle Country Front Country	Middle Country Front Country	Back Country Middle Country Front Country	Primitive	Primitive Middle Country	Primitive Middle Country	Primitive, Back, Middle & Front Country
ADMINISTRATIVE — Administration & Service: How public land managers, cooperative agencies and local businesses care for the area and serve visitors									
Mechanized Use	Primitive Rural	Primitive Rural	Middle Country Front Country	Middle Country Front Country	Primitive Back Country	Primitive	Primitive	Primitive Front Country	Back Country Middle Country Front Country
Visitor Services	Middle Country Front Country	Middle Country Front Country	Back Country Middle Country	Back Country Middle Country	Front Country Rural	Primitive	Primitive	Primitive	Primitive
Management Controls	Front Country	Front Country	Middle Country	Middle Country	Front Country	Back Country	Back Country	Back Country	Back Country Middle Country

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APPENDIX D
GLENWOOD SPRINGS FIELD OFFICE SYSTEM
ROADS AND MAINTENANCE LEVEL

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APPENDIX E

MAPS

This appendix contains the following maps:

- Glenwood Springs Reference Map
- Kremmling and Glenwood Springs Field Office Administrative Boundaries
- Hydrologic Features
- Watersheds
- Riparian Proper Functioning Condition Assessment
- Vegetation Types
- Elk Summer Range
- Elk Winter Range
- Canada Lynx Habitat
- Mule Deer Summer Range
- Mule Deer Winter Range
- Fisheries
- Greater Sage Grouse
- Special Status Plant Species
- Upper Colorado River Interagency Fire Management Unit Completed Fuels Reduction Projects
- Upper Colorado River Interagency Fire Management Unit 2007 Planned Fuels Reduction Projects
- Upper Colorado River Interagency Fire Management Unit Fuels Reduction Projects 3 Year Plan (2007, 2008, 2009)
- Landscape Units

- Citizen's Wilderness Proposal Areas (08/01)
- Visual Resources
- NSO Stipulations (1999 EIS) Draft
- Oil and Gas Leases
- Oil and Gas Leases and Occurrence Potential
- Oil and Gas Well Locations Spring, 2007 (COGCC)
- Range Allotments
- SRMAs and Recreation Sites
- OHV Designation
- Land Status
- Land Tenure
- Transportation
- Special Management Designations
- ACECs
- Eligible Wild & Scenic River Segments