

FINAL

**WHITE RIVER FIELD OFFICE
OIL AND GAS
RESOURCE MANAGEMENT PLAN AMENDMENT/
ENVIRONMENTAL IMPACT STATEMENT**



**ANALYSIS OF THE
MANAGEMENT SITUATION (AMS)**



White River Field Office



Public Lands USA: Use, Share, Appreciate

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ACRONYMS

AADT	Average Annual Daily Traffic
ACEC	Area of Critical Environmental Concern
ACHP	Advisory Council on Historic Preservation
AIRFA	American Indian Religious Freedom Act
AML	Appropriate Management Level
AMP	Allotment Management Plan
AMS	Analysis of the Management Situation
AND	Aid to the Needy Disabled
APD	Application for Permit to Drill (an oil or gas drill)
APHIS	Animal and Plant Health Inspection Service (USDA)
API	American Petroleum Institute
ARPA	Archeological Resource Protection Act
ATV	All terrain vehicle
AU	Animal unit
AUM	Animal unit month
BBLs	Barrels (a measure of the quantity of condensate)
BCFG	Billion cubic feet of gas
BEA	Bureau of Economic Analysis
bgs	Below ground surface
BLM	Bureau of Land Management
BMP	Best Management Practice
CAA	Clean Air Act
CAAQS	Colorado Ambient Air Quality Standards
CAP	Coordinated Activity Plan
CASTNET	Clean Air Status and Trends Network
CBM	Coal bed methane
CCD	Census County Division
CDNR	Colorado Department of Natural Resources
CDOLA	Colorado Department of Local Affairs
CDOW	Colorado Division of Wildlife

CDPHE	Colorado Department of Public Health and Environment
CDPHE-	Colorado Department of Public Health and Environment –
APCD	Air Pollution Control Division
CDPHE-	Colorado Department of Public Health and Environment –
WQCC	Water Quality Control Commission
CE	Categorical Exclusion
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CFR	Code of Federal Regulations
cfs	Cubic feet per second
CRMP	Cultural Resource Management Plan
CSFS	Colorado State Forest Service
CSR	Channel stability rating
CSU	Controlled Surface Use
CO	Carbon monoxide
CO	Colorado
CO₂	Carbon dioxide
COA	Conditions of Approval
COGCC	Colorado Oil and Gas Conservation Commission
CPHD	Canyon Pintado National Register Historic District
CRS	Colorado Revised Statutes
CSFS	Colorado State Forest Service
CSU	Controlled Surface Use
CVCP	Colorado Vegetation Classification Project
CWA	Clean Water Act
CWCB	Colorado Water Conservation Board
CWP	Citizens' Wilderness Proposal
DAU	Data Analysis Units
DEIS	Draft Environmental Impact Statement
DIR	Prevailing wind direction (in compass points)
DM	Departmental Manual
DNA	Documentation of Land Use Plan Conformance and National Environmental Policy Act (NEPA) Adequacy

DOE	Department of Energy
DPC	Desired Plant Community
DPI	(Colorado Department of Agriculture) Division of Plant Industry
DRMS	(Colorado) Division of Reclamation, Mining and Safety
dv	decivews
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMT	Emergency Medical Technician
EPA	U.S. Environmental Protection Agency
EPCA	Energy Policy and Conservation Act
ERMA	Extensive Recreation Management Area
ESA	Endangered Species Act
FAR	Functioning At Risk
FEIS	Final Environmental Impact Statement
FLPMA	Federal Land Policy and Management Act (of 1976)
FMAP	Fire Management Activity Plan
FMR	Federal Mineral Royalties
FMU	Fire management unit
FONSI	Finding of No Significant Impact
FR	<i>Federal Register</i>
FRCC	Fire Regime Condition Class
FTE	Full-time equivalent
GDPDEF	Gross Domestic Product Implicit Price Deflator
GIS	Geographic Information Systems
GMU	Game Management Unit
GPD	Gallons per day
GRA	Geographic Reference Area
GRSG	Greater Sage-grouse
HA	Herd Area
HFR	Historic Fire Regime
HMA	Herd Management Area
HMP	Habitat Management Plan
HUC	Hydrologic Unit Code

I	Interstate
IAP	Integrated Activity Plan
IB	Information Bulletin
IBLA	Interior Board of Land Appeals
ICP	In situ conversion process
ID	Identification number
IM	Instruction Memorandum
IMP	Interim Management Policy
IMPROVE	Interagency Monitoring of Protected Visual Environments
in	Inch(es)
ISF	In-stream flow
kg/ha-yr	kilogram per hectare per year
km	kilometer
lb(s)	Pound(s)
LHA	Landscape Health Assessment
LTC	Long-term care
LU	Land Utilization
LUP	Land Use Planning (BLM Handbook H-1601-1)
MBF	Thousand board feet
MCFG	Thousand cubic feet of gas
MFP	Management Framework Plan (pre-FLPMA BLM land use plan)
mg/L	Milligrams per liter
MIST	Minimum impact suppression techniques
ml	Milliliter
MMBTU	Million British Thermal Unit
MOU	Memorandum of Understanding
mph	Miles per hour
MY	Million years old
NA	Not applicable
NAAQS	National Ambient Air Quality Standards
NCA	National Conservation Area
NDIS	(Colorado Division of Wildlife) Natural Diversity Information Source
NEPA	National Environmental Policy Act (of 1969)

NF	Non-functional
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NHS	National Highway System
NIFMS	National Interagency Fire Management System
NM	National Monument
NMOC	Nonmethane hydrocarbon
NNL	National Natural Landmark
NO₂	Nitrogen dioxide
NOI	Notice of Intent
NOS	No Surface Occupancy
NO_x	Nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRA	National Recreation Area
NRCS	Natural Resource Conservation Service
NREL	National Renewable Energy Laboratory
NRHP	National Register of Historic Places
NSO	No Surface Occupancy (a stipulation on an oil and gas lease)
NWCFMA	Northwest Colorado Fire Management Area
NWPS	National Wilderness Preservation System
NWSRS	National Wild and Scenic Rivers System
OAP	Old Age Pension
O&G	Oil and gas
OHV	Off-Highway Vehicle
OMB	Office of Management and Budget
ORV	Off-Road Vehicle
PA	Programmatic Agreement
PBRMP	Piceance Basin Resource Management Plan
PCPI	Per capita personal income
PFC	Proper Functioning Condition (of riparian/wetland areas)
PGU	Peak gust (mph)
pH	Measure of acidity or alkalinity

PILT	Payments-in-lieu-of-taxes
PM_{2.5}	respirable particulate matter less than 2.5 microns in effective diameter
PM₁₀	respirable particulate matter less than 10 microns in effective diameter
PNC	Potential Natural Community
PNF	Prescribed Natural Fire
R	Range
RAC	Resource Advisory Council
RAMP	Recreation Area Management Plan
RBC	Rio Blanco County
RCRA	Resource Conservation and Recovery Act (1976)
RD&D	Research, Development, and Demonstration
RFD	Reasonably Foreseeable Development
RMIS	Recreation Management Information System
RMP	Resource Management Plan
RMPA	Resource Management Plan Amendment
RMPPA	Resource Management Plan Planning Area
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
ROW	Right-of-Way
R&PP	Recreation and Public Purposes Act
RPS	Rangeland Program Summary
RV	Recreational Vehicle
RVA	Remnant Vegetation Association
SAR	Sodium Adsorption Ratio
SCS	Soil Conservation Service
SH	State Highway
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SMA	Special Management Area
SN	Sundry Notice
SO₂	Sulfur dioxide
SPD	Mean wind speed (mph)
SQRU	Scenic Quality Rating Units

SRMA	Special Recreation Management Area
SRP	Special Recreation Permit
Standards	Colorado Standards for Public Land Health
Standards	Standards for Public Land Health
SWA	State Wildlife Area
T	Township
T&E	Threatened and Endangered
TBD	To Be Determined
TCF	Trillion cubic feet
TCP	Traditional Cultural Property
TDS	Total dissolved solids
TL	Timing limitation
TMDL	Total Maximum Daily Loads
TSCA	Toxic Substances Control Act
UI	Unemployment insurance
U.S.C.	United States Code
USDA	United States Department of Agriculture
USDI	United States Department of Interior
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UT	Utah
VOC	Volatile Organic Compound
VRM	Visual Resource Management
WAFWA	Western Association of Fish and Wildlife Agencies
WAP	Watershed Activity Plan
WFU	Wildland Fire Use
WH&B	Wild Horse and Burro
WHHA	Wild Horse Herd Area
WO	Washington Office
WRCC	Western Regional Climate Center
WRFO	White River Field Office
WRNF	White River National Forest

WSA	Wilderness Study Area
WSR	Wild and Scenic River(s)
WSRA	Wild and Scenic Rivers Act
WUI	Wildland Urban Interface
µg/m³	micrograms per cubic meter
° F	degrees Fahrenheit

CHAPTER 1

INTRODUCTION

CHAPTER 1 INTRODUCTION

The Colorado Bureau of Land Management (BLM) White River Field Office (WRFO) approved the *White River Record of Decision (ROD) and Approved Resource Management Plan (RMP)* in July 1997 (referred to as the 1997 White River ROD/RMP) for approximately 1,455,900 acres of BLM-administered public lands (surface estate) and 365,515 acres of federal mineral estate (split mineral estate) in Rio Blanco, Moffat, and Garfield counties in northwest Colorado (Map 2-31). The BLM WRFO has initiated the planning process to develop a RMP Oil and Gas Amendment (RMPA) to the 1997 White River ROD/RMP. As part of this RMPA, an Environmental Impact Statement (EIS) will also be prepared. The management of public lands administered by the BLM within the WRFO boundaries is referred to as the WRFO planning area. The management of public lands and federal mineral estate within the WRFO boundaries (from this point forward, referred to as the WRFO decision area) is the subject of this document (Maps 2-27 and 2-31). Areas within the WRFO planning area administered by other federal agencies, such as the U.S. Forest Service (USFS), and the National Park Service (NPS) and state agencies, such as the Colorado State Land Board, Colorado Division of Wildlife, are not the subject of this document or the current RMPA planning effort. Additionally, planning decisions and descriptions in this document do not apply to private lands.

1.1 PURPOSE AND NEED FOR THE RMP AMENDMENT

The Federal Land Policy and Management Act of 1976 (FLPMA) requires that BLM “develop, maintain, and, when appropriate, revise land use plans” (43 United States Code [U.S.C.] 1712 [a]). In addition, the Energy Policy and Conservation Act (EPCA) Reauthorization of 2000 directed the Department of the Interior to produce a scientific inventory of oil and gas resources and reserves underlying federal lands. The EPCA-generated studies of five oil and gas basins, completed and presented to Congress in January 2003, identified the Piceance Basin of Northwest Colorado, in which the WRFO is located, as one of five sub-basins in the continental United States with large reserves of undeveloped oil and gas energy potential. As a result of EPCA, higher oil and gas prices, development of interstate transportation pipelines, and other economic factors, the WRFO is experiencing an oil and gas boom (WRFO 2006). As a result, BLM has deemed it necessary to amend the existing 1997 White River ROD/RMP for oil and gas development in the WRFO.

An RMP is a set of comprehensive long-range decisions concerning the use and management of resources administered by BLM. In general, an RMP 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 (CEQ) regulations of 40 CFR 1500-1508, the Department of the Interior NEPA Manual (516 DM 1-7), and the BLM NEPA Handbook H-1790-1.

This RMPA will address oil and gas exploration and development that is expected to exceed levels projected in the 1997 White River ROD/RMP. The RMPA/EIS will evaluate revised projections for oil and gas development in the WRFO to determine a reasonable range of alternatives for development and will analyze the potential impacts of all identified alternatives, including the no-action alternative. The RMPA will incorporate valid existing decisions from the various WRFO implementation plans and the 1997 White River ROD/RMP. Decisions will also be evaluated and revised as necessary to reflect changing conditions and resource demands or protection needs.

1.2 PURPOSE OF ANALYSIS OF THE MANAGEMENT SITUATION

This Analysis of the Management Situation (AMS) is a planning precursor to developing potential alternatives, as required by NEPA regulations, and an early component of the RMPA process. The AMS is a summary document that describes the physical and biological characteristics and current condition of the resources within the WRFO planning area and how these resources are currently being managed. An analysis of the resource conditions and capabilities provides a reference for developing land use plans. The AMS is not a comprehensive, detail-oriented document, nor does it represent absolute details about various resources. It is intended to provide a summary analysis of existing management practice, including direction from existing plans and agency policy, and local resource, social, and economic conditions.

1.3 GENERAL DESCRIPTION OF PLANNING AREA, GEOGRAPHIC SCOPE, AND RESOURCES/PROGRAMS

The WRFO is located in the town of Meeker in northwestern Colorado. The public lands administered by the WRFO include all but a small portion of Rio Blanco County, with additional small tracts located in northern Garfield County and southern Moffat County, and encompasses 1,455,900 acres of BLM surface estate and 365,515 acres of federal split mineral estate. Also contained within the WRFO boundary are NPS, USFS, state, and private lands. Table 1-1 presents the BLM subsurface and surface land ownership within the WRFO planning area.

**Table 1-1
Land Ownership in the WRFO**

Ownership	Rio Blanco County (acres)	Moffat County (acres)	Garfield County (acres)	Total Acres
BLM	1,152,524	232,800	74,071*	1,455,900 (1997 RMP); 1,455,385 (Adjusted for sales and exchanges)
Private surface / BLM minerals	231,900 232,576	55,100	62,139	349,300 (1997 RMP); 349,815 (Adjusted for sales and exchanges)
State surface / BLM minerals	14,400	1,300		15,700
NPS – Dinosaur National Monument		71,480		71,480
USFS – White River National Forest	246,800		128,800	375,600
Colorado Division of Wildlife, Parks, State Land Board	23,600	19,170	320	43,060
Private	253,650	43,740	328,190	360,260
TOTAL - WRFO	1,923,550	423,560	328,190	2,675,300

SOURCE: *Preparation Plan Analysis for the White River Field Office Resource Management Plan Amendment*. Prepared by the BLM WRFO, September 7, 2006.

NOTE: *The total acreage in Garfield County owned by BLM includes those lands formerly owned by the Department of Energy (Navel Oil Shale Reserve, 4,010 acres).

1.4 KEY FINDINGS

In many respects the 1997 White River ROD/RMP, along with subsequent amendments, has adequately provided management direction of BLM-administered lands in the decision area. Key issues needing resolution generally relate to revised national level BLM policy (e.g., establishment of major right-of-way [ROW] corridors, cultural resource management, visual resource management, etc.), changing resource conditions or demands (e.g., increases in off-highway vehicle [OHV] use, substantial increases in elk populations, existence of federally listed threatened and endangered [T&E] or other “sensitive “ species, etc.), national policy direction

(e.g., focus on energy development including coalbed methane resources), and renewed focus on other issues (e.g., Wild and Scenic Rivers, designation of areas of critical environmental concern [ACEC], and protection of wilderness characteristics).

The following brief summary of currently known key issues is discussed in detail in the *Final Scoping Report for the White River Field Office Oil and Gas Resource Management Plan Amendment/Environmental Impact Statement*, May 2007. The key issues were obtained from federal, state, and local agencies as well as businesses, individuals, and special interest groups describing the issues and concerns most important to them.

Planning and NEPA Process

The public expressed concern regarding the scope of the decision that will be presented through this amendment as well as the range and scope of alternatives to be developed. In addition, the planning process is not well understood. The role of agencies and other interested parties and the input by affected entities was a concern voiced by those submitting comments. Finally, a focus on the level, adequacy, and comprehensiveness of impact analysis on all resources was stated.

Oil and Gas Development

Included in this category were comments regarding oil and gas development technologies, production technologies, and impacts of oil and gas development on other resources. The primary concern voiced was the need for a carefully planned development of an increased number of wells and implementation of appropriate best management practices (BMPs). The planning process should consider all positive and negative direct, indirect, and cumulative impacts of oil and gas development on the natural and human environment.

Air and Water Quality and Resources

Comments were received regarding degradation of air quality from increased resource production as well as the air quality effects on currently permitted uses. In addition, the need for adequate baseline air quality data and air quality modeling was expressed. The focus on detailed evaluation of direct, indirect, and cumulative impacts on air and water quality was a concern. Comments regarding the implementation and use of BMPs were also received.

Biological Resources

Comments were received regarding vegetation, noxious weeds, riparian areas, and fish, wildlife, and special status species. The comments focused on protection of biological resources, detailed analysis of direct, indirect, and cumulative impacts, and development of appropriate BMPs. In addition, the availability and quality of adequate data was a concern.

Wild Horse Management and Rangeland Management

The primary concern for wild horse management was in regards to the protection of wild horse populations. Comments regarding rangeland management focused on the impact to vegetation for livestock and wildlife.

Fire Management

Comments received for fire management were in regards to the implementation of appropriate BMPs.

Special Designations

Comments under this category included Wilderness Study Areas (WSAs), wilderness characteristics, and Areas of Critical Environmental Concern (ACECs). Comments focused on protecting these designated areas as well as appropriate designations of areas.

Cultural, Historic, and Paleontological Resources, and American Indian Concerns

The protection of resources was of primary importance in addition to the development of appropriate BMPs. Coordination with impacted communities was also a concern.

Recreation Management and Social and Economic Values

Primary concerns included evaluation of impacts to and implementation of appropriate BMPs for the recreation industry (e.g., hunting, tourism, and primitive recreation uses). Many of concerns expressed regarding recreation management were also relevant to the social and economic conditions within the WRFO.

Lands, Utility Corridors, Rights-of-Way, Withdrawals, and Roads and Travel Management

Comments were received regarding the existing management of lands within the WRFO and impacts of increased oil and gas development on lands and the existing transportation network. Many comments focused on the implementation of appropriate BMPs for direct impacts to lands, the transportation network, and utility and ROW corridors. The availability of adequate data for a comprehensive analysis was also a concern.

Visual Resource Management

The preservation of the visual resources of the WRFO was of primary concern as well as the implementation of appropriate BMPs.

CHAPTER 2

AREA PROFILE

CHAPTER 2 AREA PROFILE

This chapter addresses those resources and resource uses managed by the U.S. Bureau of Land Management (BLM) White River Field Office (WRFO). Resource/resource use sections are separated into subsections. Current conditions describe the existing conditions of the resource and resource uses. Indicators are used to assess the resource condition; trends express the direction of change between some point in the past and the present; and forecasts predict changes in the condition of resources given current management.

Geographic Information System (GIS) data were provided by the WRFO for use in preparing the baseline description and maps included at the end of this Chapter. These maps present a snapshot in time and are intended to provide a characterization of the baseline conditions within the Field Office, as described in the following resource sections. Updates and revisions to GIS data are continually ongoing by the WRFO; revised data will be included in future planning documents (i.e., the Resource Management Plan Amendment [RMPA]/Environmental Impact Statement [EIS]) for this project.

2.1 REGIONAL CONTEXT

Ecoregions delimit large areas within which local ecosystems recur more or less throughout the region in a predictable pattern. The WRFO is located within the temperate desert division and the Southern Rocky Mountain Steppe and Intermountain Semi-desert provinces based on Bailey's 1995 *Ecoregions of the United States* (Bailey 1995). The Southern Rocky Mountains Ecoregion encompasses nearly 40 million acres across portions of southern Wyoming, central Colorado, and northern New Mexico. Colorado encompasses 73.5 percent of the ecoregion that contains rugged mountains, plateaus, alpine cirques, glacial moraines, and broad valleys (Neely et al. 2001).

2.1.1 Public Land Health

BLM regulations in Title 43 Code of Federal Regulations Section 4180 (43 CFR 4180) require the State Directors, in consultation with Resource Advisory Councils (RAC), to develop rangeland health standards for lands within their jurisdiction. This includes conducting local level assessments and evaluations for ascertaining rangeland health status. The Secretary of the Interior approved the Standards for Public Land Health for BLM offices within Colorado on February 3, 1997 (Appendix A). The Colorado Standards for Public Land Health (Standards) 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/Wetland
- Standard 3: Native Species
- Standard 4: Special Status Species
- Standard 5: Water Quality

Local health assessments/evaluations will primarily be conducted on a watershed (Fifth field, ten digit Hydrologic Unit Code [HUC]) basis. Field offices are expected to conduct local assessments based on the Standards and to follow the developed guidelines. Information specific to each BLM field office is used to evaluate whether or not Standards are achieved. There is no specific written protocol used by the WRFO to conduct a landscape health assessment; however, the staff uses a methodology similar to the evaluation processes outlined in BLM Handbook 4180. The WRFO completed the Wolf Creek Watershed-Three Springs Ranch Assessment in 2005. Table 2-1 summarizes the results. The assessment area contains approximately 82,198 acres of BLM lands.

Table 2-1
Summary of Wolf Creek Watershed - Three Springs Ranch Landscape Health Assessment

Standard	Achieving		Not Achieving		Description
	Acres or Miles	Percent	Acres or Miles	Percent	
Standard 1 – Upland Soils	78,265	95	3,933	5	Much of the lower Wolf Creek watershed occurs upon shale badland soils derived from Mancos Shale. These soils are highly erosive in nature and have extremely high salt/clay content. Reduced vegetal cover in the uplands has further exposed soils to erosional processes. Active head-cutting is common within the assessment area, and soil pedestaling around vegetation root structures is widespread in the uplands.
Standard 2 – Riparian Areas	11.8	93	0.9	7	Weed infestations have been documented within all of the assessed riparian communities. In addition, preferred riparian vegetation such as willows, sedges, and rushes have been impacted by livestock and wildlife grazing. Furthermore, some riparian communities are entirely dependent on water flowing from private water sources.

Table 2-1
Summary of Wolf Creek Watershed - Three Springs Ranch Landscape Health Assessment

Standard	Achieving		Not Achieving		Description
	Acres or Miles	Percent	Acres or Miles	Percent	
Standard 3 – Plant and Animal Communities	78,265	95	3,933	5	Public lands within the assessment area have been identified as early seral communities that do not meet the Colorado Public Land Health Standards for species diversity, soil protection, and/or forage production. However, the majority of these early seral areas have crossed a threshold of cheatgrass domination whose condition would not significantly change with or without livestock/wildlife grazing.
Standard 4 – Special Status Species (including T&E)	78,265	95			All public lands (100%) within the assessment area are currently meeting Public Land Health Standard #4. However, the intensity of grazing and the number of AUM's currently allowed within the assessment area may adversely impact the vigor, and reproductive ability of BLM sensitive plant species Debris Milkvetch.
Standard 5 – Water Quality	74.2	100			Nearly all the lower Wolf Creek watershed occurs upon shale badland soils that are derived from Mancos Shale (high salt/clay content). In addition, reduced vegetal cover in the uplands has resulted in increased surface runoff and soil erosion. As a result, sediment yield from the assessment area is generally high.

SOURCE: BLM 2005b.

NOTES:

AUM = animal unit month

T&E = threatened and endangered

2.2 RESOURCES

2.2.1 Air Quality

Air quality values within the decision area include clean air; expansive vistas; and soil, streams, and lakes that support healthy ecosystems. Activities within the decision area, such as minerals development, recreational use, fire management, and construction can affect air quality within the decision area and in nearby areas. Activities on BLM-administered lands must comply with applicable local, state and federal air quality regulations. If air quality deteriorates within or near the decision area, restrictions could be imposed on activities within the decision area.

Air quality in several federally protected areas merits special consideration for decision making. Certain National Parks and Wilderness Areas are afforded special protection under the Clean Air Act (CAA) to help protect air quality in these pristine areas. Federal Class I areas benefit from

the most stringent air quality protection, while sensitive Class II areas are given special protection by the State of Colorado with regard to sulfur dioxide (SO₂) impacts. A portion of the Flat Tops Wilderness Area (Class I area) is located within the eastern part of the decision area, while a portion of the Dinosaur National Monument (a sensitive Class I area) is located along the northwestern boundary of the decision area. Table 2-2 includes a list of all Class I and sensitive Class II areas within a 100-kilometer (km) radius of the decision area boundary. Map 2-1 shows the decision area and nearby sensitive areas.

**Table 2-2
Federal Class I and Sensitive Class II Areas**

Area Name	Distance from Decision Area (km)	Direction from Decision Area
Class I Areas		
Arches National Park	87	Southwest
Eagles Nest Wilderness Area	61	East
Flat Tops Wilderness Area	On eastern boundary	East end
Maroon Bells-Snowmass Wilderness Area	53	South-Southeast
Mount Zirkel Wilderness Area	69	Northeast
Sensitive Class II Areas		
Colorado National Monument	50	South
Dinosaur National Monument	On northern boundary	North

NOTE:

km = kilometer

Indicators

Criteria Pollutant Concentrations

The CAA requires the United States Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for seven criteria pollutants that are considered harmful to public health and the environment. The CAA established two types of air quality standards (primary and secondary). Primary standards set limits necessary to protect public health, including the health of “sensitive” populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection of the general environment, as well as preventing damage to animals, crops, vegetation, and buildings.

The Federal NAAQS are implemented by state agencies with EPA oversight. The State of Colorado has adopted all of the NAAQS. In addition, Colorado has adopted a 3-hour SO₂ standard of 700 micrograms per cubic meter (µg/m³). Refer to Table 2-3 for a list of ambient air quality standards for the six criteria pollutants that have been monitored in or near the decision area: (1) carbon monoxide (CO), (2) nitrogen dioxide (NO₂), (3) ozone, (4) fine particulate matter less than 2.5 microns in effective diameter (PM_{2.5}), (5) respirable particulate matter less than 10 microns in effective diameter (PM₁₀), and (6) SO₂. Due to low emissions of lead in the decision area, no monitoring data have been collected for this criteria pollutant.

**Table 2-3
Assumed Background Concentrations**

Pollutant	Averaging Time ⁽¹⁾	Background Concentration (µg/m ³)	NAAQS ⁽²⁾ (µg/m ³)	CAAQS ⁽³⁾ (µg/m ³)	PSD Class I Increments (µg/m ³)	PSD Class II Increments (µg/m ³)
CO ⁽⁴⁾	1-hour	1,145	40,000	40,000	NA	NA
	8-hour	1,145	10,000	10,000	NA	NA
NO ₂ ⁽⁵⁾	Annual	9	100	100	2.5	25
Ozone	1-hour ⁽⁶⁾	173	235	235	NA	NA
	8-hour ⁽⁷⁾	145	157	157	NA	NA
PM _{2.5} ⁽⁸⁾	24-hour	18	65 ⁽⁹⁾	65	NA	NA
	Annual	8	15	15	NA	NA
PM ₁₀ ⁽⁴⁾	24-hour	41	150	150	8	30
	Annual	11	50	50	4	17
SO ₂ ⁽¹⁰⁾	3-hour	24	1,300	700	25	512
	24-hour	13	365	365	5	91
	Annual	5	80	80	2	20

SOURCE: CDPHE APCD 2006a.

NOTES:

⁽¹⁾ Annual standards are not to be exceeded; short-term standards are not to be exceeded more than once per year.

⁽²⁾ National Ambient Air Quality Standards

⁽³⁾ Colorado Ambient Air Quality Standards

⁽⁴⁾ Data collected by American Soda, Piceance Basin, 2003-2004

⁽⁵⁾ Based on data collected by Southern Ute Indian Tribe at Ignacio, CO

⁽⁶⁾ Data collected by the USDI-National Park Service at Mesa Verde, 2003

⁽⁷⁾ Based on data collected by the CASTNET Network at Gothic and Mesa Verde, CO, and Canyonlands, UT

⁽⁸⁾ Data collected in Grand Junction, CO (515 Patterson)

⁽⁹⁾ The Federal NAAQS for PM_{2.5} will be reduced to 35, effective December 18, 2006

⁽¹⁰⁾ Data collected by Unocal, Piceance Basin, 1983-1984

NA = not applicable

Visibility Indicators

Visibility impairment due to regional haze is a complex phenomenon with impacts at long distances. Pollutants responsible for regional haze include particulate matter that may be emitted directly into the atmosphere, as well as aerosols which may be formed through chemical reactions taking place within the atmosphere. Examples of haze-forming particulate include soot from diesel combustion, smoke from fires, fly ash from coal combustion, and wind-blown dust. Gaseous emissions that help form aerosols and reduce visibility include emissions of SO₂, nitrogen oxides (NO_x), and hydrocarbons.

Visibility is characterized in units of deciviews (dv). One dv is defined as a change in visibility that is just perceptible to the average person; this is approximately a 10 percent change in light extinction. In the western U.S., the natural visual range is estimated to average about 8 dv, which is equivalent to a visual range of approximately 110 to 115 miles (Malm 1999).

Atmospheric Deposition Indicators

Air pollutants can also affect land and water when they are deposited in terrestrial and aquatic ecosystems. These pollutants can be deposited by rain (wet deposition) or by gravitational settling on surfaces (dry deposition). Substances deposited include:

- Nitrogen and sulfur compounds (nitrates, nitrites, sulfates, and sulfites);
- Acids (sulfuric acid and nitric acid), which are commonly known as acid rain;
- Air toxics (such as pesticides, herbicides, and certain volatile organic compounds [VOCs]); and
- Nutrients (such as nitrates and ammonium).

Deposition can occur via rain, snow, cloud water, particle settling, and gaseous adherence to vegetation. Because deposition varies with precipitation, it also varies with elevation and time. Due to the many deposition mechanisms, the quantity of pollutants deposited on soil, plants, and water is difficult to quantify. Deposition is often measured in terms of kilograms of pollutant deposited per hectare of land per year (kg/ha-yr).

Current Conditions

Climate and Meteorology

The WRFO decision area is primarily pinyon/juniper woodland at elevations from 6,000 to 9,000 feet with average annual precipitation between 11 to 16 inches. Further east is the Flat Tops Wilderness Area, a large elevated and flattened dome plateau ranging from nearly 9,000 to just over 12,000 feet within the decision area portion of the wilderness area. Representative temperature and precipitation data were obtained from the Western Regional Climate Center (WRCC 2006). However, the complex terrain causes considerable climatic variability because elevation, slope, and aspect affect precipitation and temperatures. Precipitation at lower elevations is typically distributed fairly evenly throughout the year at nearly 1 inch per month, with mid-winter receiving the lowest average amounts and spring and fall the highest levels. Table 2-4 provides average temperature and annual precipitation measurements.

Table 2-4
Average Annual Temperature and Precipitation

Station Name	Station ID	Annual Temperature		Annual Precipitation		County
		Minimum (°F)	Maximum (°F)	Total (in)	Snow (in)	
Dinosaur National Monument	52286	33.3	61.5	11.60	41.0	Moffat
Little Hills	55048	24.0	60.5	13.82	56.7	Rio Blanco
Meeker	55484	27.4	60.4	16.39	69.6	Rio Blanco
Rangely	056832	30.9	62.9	10.02	26.2	Rio Blanco
Yampa	59265	25.3	53.6	16.37	120.3	Routt

NOTES:

°F = degrees Fahrenheit

ID = identification number

in = inches

Representative wind measurements are limited within the analysis area. Table 2-5 shows wind data collected within the Piceance Basin Bar-D station, which is located within the decision area.

Table 2-5
Piceance Basin (Bar-D) Wind Data Summary (Years 2002–2007)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
DIR	S	SSE	SSE	SSE	SSE	SSE	S	SSE	S	S	S	S	SSE
SPD	7.1	7.4	8.5	9.6	8.9	8.8	7.8	7.9	8.1	7.6	7.4	7.2	8.0
PGU	30.0	31.8	27.3	29.3	29.3	29.8	31.5	28.2	26.8	26.8	24.2	23.9	31.8

SOURCE: CDPHE APCD 2007. Data recorded from January 1, 2002 through March 15, 2007.

NOTES:

DIR = prevailing wind direction (in compass points)

PGU = peak gust (mph).

SPD = mean wind speeds (mph)

S = south

SSE = south southeast

Figure 2-1 illustrates wind speed and direction in knots based on data collected at the Bar-D meteorological monitoring station in the Piceance Basin. The bars indicate the direction from which wind originates.

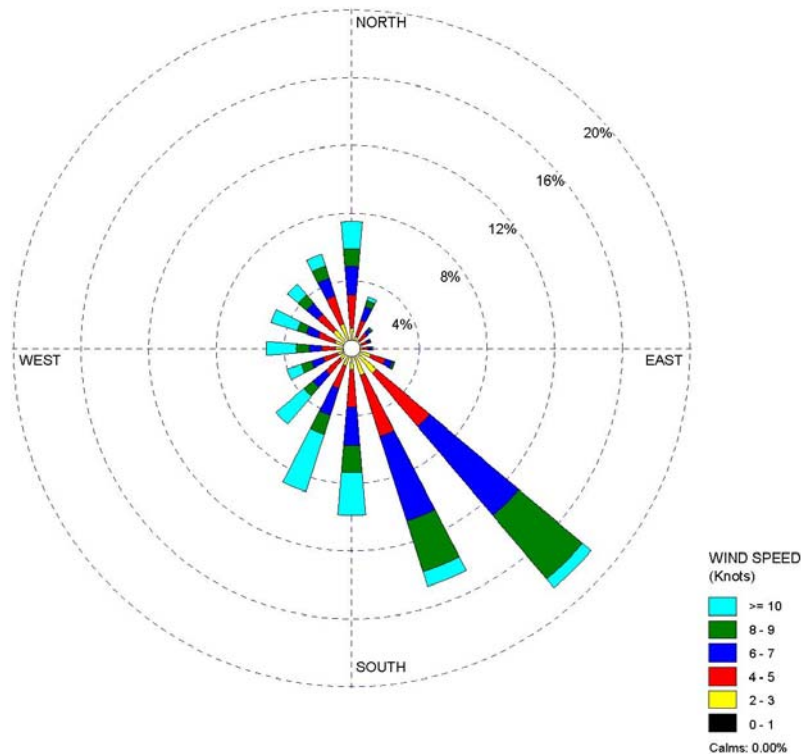


Figure 2-1. Bar-D Windrose

SOURCE: CDPHE APCD 2007.

NOTE: Data recorded from January 1, 2002 through March 15, 2007.

Existing Air Quality

Although specific air quality monitoring is not conducted throughout most of the analysis area, air quality is good, due to relatively few air pollutant emission sources and favorable winds. Sources within the decision area include limited industrial facilities and few residences, primarily located in small communities and isolated ranches. Good atmospheric dispersion conditions, as well as limited air pollutant transport into the project area, result in relatively low local air pollutant concentrations. Based on the data shown in Table 2-3, the air quality within the decision area complies with the applicable air quality standards.

In May 2005, a 2-year air quality monitoring study was initiated by the Garfield County Public Health Service (documented in a report entitled *Status of Garfield County Air Quality Monitoring Program*) to collect ambient air quality data for PM₁₀ and VOCs. Results from this effort to date show generally low PM₁₀ concentrations and very low VOC concentrations (Garfield County Public Health Service 2006). The Garfield County Public Health Service is also partnering with the United States Department of Agriculture-Forest Service (USDA-FS) on a regional ozone monitoring project.

The Colorado Department of Public Health and Environment (CDPHE) provided ambient background data for the Piceance Creek area. Reported in $\mu\text{g}/\text{m}^3$, these background data are presented in Table 2-3, which includes impacts from existing sources both inside and outside the project area. The maximum pollutant concentrations are below applicable Colorado and National Ambient Air Quality Standards (CAAQS and NAAQS, respectively) for all pollutants except ozone. Ozone levels approaching the federal standard have been observed. The cause of observed high ozone levels is uncertain, although regional transport or subsidence of stratospheric ozone is possible.

Existing Visibility

Visibility within the decision area is measured under the IMPROVE (Interagency Monitoring of Protected Visual Environments) program. Visibility measurements for the Flat Tops Wilderness Area are recorded by the WHRI1 monitor, which is located approximately 57 miles southeast from the closest Flat Tops Wilderness Area boundary within the White River National Forest. Table 2-6 provides EPA estimates of expected natural visibility if no human-caused impairment occurred. Values are given for the 20 percent best days of visibility and for the 20 percent worst days of visibility. EPA's estimated values for the 20 percent best visibility days are slightly worse than actual monitored values during the years 2001 through 2004. However, when the 20 percent worst days are considered, monitored visibility is less than EPA's estimate of what natural visibility conditions should be.

Table 2-6
Natural and Existing Visibility

	20% Best Days		20% Worst Days	
	Natural	Existing	Natural	Existing
Visibility (dv)	1.95	0.7	7.1	9.6
Visual Range (miles)	200	227	120	93
Visual Range (km)	322	365	193	150

SOURCE: CDPHE APCD 2006b.

NOTES:

dv = deciviews

km = kilometer

Existing Atmospheric Deposition

The closest total deposition monitoring station to the decision area is part of the Clean Air Status and Trends Network (CASTNET) and is located east of the Continental Divide in Rocky Mountain National Park, which is approximately 75 miles east of the eastern tip of the decision area. Table 2-7 presents total nitrogen and sulfur deposition measured at this monitoring site during 2005. Given the influence of industrial and urban emissions along the Front Range, these values represent a conservative upper estimate of atmospheric depositions within the decision area.

Table 2-7
2005 Deposition at Rocky Mountain National Park

Pollutant	Deposition (kg/ha-yr)
Total Nitrogen	2.72
Total Sulfur	1.05

NOTE: kg/ha-yr = kilograms per hectare per year

Trends

Criteria Pollutant Trends

Trends in criteria pollutant concentrations are difficult to identify due to the lack of monitoring stations in the decision area. Trend data for NO₂, SO₂, and ozone are not readily available, although some additional monitoring data are being collected. As mentioned earlier, Garfield County began a 2-year monitoring project in mid-2005 for VOC and PM₁₀. In addition, some private entities are collecting ambient concentration data for certain pollutants.

Particulate monitoring data are being collected in several areas near the decision area, including Parachute and Grand Junction, Colorado. These monitors are located approximately 20 km and 60 km south of the decision area, respectively. In its 2005 *Air Quality Data Report* (CDPHE APCD 2006b), the CDPHE Air Pollution Control Division (APCD) reported PM₁₀ values at Parachute indicated a slight increase in ambient PM₁₀ concentrations from 2001 to 2005. Although ambient concentrations increased, they remained at levels that are less than half of the NAAQS. For PM_{2.5}, data collected in Grand Junction. Slight decrease in annual average PM_{2.5} concentrations was observed from 2002 to 2005. In contrast, 24-hour monitored PM_{2.5} concentrations have been highly variable between 2002 and 2005. For both annual average and 24-hour PM_{2.5} data, ambient concentrations in Grand Junction remain well below the NAAQS.

Ambient CO concentrations from a monitoring location in Grand Junction indicate a significant reduction from 1995 to 2005.

Visibility Trends

Visibility has improved slightly between 2001 and 2004 for the best 20 percent of days, worst 20 percent of days, and annual average (lower dv values indicate improved visibility). Figure 2-2 illustrates visibility trends based on the most recent data available from the IMPROVE monitor located southeast of the decision area.

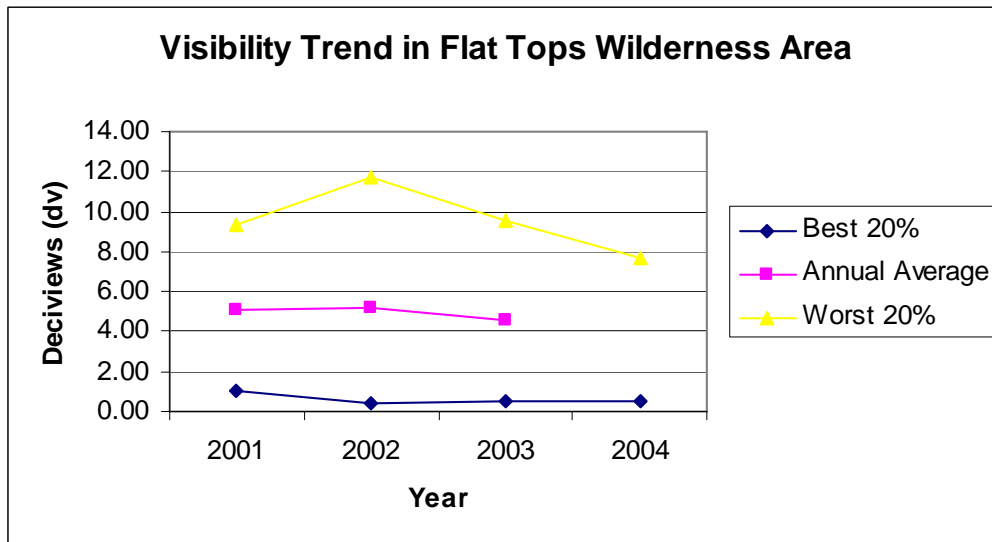


Figure 2-2. Visibility Trend in Flat Tops Wilderness Area

SOURCE: IMPROVE data from the WHRI1 monitor.

NOTE: dv = deciviews

Deposition Trends

Based on the Rocky Mountain National Park monitoring station for total wet and dry deposition, nitrogen and sulfur deposition spiked in 2004. However, 2005 deposition returned to levels seen in 2000 and 2001. Figure 2-3 shows the deposition trend from 2000 through 2005.

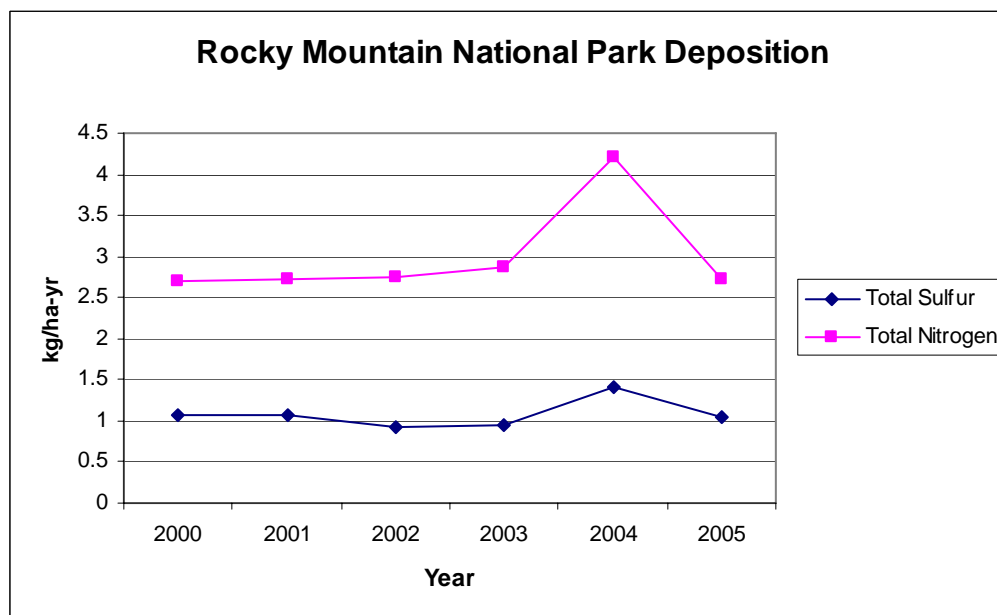


Figure 2-3. Rocky Mountain National Park Deposition

SOURCE: Clean Air Status and Trends Network (CASTNET), monitoring station ROM406.

NOTE: kg/ha-yr = kilograms per hectare per year

Anticipated Future Conditions

Criteria Pollutants

Total emissions of criteria pollutants depend on a variety of factors. As economic activity and population increase, more criteria pollutants are likely to be emitted. However, air quality regulations reduce emissions from certain types of equipment and activities (such as motor vehicle and residential woodburning emission controls). The change in future emissions is difficult to quantify.

Recent energy development on Colorado's Western Slope is likely to increase emissions of CO, NO_x, PM₁₀, PM_{2.5}, SO₂, and VOCs. Significant increases in oil and gas drilling, as well as shale oil development, are forecast for the decision area. Table 2-8 summarizes additional air pollutant sources that are being proposed in the decision area. In addition, the economic growth in the area is expected to attract a larger population, thereby increasing emissions from homes, businesses, construction activities, and personal vehicles.

Table 2-8
Additional Air Pollution Sources

Primary Sources	Secondary Sources
Natural Gas Compressor Stations	Diesel Powered Drill Rigs
Natural Gas Processing Plants	Construction Emissions
Coal Mines	Vehicle Traffic on Dirt Roads
Oil Shale Development	Increased Traffic on Paved Roads and Railroads

Federal and state emission reduction regulations significantly reduce criteria pollutant emissions from many types of equipment, including trains, highway diesel trucks and buses, nonroad vehicles (including construction vehicles), internal combustion engines, and oil and gas operation condensate tanks. Many of these regulations have been in effect for several years. However, some emission limits apply only to new equipment, or reduce future emissions as older more-polluting equipment is replaced with newer equipment meeting stringent emission limits. Table 2-9 summarizes existing regulations which reduce emissions from these sources.

**Table 2-9
Regulations That Will Reduce Future Emissions from Specific Sources**

Rule	Affected Pollutants				
	CO	NO _x	PM ₁₀ and/or PM _{2.5}	SO ₂	VOC*
Locomotive Rule	✓	✓	✓		✓
Highway Diesel Rule		✓			✓
Tier 2 and 3 Nonroad Diesel Rule		✓	✓		
Clean Diesel Truck/Bus and Low Sulfur Diesel Rule		✓		✓	✓
Clean Air Nonroad Diesel Rule		✓	✓	✓	
Colorado Regulation Number 7 Rule	✓	✓			✓
Stationary Compression-Ignition Internal Combustion Engine Rule	✓	✓	✓		✓
Stationary Spark-Ignition Internal Combustion Engine Rule	✓	✓			✓

NOTE: * In some cases, nonmethane hydrocarbons (NMOCs) are the regulated pollutant; VOC emissions are also reduced when NMOCs are reduced.

In addition to the rules included in the table, EPA and the CDPHE APCD continue to develop emission control regulations to improve air quality, including regulations to reduce ozone and visibility impacts.

Over the long run, ambient pollutant concentrations are likely to increase due to economic growth in the decision area. However, active oversight by air quality regulatory authorities and BLM management will assure the decision area remains in compliance with applicable air quality standards.

Visibility

By 2018, visibility within the Flat Tops Wilderness Area is anticipated to improve by 0.6 dv on the 20 percent worst visibility days and achieve EPA's goal of 9.0 dv on these worst days. Visibility on the 20 percent best should remain stable or potentially improve slightly. This forecast is based on requirements of EPA's Regional Haze Rule, which was promulgated on July 1, 1999.

Under the Regional Haze Rule, Colorado must develop a state implementation plan (SIP) to improve and maintain visibility within mandatory federal Class I areas. As part of this effort, the CDPHE APCD has conducted visibility modeling and published an August 2006 document entitled the *Colorado State Implementation Plan for Regional Haze Technical Support Document for the Flat Tops Wilderness Area*. This document describes current emissions and visibility baselines and identifies needed visibility improvements to comply with the federal Regional Haze Rule (Figure 2-4). In coming years, CDPHE APCD will develop specific plans to reduce those air pollutant emissions which cause regional haze. Achieving the federally

stipulated visibility improvement will depend on many factors, including the efficacy of Colorado's regional haze SIP and reductions in haze-forming pollutant emissions in other states whose emissions affect the decision area.

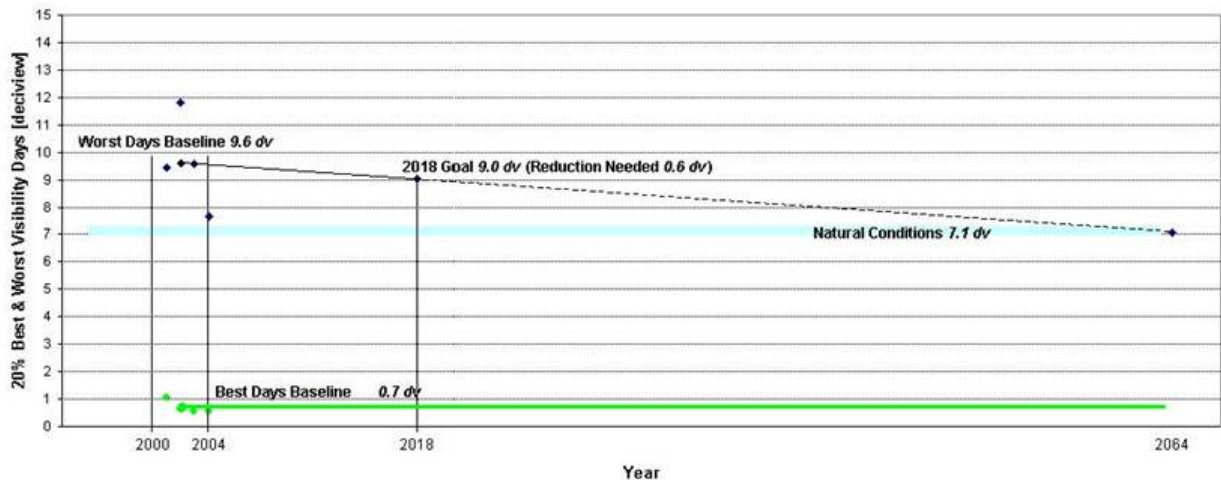


Figure 2-4. Visibility Forecast if Federal Regional Haze Rule Mandates Are Met

SOURCE: CDPHE 2006b.

NOTE: dv = deciviews

Atmospheric Deposition

Future deposition of sulfur and nitrogen will depend on changes in SO₂ and NO_x emissions. Due to stringent emissions standards for many sources of SO₂ and NO_x, such as vehicles and compressor engines, deposition from these individual sources will be reduced. However, increased activity in the decision area may increase total deposition.

Key Features

Key air quality features include clean air (pollutant concentrations below ambient air quality standards), good visibility, and limited deposition of air pollutants. The decision area includes the western portion of one mandatory Federal Class I area (Flat Tops Wilderness Area) and the southern portion of one State of Colorado sensitive Class II area (Dinosaur National Monument).

Scenic vistas are also an important resource to be preserved by reducing regional haze. There are several Colorado-designated scenic and important views (Map 2-23) in the decision area. In addition, the decision area includes two scenic byways: Dinosaur Diamond and the Flat Tops Trail.

2.2.2 Geologic Resources

Geologic resources are defined with descriptions of the surficial and bedrock geology, and stratigraphy of the decision area. Geologic information is used to evaluate potential development of mineral resources and to limit land use based on slope stability and accessibility issues. Several geologic “Type Localities” and areas of paleontologic significance are likely to occur in the decision area.

Indicators

Surficial and Bedrock Geology

A majority of the WRFO overlaps two U.S. Geological Survey (USGS) petroleum resource assessment provinces: the Uinta-Piceance Province and the Greater Green River Province (USGS 1995; USGS 2003). However, a relatively small portion of the WRFO is in the Greater Green River Province and is characterized by relatively low hydrocarbon potential. A major portion of the decision area lies in the northern part of the Piceance Basin in northwestern Colorado. The western portion of the decision area lies within the Colorado Plateau physiographic province, which is characterized by dissected plateaus with strong relief. The eastern portion of the WRFO area lies in the Southern Rocky Mountains physiographic province. The Grand Hogback, a monoclinical structure of steeply dipping sedimentary rocks traverses the area in a general north-south direction and divides these two major provinces. East of the Grand Hogback, in the White River Uplift, land elevations range from about 6,000 to 12,000 feet. Subsequent stream erosion and glacial erosion have exposed rocks of Precambrian age in this area.

The Piceance Basin is located to the west of the Grand Hogback. The basin is a broad, southeast-northwest trending structural and topographic basin. It is bordered by the White River Uplift to the east, the West Elk Mountains to the southeast and south, the Uncompaghre Uplift to the southwest, the Douglas Creek Arch to the west-northwest, the Yampa Plateau to the north, and the Axial Basin Uplift to the northeast (Dunn 1972).

The Douglas Creek Arch and Rangely Anticline are large north trending anticlinal features that extend northward from the Uncompaghre Uplift through Rangely to the Yampa Plateau. These features separate the Piceance Basin from the Uinta Basin of Utah. The Douglas Creek Arch contains significant resources of recoverable oil and gas. Structural relief is more than 12,000 feet in the northern portion of the Douglas Creek Arch (Kellogg 1977).

The Yampa Plateau is defined by Jurassic and older rocks at the northern end of the basin (BLM 2007). The Axial Basin Uplift is a west-northwesterly trending structural saddle that separates

the Sand Wash Basin on the north from the Piceance Basin to the south. The uplift is defined by Mesozoic rock outcrops bounded on the northeast and southwest by Tertiary rocks of the Sand Wash and Piceance Basins (Dunn 1972). The northeastern limit of the basin is defined by an area of folding in the northern Danforth Hills area.

The Piceance Basin encompasses 3,900 square miles of exposed Tertiary rocks. The Tertiary-Cretaceous contact forms a nearly continuous outcrop along the basin margins. The basin is asymmetric with gentle dipping beds along the southwest flank and steeply-dipping beds along the northeast flank forming the Grand Hogback. The basin axis parallels the Grand Hogback in the central part of the basin; however, the axis on the northern and southern portions of the basin is bifurcated due to basinward-plunging anticlinal features (Dunn 1972). The interior portion of the northern part of the basin is characterized by a series of broad northwest-trending folds in the eastern and central portions of the basin, and a series of northeast-trending normal faults across the Douglas Creek Arch. Map 2-2 depicts the generalized surface geology within the WRFO planning area.

Deposition of sediments into this region began with downwarping of the Piceance Basin floor during the Cretaceous and continued through the Eocene. Low stream gradients and moderate uplift of the marginal mountains prevented significant erosion of the basin's perimeter. This sequence of events resulted in the deposition of the Wasatch, Green River, and Uinta formations in and around a series of landlocked lakes (Bradley 1964). The surface drainage system of the basin is defined by Piceance Creek and its tributaries which drains surface exposures of the Uinta Formation in the central portion of the WRFO (BLM 2007).

Surface geology in the decision area consists mostly of sedimentary rocks ranging in age from Paleozoic (230-600 million years) to the Cenozoic (present to 63 million years). Paleozoic and Mesozoic sedimentary rocks are most common in the eastern third of the area; Mesozoic and Cenozoic sedimentary rocks dominate the northern, central, and western parts of the area. During the last half of the Cenozoic, extrusive volcanic rocks of mostly basaltic composition intermittently covered exposed rocks along the crest of the White River Uplift. The volcanic rocks are exposed as resistant rock layers that cap older sedimentary rocks in the eastern part of the decision area. Cretaceous and Tertiary shales and siltstones are common in the central and western part of the area and are generally less resistant to erosion than the rocks in the White River Uplift.

Stratigraphy

The Piceance Basin contains stratified rock units ranging in age from Cambrian through middle Tertiary. This discussion of the stratigraphy describes the rock units from youngest to oldest.

Stratigraphically there are approximately 28,000 feet of rock units between the highest point on the White River Uplift to the east and the Precambrian crystalline basement at the lowest depth of the basin. Figure 2-5 is a generalized geologic stratigraphic column of the area. In general, a thin veneer of unconsolidated Quaternary alluvium, valley fill, and terrace deposits occupies low-lying areas.

Approximately 8,000 feet of Tertiary sedimentary deposits lie below these unconsolidated sediments. Map 2-3 presents the major geologic structures within the WRFO planning area.



Tertiary

The Tertiary section consists of three major formations: the Uinta (Eocene), Green River Eocene), and Wasatch (Paleocene-Eocene) formations. The Wasatch Formation unconformably overlies the Cretaceous Mesaverde Group throughout the basin.

The Uinta Formation outcrops throughout most of the Piceance Basin and is present below unconsolidated Quaternary sediments. The Uinta Formation consists of sandstones with interbedded sequences of siltstones and marly siltstones. Marlstone is more abundant in the lower portion of the formation. It also includes conglomerates and tuff. The Uinta Formation was formed mainly from clastic fluvial-deltaic sediments prograding southward and inter-tonguing with the lacustrine Green River Formation. The thickness of this formation varies within the decision area.

The Green River Formation lies below the Uinta Formation and includes beds of oil shale (Cashion 1973). The lower contact of the Uinta Formation with the Green River Formation is marked by an abrupt transition from gray siltstone to dark brown, moderately rich oil shale. The Green River Formation in the Piceance Basin is divided into four members: the Parachute Creek (upper member), Garden Gulch (intermediate member), Douglas Creek (lowest member), and Anvil Points (lateral correlative of the Douglas Creek and Garden Gulch Members, and part of the lower Parachute Creek Member). The Parachute Creek Member contains virtually all of the oil shale, nahcolite, and dawsonite resources in the Piceance Basin. At the top of the Parachute Creek Member, tongues of the Green River Formation are interfingered with the lower part of the Uinta Formation. The Green River Formation rests conformably on top of the Wasatch Formation.

Age	Ma	Formation	Tectonic Events
Pliocene	2.5		Rapid Erosion by Colorado & Green Rivers: Regional Uplift
Miocene	5	Basalt Flows	Rio Grande Rift
	24		Treasure Mt Mt Emmons
Oligocene	38	Rhyolite Flows	Igneous Intrusions Along Colorado Mineral Belt
			Mt Sopris
Eocene		Uinta Fm Green River Fm Parachute Creek Gorden Gulch Douglas Creek Anvil Points	Uplift of White River Plateau and Axial Arch Lacustrine
	55	Wasatch Fm	Uinta Uplift
Paleocene		Shire Molina Atwell Gulch	LARAMIDE II Uplift of Douglas Creek Arch Subsidence of Piceance Basin Deep Weathering at K-T Unconformity
	60		
Cretaceous	67	Mesaverde Gp	White River Uplift
		Hunter Canyon Fm	LARAMIDE I
	72	Mount Garfield Fm	
	75	Rollins Member Cozette Member Corcoran Member Sego Sandstone	Front Range & Sawatch Uplifts Gradual Infilling of Seaway
			Ute Mt Intrusion
	80	Mancos Sh Niobrara Fm Frontier Fm	Subsidence of Western Interior Seaway
90		Absaroka Thrust in Utah	
112	Dakota Gp	Fluvial & Marine Ss	
Jurassic	135	Morrison Fm	Fluvial & Lacustrine
	165	Entrada Ss	Eolian Dunes, Marine Shorelines
Triassic	215	Chinle Fm Moenkopi Fm	Minor Upwarping & Block Faulting
	240	State Bridge Fm	
Permian	260	Phosphoria Fm	Carbonates & Shale
		Weber Ss	Eolian Dunes
	285		
Pennsylvanian		Maroon Fm	Fill Basins with Arkosic Ss & Conglomerate
		Minturn Fm	Fan Deltas
		Eagle Valley Fm	Evaporites & Black Sh
		Belden Fm	Uncompahgre, Gore & Front Range Uplifts
unconformity	310	Molas Fm	Subsidence of Eagle & Paradox Basins
	325		Ouachita & Marathon Orogenies
Mississippian		Leadville Ls	Regional Uplifts & Karstification
		Castle Butte Mbr Redcliff Mbr	Shallow Carbonate Shelf
Devonian	360	Gilman Ss	
		Dyer Fm	Shallow Carbonate & Clastic Shelf
unconformity	440	Parting Fm	
Ordovician	505	Manitou Fm	Shallow Carbonate & Clastic Shelf
Cambrian		Peerless Fm	
	560	Sawatch Ss	Marine Transgression
PreCambrian	900	Unita Mt Gp	Uinta Aulacogen
	1400		Uplift & Erosion
	1900	Igneous & Metamorphic Basement	

U.S. Department of the Interior Bureau of Land Management   URS	AMS November 2007	Figure 2-5 Stratigraphic Units and Tectonic Events Piceance Basin, Colorado BLM White River Field Office Oil and Gas RMPA/EIS
	Source: Rocky Mountain Association of Geologists, 2003. Technical Session: Piceance Basin Field Symposium. Co-Sponsored with the American Institute of Professional Geologists, October 5.	

The Wasatch Formation may reach a maximum thickness of 5,500 feet, making this stratigraphic sequence the thickest Tertiary unit in the Piceance Basin. In the southern and eastern portion of the basin, the Wasatch Formation has been subdivided from top to bottom into the Shire, Molina, and Atwell Gulch members. The Shire Member has variegated siltstone, claystone, and sandstones. The Molina Member is dominated by massive, cross-stratified sandstone.

The basal Atwell Gulch Member is composed of variegated siltstone and claystone (Donnell 1961). The Wasatch Formation is undivided in the northern part of the basin.

The base of the Tertiary section is composed of a conglomerate formerly called the Ohio Creek Formation, which overlies Cretaceous rocks of the Mesaverde Group (Hunter Canyon or Williams Fork Formation).

Cretaceous

Rocks of Cretaceous age are extensive in the area; and cover more than 31,000 square miles. Thicknesses range from 6,000 to 10,000 feet. The Cretaceous section is characterized by complex interfingering of marine and continental strata. The environments of deposition were mainly marine in the eastern part of the basin and mainly continental in the western part. Nine principal marine transgressions and regressions have been recognized. The seas were mostly transgressive in the early Cretaceous and early parts of the Late Cretaceous, and then mostly regressive throughout the remaining portion of the Late Cretaceous (Kellogg 1977). From oldest to youngest, Cretaceous rocks consist of the Dakota Sandstone, Mowry Shale, Frontier Formation, Niobrara Formation (limestone and calcareous shale), Mancos Shale, and Mesaverde Group. The Mesaverde Group consists of in descending order: Hunter Canyon Formation, Mount Garfield Formation (Rollins Member, Cozzette Member, and Corcoran Member), and Segoe Sandstone (Johnson 1979). The Hunter Canyon Formation and the upper part of the Mount Garfield Formation consist of fluvial channel-form sandstone that is locally conglomeratic and interbedded with siltstone, claystone, and carbonaceous shale. The Hunter Canyon Formation grades into the Williams Fork Formation in the northern part of the basin. The members of the Mount Garfield Formation consist of laterally extensive marine sandstone interbedded with paludal organic rich shale, carbonaceous claystone, and coal. The Cozzette Member also contains marine shale. The Segoe Sandstone consists of laterally extensive marine sandstone.

Jurassic and Triassic

Jurassic and Triassic rocks are composed of interbedded marine and continental strata. Total thicknesses range from 500 to 6,000 feet. Three marine cycles of deposition are represented in this section. The cycles consist of red and varicolored continental shale and red, orange, and

white fluvial and eolian sandstone. The Shinarump, Navajo, and Entrada sedimentary rocks include regionally well-developed porous sandstones that provide reservoirs for several producing oil and gas fields, including Wilson Creek (Kellogg 1977).

Pennsylvanian and Permian

Pennsylvanian and Permian rock thicknesses range from zero to more than 10,000 feet. Sediments were deposited during a period of great tectonic activity. Large quantities of clastic sediment were eroded and a large amount of sand was transported into the area during the uplift of the ancestral Rockies. The rock units consist predominantly of sandstone and arkose with interbedded carbonate rocks present in northwestern Colorado. At least three, and possibly four, major unconformities have been recognized within these sequences.

In northwestern Colorado, lower Pennsylvanian rocks contain interbedded dark-gray organic shale and limestone, above which are evaporite rocks that were deposited in a basin that developed locally. Two types of sandstone are prevalent in this sedimentary sequence: mature quartzose sandstone and arkose. The arkose lies in thick wedges adjacent to Precambrian granite uplifts. The ancestral Rockies were the source for these arkosic sediments. The uppermost of the quartzose sandstone is the Weber Sandstone of Pennsylvanian and Permian age. Overlying the Weber Sandstone is the Upper Permian Park City or Phosphoria Formation, a marine cyclic deposit rich in hydrocarbons (Kellogg 1977).

Devonian and Mississippian

The Devonian of northwestern Colorado is composed of dolomite and quartzitic sandstone. Devonian and Mississippian age rocks range in thickness from zero to more than 3,000 feet with predominantly carbonate rocks (dolomite) and an upper dark shale sequence. Some sandstone is present at the base and also overlies the carbonate rocks. The sandstone is usually cemented by calcite and has limited porosity (Kellogg 1977).

Precambrian

Precambrian crystalline basement rock is estimated to be 24,000 feet below ground surface (bgs) in the central portion of the northern Piceance Basin (Murray and Haun 1974). Precambrian rocks are exposed in the White River Plateau and include metamorphic rocks (gneiss and schist) ranging in age from 1,700 million years old (MY) to 1,800 MY. Precambrian granitic rocks approximately 1,700 MY also are present in the White River Plateau.

Current Conditions

Geologic Hazards

The WRFO planning area lies within Seismic Risk Zone 1 (on a scale of 0 to 3, with Zone 3 having the highest risk) (Algermissen 1969). Within Zone 1, minor damage to structures from distant earthquakes may be expected. The National Earthquake Information Center database (2006) was searched in the area within approximately 100 miles of the decision area. Since 1950, the largest seismic event within the search area was magnitude 5.7 (Modified Mercalli Intensity VII) and was centered at approximately 39° 47'N, 108° 22'W, which is six miles south of the southern border of the WRFO planning area.

Unstable slopes occur on hillsides or cliffs, or in areas that are susceptible to landslides, mudflows, rock falls or accelerated creep of slope-forming materials. Unstable slopes occur naturally and are wide spread in the WRFO planning area. Most unstable slopes consist of weathered sedimentary strata and/or recent colluvium deposits that move downhill due to gravity. Unstable slopes can be active or inactive. Slope failure can be initiated by a change of conditions, either natural or man induced. Natural factors contributing to slope instability include weathering and erosion, changes in the hydrologic characteristics of the hillside, loss of vegetation cover, earthquakes, and the slow natural deterioration of slope strength. Artificial factors that can undermine slope strength are cut and fill operations, alteration of surface drainages, excessive irrigation, removal of vegetation cover, blasting, and vehicular traffic.

Trends

Geologic trends that may be of concern to the White River decision area are limited and well defined.

Forecast

Additional subsurface geologic information is being gathered in the WRFO planning area at a rapid pace that will continue for over a decade based on current forecasts for oil and gas development. The USGS, BLM, and Colorado Oil and Gas Conservation Commission (COGCC) will add new information to the substantial geologic descriptions that already exists.

Key Features

Geologic information will be important to effective development of mineral resources. Some areas exist within the multiple mineral deposits of the decision area, located at varying subsurface depths. For example, areas designated for potential coal, sodium, and oil shale development, also include potential for development of natural gas reserves. These mineral

resources are located closer to the surface and are underlain by the gas producing geologic strata. Different corporate entities may pursue development of each of these resources.

Geologic information should be developed and shared to improve planned development of other mineral resources and natural gas producing strata.

2.2.3 Soil Resources

Several resources and resource uses, such as livestock grazing, wildlife habitats, and recreation, depend on suitable quality soils for sustainment. Thus, the preservation of topsoil and the productivity of public land are a high priority in BLM land management decisions. In this section, the indicators of the status and trends of soils in the planning area will be discussed as they relate to resource management and planning decisions.

Indicators

Soil erosion by wind or water is a normal process of the ecological function of any landscape. Through this process, nutrients are replaced, microbial communities are renewed, and soil structures are re-established. However, the ecological landscape can degrade when the process of erosion or deposition of soils exceeds the ability of the plant and animal community to adapt to this process, or when soil is severely eroded or completely lost from the landscape. There are many land uses that can contribute to soil loss. Any use that removes or alters soil properties has the potential to accelerate soil loss.

The BLM Colorado State Office has established Standards for Public Land Health (Standards), which may be applied on a landscape scale for five categories. Standard 1, Upland Soils, is applicable to soils and soil conditions (Appendix A). Standard 1 uses Land Health Assessments for soil resources to determine if public land health is being sustained. The BLM Colorado State Office adopted a specific strategy for assessing general ecological health by using indicators, including soil conditions, to determine if a standard is not being met. If standards are not being met, and livestock grazing has been shown to be the causal factor, guidelines for resource management practices, such as grazing management, that result in progress toward meeting that standard are implemented.

The BLM also has established Best Management Practices (BMPs) for oil and gas development operations on leased public lands (BLM 2007c). BMPs are used because they help meet and maintain the Standards found in BLM Land Use Plans, and protect resources such as soil, water, wildlife habitat, grazing and visual resources.

The BMPs are frequently updated and modified to improve the way BLM manages oil and gas development and lessen the effects of such development on soil resources and other environmental resources. The BMPs are not one-size-fits-all, and should be matched and adapted to meet the site-specific requirements of the project and the local environment. Representative BMPs that are used successfully by oil and gas operators to mitigate the impact to soil resources on BLM-administered lands include:

- Construct roads to follow the contours of the land to minimize cuts and fills, and reduce steep grades to minimize runoff and soil erosion.
- Avoid building roads or pads, or cutting into slopes, that have erosive or sensitive soils.
- Implement erosion control measures, such as culvert outlet erosion control techniques (rip rap or diversion barriers), to control runoff and mitigate erosion of soil resources.
- Recontour disturbed areas to original ground contours to blend with surrounding topography, which will reestablish drainage and help reduce localized erosion.
- Salvage topsoil during construction operations, then restore topsoil to a uniform depth during reclamation activities. Rip or scarify disturbed and compacted areas, such as roads that are no longer needed for production operations, then reseed to revegetate impacted areas. Revegetated areas promote sediment capture, dissipate energy, and ultimately contribute to stream stability and groundwater recharge.

Current Conditions

The U.S. Department of Agriculture (USDA) has mapped soil resources in most of the planning area. The soil resources in most of Rio Blanco County were previously mapped by the USDA Soil Conservation Service (SCS) (USDA 1982) and more recently by the USDA Natural Resource Conservation Service (NRCS) (NRCS 2007a). Soil resources in much of Garfield County also were mapped by the SCS (USDA 1985) and NRCS (2007b). More recently, the soils in most of Moffat County have been mapped by the NRCS (2006). The NRCS also completed a separate soil survey for Dinosaur National Monument (NRCS 2001). Soil data are not available for USFS lands in the eastern portion of Rio Blanco County. The following discussion of current conditions for soil resources in the planning area is based on the Map 2-4 (Fragile or Highly Erodible Soils).

The soil resources of the planning area are categorized according to soil associations in the terminology of the NRCS general soil map units. These units are large enough to be of

importance to the scale of the Resource Management Plan (RMP), but detailed enough to distinguish the important regional variety of the planning area.

Soils in the planning area are primarily the product of the climate, the underlying bedrock lithology, and the topography. Many of the soils described below are derived from shale lithologies, such as the Green River Formation, Wasatch Formation, and Mancos Shale. Soils derived from Mancos Shale or from other saline sedimentary formations tend to be high in salts. Soils located in Mancos Shale basins also may have high selenium levels, especially in areas that support irrigated agriculture. Due to the salt content in these soils, vegetative cover is sparse, resulting in soil particles not being "anchored" in place, and soil easily erodes by wind and water. These sparsely vegetated sedimentary basins with poor soil, known as shale deserts, occur in the northern portion of the planning area, northwest of Rangely and around Meeker. These areas are characterized as nearly level basins and valleys, benches, and low rounded hills containing shallow clayey and silty soils.

The landscape in the planning area provides the most systematic discrimination of soil resources relative to the uses of the public lands. The mapped soil associations are most closely correlated to the various landforms of the planning area. The following descriptions for each county are primarily developed from the NRCS soil surveys.

Rio Blanco County

Soil types in the portion of the planning area that occurs in Rio Blanco County are as diverse as the underlying parental material. In the westernmost quarter of the county, along much of the northern boundary, and along the Grand Hogback that bisects the county from north to south, the most prevalent soil associations include the Rentsac-Moyerson-Rock Outcrop complex. This is a shallow, well-drained group of loam soils formed on the Mesaverde Group sandstones and shales. The Rentsac soil type is a grayish brown channery loam formed in residuum derived primarily from sandstone. It is the most widespread soil type by acreage in the county. The Moyerson soil is a light gray clay loam formed in residuum derived primarily from shale. This complex has a moderate to very high erosion hazard due to slope erodibility.

The Irigul-Parachute complex and its component soils are common in the much of the west-central half of Rio Blanco County, as is the Castner channery loam. The Irigul soil is a grayish brown channery loam and is shallow and well drained. The Parachute soil is a grayish brown loam and is moderately deep and well drained. These soils are formed on the sandstone, siltstone, shale and claystone of the Uinta, Wasatch and Green River Formations. This complex is common on ridges and mountainsides and has a moderate to very high erosion hazard due to slope erodibility. The Castner channery loam consists of shallow, well-drained soil with

moderate permeability that is mainly suitable for rangeland. It has a moderate erosion hazard due to slope erodibility.

Much of the southeastern portion of Rio Blanco County contains a diverse range of soils. The most common soils include the Tampico-Miracle complex. The Tampico soil consists of brown, deep, well-drained loam that is moderately permeable and forms on mountain slopes. This soil has a moderate to high erosion hazard due to slope erodibility. The Miracle soil is a brown, moderately deep, well-drained fine sandy loam that formed in material weathered from sandstone. Miracle soils are on upland hills and plateaus and have a slight erosion hazard. The overall erosion potential for the Tampico-Miracle complex is moderate to very high. These soils are derived from Paleozoic sandstone, shale and limestone, as well as younger volcanic and granitic parent material.

The Winnemucca-Clayburn loams also are common in southeastern Rio Blanco County. The Winnemucca soil is dark gray brown and consists of very deep, well-drained loam and has a slow permeability. The Winnemucca soils formed in alluvium and colluvium derived from intermediate volcanic materials. The Clayburn loam is very dark gray brown, very deep, well drained soil that formed in glacial drift, colluvium, or alluvium derived mainly from shale, sandstone, and andesite. This complex has a moderate to high erosion hazard due to slope erodibility.

Throughout Rio Blanco County, the Torriorthents-Rock Outcrop complex is found on steep slopes. This soil complex is well drained and varies from loamy to clayey with variable amounts of gravel and stones. This complex has a severe erosion hazard due to slope erodibility. Although they do not comprise a large percentage of the planning area, the Razorba channery loam and the Rhone loam are two soils that warrant concern because they are common on steep slopes. These soils have a very severe erosion hazard due to slope erodibility.

Garfield County

Soil types in the planning area within northern Garfield County are generally comparable to those described for southern Rio Blanco County. In the northwestern part of the planning area, the Parachute-Irigul complex is common. The Parachute soil is a grayish brown loam and is moderately deep and well drained. The Irigul soil is a grayish brown channery loam and is shallow and well drained. These soils are formed on the sandstone, siltstone, shale and claystone of the Green River and Wasatch Formations. This complex is common on ridges and mountainsides and has a moderate to very high erosion hazard due to slope erodibility. The common soil downslope from the Parachute-Irigul complex is the Torriorthents-Rock Outcrop complex.

The Wrayha-Veatch-Rabbitex and Wrayha-Rabbitex-Veatch complexes also are common on slopes in the northwestern part of the planning area in Garfield County, and may be comparable to the Rentsac-Moyerson complex in Rio Blanco County. The Wrayha soil is brown stony clay loam that is deep and well drained with slow permeability. It is formed from residuum derived from shale. The Veatch soil is dark brown channery loam formed from colluvium and alluvium. It is moderately deep and well drained with moderate permeability. The Rabbitex soil is a brown loam formed from colluvium weathered from limestone. It is a deep to very deep well drained soil. The hazard of water erosion is very severe in this complex.

The Caballo is a dark gray brown, deep, and well-drained soil that formed in material weathered from residuum of limestone, siltstone and limy soft shale derived from the Green River Formation. Caballo soils are on mountain sideslopes. The soil has a rapid runoff potential and a very severe erosion hazard due to slope erodibility.

In the central part of northern Garfield County, the Parachute-Irigul and Northwater-Adel complexes are formed from residuum derived from the sandstones and siltstones of the Uinta Formation. The Northwater-Adel complex is found on mountainsides and footslopes of 5 to 50 percent. The Northwater soil consists of deep, grayish brown loam with rapid runoff and moderate drainage. The Adel soil is a deep and well-drained dark gray clay loam. It has moderate permeability and medium runoff. The water erosion hazard for this complex is moderate to very severe.

In northern Garfield County east of the Grand Hogback, common soils include the Lamphier-Miracle complex. The Lamphier soil is a brown loam that is very deep and well drained, with moderate runoff and moderate permeability. This complex has a slight to moderate erosion hazard. The Miracle soil is a brown, moderately deep, well-drained fine sandy loam that formed in material weathered from sandstone. Miracle soils are on upland hills and plateaus and have a slight erosion hazard. The overall erosion potential for the Lamphier-Miracle complex is moderate to very high. These soils are derived from Paleozoic sandstone, shale and limestone, as well as younger volcanic and granitic parent material.

Moffat County

Soil types in the planning area within southwestern Moffat County are generally comparable to those in northwestern Rio Blanco County. A portion of the planning area south of the Yampa River is within Dinosaur National Monument, which has its own soil survey containing different mapped soil units.

The eastern area of Moffat County within the planning area and east of Strawberry Creek contains extensive acreage of the Rentsac-Moyerson-Rock Outcrop complex. This is a shallow,

well-drained group of loam soils formed on the Mesaverde Group sandstones and shales. The Rentsac soil type is a grayish brown channery loam formed in residuum derived primarily from sandstone. It is the most widespread and abundant soil type by acreage in the county. The Moyerson soil is a light gray clay loam formed in residuum derived primarily from shale. This association supports a pinyon/juniper woodland community on moderate clayey slopes. This complex has a moderate erosion hazard due to slope erodibility. A very common soil downslope from the Rentsac-Moyerson-Rock Outcrop complex is the Torriorthents-Rock Outcrop complex. This soil complex forms on steep slopes, is well drained and varies from loamy to clayey textures with variable amounts of gravel and stones. This complex has a severe erosion hazard due to slope erodibility. This part of the planning area also contains the Jerry-Thornburg-Rhone complex, which is described below.

The eastern area of Moffat County within the planning area and west of Strawberry Creek contains the Jerry-Thornburg-Rhone complex and Veatch soils. The Jerry soil is a dark gray loam. It is a deep to very deep and well-drained soil formed from residuum of sandstone and shale. It has rapid runoff and low permeability. The Thornburg loam soil is brown, deep and very well drained, with rapid runoff and moderate permeability. Rhone loam soils are formed on the sandstone, siltstone, shale and claystone of the Uinta, Wasatch and Green River Formations. The Rhone soil is common on ridges and mountainsides and has a moderate erosion hazard due to slope erodibility. The Veatch soil is dark brown channery loam formed from colluvium and alluvium. It is moderately deep and well drained with moderate permeability.

The most common soils in the western part of Moffat County, both within and south of Dinosaur National Monument, are Rock Outcrops, Ustorthents soils, and the previously described Torriorthents-Rock Outcrop complex. These soil types indicate the relative scarcity of developed soil profiles and stabilizing vegetative cover on steep slopes in desert terrain.

The Cragnot-Pensore-Grapit Association also is present in the western part of the planning area. The Cragnot soil is dark brown channery loam. It is a very deep, well-drained soil with moderate runoff and low to moderate permeability. The Pensore soil is a gray brown gravelly loam that is shallow and well drained. The Grapit soil is a very deep and well-drained brown gravelly loam with low to high runoff and moderate permeability. The Cragnot-Pensore-Grapit Association is a stony soil complex with moderate erosion hazard due to slope erodibility.

Sensitive and Fragile Soils

BLM defines soils as sensitive or fragile if they are highly erodible, have steep slopes (greater than 35 percent), and also have one of the following characteristics:

- Sand, loamy sand, sand, very fine sandy loam, fine sandy loam, silty clay, or clay surface textures
- A depth to bedrock that is less than 20 inches
- An erosion condition rated as poor
- A K factor¹ that exceeds 0.32.

Activities proposed on steep slopes or fragile soils would be subject to surface use stipulations that would mitigate surface erosion and subsequent watershed problems. Areas designated for Controlled Surface Use (CSU) stipulations are generally associated with steep slopes and slopes that have soil types that are easily eroded. More specifically, CSU-1 designates areas where soils are located on slopes greater than 35 percent and saline soils. Surface disturbing activities in CSU-1 areas require a plan that addresses restoration of soil productivity and soil erosion. Surface disturbing activities in areas that have soils designated as CSU-1 and others require a plan that addresses protection of additional resources. Map 2-4 presents the soils designated as CSU-1 and CSU-1 and others within the planning area. A summary of the percentage of soils in each county within the planning area that have a severe or very severe erosion hazard are presented below:

- Garfield County: CSU-1 (9.0%); CSU-1 and others (0.2%)
- Moffat County: CSU-1 (7.6%); CSU-1 and others (0.4%)
- Rio Blanco County: CSU-1 (21.1%); CSU-1 and others (3.4%)

BLM recognizes the ecological value of fragile biological soil crusts and typically implements controlled surface use stipulations to preserve them (BLM 2002). Biological soil crusts, also known as cryptogamic soils, are found throughout the public lands and represent a critical ecological component in the arid West. Biological soil crusts can be composed of cyanobacteria, green algae, lichens, mosses, microfungi, and other bacteria (Belnap et al. 2001). Biological soil crusts fix nitrogen and contribute to the sparse nutrients available to desert plants. Infiltration rates through biological soil crusts vary, and they tend to retain soil moisture. Biological soil crusts are both an indicator and contributor to rangeland health (Pellant et al. 2000).

¹ Soil erodibility factors (K_w) and (K_f) quantify soil detachment by runoff and raindrop impact. These erodibility factors are indexes used to predict the long-term average soil loss, from sheet and rill erosion under crop systems and conservation techniques (NRCS 2005).

Biological soil crusts are known to occur on public lands near and within the planning area (BLM 2004, 2005). However, spatial inventories of these occurrences on public land in the planning area have not been performed. Thus, it is not possible at this time to assess the current state of these resources.

Disturbance of biological soil crusts requires considerable time to revegetate, up to 56 years from one study (Kade and Warren 2001). Less frequent and intensive disturbance may be more easily correctable. Vehicle tires are particularly destructive to biological soil crusts (Belnap et al. 2001; Kade and Warren 2001).

Important Farmlands

Four categories of farmlands are federally regulated by the United States Department of Agriculture (USDA) under the Farmland Protection Policy Act: (1) Prime farmlands, (2) Unique farmlands, (3) Farmlands of statewide importance, and (4) Farmlands of local importance. Important farmlands are a distinction made by the USDA as soils that support the crops necessary for the preservation of the nation's domestic food and other supplies, specifically the capacity to preserve high yields of food, seed, forage, fiber, and oilseed with minimal agricultural amendment of the soil, adequate water, and a sufficient growing season. Several USDA and other Federal natural resource programs, permits, and regulations require the identification of important farmlands.

Important farmlands occur in the planning area. Moffat County contains farmlands of statewide importance and prime farmlands if irrigated. Rio Blanco County also contains areas of prime farmland if irrigated; additionally, some areas would require drainage to meet this classification. Both Moffat and Rio Blanco counties contain soils that would be classified as prime farmlands if they are irrigated and reclaimed of excess salts and sodium. The Douglas Plateau area of Garfield County contains soils that would be prime farmland if irrigated and farmlands of statewide importance occur near Rifle.

Trends

Currently, soil conditions are routinely assessed on grazing allotments. Observational data are collected in support of comparison to Standards. Outside of the allotments, soil resource observations are only made as part of specific environmental assessments, as needed by specific restoration projects, or during construction of roads or other surface disturbing activities. Based on these observations, the allotment assessments and the general understanding of BLM resource specialists, there is no evidence of a trend in soil conditions that suggests that the current management in the planning area is causing a loss of or damage to the resource.

Forecast

The lack of numeric data on soil conditions makes forecasting less robust than it might be for other resources. However, some projection of current trends is possible from regional trends and analyses for the planning area. These can be applied with some caution to the planning area, recognizing that soil loss is a highly site-specific condition.

With the changes in precipitation expected to accompany the current regional drought, some impact on soil resources are expected to occur in the planning area. A declining water table and decreasing soil moisture caused by the lack of direct infiltration would suggest that more soil may be lost due to wind erosion in the future. Soil loss could be exacerbated by increasing demands for water for resource uses on land within the planning area.

Impacts to soil resources may result from increased exploration and development of energy resources, particularly natural gas exploration and development from coal beds (coal bed methane). More specifically, soils would be impacted by road and drill pad construction, installation of pipelines and tank batteries, and waste products from the drilling process, including drilling muds and produced formation water that may have high salinity or petroleum contaminants. The volume and extent of such impacts depends on the size of the gas field, well spacing (i.e., number of wells per acre), drilling method, depth of the well, geologic formation, and type of fluid resource encountered. For example, exploration and development of a new gas field could range from approximately 70 acres for a small gas field (500 acres) with 40-acre spacing, to approximately 840 acres for a large gas field (2,000 acres) with 10-acre spacing (Rocky Mountain Federal Leadership Forum 2002).

Potentially extensive impacts to soil resources may also result from future mining and processing of large oil shale deposits located in the central portion of the planning area. Soil reclamation and restoration would be required as part of the mine closure plan to mitigate for the removal and storage of topsoil.

Excessive erosion of soil could also be initiated if unauthorized OHV use increases due to the future expansion of this activity. This impact has been documented on public land throughout the Southwest. An increase in access roads for resource uses could cause an increase in soil loss, but only if roads are incorrectly designed or maintained. Similarly, poor grazing management can also cause increases in soil loss.

Key Features

Key features to consider for managing soils in the planning area are shallow depth to bedrock, salinity, and steep slopes. Management of soils on public lands is directly tied to the Standards and should be a criterion used in future land-use decisions.

2.2.4 Water Resources

Water resources include groundwater and surface water which are integral in maintaining healthy plant communities and wildlife habitats and provide drinking water for wildlife and people. Surface water also provides important habitat for aquatic organisms. For the water present within the decision area, there is an existing natural balance between wildlife and surface water occurrence and water quality. BLM management decisions on both uplands and in drainages endeavor to maintain this balance.

As addressed Standard 5, Water Quality of the Colorado Standards of Public Land Health (Standards, see Appendix A) (BLM 1997a), water bodies within or influenced by BLM lands need to meet the Water Quality Standards established by the CDPHE Water Quality Control Commission (WQCC) and applicable federal standards. The CDPHE has published Regulation No. 31 *The Basic Standards and Methodologies for Surface Water* (CDPHE WQCC 2005a), and Regulation No. 41 *The Basic Standards for Ground Water* (CDPHE WQCC 2004). Additionally, Regulation No. 37, *Classifications and Numeric Standards for the Lower Colorado River Basin*, provides the standards relative to this watershed (CDPHE WQCC 2005b). To maintain beneficial use of surface water, the state has developed numeric criteria, narrative criteria, and antidegradation requirements that can be applied to stream segments.

In accordance with Section 303(d) of the Clean Water Act, CDPHE Regulation No. 93 identifies the water quality limited stream segments requiring Total Maximum Daily Loads (TMDLs) (*Section 303(d) List Water-Quality-Limited Segments Requiring TMDLs*, CDPHE WQCC 2006a). These segments are where water quality standards are not being met and/or designated uses are not being attained. CDPHE Regulation No. 94 is *Colorado's Monitoring and Evaluation List* of stream segments in the state where there is reason to suspect water quality problems, or there is also uncertainty regarding one or more factors.

In 1973, Colorado adopted legislation that recognized the maintenance of minimum instream flows as a beneficial use of water. This legislation stated that instream flow could be used “to preserve the natural environment to a reasonable degree.” The Colorado Water Conservation Board (CWCB) oversees this process, and BLM is also able to designate minimum instream flows to protect and maintain beneficial uses. Flow surveys have been completed for Black

Sulphur Creek, Yellow Creek, Piceance Creek, and Little Beaver Creek. Additional creeks have been identified for flow surveys, and represent opportunities for future programs.

2.2.4.1 Groundwater

Indicators

Groundwater quality must be maintained to meet Colorado basic groundwater standards per Regulation No. 41. Groundwater recharge to stream valleys (baseflow), either as spring inflow or gaining segments of streams, supports a wide range of riparian habitats.

Groundwater is present beneath the entire decision area, and occurs in both unconsolidated and bedrock aquifer types. Both aquifer types are capable of yielding usable quantities of water of a quality suitable for most agricultural or domestic use. The shallow alluvial aquifers exist within unconsolidated sediments along stream valleys. Deeper bedrock aquifers are present beneath the entire decision area and are described in more detail under Current Conditions, below.

The Grand Hogback marks the eastern edge of the Piceance Basin, and trends roughly north-south and bisects the decision area. East of the Grand Hogback, bedrock aquifers are present in the Cretaceous-aged Mesaverde Group rocks (sandstones, shales, and coals). West of the Grand Hogback, in the area overlying the Piceance Creek basin, the uppermost bedrock aquifer is present in rocks of the Tertiary-aged Uinta (sandstones and siltstones) and underlying Green River Formation (sandstones, siltstones, shales, and oil shales). Within the Green River Formation, in the central portion of the Piceance Creek Basin, nahcolite (sodium bicarbonate) and halite (sodium chloride) precipitated from brines and were deposited in sediments that formed in Tertiary-aged Lake Uinta. This is the same depositional setting that formed the oil shales (kerogenous marlstones), and the units are interbedded. Groundwater present at depth in the Green River Formation beneath Yellow and Piceance Creeks typically has elevated total dissolved solids concentrations from dissolution of these evaporite deposits.

BLM has identified more than 700 springs in several of the higher elevation areas of the decision area, including the Cathedral Bluffs above the Yellow Creek and Douglas Creek watersheds, Joe Bush Mountain above the Piceance Creek and White River drainages, the Roan Cliffs, and the Douglas Pass area (Map 2-5). The spring locations have been recorded and basic water quality field parameters (temperature and conductance) have been measured at many locations.

Current Conditions

Current conditions regarding groundwater resources in the area are based upon studies completed in the late 1970s and early 1980s during the oil shale “boom”, and more recently from

development of nahcolite solution mining and renewed interest in extraction of shale oil. The decision area is a large area with little rural development. There are relatively few water wells in the area. There are a large number of springs that have been documented in the area, and many more exist but have not been surveyed or sampled.

The conceptual hydrogeologic model for the area is still evolving. Studies by the United States Geological Survey (USGS) in the 1970s and 1980s described two bedrock aquifers within the Uinta and Green River Formations, an Upper and Lower Aquifer (USGS 1971; USGS 1987). The two aquifers were separated by a confining unit consisting of relatively unfractured and rich oil shales forming the Mahogany Zone of the Parachute Creek Member of the Green River Formation. The Upper Aquifer is present within the Uinta Formation and the upper part of the Green River Formation, down to the "A Groove" located just above the Mahogany Zone. The Lower Aquifer was described as occurring below the Mahogany Zone ("B Groove") to the base of the Parachute Creek Member, which includes the lower Saline Zone (high resistivity zone). Dissolution of saline or evaporite beds in the Lower Aquifer has created a "leached zone" where most of the groundwater occurs. Much of the groundwater flow in the Parachute Creek Member occurs within fractures and associated dissolution zones. Groundwater flow in the overlying Uinta Formation occurs within permeable sandstone and fractured siltstone (USGS 1987).

Although the hydrogeologic conceptual model just described may be accurate for much of the basin, more recent drilling and installation of piezometers associated with permitting of oil shale leases has provided additional water level and water quality measurements in the area of Yellow and Piceance Creeks. Nested piezometers show that the primary confining unit in the Parachute Creek Member is the R5 layer, located several hundred feet below the Mahogany Zone (R7 Unit). Based on hydraulic head differences observed at their nested piezometers, Shell Oil has placed the boundary between the Lower and Upper Zones at the R5 Unit. In 15 of the 16 nested piezometer locations, a downward hydraulic gradient was observed within well clusters screened above and below the R5 Unit. An upward hydraulic gradient across the R5 Unit was observed at one well cluster.

As reported by Saulnier (1999), groundwater quality in the bedrock aquifers is largely dependent on total dissolved solids (TDS) concentrations. TDS concentrations are lowest in higher elevation recharge areas present around the basin margins (400 to 800 milligrams per liter [mg/l]), and generally increase to the north, where groundwater discharges to lower reaches of Yellow and Piceance Creeks and the White River (up to 30,000 mg/l). TDS concentrations change markedly both vertically and horizontally within the basin depending upon the proximity of groundwater to soluble saline mineral deposits in the Parachute Creek Member (Saulnier 1999; BLM 2006l).

Saulnier (1999) describes several locations in the Piceance Creek Basin where elevated TDS concentrations are observed in the Upper Aquifer at locations downgradient of older exploratory well completions. Antiquated exploratory well completion, and plugging and abandonment procedures are interpreted to account for inter-aquifer migration of saline waters or cross-contamination of aquifers by higher TDS groundwaters.

Other authors report that groundwater quality is generally better in the Upper bedrock aquifer than the Lower bedrock aquifer, with the Lower Aquifer generally having higher concentrations of fluorine, boron, barium, lithium, sodium, TDS, and dissolved methane (Cole 1995).

Colorado basic groundwater standards (Regulation No. 41) for select organic constituents do not apply to groundwater in confined aquifers underlying the Rangely Oil and Gas field of Rio Blanco County, unless the origin of the compounds is caused by exploration or production activities. Groundwater in unconfined and confined aquifers present beneath the area of the Meeker well field have been designated as Domestic Use and Agricultural Use-Quality.

Trends

There are few areas with sufficient groundwater data to establish trends in either groundwater quantity or quality. Recognition of significant trends in specific areas would require monitoring and sampling of water wells and springs on a routine basis. This sampling program would be most valuable if completed in conjunction with a surface water monitoring and sampling program. Implementation of a consistent set of analytical parameters and field methods is recommended. A logical location to conduct this sort of sampling program would be in an area located downgradient of a large number of oil and/or gas wells, in conjunction with focused upgradient sampling.

Forecast

Completion of oil and gas wells into deeper overpressured reservoirs may increase the probability of deeper, more saline, formation waters to migrate upwards within the well annular opening and/or subvertical fractures, migrating outward from the annular area along natural fracture zones, and intersecting shallow potable water zones. Due to the relatively high salinity of this deeper formation water, mixing of this water with the shallow aquifer water will lead to salinization of the potable water source. If allowed to continue, the more saline groundwater may flow into a stream or creek, and increase the salinity of the surface water.

There is also a possibility of both surface and subsurface releases of hydrocarbons or produced water (high salinity) associated with exploration, completion, production, transportation, and disposal facilities. Groundwater monitoring at hydraulically downgradient locations in areas of

long-term oil and gas operations (i.e., well fields and treatment and processing areas) is recommended.

Use of relatively large quantities of groundwater for drilling and completion of oil and gas wells and/or oil shale, may cause a reduction in the natural recharge of groundwater to streams, and a corresponding depletion of the streamflow.

Key Features

A baseline survey of groundwater quality is necessary in areas where oil and gas wells will be drilled. The baseline survey should be performed prior to significant drilling in an area to provide a defensible baseline data assessment for each area. Evaluation of the baseline data in a hydrogeologic context is recommended, concurrent with receipt of the analyses. This provides an immediate check on the validity of the data and allows water quality variability to be viewed and interpreted in a geologic context. An ambient groundwater quality monitoring program to provide ongoing verification of water quality standards is also recommended. This may be incorporated into the regional monitoring program already underway between BLM, the USGS, and industry.

2.2.4.2 Surface Water and Floodplains

Indicators

The primary indicators of water quality in the area are the overall health of stream biota, and maintenance of the basic standards for surface water established by CDPHE (Regulation No. 31). Suspended sediment in the stream can diminish the health of the aquatic environment, as can an increase in salinity and certain inorganic ions and metals.

The decision area is located within four basins of the Colorado River Region (Yampa, Green, White, and Lower Colorado River basins) (Map 2-6). The majority of the White River planning area is within the White River Basin. The White River, formed by headwater creeks in the eastern portion of the planning area, flows to the west and is joined by Piceance Creek, Yellow Creek, Douglas Creek, and other minor tributaries before it flows out of the planning area at the Colorado-Utah state line at the western end of the planning area. A small portion of the planning area lands extend south of the Roan Cliffs in Garfield County, and drain south to Parachute and Roan Creeks, which merge with the Colorado River. The northwestern portion of the decision area, located in Moffat County, contains the upper portions of several small watersheds that flow north into the Yampa River and Green River basins (Map 2-6).

There are several reservoirs and lakes within the eastern portion of the planning area, in the headwater region of the North and South Forks of the White River. This area is on USFS lands. The largest reservoir is the Big Beaver Reservoir, located near the confluence of the North and South Forks of the White River. The largest lake is Trappers Lake, which serves as the headwater of the North Fork of the White River. There are also many smaller lakes in the eastern portion of the WRFO. Rio Blanco Lake and Kenny Reservoir are two of the larger surface water bodies located in the western portion of the resource area.

The Colorado River Basin is comprised of smaller watersheds that are each identified by a Hydrologic Unit Code (HUC) and a descriptive name. The Colorado River Basin is a level one watershed (the largest). As shown on Table 2-10 below, BLM has subdivided the WRFO into 206 watersheds. Appendix B lists the individual watersheds in each of the four major river basins with the corresponding watershed acreages. Each of these watersheds contains one or more perennial and/or intermittent stream drainages, and there are a total of 613 documented drainages.

Table 2-10
Watersheds in the WRFO

Drainage Basin	Watersheds	Drainages	Combined Acreage
White River	159	475	188,638
Yampa River	26	62	26,856
Colorado River	13	62	8,483
Green River	8	14	3,260
TOTAL	206	613	227,238

The major perennial streams within the WRFO are shown on Map 2-6. Many of the smaller streams are intermittent and flow only for brief periods during the snowmelt season and high-intensity thunderstorms. Snowmelt in spring and early summer provides the major source of runoff for perennial streams, with groundwater inflow along gaining stream segments being a contributor during the remainder of the year. Many of the perennial streams and their major tributaries are diverted for irrigation.

Historic stream flow data are available for several gaging stations on the White River and other drainages that flow into White River (USGS). Table 2-11 lists data from several of these gaging stations arranged in an upstream to downstream order. The majority of the flow originates in the eastern portion of the decision area (North Fork and South Fork of the White River) where topographic elevations and precipitation amounts are highest. Tributary streams entering the White River in the western portion of the WRFO (i.e., Piceance, Yellow, and Douglas creeks) have lower flow rates. Both the low-flow and high-flow calculated annual rates show significant but consistent departure from the average or mean flow rate.

Table 2-11
Select USGS Annual Stream Flows

Gage Location	Years Recorded	Average, cfs	Low, cfs (year)	High, cfs (year)
South Fork White River near Buford (09304000)	1919-1997	256	129 (1977)	362 (1985)
North Fork White River near Buford (09303000)	1910-2001	316	157 (1977)	523 (1984)
White River near Buford (09304115)	2004-2005	568	459 (2004)	677 (2005)
White River near Meeker (09304500)	1901-2005	620	274 (1977)	1,004 (1984)
Willow Creek near Rio Blanco (09306058)	1974-1985	3.16	0.98 (1978)	8.70 (1985)
White River above Boise Creek near Rangely (09306290)	1983-2005	737	332 (2002)	1345 (1984)
Stewart Gulch above West Fork (09306022)	1975-1985	2.3	1.22 (1979)	6.86 (1985)
Piceance Creek below Ryan Gulch (09306200)	1965-2007	28.7	6.4 (2003)	96 (1985)
Piceance Creek below Rio Blanco (09306007)	1974-1998	20.9	5.0 (1977)	55 (1984)
Piceance Creek at White River (09306222)	1965-2005	36	6 (2002)	109 (1985)
Corral Gulch near Rangely (09306242)	1974-2007	1.93	0.24 (2006)	7.75 (1984)
Yellow Creek near White River (09306255)	1973-2005	3	1 (1977)	9 (1989)
Douglas Creek at Rangely (09306380)	1977-1995	12	7 (1977)	23 (1995)

SOURCE: USGS 2006.

NOTES: Gage locations represent select active and inactive USGS sites in the area.
cfs = cubic feet per second

Current Conditions

The higher priority watersheds are the larger drainages that support perennial stream flows. This includes Cow Creek, Black Sulphur Creek, Piceance Creek, Yellow Creek, Willow Creek, Fawn Creek, Wolf Creek, Douglas Creek, Soldier Creek, Cathedral Creek, and Evacuation Creek (Map 2-6). In many instances, these streams can support cutthroat trout and beneficial riparian habitats. Current issues in some of these drainages are associated with increases in suspended sediment, exceedances of selenium concentrations, pH, and increasing salinity in downstream reaches of tributaries of the White River. Areas of greater risk of suspended sediment and selenium impacts are those where Mancos Shale outcrops within the drainage basin. Soils in these areas are sensitive to overgrazing and runoff following surface disruption, and selenium occurs naturally in many shales.

The *Status of Water Quality in Colorado –2006* (CDPHE Water Quality Control Division 2006c) and Regulation No. 37 *Classifications and Numeric Standards for Lower Colorado River Basin* (CDPHE WQCC 2005b) were reviewed for information relating to drainages within the planning area. The tables in Regulation No. 37 (Section 37.7) list the classifications and numeric standards for many stream segments within the planning area. Stream segment 13b of the White River Basin is defined as the mainstem of Yellow Creek including all tributaries from the source to the confluence with the White River. The state has classified stream segment 13b of the

White River Basin as “Use Protected” and further designated it as beneficial for the following uses: Warm Aquatic Life 2, Recreation 2, and Agriculture. The antidegradation review requirements in the Antidegradation Rule are not applicable to waters designated use-protected. For those waters, only the protection specified in each reach will apply. For this reach, minimum standards for four parameters have been listed. These parameters are: dissolved oxygen = 5.0 mg/L, pH = 6.5 - 9.0, and Fecal Coliform = 2,000 counts/100 milliliters (ml) and 630 counts/100 ml E. coli. Numeric standards for inorganic compounds and metals can be found within Regulation No. 37 *Classifications and Numeric Standards for Lower Colorado River Basin* (CDPHE WQCC 2005b). Stream segment 13b is subject to temporary modification for all numeric standards to reflect “current conditions.” The temporary modifications reflect uncertainty regarding the numeric standards necessary to protect aquatic life and agricultural uses in Yellow Creek.

In March 2004, CDPHE and WQCC promulgated Colorado Regulations Nos. 93 and 94 (updated and revised in 2006, CDPHE WQCC 2006a and 2006b, respectively). These publications were reviewed for information related to planning area drainages. Regulation No. 93 is the State’s Section 303(d) list of water-quality-limited segments requiring TMDLs. The 2006 303(d) list of segments needing development of TMDLs includes two segments within the White River and two segments of the Colorado River.

White River –

- Segment 09b, tributaries to the White River from the North and South Forks of the White River to Piceance Creek, specifically the Flag Creek portion (for impairment from selenium with a low priority for TMDL development).
- Segment 22, tributaries to the White River, from the confluence of Douglas Creek to the Colorado/Utah boarder, specifically West Evacuation Creek, and Douglas Creek (sediment impairments).

Lower Colorado River –

- Segment 04a, tributaries to Colorado River, Roaring Fork to Parachute Creek except for specific segments, (impaired from selenium with a moderate priority for TMDL development).
- Segment 13b, tributaries to Colorado River from Government Highline Canal Diversion to Salt Creek (selenium impairment with moderate priority).

Regulation No. 94 is the State's list of water bodies identified for monitoring and evaluation, to assess water quality and determine if a need for TMDLs exists. The list includes two White River segments and one Yampa River segment that are potentially impaired.

White River –

- Segment 09, tributaries to White River, confluence of North and South Forks to Piceance Creek, specifically Flag Creek for pH.
- Segment 22, tributaries to White River, Douglas Creek to Colorado/Utah border, specifically Soldier Creek for sediment.

Yampa River –

- Segment 02, Yampa River, Lay Creek to Green River, all portions listed for sediment.

Trends

Recognition of significant trends in specific areas would require additional water quality sampling for comparison to historic data collected by USGS. The sampling events would need to be performed at specific time periods, and/or correspond to specific historic discharge conditions to allow comparison between recent and historic data. A logical location to conduct this sort of sampling program would be in an area located upgradient and downgradient of a large number of existing and/or recently permitted oil and/or gas well locations.

Water quality for the White River observed from 10 sampling events between 1970 and 1985 by the USGS, collected at the White River near Meeker station, is summarized in Table 2-12. The large range in values is anticipated for stream samples based on varying discharge rates.

Table 2-12
White River Water Quality – Range of Values 1970 to 1985

Analyte	Value (low – high, mg/L)
Sodium	4 – 53
Chloride	1 – 62
Total Dissolved Solids	91 – 455
Sodium Adsorption Ratio (SAR)	0.2 – 2

SOURCE: USGS 2006.

NOTES: USGS data from Whiter River near Meeker, station No. 09304500
mg/L = milligrams per liter

Forecast

Construction of new roads and drilling pads to support an increase in the number of oil and gas wells will create more opportunities for stormwater runoff to erode soils and transport sediment into adjacent surface water bodies. Additional consideration of soil type, slope angle, and type of vegetation present should be encouraged in areas of new development.

The potential use of groundwater and surface water for oil shale development has the potential to cause stream depletion (BLM 2006l). There is also the potential for stream depletion to occur with an increase in the number of oil and gas wells to be drilled in the area associated with the need for a water supply for temporary living quarters. The potential stream depletions may have a cumulative effect on stream systems at any watershed level.

Key Features

Perennial streams likely represent the most valuable surface water resources. Perennial streams can support either cold water or warm water biota, in addition to riparian habitats beneficial to a range of plants and animals. BLM must comply with Executive Order No. 11988, *Floodplain Management*, protecting floodplains.

Areas with outcrops of fine-grained Mancos Shale deposits are more susceptible to overgrazing or other forms of erosion. Construction of roads or other facilities on these soils is likely to result in increased suspended sediment, salinity, and selenium concentrations in downgradient stream segments if not adequately protected from erosion.

2.2.5 Vegetation

Indicators

The most common indicators of vegetation health include cover, diversity, and presence and density of noxious weed species. Vegetative cover and diversity are two of the most commonly used indicators of vegetative health. Different vegetation communities have different cover and diversity standards. For example, desert shrub communities have overall much lower cover and diversity than foothill/mountain shrub communities. These are the indicators associated with Public Land Health Standard 3. Other indicators for forests and woodlands include mortality rate, insect and disease, forest type conversion and fuel loading.

Riparian-wetland areas are subject to Public Land Health Standard 2, which shares many of these same indicators, but also emphasizes the vertical structure of the community. Indicators include a species composition that is indicative of high water tables and able to withstand high streamflow events; the distribution of vegetation relative to point bars, active floodplains,

sediment capture and flood energy dissipation; and the presence of woody debris in stream channels.

The presence of noxious weeds and other invasive species may indicate a disturbance to the native vegetation community. Denser populations of invasive species are generally associated with areas that have been disturbed by earth moving activities, changes in water regime, or other major events.

Current Conditions

Ecological Setting

Vegetation communities serve multiple purposes for other resources and resource uses. Many of BLM's land management policies are directed toward maintenance of healthy vegetation communities. Vegetation communities can generally be characterized by ecological provinces and more specifically characterized by plant communities. Special status plant species are discussed in Section 2.2.8.

Bailey's (1995) description of North American ecoregions places the WRFO in three different ecological provinces, including the Intermountain Semi-Desert and Desert Province (341), the Nevada-Utah Mountains Semi-Desert-Coniferous Forest-Alpine Meadow Province (M431), and the Southern Rocky Mountain Steppe-Open Woodland-Coniferous Forest-Alpine Meadow Province (M331).

The Intermountain Semi-Desert and Desert Province (341) includes the Great Basin and the northern Colorado Plateau. The western-most portions of the WRFO are included in this province. This province experiences hot summers and moderately cold winters, with average annual temperatures between 40° F and 55° F. Annual precipitation varies between 5 and 20 inches, and most of it is in the form of winter snow. The dominant vegetation in lower elevations of the province is sagebrush (*Artemisia* spp.) with pinyon/juniper and/or ponderosa pine (*Pinus ponderosa*) woodlands in middle elevations. The higher parts of the province are dominated by spruce/fir forests with some of the very highest elevations containing alpine plants (Bailey 1995).

The Nevada-Utah Mountains Semi-Desert-Coniferous Forest-Alpine Meadow Province (M431) includes the highest elevations of the Great Basin and Colorado Plateau. This province covers most of the central portion of the WRFO and is characterized by long winters and a pronounced drought season. Average annual temperatures are between 38°F and 50°F, and the climate varies substantially with altitude. The annual precipitation varies between 5 and 8 inches in the valleys to more than 35 inches at higher elevations. Most of the precipitation is from winter snow or

afternoon thunderstorms in the summer. The dominant vegetation is similar to that of the Intermountain Semi-Desert and Desert Province with a gradation from sagebrush in lower elevations to spruce/fir forests in higher elevations (Bailey 1995).

The Southern Rocky Mountain Steppe-Open Woodland-Coniferous Forest-Alpine Meadow Province (M331) includes much of the Rocky Mountains and high elevation parks and plateaus. This province dominates the eastern and northwestern parts of the WRFO and contains the planning area's highest peaks. The climate is temperate semiarid steppe, with average annual temperatures between 35°F and 50°F. Annual precipitation varies between 10 and 20 inches in lower elevations to more than 40 inches in higher elevations. Precipitation is greatly influenced by the prevailing westerly winds, and the east slopes of the mountains are much drier than the west slopes. The dominant vegetation is highly dependent on altitude, slope, and aspect. Vegetation in the uppermost areas is alpine tundra, with spruce/fir dominating the adjacent, slightly lower areas. Ponderosa and lodgepole pine is found in moderate to lower elevations. Many open areas are dominated by sagebrush shrublands and/or grasslands (Bailey 1995).

Plant Communities

A plant community is a group of plant populations that coexist in space and time and affect each other's population dynamics directly or indirectly (BLM 2006). Distinct plant communities within the WRFO are influenced by characteristics such as soil depth, texture, and salinity; climate variables, particularly temperature, total and seasonal distribution of precipitation, wind; and topographic features, most importantly elevation, aspect, and slope (BLM 2005).

Plant community information for the WRFO is based on the adapted classification scheme used for the Colorado Vegetation Classification Project (CVCP) (BLM 2006m). The CVCP is a collaborative effort between Colorado Division of Wildlife (CDOW), BLM, USFS, and others, to map land cover for the entire state of Colorado. The CVCP data include 34 land cover types for the WRFO. These have been combined into nine cover types and grouped into five overall categories that best describe the WRFO vegetation communities or cover types. These are listed in Table 2-13 with the acres and percent of the WRFO planning and decision areas. As previously mentioned in Chapter 1, the management of public lands administered by the BLM within the WRFO boundaries is referred to as the WRFO planning area, and the management of public lands and federal mineral estate within the WRFO boundaries is referred to as the WRFO decision area. Map 2-7 illustrates the cover types within the planning areas.

**Table 2-13
WRFO Land Cover Types**

Cover Type	Acres in Planning Area	Percent of Total Planning Area	Acres in Decision Area	Percent of Total Decision Area
Developed and Non-Vegetated Land				
Development, cropland, rock, soil, and water	89,060	3	26,480	2
Subtotal	89,060	3	26,480	2
Grasslands				
Lowland, foothill, mountain, and alpine	175,392	7	74,079	5
Subtotal	175,392	7	74,079	5
Shrublands				
Sagebrush	841,643	31	455,910	31
Salt desert	148,917	6	100,525	7
Foothill and mountain	248,772	9	101,045	7
Subtotal	1,239,332	46	657,480	4500%
Forests/Woodlands				
Pinyon/Juniper	772,510	29	636,779	44
Ponderosa pine, lodgepole, and spruce/fir	230,349	7	30,484	2
Aspen	139,421	7	18,327	1
Subtotal	1,142,280	43	685,590	4700%
Riparian and Wetlands				
Herbaceous and woody	27,752	1	9,560	1
Subtotal	27,752	1	9,560	1
TOTAL	2,673,816	100		

SOURCE: BLM WRFO GIS.

NOTE: Cover types adapted from CVCP (BLM 2006m).

Developed and Non-Vegetated Land

This cover type includes commercial and residential development, cropland, rock and bare ground. Other non-vegetated areas included in this cover type include rock outcrops, talus slopes, bare ground, and open water. It covers 89,060 acres (3 percent) in the planning area and about 26,480 (2 percent) of the decision area (Table 2-13, Map 2-7) and generally contains very little vegetation or native vegetation. The developed areas consist of a high density of buildings, parking lots, roadways, landscaped areas, and other man-made facilities. These areas generally provide lower quality wildlife habitat value, except in more urban settings where landscaped areas may be the only vegetated lands. In some cases, these small areas of vegetation can provide buffers for waterways that may help improve water quality and prevent sedimentation/erosion. Often times small pockets of native plant communities may be found on the perimeter of developments, and some urban areas may even be landscaped with native vegetation.

Croplands are mainly concentrated along waterways in lower elevations and include both dryland and irrigated areas. The most common crop in the WRFO is hay. Cropland can provide good forage and other habitat value, especially hay meadows that are not tilled or plowed annually.

Grasslands

Grasslands are very diverse in the WRFO and include lowland, foothill, mountain, and alpine areas. They cover a total of 175,392 acres (7 percent) of the planning area, 74,079 acres (5 percent) of the decision area and their composition is dependent on soil type, land use, aspect, and elevation (Table 2-13, Map 2-7). Most of these areas are located in valley bottoms, uppermost south-facing slopes, and in scattered patches on windswept ridges (BLM 1994). Grasslands in the WRFO have the potential to provide good forage for many wildlife species and livestock, although heavy grazing or other land use practices may adversely affect the composition and productivity of some areas.

Lowland grasslands are generally dominated by native and non-native grasses with various forbs. Many of these lowland areas may have naturally been dominated by woody riparian vegetation or shrublands, but due to irrigation, fire, land clearing, and other land use practices, are currently grasslands. Most of these areas are actively grazed by livestock and wildlife and are dominated by grasses like Colorado wildrye (*Leymus ambiguus*), Salina wildrye (*Leymus salinus*), Indian ricegrass (*Achnatherum hymenoides*), squirreltail (*Elymus elymoides*), western wheatgrass (*Pascopyrum smithii*), beardless bluebunch wheatgrass (*Pseudoroegneria spicata*), Sandberg bluegrass (*Poa secunda*), brome (*Bromus* spp.), arrowleaf balsamroot (*Balsamorhiza sagittata*), buckwheat (*Eriogonum* spp.), and penstemon (*Penstemon* spp.) (BLM 1994). In lower elevations, grasslands are heavily degraded due to the presence and/or dominance of cheatgrass (*Broumus tectorum*).

Foothill and mountain grasslands are generally located between 5,500 and 9,000 feet and mostly on south-facing slopes and ridgelines. They are usually naturally dominated by grasses but may also include scattered forbs and shrubs. Foothill/mountain grasslands are generally highly productive systems that support a wide range of plant and animal diversity. Much of this community, combined with adjacent shrublands, is used as winter range for deer, elk, and pronghorn antelope. Common grasses include Parry's oatgrass (*Danthonia parryi*), tall fescue (*Festuca arundinacea*), Idaho fescue (*Festuca idahoensis*), Thurber's fescue (*Festuca thurberi*), mountain muhly (*Muhlenbergia montana*), needle and thread (*Hesperostipa comata*), Junegrass (*Koeleria macrantha*), slender wheatgrass (*Elymus trachycaulus*), Sandberg bluegrass, and Letterman's needlegrass (*Achnatherum lettermanii*) (BLM 1994).

The alpine grasslands include grasslands and tundra above 11,500 feet. This community is confined to the Flat Tops Wilderness along the eastern edge of the WRFO planning area. It is highly productive in mid-summer, but has an extremely short growing season due to the elevation. Large herds of ungulates and many other species of wildlife use this community during the summer for forage, nesting, and brood rearing. The community is dominated by both grasses and forbs, and contains scattered pockets of small shrubs. Common plants in this community are typically low-growing and include species like kobresia (*Kobresia* spp.), sedges (*Carex* spp.), bluegrass (*Poa* spp.), and alpine avens (*Acomastylis rossii*) (Fitzgerald et al. 1994).

Shrublands

Shrublands dominate the WRFO, covering 1,239,332 acres (46 percent) of the planning area, 647,480 acres (45 percent) of the decision area (Table 2-13, Map 2-7). These communities are generally very diverse in plant composition and provide very important forage and cover to wildlife and livestock (BLM 2005). Shrublands have been split into four vegetation communities: sagebrush, salt desert, foothill/mountain, and tundra shrub.

Sagebrush: The sagebrush community is very large and diverse, covering more than any other community in the planning area at 841,643 acres (31 percent) and 455,910 acres (31 percent) of the decision area (Table 2-13). This community includes vegetation associations dominated by several different subspecies of sagebrush, including Wyoming big sagebrush (*Artemisia tridentata* subsp. *wyomingensis*), mountain big sagebrush (*Artemisia tridentata* subsp. *vaseyana*), and Basin big sagebrush (*Artemisia tridentata* subsp. *tridentata*), as well as bitterbrush (*Purshia tridentata*) and rabbitbrush (*Chrysothamnus nauseosus*). Sagebrush areas typically occur with shallow to moderately deep soils at elevations between 4,500 and 8,000 feet and precipitation in the 9- to 20-inches per year range (BLM 2005).

Common grass and grass-like species found in the sagebrush community include bluebunch wheatgrass (*Pseudoroegneria spicata*), thickspike wheatgrass (*Elymus lanceolatus*), Sandberg bluegrass, muttongrass (*Poa fendleriana*), Indian ricegrass, needle and thread, threadleaf sedge (*Carex filifolia*), green needlegrass (*Nassella viridula*), Colombia needlegrass (*Achnatherum nelsonii*), squirreltail, and Idaho fescue. Common forbs include phlox (*Phlox* spp.), Hooker's sandwort (*Arenaria hookeri*), buckwheat, penstemon, wild onion (*Allium* spp.), Indian paintbrush (*Castilleja* spp.), globemallow (*Sphaeralcea* spp.), Oregon grape (*Mahonia* spp.), and prickly pear cactus (*Opuntia* spp.) (BLM 2005).

Generally, sagebrush provides a food staple for pronghorn antelope (*Antilocapra americana*) and sagegrouse (*Centrocercus urophasianus*) and is also one of the dominant species found on pronghorn antelope and mule deer (*Odocoileus hemionus*) crucial winter ranges (BLM 2005).

Fire is an important component of all sagebrush-dominated plant communities. Depending on the nature of the site, the fire return interval can be between 25 and 100 years (BLM 2005).

Salt Desert: The salt desert shrubland community covers 148,917 acres (6 percent) of the planning and 100,525 acres (7 percent) of the decision area (Table 2-13). This community is generally located between 4,500 and 6,000 feet in areas characterized by accumulations of salt on poorly developed deep soils (BLM 2005). Soils in these areas usually have a high pH (7.8 to 9), which restricts the uptake of water by all but the most salt-tolerant plants (BLM 2005). Forage in these areas is excellent in the winter, as these shrubs maintain relatively high levels of protein and carbohydrates.

Dominant shrubs found in this community are drought tolerant and include Gardner's saltbush (*Atriplex gardneri*), four-wing saltbush (*Atriplex canescens*), birdfoot sagebrush (*Artemisia pedatifida*), bud sagebrush (*Picrothamnus desertorum*), spiny hopsage (*Grayia spinosa*), greasewood (*Sarcobatus vermiculatus*), broom snakeweed (*Gutierrezia sarothrae*), Basin big sagebrush, rabbitbrush, and winterfat (*Krascheninnikovia lanata*) (BLM 2005). Grasses associated with these sites are Indian ricegrass, squirreltail, Sandberg bluegrass, bluebunch wheatgrass, needle and thread, and western wheatgrass (BLM 2005). Forbs include wild onion, biscuit-root (*Lomatium* spp.), woody aster (*Xylorhiza* spp.), globemallow, and prickly pear cactus (BLM 2005).

Foothill/Mountain: The foothill/mountain shrub community covers 248,772 acres (9 percent) of the planning area, 101,045 acres (7 percent) of the decision area and is generally found between 6,500 and 7,500 feet (Table 2-13). This community receives 10 to 14 inches of precipitation annually and provides excellent cover and browse for many species of wildlife (BLM 2005).

Foothill/mountain shrubland includes large stands of Gambel's oak (*Quercus gambeli*) and other more diverse associations with Gambel's oak, mountain mahogany (*Cercocarpus* spp.), mountain snowberry (*Symphoricarpos* spp.), and serviceberry (*Amelanchier* spp.), with scattered sagebrush, rabbitbrush, bitterbrush, kinnikinnik (*Arctostaphylos* spp.), currant (*Ribes* spp.), shrubby cinquefoil (*Dasiphora fruticosa*), and skunk bush sumac (*Rhus trilobata*). Grasses found in the community include needle and thread, prairie sandreed (*Calamovilfa longifolia*), basin wildrye, Indian ricegrass, sand dropseed (*Sporobolus cryptandrus*), green needlegrass, Columbia needlegrass, and thickspike wheatgrass. Common forbs include Indian paintbrush, lupine (*Lupinus* spp.), penstemon, sego lily (*Calochortus nuttallii*), wild onion, larkspur (*Delphinium* spp.), violet (*Viola* spp.), bluebells (*Mertensia* spp.), and prickly pear cactus (BLM 2005).

This cover type also includes a small area of shrubland that is found at or above timberline. This area consists of mostly willows (*Salix* spp.) and krummholz patches of subalpine fir (*Abies lasiocarpa*). Herbaceous plants in this community are similar to those found in the subalpine/alpine grassland. These areas can be heavily used by wildlife (especially birds and small mammals) in the summer months for forage and cover, but are minimally used in the winter.

Forests/Woodlands

Forests and woodlands cover 1,142,280 acres (44 percent) of the WRFO planning area and 685,590 acres (45 percent) of the decision area (Table 2-13, Map 2-7). The lowest elevation of this cover type is pinyon/juniper woodlands and the highest is spruce/fir forest in the WRFO planning area. Other forest types are found at various elevations in between and include ponderosa pine, aspen (*Populus tremuloides*), and lodgepole pine (*Pinus contorta*) communities. Herbaceous cover within woodlands is generally very low, although some areas with openings may have a substantial understory (including shrubs).

Pinyon/Juniper: Pinyon/juniper woodlands cover 772,510 acres (29 percent) of the WRFO planning area and 636,799 acres (44 percent) of the decision area (Table 2-13). This vegetation community is mostly found between 5,200 and 8,000 feet on somewhat xeric ridgetops (BLM 1994). It is the climax association in these locations and varies from an open to closed canopy with a highly variable understory of shrubs and herbaceous plants. Old growth pinyon/juniper and areas with a greater dominance of juniper generally have less understory vegetation (BLM 2005). Dominant plants in this community include pinyon pine (*Pinus edulis*), Utah juniper (*Juniperus utahensis*), Gambel's oak, sagebrush, mountain mahogany, and many of the herbaceous species listed under the sagebrush shrubland community.

Ponderosa Pine, including Lodgepole, and Spruce/Fir: The combination of ponderosa pine, lodgepole, and spruce/fir woodlands encompass about 230,349 acres (9 percent) of the WRFO planning areas and 30,484 acres of the decision area. This vegetation community is scattered through much of the eastern and southern portions of the planning area (Table 2-13).

Ponderosa pine forests are generally found between 6,000 and 8,000 feet (BLM 2005). They generally occur on higher mesas and mountain slopes, and can contain substantial amounts of Douglas fir (*Pseudotsuga menziesii*), aspen, or pinion/juniper woodlands. Healthy ponderosa pine forests have somewhat open canopies and contain a substantial understory of shrubs and grasses. This type of structure provides year-round forage for wildlife than most other coniferous forest types. Herbaceous plants found in this community typically include many of those listed for foothill/mountain shrubland.

Lodgepole pine forests occur between 8,000 and 10,000 feet (Kingery 1998). This community represents an early successional stage and is the result of past stand replacing fires. In these stands, the community is usually dominated by dense monocultures of trees of similar age. Lodgepole pine forests commonly have very little understory, but species like kinnikinnik and others from the foothill/mountain shrubland community may be found in more open areas.

Spruce/fir forests are usually found between 7,000 and 11,000 feet. These areas typically have shallow soils and contain dense stands of Englemann spruce (*Picea engelmanni*), Douglas fir, and subalpine fir with a closed canopy. The community typically receives several feet of snow during the winter and remains cool and moist during the summer (Kingery 1998). Openings in the forest support many herbaceous and woody plants that are found in the foothill and mountain shrublands and foothill and mountain grassland communities. The lower elevation spruce/fir forest areas found in the sheltered areas along the southwestern edge of the WRFO contain mostly Douglas fir and very few Englemann spruce and subalpine fir.

Aspen: The aspen forests encompass about 139,421 acres (5 percent) of the planning area and 18,327 acres (1 percent) of the decision area (Table 2-13). These forest communities are usually found between 7,000 and 10,000 feet. This community is early successional and consists of open to dense stands of aspen in sometimes isolated pockets in higher elevations (BLM 1994). Understory vegetation is highly variable and depends mostly on available moisture and canopy closure. Many aspen forests are very productive and contain a very lush understory, whereas others can be somewhat sparse. Plant species commonly found with the aspen trees in this community include those listed under the foothill/mountain shrubland community.

Riparian and Wetlands

The riparian community includes wetlands and is associated with and depends on the presence of water during some part of the growing season. This community provides the link between aquatic and upland (dry) habitats across all elevations. 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 2004b). Wetlands are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions under normal circumstances. Wetlands include marshes, shallows, swamps, lakeshores, bogs, muskegs, wet meadows, estuaries, and riparian areas (BLM 2004b).

Riparian areas in the WRFO are generally small and account for a total of only 27,752 acres (1 percent), but are highly productive, and provide forage and/or cover for nearly all wildlife

species at some point in their life cycle (Table 2-13, Map 2-7). A variety of vegetation types containing riparian zones and wetlands occur with the planning area, 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 (Carsey et al. 2003). Riparian and wetlands are key in providing water quality improvement in watersheds by buffering open waterways from surface runoff that may contain sediment, toxicants, or other undesirable constituents. The location of riparian areas and wetlands for the planning area can be found on U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory maps, WRFO Geographic Information System (GIS) layers (streams, rivers, lakes, springs, vegetation, proper functioning condition assessment), aerial photos, USGS quadrangle maps, and WRFO specific maps of lentic and lotic resources.

Riparian Proper Functioning Condition

BLM resource specialists record information on the condition of various riparian resources in the WRFO. During these assessments, riparian vegetation and wetlands are evaluated using a qualitative assessment method called Proper Functioning Condition (PFC) (BLM 1998). 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, functional at-risk (FAR) FAR with an upward trend (FAR-UP), FAR not apparent trend (FAR-NA), FAR with a downward trend (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 streambank 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). A total of 221.7 miles of riparian areas along 72 different waterways have been inventoried and 111 miles assessed in the WRFO decision area. Of the miles assessed, 31.2 miles are rated as PFC, 35.4 miles are rated as FAR, and 44.4 miles are rated as NF. Causal factors for not getting a rating of PFC include: trampling by domestic or wild animals, presence of invasive plant species, and/or degraded stream channels (e.g., downcutting, unstable banks, excessive erosion or deposition). Other possible causal factors were either not apparent during the assessment or may be related to drought or factors difficult to identify in the field. Table 2-14 lists the riparian areas assessed and the rating and length of each reach. These areas are shown in Map 2-8.

Table 2-14
WRFO Proper Functioning Condition (PFC) Assessment Data

Waterway	Functional Rating (miles)			
	PFC	FAR	NF	Total
Bear Canyon Creek		0.4	0.7	1.1
Big Duck Creek		0.3	0.8	1.0
Big Foundation Creek	0.1			0.1
Bitter Creek Cow Creek	0.2			0.0
Black Sulphur Creek	0.9	0.3		1.2
Blacks Gulch Creek			0.7	0.7
Box Elder Gulch	0.2	1.2		1.4
Brush Creek	0.6	0.2	1.2	2.0
Buckwater Draw Creek		0.5	0.8	1.3
Bull Canyon		0.4	0.6	0.9
Cathedral Creek	0.8		1.1	1.9
Clear Creek		0.1	1.9	2.0
Collins Gulch	0.2		0.4	0.5
Corral Gulch		0.6		0.6
Cow Creek		1.9		1.9
Crooked Wash Creek	0.2	1.7	0.6	2.4
Dark Canyon Creek		2.3		2.3
Davis Gulch			0.8	0.8
Deep Channel Creek	0.2	0.8		1.0
Deer Gulch	0.1	0.8	0.1	1.0
Douglas Creek	9.0			9.0
Dry Fork Piceance Creek			1.2	1.2
Duck Creek		1.0	0.1	1.0
East Douglas Creek	5.3		0.4	5.7
East Evacuation Creek		0.8	1.1	1.9
East Twin Wash	0.4		0.8	1.1
East Willow Creek	0.4	0.4		0.8
Evacuation Creek		0.5	1.6	2.1
Fawn Creek	0.4			0.4
Greasewood Gulch	0.4	0.2	3.8	4.4
Hay Gulch	0.2	0.3	1.4	1.9
Joe Bush Gulch		1.5		1.5
Lake Creek		1.1		1.1
Lfk Gillam Draw Creek	0.2			0.2
Lfk Lake Creek	0.8			0.8
Little Red Wash Creek			1.1	1.1
Little Whiskey Creek	0.5			0.5
Meadow Creek		0.3		0.3
Mfk Soldier Creek	0.3			0.3
Missouri Creek	0.4		0.5	0.9
Mud Springs Creek			0.1	0.1
No Name Cow Creek	0.2	0.2	0.6	1.0
Piceance Creek	0.5	0.8		1.2

Table 2-14
WRFO Proper Functioning Condition (PFC) Assessment Data

Waterway	Functional Rating (miles)			
	PFC	FAR	NF	Total
Price Creek	0.5			0.5
Rfk Lake Creek	0.4			0.4
Rf Soldier Creek			0.6	0.6
Scenery Gulch Creek		2.5		2.5
Segar Gulch		1.8	0.3	2.2
Sloughs Creek			0.9	0.9
Soldier Creek			0.5	0.5
Spring Creek	3.6			3.6
Stake Springs Draw	0.2	0.4		0.5
Stinking Water Creek	0.4	0.5	0.1	1.0
Swizer Gulch			1.9	1.9
Thirteenmile Creek			1.2	1.2
Timber Gulch	0.1		1.3	1.4
Trail Canyon Creek	0.5		0.2	0.7
Tschuddi Gulch Creek		1.7	0.2	1.8
Turner Creek	0.4	0.9		1.3
W. Branch Cow Creek		0.2		0.2
Water Gulch		0.1		0.1
West Creek	0.8			0.8
West Douglas Creek		3.6	1.9	5.5
West Evacuation Creek		0.9		0.9
West Fawn Creek	0.4	0.5	0.5	1.4
West Twin Wash			2.2	2.2
Wet Swizer Gulch			2.1	2.1
Whiskey Creek	0.2	0.6	1.2	2.0
Willow Creek	1.5	0.9	0.3	2.7
Wolf Creek			2.2	2.2
Yankee Gulch			3.5	3.5
Yellow Creek		2.5	1.3	3.7
Total	31.2	35.4	44.4	110.8

SOURCE: BLM 1994; BLM 2006g.

NOTES:

PFC = proper functioning condition

FAR = functioning at risk

NF = non-functional

Noxious Weeds

Non-native invasive plant species include those listed by the State of Colorado Department of Agriculture as noxious weeds and other species that are not formally listed as noxious, but are very aggressive and tend to displace native plants in wildland situations. The BLM considers plants invasive if they have been introduced into an environment where they did not evolve. As

a result, they usually have no natural enemies to limit their reproduction and spread (Westbrooks 1998). Invasive plant species and noxious weeds and their continued establishment represent a serious threat to the continued productivity, diversified use, and aesthetic value of the WRFO (BLM 1994). Noxious weeds are defined by the Colorado Noxious Weed Act as plants that aggressively invade or are detrimental to economic crops or native plant communities; are poisonous to livestock; are carriers of detrimental insects, diseases, or parasites; or are detrimental to the environmentally sound management of natural or agricultural ecosystems (DPI 2006).

Colorado has published a list of 72 noxious weeds that may be found in the state. The species on the list have been assigned a rating of “A,” “B,” or “C,” depending on the severity of the threat. Of these, 18 have been put on the “A” list, meaning that they are subject to eradication wherever detected (DPI 2006). The other 54 species are either on the “B” list (discrete statewide distributions that are subject to eradication, containment, or suppression) or the “C” list (controls are recommended, but populations exist statewide).

Of the 72 species listed by the state, BLM has identified 20 noxious weed species that are present in the WRFO and are actively being managed. Only squarrose knapweed is rated as an A species. These species are listed in Table 2-15.

Table 2-15
WRFO Noxious Weeds

Common Name	Scientific Name	Colorado Rating
Russian knapweed	<i>Acroptilon repens</i>	B
Whitetop	<i>Cardaria draba</i>	B
Plumeless thistle	<i>Carduus acanthoides</i>	B
Musk thistle	<i>Carduus nutans</i>	B
Diffuse knapweed	<i>Centaurea diffusa</i>	B
Spotted knapweed	<i>Centaurea maculosa</i>	B
Squarrose knapweed	<i>Centaurea virgata</i>	A
Canada thistle	<i>Cirsium arvense</i>	B
Bull thistle	<i>Cirsium vulgare</i>	B
Chinese clematis	<i>Clematis orientalis</i>	B
Poison hemlock	<i>Conium maculatum</i>	C
Houndstongue	<i>Cynoglossum officinale</i>	B
Leafy spurge	<i>Euphorbia esula</i>	B
Black henbane	<i>Hyoscyamus niger</i>	B
Tall whitetop	<i>Lepidium latifolium</i>	B
Oxeye daisy	<i>Leucanthemum vulgare</i>	B
Dalmatian toadflax	<i>Linaria dalmatica</i>	B
Yellow toadflax	<i>Linaria vulgaris</i>	B
Scotch thistle	<i>Onopordum acanthium</i>	B
Common mullein	<i>Verbascum thapsus</i>	C

SOURCE: BLM 2006g; DPI 2006.

NOTES:

A—subject to eradication wherever detected

B—discrete statewide distributions that are subject to eradication, containment, or suppression

C—controls are recommended, but populations exist statewide

In addition to the 20 species listed in Table 2-15, BLM is also committed to immediately treating any other Colorado “A” list noxious weeds that may be found in the WRFO. Any additional “B” or “C” list species will be managed as opportunity is presented (BLM 2006g).

Weed Free Areas

Although much of the WRFO contains some of the noxious weed species listed in Table 2-15, in 1996 BLM estimated that an area covering 19 percent (497,880 acres) of the WRFO that is considered “weed free” (BLM 1996; BLM 2006g). This area covers much of the north central and northeast portions of the WRFO and is shown on Map 2-9. Noxious weeds are likely to have invaded some of these areas since the data were compiled. Nonetheless, particular care should be taken in these areas to avoid introducing new populations of noxious weeds.

Remnant Vegetation

Much of the WRFO vegetation has been affected by the construction of roadways, railroads, pipelines, commercial developments, residential developments, livestock use, noxious weed invasions, and other natural and man-made events. As a result, few of the native vegetation communities in the WRFO have maintained their original species composition, vegetative cover, and size.

Surveys in part of the WRFO have revealed numerous “remnant vegetation” areas, where the integrity of the original vegetation community has remained intact. This remnant vegetation is unique and warrants additional consideration when working in these locations. Most of these areas are in the central part of the WRFO and encompass 3,672 acres, or less than 0.01 percent of the total planning area (Roberts and Dudley 2006). These areas are found in four of the six of the cover type groups, as shown in Table 2-16.

Table 2-16
WRFO Remnant Vegetation

Cover Type	Acres in Planning Area	Percent of Total Remnant Vegetation
Grasslands	169	4.6
Shrublands		
Sagebrush	442	12.0
Salt Desert	271	7.4
Foothill/Mountain	377	10.3
Subtotal	1,090	29.7
Forests/Woodlands		
Pinyon/Juniper	827	22.5
Aspen	379	10.3
Spruce/Fir	1,188	32.4
Subtotal	2,394	65.2
Riparian and Wetlands	19	0.5
TOTAL	3,672	100

SOURCE: BLM 2006g.

NOTE: If only a cover type group is listed, the available data are not detailed enough to provide the specific cover type.

Trends

Since the early 1980s vegetation diversity has continued to be affected by wildfire, drought, invasive species, increased recreation use, grazing and commercial operations. Due to land use practices, recreation, and development in the WRFO, the distribution and diversity of noxious weeds has increased. This means that there are new populations in previously “weed-free” areas and that many existing noxious weed populations are larger and/or denser. This has negative implications for grazing, overall habitat quality, and native plant recruitment.

The loss of proper functioning condition is a localized trend and not all waterways are experiencing degradation. Degradation to functioning condition is a result of erosion and/or sedimentation associated with development and land use practices that reduce overall vegetative cover and/or increase runoff. The overall ecological impacts of this degradation commonly include decreases in water quality, loss of aquatic habitats, narrowing or loss of productive floodplain areas (including agricultural land), reduction of woody riparian habitats and wetlands, increases in the potential for flooding, and reduction of groundwater recharge.

Forecast

Based on wildland fires, land uses, and associated increases in invasive nonnative plant species, vegetation diversity and cover of native species is likely to continue to decline. Watershed management actions to rehabilitate burned areas and areas affected by commercial activities are planned. Increased oil and gas exploration and development in the WRFO could increase in noxious weed populations due to construction of more roads, pipelines, and other vectors for weed transport, therefore continued degradation of riparian corridors is likely to occur. The effects of increased development depend on the amount of development, final conditions of approval and stipulations, and success of reclamation. Successful implementation of these plans may slow or gradually reverse the loss of native vegetation.

Key Features

Key features of the vegetation communities in the WRFO are riparian and wetland areas, weed-free areas, and remnant vegetation sites. These key features provide resources for wildlife habitat, livestock grazing, and recreation.

2.2.6 Forest, Woodland, and Native Plant Products

Current Use

All BLM forestlands are managed under the principles of multiple use, sustained yield, and environmental quality protection in accordance with the Federal Land Policy and Management

Act (FLPMA). Management of values and uses such as recreation, aesthetics, water quality, wildlife habitat, and wilderness, as well as timber production, is accomplished through an ecologically-based program that emphasizes biological diversity, sustainability, and the long-term health of forests and woodlands. The forest and woodland resources within the WRFO planning area are shown on Map 2-7 and Section 2.2.5 describes the vegetation in the planning area.

Timber resources within the planning area consist of small stands of ponderosa pine, Douglas-fir, aspen, and an aspen/conifer mix. Woodland areas are dominated by pinyon pine and juniper species that are not traditionally used in commercial wood product markets. Wood products harvested in Colorado include sawtimber, firewood, Christmas trees, post and poles, and biomass. Forest lands in Colorado have low productivity rates, and BLM manages lands to restore forest health conditions rather than produce commercial timber.

Forest and woodlands in Colorado have been affected by drought, insects and disease. Pinyon ips, mountain pine beetle, spruce bark beetle, and balsam fir beetle have all been increasing in population. Aspen within the planning area are in varying stages of growth although overall decline with many stands exhibiting signs of rot (Colorado State Forest Service 2005).

Forecast

The reduction in National Forest timber harvest had significant impacts on closures or very low levels of capacity utilization at sawmills. Increases occurred in the log home and log furniture industries, where Colorado now ranks third behind Montana and Idaho, with Utah fourth in value of output from log home plants in the Western United States. Based on the most recent data, a total of 109.8 million board feet of timber were cut in Colorado in 1999 (Lynch, Mackes 2001). During 2002 (see Table 2-17), Garfield County led Colorado's timber harvest with just under 12 percent of the volume (Morgan et al 2006).

Table 2-17
Colorado Timber Harvest by County, selected years

County	1974	1982	2002	1974	1982	2002
	MBF Scribner			Percentage		
Garfield	2,218	500	9,321	1.0	0.5	11.7
Moffat	158	-	124	0.1	-	0.2
Rio Blanco	370	10	730	0.2	<0.05	0.9

SOURCE: USFS 2006.

NOTE: MBF = thousand board feet

Key Features

Forest and woodland product harvest within the planning area is limited to areas where this would assist in meeting the goals and objectives of the Healthy Forest Restoration Act of 2003 and ecosystem health. No areas have been designated as a Traditional Cultural Property under criteria “a” and “b” (criterion “a” pertains to areas that are associated with events that have made a significant contribution to the broad patterns of our history; criterion “b” pertains to areas that are associated with the lives of persons significant in our past).

2.2.7 Fish, Wildlife, and Habitat

2.2.7.1 Indicators

Fish and wildlife resources include big game, upland game, waterfowl, raptors, migratory birds, small mammals, reptiles and amphibians, and fish. BLM works closely with CDOW to manage habitat for fish and wildlife in order to achieve and maintain suitable habitat for desired population levels and distribution within the decision area. CDOW is directly responsible for managing population levels, while BLM is responsible for managing fish and wildlife habitats in a condition that will support desired levels of species.

BLM has established Standards for Public Land Health (Standards) (Appendix A). While all of the Standards support wildlife habitat, two of them specifically address wildlife and fish. Standard 3 addresses plant and animal communities, including establishment and maintenance of viable populations commensurate with species and habitat potential, and maintenance of productive and diverse communities that are able to sustain natural fluctuations and support ecological processes. Indicators for wildlife include spatial distribution and composition, mixed age classes, habitat connectivity, and diversity and density of species. Additional indicators for standard 3 address plant community conditions necessary to sustain wildlife habitats, such as minimal presence of noxious weeds and undesirable species.

Other indicators for wildlife include estimates of population numbers, which are regularly prepared by CDOW for big game and some other species, and the amount and quality of key habitats such as production (calving/fawning) areas and areas of concentrated winter or summer use. While key habitats are evaluated primarily for game species, assessment of the amount and quality of habitat provides an umbrella for maintenance of populations of many non-game species.

2.2.7.2 Current Conditions

Terrestrial Habitats

Wildlife habitats within the planning area consist of 2,648,064 acres of terrestrial uplands and 27,752 acres of riparian and wetland habitat. Of these totals, 1,443,633 acres of uplands and 9,560 acres of riparian and wetland habitats are managed by BLM.

Wildlife species distribution and abundance are closely tied to habitats, with some species being specialists that use a narrow range of habitats and some being generalists that occur across a broad range of habitats and conditions. Most habitats are defined by vegetation structure and composition, including forests, woodlands, tall and low shrublands, and grasslands. Non-vegetation habitats include cliffs and rock, dirt banks, barren areas, caves and mines, streams, and ponds and lakes.

The vegetation communities of the planning area are described in Section 2.2.5, and the distribution of communities is provided in Map 2-7. Most of the central and western parts of the planning area consist of pinyon/juniper woodlands and sagebrush shrublands that are used as elk and deer winter range. Foothill and mountain shrub occur at higher elevations along the Colorado – White River Divide, Danforth Hills, and Blue Mountain, and provide elk production habitat and summer concentration areas. Conifer forests (ponderosa pine, lodgepole pine, and spruce fir) and aspen occur mainly in the eastern portion of the planning area in and near the Flat Tops Wilderness. Forest types on BLM-administered lands consist primarily of Douglas-fir, aspen, and spruce-fir stands adjacent to the White River National Forest and along the White-Colorado River divide. Salt desert shrub and low elevation grasslands provide habitat for species such as white-tailed prairie dog and pronghorn antelope, and occur along U.S. Highway (US) 40 and in the Coal Oil Basin near Rangely. Agricultural meadows occur mostly near Meeker and along the White River and Piceance Creek.

A land health assessment has been performed for the Wolf Creek Watershed –Three Springs Ranch. This is an area of 107,831 total acres, 82,198 acres of which is BLM-managed land, located between Dinosaur National Monument and the White River. Approximately 95 percent of the area is achieving or moving toward achieving the public land health standard for animal communities. Areas not achieving the standard have been adversely affected by historical grazing practices, historical feeding practices, and use near water. The majority of the early seral areas that do not meet the standard are dominated by cheatgrass. These conditions are generally representative of the planning area.

CDOW (2006) identifies some concerns relating to habitats for big game and other species. Browse plants in some areas are mature to over-mature or decadent. Browse seedlings and young plants are sparse and the grass/forb understory is sparse and lacks diversity in many areas. Pinyon/juniper stands tend to be mature with a closed canopy that severely restricts understory vegetation. Due to long-term fire suppression, pinyon/juniper woodlands can invade sagebrush and mixed mountain shrub stands and convert them to much less productive sites. Many of the mixed mountain shrublands are over-mature, less productive and unavailable for winter browse use because growth occurs too high for big game. Understory deciduous browse in the Piceance Basin's lower elevations generally have low plant vigor and production due to excessive browsing. There is heavy utilization of Wyoming big sagebrush, black sagebrush, and rubber rabbitbrush during the late winter and early spring in the Douglas Creek drainage. Die-offs of sagebrush have been observed in Game Management Unit 21 (Douglas Creek area), probably related to maturity and drought, which may reduce winter range quality for deer and elk. Pinyon pine is aggressively colonizing several thousands of acres of mountain shrub and mountain big sagebrush communities on the southern rim of the Piceance Basin between 7,200 and 7,800 feet. These habitat issues are caused by plant succession toward late seral or climax communities, inappropriate historic livestock grazing, localized excessive big game use, increasing elk populations since the late 1970s, fire suppression, increased recreation, harassment of deer and elk on the summer and winter ranges, and invasion of noxious weeds.

Key Terrestrial Wildlife

Big Game Species

The planning area includes all or nearly all of five Colorado Division of Wildlife (CDOW) Game Management Units (GMUs), including GMUs 21, 22, 23, 24, and 10, and portions of several other GMUs (Maps 2-10 through 2-13). The CDOW manages big game species by herd units defined as Data Analysis Units (DAUs), which are comprised of one or more GMUs. Population objectives are set for each DAU and are monitored by CDOW.

Elk. Three populations of elk occur in the planning area, the Blue Mountain herd, Yellow Creek herd, and White River herd (Table 2-18). The White River herd is the largest of the three elk herds, with an estimated current population of 38,000 elk.

Table 2-18
Elk Herd Populations

Data Analysis Unit (DAV)	Current Population Estimate	CDOW Population Objective
E-10 -Yellow Creek	8,300	7,000-9000
E-6 -White River	38,000	32,000-39,000
E-21 - Blue Mountain	3,200	1,200

SOURCE: CDOW data.

The White River herd (DAU E-6) occurs primarily in Game Management Units 23 and 24, which are east of SH 13 between Rifle and Meeker. This herd summers primarily on the White River National Forest (Map 2-12), in habitats ranging from sagebrush to subalpine/alpine grassland. Relatively small or isolated tracts of BLM-administered lands with aspen and foothill/mountain shrubland also provide summer range in the Danforth Hills, Oak Ridge and Nine Mile Gap areas. Winter range is confined (Map 2-13), and includes the benchlands along the White River and its major tributaries, extending south along the Hogback and north to Nine Mile Gap and Milk Creek. These areas include both winter concentration areas and severe winter range, and consist of mostly Gambel oak, sagebrush and agricultural lands. The Oak Ridge State Wildlife Area southeast of Meeker, administered by the CDOW, contains about 3,000 acres of BLM land. This is a major winter concentration area that supports about 2,000 elk from December through April.

The Yellow Creek herd (DAU E-21) summers along the Piceance Rim and Road Plateau, and west into Utah, in the southern parts of GMU 21 and 22, and the northern edge of GMU 31 and 32. Summer concentration areas and production areas are present at higher elevations, in mountain shrub and higher elevation pinyon-juniper and sagebrush habitats. Due to its limited extent, summer range is considered critical (Map 2-12). About 70 percent of this herd winters in the Douglas and Piceance Creek Basins, where winter concentration areas are present. About half of SH 139 between Douglas Pass and Rangely is identified as highway crossing where there are problems with vehicle collisions.

The Blue Mountain herd (DAU E-21) summers on Blue Mountain and east to the Citadel Plateau, in the north half of GMU 10, north of US 40. Due to their limited extent, summer ranges are considered critical habitat, especially aspen. The CDOW identifies much of the area around Blue Mountain as a summer concentration area, and elk production areas are also present. Critical summer ranges consist mostly of mountain shrub and higher elevation sagebrush. The Blue Mountain herd winters in lower elevation juniper and sagebrush, with significant concentrations in Lower Wolf Creek, Crooked Wash, and Dinosaur National Monument, which are mapped by CDOW as winter concentration and severe winter range (Map 2-13). All of US 40 and portions of SH 64 and the road from Blue Mountain to Rangely are identified as highway crossing, where there are problems with collisions between elk and vehicles.

The Yellow Creek and White River herds have current populations that are within CDOW's population objectives, while the Blue Mountain herd is substantially larger than CDOW's objective. Elk production area, movement corridors and severe winter range are considered critical habitat in all herd units, and summer range is considered critical for the Yellow Creek and Blue Mountain herds.

Mule deer. There are three general herds of mule deer in the planning area, the Blue Mountain herd, the Bookcliff Herd, and the Piceance Basin herd. Many of the main roads in the planning area are identified as highway crossing areas, where vehicle collisions with deer are a concern.

Table 2-19
Mule Deer Populations

Data Analysis Unit	Current Population Estimate	CDOW Population Objective
D-6 - Rangely	8,000	7,000
D-7 - White River	106,000	67,500
D-11 - Douglas Pass	9,800	10,000-12,000

SOURCE: CDOW data.

The White River herd (identified in the 1997 White River ROD/RMP as Piceance Basin herd) (DAU D-7) is the largest, with a current estimated population of more than 100,000 deer. It summers on the White River National Forest and the Roan Plateau, and winters in the Piceance Basin. Winter concentration areas are located along the White River and around Meeker, and severe winter range occupies the lower Piceance Basin (Map 2-11). Winter ranges consist largely of lower elevation pinyon/juniper woodlands and sagebrush, while summer range includes higher elevation pinyon/juniper and sagebrush, as well as aspen, mountain shrub, and other higher elevation habitats (Map 2-10).

The Rangely (Blue Mountain) herd (DAU D-6) summers on Blue Mountain, and winters on benches along the White and Yampa Rivers and the south face of Blue Mountain, mostly in GMU 10. Winter concentration areas and severe winter range are located along and south of US 40, to the White River east of Rangely.

The Douglas Pass (Bookcliff) herd (DAU-11) occurs mostly in GMU 21. The herd summers on the Colorado/White River divide. Suitable summer habitat is confined to a portion of the Cathedral Bluffs, the Baxter/Douglas Pass divide, and isolated tracts on Oil Spring, Rabbit and Texas Mountains. About 60 percent of the population winters at lower elevations in the Douglas, Missouri and Evacuation Creek drainages. Winter concentration and severe winter areas are located along the White River and in the Douglas Creek Basin.

The current population of the White River herd is substantially larger than the CDOW population objective, while the much smaller Rangely and Douglas Pass herds are near population objectives. Production areas, movement corridors and severe winter range are considered critical habitat by CDOW for mule deer.

Pronghorn antelope. Pronghorn occur in the northwestern portion of the planning area, primarily between Pinyon Ridge and the Colorado-Utah state line, mostly in GMU 10

(Table 2-20 and Map 2-14). Overall range consists primarily of salt desert and sagebrush shrublands and lowland grassland.

Table 2-20
Pronghorn Antelope Populations

Data Analysis Unit	Current Population Estimate	CDOW Population Objective
A-10 – Maybell	1,200	1,400
A-21 – Dinosaur	400	300

SOURCE: CDOW data.

The Dinosaur herd unit (DAU A-21) currently supports 400 animals, while CDOW’s long-term goals call for an average post-season herd of 300 animals. All occupied habitat in the Dinosaur herd unit is identified by CDOW as “overall range,” except for a resident population northwest of Rangely in the Coal Oil Basin. The general distribution shifts toward the west in winter, but no identified areas of winter range are present. A small area of pronghorn overall range is also present in the northern part of GMU 21, adjacent to pronghorn overall range and resident population areas near Rangely.

The Maybell herd unit (DAU A-10) mostly occurs north of the planning area. Small areas of overall range and winter range occur in the planning area near Elk Springs and Crooked Wash. Habitats include sagebrush and rangeland/lowland grassland. The number of pronghorn in this area normally does not exceed 40 or 50 animals.

Other Key Mammal Species

Black bear. Black bear occur in about two-thirds of the planning area, including the higher elevations in the Douglas Creek and Piceance Creek drainages, the upper White River, Danforth Hills, and portions of the Blue Mountain area. Summer concentration areas occur in portions of the Danforth Hills and White River National Forest. Fall concentration areas occur on the Baxter Pass/Douglas Pass divide and Roan Plateau (NDIS 2006). Concentration areas include aspen, mountain shrub, higher elevation sagebrush, and Douglas fir habitats. The WRFO has not developed specific bear management objectives, but manages their habitat integral with big game habitat.

Mountain lion. The entire planning area is within the overall range of mountain lion, which occurs in all habitats. No areas of human conflict have been identified by CDOW (NDIS 2006). Their seasonal movements largely follow those of mule deer, their main prey. The WRFO has not developed specific lion management objectives, but manages their habitat integral with big game habitat.

White-tailed prairie dog. White-tailed prairie dog towns occur primarily in the salt desert shrubland and rangeland/low grassland along US 40 from Pinyon Ridge to the Utah border, in

the Coal Oil Basin northwest of Rangely, in the Crooked Wash area. White-tailed prairie dog is a special status species, and their towns provide habitat for black-footed ferret and burrowing owl, special status species discussed in more detail in Section 2.2.8, Special Status Species.

Birds

Turkey. Turkey were not addressed in the 1997 White River ROD/RMP, but reintroduced populations have since become established in the planning area. They inhabit mountain shrub, pinyon/juniper, ponderosa pine, and mixed conifer habitats. Turkey overall range occurs along the Roan Plateau, Baxter Pass/Douglas Pass divide, and upper White River Valley (Map 2-14). Winter range and a winter concentration area are located in the White River Valley above Meeker, and a second area of winter range is located the East Douglas Creek/Cathedral Creek area. The WRFO has not developed specific turkey management objectives, but manages their habitat integral with big game and grouse habitat.

Grouse. Dusky grouse (formerly known as blue grouse) are relatively common and widely distributed in mixed and mountain shrub, aspen, and coniferous forest habitats above 7,200 feet in the planning area. BLM administers approximately 405,635 acres of dusky grouse habitat in the resource area. Population statistics show that dusky grouse populations are stable, although significant periodic swings in abundance occur due to environmental effects on annual recruitment. Blue Mountain and Piceance Basin/Roan Plateau are the two most important dusky grouse areas in terms of recreation use and abundance.

Greater sage grouse and sharp-tailed grouse are considered species of special concern and are discussed in Section 2.2.8, Special Status Species.

Raptors. Raptors include eagles, falcons, and hawks. Because they are at the top of food chains and therefore present in fewer numbers than their prey, they serve as important indicators of overall ecosystem health. In addition, several species have special status under the Endangered Species Act, BLM sensitive, and State of Colorado special concern. In addition, active nests of all species of raptors are protected under the Migratory Bird Treaty Act, and bald and golden eagles are protected under the Eagle Protection Act. The BLM requires nest surveys for projects potentially affecting nesting raptors, and maintains a database of raptor nest locations. BLM management focuses on protection of breeding raptor species.

Table 2-21 summarizes raptor occurrence in the planning area, based on Righter et al. 2004 and the BLM databases for historic and recent raptor nests. Twenty-seven species of raptors occur in the planning area at least occasionally, of which 20 are known or suspected to breed. Of these, 15 species of raptors have been reported to nest on BLM-administered land. The most common species on BLM-administered land include red-tailed hawk, golden eagle, ferruginous hawk,

Cooper's hawk, and great-horned owl. Nest records are more comprehensive for species that build large conspicuous stick nests, while species that are inconspicuous and nest in trees or cavities are under-represented.

Land-use practices over the past 25 years or more generally favor species that forage over open country, but may be reducing habitat for species that nest in woodlands, such as accipiters (Cooper's hawk, sharp-shinned hawk, and northern goshawk). The less-common woodland habitats, including spruce-fir, aspen and riparian, are relatively small and dispersed but have very high breeding densities.

Table 2-21
Raptor Species and Habitats

Species	Residency Status	Breeding in Planning Area/ Recorded to Nest on BLM*	Nesting Habitat	Special Status
Turkey vulture	Common summer resident, migrant	BR/--	Cliffs and riparian areas	--
Osprey	Uncommon migrant and rare summer resident	BR/--	Riverine cottonwood	--
Bald eagle	Fairly common summer resident, fairly common winter resident	BR/--	Riverine cottonwood and ponderosa pine	Federal Protected, State threatened
Northern harrier	Uncommon summer resident and common migrant	BR/BLM	Wetlands, grasslands, sagebrush	--
Sharp-shinned hawk	Fairly common summer resident, migrant and winter resident	BR/BLM	Douglas fir, spruce fir, pinyon-juniper	--
Cooper's hawk	Fairly common summer resident, migrant and winter resident	BR/BLM	Riparian areas, conifers, pinyon/juniper	--
Northern goshawk	Uncommon permanent resident	BR/BLM	Mature coniferous and aspen forests over 6,500 feet	BLM sensitive
Swainson's hawk	Uncommon summer resident, uncommon migrant	BR/--	Gambel oak, trees in or adjacent to open country, all elevations	--
Red-tailed hawk	Common summer resident, migrant and winter resident	BR/BLM	Cliffs and forested areas, all habitats	--
Ferruginous hawk	Uncommon summer resident, uncommon migrant and rare winter resident	BR/BLM	Isolated junipers in desert or sagebrush	BLM sensitive, state special concern
Rough-legged hawk	Fairly common winter resident	--	NA	--
Golden eagle	Fairly common resident	BR/BLM	Cliffs, occasionally in cottonwoods	--
American kestrel	Common resident and migrant	BR/BLM	Cavities including trees, nest boxes, magpie nests, holes cliffs, all habitats	--

**Table 2-21
Raptor Species and Habitats**

Species	Residency Status	Breeding in Planning Area/ Recorded to Nest on BLM*	Nesting Habitat	Special Status
Merlin	Rare migrant and winter resident	--	NA	--
Peregrine falcon	Uncommon summer resident, rare migrant	BR/--	Cliffs near water	State special concern
Prairie falcon	Uncommon permanent resident	BR/BLM	Cliffs adjacent to open country	--
Flammulated owl	Fairly common summer resident	BR/--	Conifer forest, aspen, above 7,000 feet	--
Barn owl	Rare permanent resident	BR/--	Lowland agricultural areas, roosts in buildings and trees	--
Western screech-owl	No known records	BR/--	Cottonwoods in riparian, urban, and rural areas, possibly pinyon-juniper	--
Great-horned owl	Fairly common permanent resident	BR/BLM	Riparian areas, hawk nests, ledges, all habitat	--
Snowy owl	Casual winter visitor	--	NA	--
Northern pygmy owl	Uncommon permanent resident	BR/BLM	Aspen, dense pinyon/juniper	--
Burrowing owl	Uncommon summer resident	BR/BLM	Prairie dog towns	State threatened
Long-eared owl	Uncommon summer and winter resident	BR/BLM	Pinyon-juniper woodlands, woody riparian growth, often occupy magpie nests	--
Short-eared owl	Rare migrant and winter visitor	--	NA	--
Boreal owl	Uncommon permanent resident	BR (Flat Tops)/--	Mature and old-growth spruce fir forest	--
Northern saw-whet owl	Common summer resident and migrant, uncommon winter resident	BR/BLM	All forest types	--

NOTES:

* BR – breeding in planning area

BLM – recorded breeding on BLM-administered lands

Other Important Bird Species. More than 200 species of non-game birds, including neotropical migratory species, have been documented in the WRFO, of which 60 percent are breeding or resident species. Many of the more uncommon breeding species are associated with riparian, wetland, or aquatic habitats, or other habitats such as aspen or spruce fir that are of limited extent on BLM lands in the planning area, but are common within the region. Species that occur in pinyon/juniper and sagebrush, such as juniper titmouse and gray flycatcher, are common in the planning area but have restricted continental distributions.

Table 2-22 provides a list of bird species present in the planning area that have been identified as being of conservation concern. The USFWS compiled a list of Birds of Conservation Concern to identify migratory and non-migratory bird species that without conservation actions may become candidates for listing under the Endangered Species Act (USFWS 2002). The species listed below may occur in the planning area and are included in USFWS 2002 as birds of conservation concern for Region 16 (Southern Rocky Mountains/Colorado Plateau), USFWS Region 6 (Mountain-Prairie Region), and/or the National list. Species that are addressed in more detail in Section 2.2.8, Special Status Species, and are shown in italics.

Table 2-22
Other Important Bird Species

Bird Species	Habitat Affiliation	Distribution	Estimated Square Miles (BLM-administered)	Abundance*
Breeding Species				
Northern harrier	Major: springs, wetlands. Minor: mountain big sagebrush.	Widespread	FO-wide	Uncommon
Swainson's hawk	Aspen, cottonwood, Gambel oak in mountain shrub matrix	No BLM records	NA	Rare
Ferruginous hawk	Saltbush, Utah juniper/ Wyoming big sagebrush	Localized	175	Fairly common
Golden eagle	Major: cliff. Minor: aspen, cottonwood, oakbrush.	Widespread	FO-wide	Fairly common
<i>Peregrine falcon</i>	Cliff	1 site	FO-wide	Rare
Prairie falcon	Cliff	Widespread	FO-wide	Uncommon
Mountain Plover	Wyoming big sagebrush	1 historic site	5	Rare, peripheral
Wilson's Phalarope	Persistent ponds	Localized	NA	Uncommon
Yellow-billed Cuckoo	Major: Riverine riparian. Minor: Urban deciduous.	1 historic report	1	Rare
Flammulated Owl	Mature aspen, Douglas-fir	Widespread	75	Fairly common
Burrowing Owl	Prairie dog towns	Localized	75	Uncommon to fairly common
Lewis's Woodpecker	Mature ponderosa pine, Gambel oak, cottonwood riparian	Localized	5	Uncommon
Williamson's Sapsucker	Major: mature pinyon-juniper, Douglas-fir, spruce-fir, aspen, Minor: cottonwood	Widespread	300	Uncommon
Red-naped Sapsucker	Major: aspen. Minor: urban deciduous	Widespread	10	Fairly common
Olive-sided flycatcher	Major: Douglas-fir and spruce-fir. Minor: riverine cottonwood	Widespread	50	Fairly common

**Table 2-22
Other Important Bird Species**

Bird Species	Habitat Affiliation	Distribution	Estimated Square Miles (BLM-administered)	Abundance*
Loggerhead Shrike	Major: Wyoming and basin big sagebrush, greasewood in saltbush matrix. Minor: Utah juniper/Wyoming big sagebrush	Localized	275	Fairly common
Gray Vireo	Utah juniper/black and Wyoming big sagebrush	Localized	150	Fairly common
Pinyon Jay	Pinyon-juniper woodlands	Widespread	1,000	Common
Virginia's Warbler	Major: mountain shrub. Minor: woody riparian, pinyon-juniper	Widespread	450	Common
Black-throated gray Warbler	Pinyon-juniper woodlands	Widespread	1,000	Abundant
Brewer's Sparrow	Big sagebrush, saltbush	Widespread	600	Common to Abundant
Sage Sparrow	Saltbush, Wyoming big sagebrush	Localized	200	Common
Strict Migrants (No Evidence of Breeding)				
Snowy plover	Rio Blanco Lake SWA	--	--	Uncommon
Solitary Sandpiper	Widely scattered reservoirs, stock-tanks, beaver ponds	--	--	Uncommon
Long-billed curlew	Rio Blanco Lake SWA, Piceance Creek, Wolf Creek, Coyote Basin	--	--	Rare
Marbled Godwit	Rio Blanco Lake SWA	--	--	Fairly common
Stilt Sandpiper	Rio Blanco Lake SWA	--	--	Rare
Common Tern	Rio Blanco Lake SWA, Kenney Reservoir	--	--	Rare
Short-eared Owl	Cathedral Bluffs, Wolf Creek, Rio Blanco SWA	--	--	Rare
Black Swift	No records from BLM	--	--	NA
Rufous Hummingbird	Widespread	--	--	Common
Harris's Sparrow	White River Valley	--	--	Rare
McCown's Longspur	Little Beaver Creek, Wolf Creek	--	--	Rare
Chestnut-collared Longspur	Piceance Basin (1970s record, no details)	--	--	NA

NOTES:

* – Abundance:

Breeding: abundant – always encountered in number; common – always encountered in lesser numbers; fairly common – usually encountered in lesser numbers; uncommon – infrequently encountered on annual basis; rare – less than 3 breeding pairs or only encountered on decade basis.

Migration: abundant – encountered daily in number; common – encountered daily in less number; fairly common – consistently recorded on annual basis; uncommon – recorded most years in very small numbers (<10); rare – recorded only infrequently on decade basis.

Italicized species discussed in detail in Section 2.2.8, Special Status Species.

Other Nongame species

Based on CDOW records, 47 species of nongame mammals, six amphibian species, and seven reptiles are known or suspected to occur as seasonal or permanent residents. The status of small mammals associated with the pinyon-juniper and sagebrush habitat in the Piceance Basin has been documented through oil shale baseline studies from the 1970s and 1980s. Other groups, such as bats, reptiles, and amphibians, are less well known.

2.2.7.3 Aquatic Resources

Aquatic Habitat

Several lakes are present along or near the White River in the planning area, including Trappers Lake, Lake Avery, Rio Blanco Lake, and Kenney Reservoir, but are not managed by BLM. The only BLM-administered pond or lake fisheries are small and intermittent or marginal fish habitat. They include Divide Creek Reservoir, a 5-acre pond that has supported black bullhead and channel catfish, and Peterson Draw Reservoir, a 2-acre impoundment stocked intermittently with rainbow trout.

BLM manages portions of 80 perennial stream systems in the planning area, of which 21 are known to support nongame and sport fish (Table 2-23, Map 2-15). Including the White River, BLM administers about 107 miles of stream fisheries. Many BLM-administered reaches consist primarily of small perennial headwater reaches in the Piceance and Douglas Creek areas. Most of these streams have few fish species present and are rated as fair condition, with a trend of static or improving. With few exceptions, fish populations are fair due to marginal or fluctuating flows and/or degraded stream conditions. Limitations present for these habitats include low flow, lack of woody vegetation, and high sediment. In addition, BLM manages only short, isolated reaches of some of these streams.

BLM manages about 22.4 miles of the lower White River and 3.6 miles of the upper White River and North Fork of the White River. These rivers have a greater diversity of fish species than most of the streams on BLM-managed lands, including more game fish, and are in fair to good condition. Many BLM-managed segments are short and isolated, making management difficult. The other major river in the region, the Yampa River, occurs on the north edge of the planning area but is entirely within Dinosaur National Monument.

**Table 2-23
Stream Fish Habitats Managed by BLM**

Geographic Reference Area/ Streams	BLM Management (miles)	BLM Length > 0.25 mile	Fishery Type	Condition and Trend	Problems/ Limitations
Danforth Hills/Jensen					
Big Beaver Creek	0.7	0.7	Cutthroat trout	Good	Recognized strain of Colorado River cutthroat trout
Piceance					
Black Sulphur Creek	3.6	3.4	Cutthroat trout, mountain sucker, speckled dace, rainbow trout	Fair-static	High sediment, limited flow
East Willow Creek	2.2	2.0	Rainbow trout	Fair-static	Low flow, woody expression
Fawn Creek	1.2	1.0	Brook trout, mountain sucker, speckled dace	Fair-static	Woody expression, limited flow
Piceance Creek	6.1	4.7	Speckled dace, rainbow trout, brook trout, mountain sucker, flannelmouth sucker	--	Short and isolated reaches, woody expression, irrigation drawdowns
Willow Creek	1.0	0.4	Speckled dace, rainbow trout, brook trout, mountain sucker	Fair-static	Short, isolated reaches; wood expression
Yellow Creek	6.0	6.0	Speckled dace, mountain sucker	Fair-static	High salinity
Douglas/Cathedral					
Bear Park Creek	1.9	1.7	speckled dace, cutthroat trout	Fair-improve	Woody expression, limited flow
Bitter Creek	1.9	1.9	brook trout, cutthroat trout	Fair-static	Woody expression
Brush Creek	0.2	0	rainbow trout	Fair-static	Woody expression; bank stability; short, isolated reaches
Cathedral Creek	2.5	2.0	Cutthroat trout	Fair-improve	Irrigation drawdown, recognized strain of Colorado River cutthroat trout
Douglas Creek	23.5	23.0	Speckled dace	Fair-improve	Heavy sediment, intermittent flow
E. Douglas Creek	15.2	14.6	Brook trout, cutthroat trout, speckled dace	Fair-static	Channel barriers from large beaver dams, high sediment
Lake Creek	2.8	2.8	Cutthroat trout	Fair-improve	Woody expression, recognized strain of Colorado River cutthroat trout

**Table 2-23
Stream Fish Habitats Managed by BLM**

Geographic Reference Area/ Streams	BLM Management (miles)	BLM Length > 0.25 mile	Fishery Type	Condition and Trend	Problems/ Limitations
Right Fork of Lake Creek	1.1	1.1	Cutthroat trout	Fair-improve	Mass wasting, recognized strain of Colorado River cutthroat trout
Soldier Creek	2.1	2.1	Cutthroat trout, brook trout	Fair-improve	Mass wasting, recognized strain of Colorado River cutthroat trout
West Douglas Creek	7.2	7.2	Speckled dace	Fair- static	Heavy sediment, intermittent flow
White River					
Lower White River	22.4	14.3	Mountain whitefish, roundtail chub, Colorado pikeminnow, speckled dace, bluehead sucker, flannelmouth sucker, mottled sculpin, rainbow trout, channel catfish, black bullhead	Fair/good-static	Bank stability (Tamarisk and Russian olive infestations), flow modification, short and isolated stretches
North Fork White River	1.6	0	Rainbow trout, brook trout, brown trout, mountain whitefish, cutthroat trout, mountain sucker	Good-improve	Short, isolated reaches
Upper White River	2.0	0.3	Brown trout, rainbow trout, mountain sucker, mountain whitefish, bluehead sucker, flannelmouth sucker, speckled dace	Fair/good-static	Short, isolated reaches
Crooked Wash/Deep Channel					
Crooked Wash	2.4	2.3	Speckled dace, mountain sucker	Poor-static	Intermittent flow, limited site capability

Key Aquatic Species

The primary cold water game fish species are trout, including cutthroat, rainbow, brook, and brown trout. Mountain whitefish is also present in the upper White River and North Fork of the White River. Warm water game fish species include northern pike, yellow perch, smallmouth bass, largemouth bass, black crappie, bluegill, green sunfish and black bullhead, and are primarily located in two CDOW state wildlife areas along the White River (Rio Blanco Lake and

Lake Avery), and have also appeared at Kenney Reservoir. Channel catfish and black bullhead are present in the lower White River.

Non-game fish species include native species such as speckled dace, bluehead sucker, flannelmouth sucker, and mottled sculpin, and non-natives such as common carp, red shiner, fathead minnow, and plains topminnow. Speckled dace are the most widely distributed native non-game fish, occurring regularly in most perennial streams. The other native fish occur primarily in the White River and its larger tributaries. Populations of non-native fish are stable, except below Taylor Draw Dam. Native fish populations dominated the White River drainage prior to closure of Taylor Draw Dam in 1984. Since then, non-native fish including red shiner, fathead minnow, and to a lesser extent common carp and predatory game fish, have been common in the lower White River.

Trends

Populations of big game are monitored by CDOW. Populations are variously within, above, or below population targets for the various DAUs. The largest imbalance is in the White River deer herd and Blue Mountain elk herd, which exceed population objectives by 50 percent or more. Populations exceeding the objectives are expected to become smaller and more in balance with available habitat, while those that are below objectives are likely to increase. Fish and aquatic habitats are also assessed by CDOW, and current trends are static or improving in all of the decision area streams with fish populations. Raptor nest sites are identified and monitored in areas of oil and gas activity, and populations appear to be stable. Habitat quality for big game and other species are assessed on grazing allotments and other studies. While problems are present in some areas, such as poor browse conditions for wintering big game, most of the planning area appears to be meeting land health objectives. However, detailed assessments of land health have not been conducted in most of the decision area. Populations of most other species are not routinely monitored but adverse trends have not been observed.

Forecast

With the exception of the effects of natural resource extraction, wildlife and fish populations and habitats are expected to remain relatively stable in much of the planning area, and to improve in areas that are undergoing management actions to rehabilitate degraded habitats. However, some areas of degraded habitat, such as those dominated by cheatgrass or other invasive species or noxious weeds, are likely to continue in their present condition for the foreseeable future. In addition, long-term vegetation trends may affect the composition and size of wildlife communities. For example, about 20 percent of the sagebrush ecosystem in western Colorado is at high risk for pinyon-juniper encroachment, and the risk of invasion by invasive herbaceous

plants is considered to be moderate to high on more than 40 percent of sagebrush habitat (Bio-Logic Environmental 2005).

Natural gas and oil development, oil shale development and other resource extraction activities have the potential to adversely impact the habitat and populations of big game and other wildlife within the resource area. Habitat quality may be reduced in some areas from introduction of non-native weeds, and erosion from disturbed areas. Streams could potentially be affected by erosion from roads and other disturbed areas, resulting in sediment deposits in aquatic habitats and adverse changes in water quality. Deer, elk, and many other species may avoid areas of human activity, and usage of available habitat is likely to be reduced well beyond the area of cleared vegetation. Species associated with woodlands may be affected more than those of other habitats, due to fragmentation and the long time needed to replace this habitat after it is cleared.

Key Features

The planning area consists of relatively natural habitats that support large populations of deer, elk, and numerous other species. Until recently, much of the area was relatively remote and undisturbed. Because of this, hunting has been an important part of the regional lifestyle and economy.

CDOW has identified several types of critical habitats for elk and deer in the decision area, including production areas, movement corridors, severe winter range, and elk summer range in the Yellow Creek and Blue Mountain herds (CDOW 2006). Changes in these areas, such as loss of habitat or reduction in quality, fragmentation, or disturbance during key activity periods, could have a disproportionate effect on the entire herd populations by reducing habitat carrying capacity during critical periods.

Other key features include perennial streams, riparian and wetland vegetation, and other habitats that are uncommon or scarce in the decision area and that support wildlife species or fish species limited to those habitats. Nests of many raptor species are key features because of their importance for maintaining the population and susceptibility to disturbance from human activity.

2.2.8 Special Status Species

Indicators

BLM Standards for Public Land Health (Appendix A) directly address special status species. Indicators include all those listed for plant and animal communities (Standard 3) including noxious weeds, spatial distribution and composition, mixed age classes, habitat connectivity, and diversity and density of species. Additional indicators for Standard 5, special status species,

include stable and increasing populations of endemic and protected species in suitable habitat, and availability of suitable habitat for recovery of endemic and protected species.

Current Conditions

Special status species are those species with populations that have declined to the point of substantial federal or state agency concern. Special status species those listed by the USFWS under the federal Endangered Species Act; species listed as endangered, threatened or special concern by the State of Colorado, Division of Wildlife; and those placed on the Colorado BLM State Director's Sensitive Species List. Federal threatened and endangered species and designated critical habitat 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, 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. State of Colorado and BLM sensitive species are treated similarly. BLM, USFWS, and the State of Colorado have developed formal and informal agreements to provide guidance on the management of species. Consultation is required on any action proposed by the BLM or another federal agency that affects a listed species or results in jeopardy or modifications of critical habitat.

Federal Endangered, Threatened, Proposed and Candidate Species

There are 15 federally listed species that may occur in the planning area, including three candidates for federal listing (Table 2-24). Critical habitat for the four species is present in the planning area. Specific management direction to influence habitat components, leading to species recovery, is integrated into BLM management plans.

Table 2-24
Federally Listed Animal and Plant Species

Name	Species	Federal Status	Designated Critical Habitat in Planning Area
Birds			
Bald eagle	<i>Haliaeetus leucocephalus</i>	Protected under Bald and Golden Eagle Protection Act	No
Mexican spotted owl	<i>Strix occidentalis lucidis</i>	Threatened	No
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	Candidate	No
Mammals			
Black-footed ferret	<i>Mustela nigripes</i>	Endangered, Experimental Non-essential population	No
Canada lynx	<i>Lynx Canadensis</i>	Threatened	No
Gray wolf	<i>Canis lupus</i>	Endangered	No
White-tailed prairie dog	<i>Spermophilus leucurus</i>	Petitioned	No

Table 2-24
Federally Listed Animal and Plant Species

Name	Species	Federal Status	Designated Critical Habitat in Planning Area
Fish			
Colorado pikeminnow	<i>Ptychocheilus lucius</i>	Endangered	Yes
Bonytail chub	<i>Gila elegans</i>	Endangered	Yes
Humpback chub	<i>Gila cypha</i>	Endangered	Yes
Razorback sucker	<i>Xyrauchen texanus</i>	Endangered	Yes
Plants			
Dudley Bluffs bladderpod	<i>Lesquerella congesta</i>	Threatened	No
Piceance Twinpod	<i>Physaria obcordata</i>	Threatened	No
Ute lady's-tresses orchid	<i>Spiranthes diluvialis</i>	Threatened	No
Graham beardtongue	<i>Penstemon grahamii</i>	Former Candidate	No
White River beardtongue	<i>Penstemon scarious</i> var. <i>albifluvis</i>	Candidate	No

Bald eagle. Bald eagles occur primarily as winter residents and migrants across most of the eastern and northwestern portions of the planning area (Map 2-16). Migrant and winter residents arrive in October and leave by mid-April. Mid-winter (December through February) populations on the White River vary from 50 to 70 birds, with migratory peaks of up to 160 birds. Winter roosts have been identified at a number of sites along the White River between Meeker and the Utah state line and along Piceance Creek, mostly in cottonwood and Douglas fir stands on private lands. Winter concentrations occur along the upper White River, but winter range and foraging also occupies large areas away from the river. About 11 pairs of eagles are known to breed in the planning area, in cottonwood stands along the White River, and mostly on private land. Breeding pairs begin nest selection and establishment in early February, and if successful, young are fledged by mid-July.

Mexican spotted owl. There are no substantiated reports of Mexican spotted owls within the planning area, although small and widely separated areas of suitable habitat may be present in the Douglas Creek drainage. The nearest records are from Dinosaur National Monument and the upper Book Cliffs in Utah. Habitat includes deep canyons with dense old-growth conifers that exhibit high canopy closure and stand density.

Yellow-billed cuckoo. There are no recent records of this species from the planning area, and it has declined significantly in western Colorado in the twentieth century. Suitable habitat includes large stands of riparian forest. Since most stream valleys with riparian forest are privately owned, this species is unlikely to occur on BLM land.

Black-footed ferret. Although black-footed ferrets occurred historically in the planning area, they were extirpated by the mid-1980s or earlier. As part of species recovery, excess ferrets in

the captive breeding population are being reintroduced into the wild in several states. Northwestern Colorado and northeastern Utah are one of nine primary recovery sites (Wolf Creek Work Group 2001). Recovery goals include a pre-breeding population of 1,500 free-ranging breeding adults in 10 or more populations, with not fewer than 30 breeding pairs per population.

Reintroduced ferrets and their offspring are designated as a nonessential experimental population. All of the planning area within Rio Blanco and Moffat counties and west of State Highway (SH) 13 to the Utah state line is within the boundaries designated for the nonessential experimental population. Within this larger area, two ferret management areas have been designated for reintroduction efforts (Map 2-19). The Wolf Creek ferret management area occupies about 81 square miles, covers about half of the white-tailed prairie dog colonies within the planning area, and is part of a larger complex of prairie dog towns that extends along US 40 into Utah. Since 2001, about 189 ferrets have been released in the Wolf Creek management area. Minimum year-end population estimates have increased from 0 in 2001 to a range of 13 to 16 in 2005 through 2007. Since reproduction was first confirmed in 2005, the number of wild born kits has progressively increased from 1 in 2005, 2 in 2006, and at least 5 in 2007. The Coyote Basin management area occupies about 10 square miles in extreme western Rio Blanco County, and is intended to complement reintroduction efforts in the primary management zone in the adjoining part of Utah.

Canada lynx. Lynx occurred historically in the planning area, and currently occur in Colorado primarily in the southwestern part of the state where the CDOW released 204 lynx between 1999-2005. Potential habitat in the planning area occurs primarily on the White River National Forest, and consists of mature spruce-fir forests (See Map 2-7). Dispersing lynx have been found north of I-70, and into adjacent states such as Wyoming and Utah (Schenk 2006). Based on observations of dispersing lynx, individuals may occur occasionally in the decision area, but there is little suitable denning or winter habitat on BLM lands.

Gray wolf. Gray wolves occurred historically throughout the planning area, but are considered to be extirpated in Colorado. Gray wolves introduced into Yellowstone National Park provide the closest source of dispersing individuals, and a probable wolf sighting was made near the Wyoming border near Walden in February 2006. Based on this sighting, wolves may occur sporadically in the planning area now and in the future. All of Colorado north of I-70 (including the entire planning area) is part of the Western Distinct Population Segment, under the USFWS Section 4(d) rule, which allows for management of wolves dispersing from the reintroduced population in Yellowstone.

White-tailed prairie dog. This species was petitioned for listing in 2002, and the USFWS determined that listing was not warranted. In July 2007, the USFWS announced that it would review the 2004 petition finding and take further action as appropriate, because of inappropriate non-scientific influence on the finding. White-tailed prairie dogs occur primarily in the salt desert shrubland and lowland grassland along US 40 from Pinyon Ridge to the Utah border, and in the Coal Creek Basin northwest of Rangely and the Crooked Wash area. Their towns, presently occupying about 39,000 acres in the planning area, provide habitat for other special status species, including black-footed ferret and burrowing owl. White-tailed prairie dogs are susceptible to campestrial (sylvatic) plague, which periodically decimates their populations. CDOW mapping of towns in 2002 found 192,000 acres of active and 47,000 acres of unknown activity white-tailed prairie dogs in western Colorado, according to the 2004 *White-tailed Prairie Dog Conservation Assessment* (Seglund et al. 2004).

Upper Colorado River Basin Fish - Colorado pikeminnow, bonytail chub, humpback chub, and razorback sucker. The lower White River and its 100-year floodplain downstream from Rio Blanco Lake was designated as critical habitat for Colorado pikeminnow in 1994. The White River is used throughout the year by adult and subadult Colorado pikeminnow. Following closure of Taylor Draw Dam in 1984, pikeminnow were confined to the 32.5 miles of the White River below the dam. The White River does not appear to support spawning activity, young-of-year nurseries, or juvenile concentration areas, but portions of the White River in Utah serve as concentration areas for adults and juveniles.

Critical habitat for all four endangered fish species is present in the Yampa River and its 100-year floodplain within Dinosaur National Monument. Bonytail chub, humpback chub, and razorback sucker do not occur on BLM lands within the planning area.

All waters within the planning area are associated with the Upper Colorado River Basin. The White River is an important flow contributor to downstream fisheries in the Green River in Utah, which provides vital nursery habitat and most of the Upper Colorado River Basin's remaining spawning and juvenile concentration areas. Kenney Reservoir operates on a run-of-the-river basis, which generally maintains natural flow regimes.

The USFWS has determined that any federally authorized depletion from the Upper Colorado River Basin has an adverse effect on listed Colorado River fishes. Depletions adversely affect listed fish populations by reducing spring peak and base flows, which limits access to and the extent of off-channel waters, such as backwaters, eddies, and oxbows. These habitats are needed as larval and young-of-the-year rearing areas. In addition, reductions in flow velocity and depth adversely affect spawning and overwinter survival. Moderated flow regimes favor introduced fish populations, many of which are strongly competitive with or prey on endemic fish.

Dudley Bluffs bladderpod. This species is endemic to the planning area and the Piceance Basin. It is restricted to exposures of the Thirteen Mile Tongue of the Green River Formation along knolls and ridge crests that are generally under 15 percent slope, along Piceance Creek and Yellow Creek and their tributaries. Most of the occurrences are located in the Duck Creek, Ryan Gulch, and Dudley Bluffs areas of critical environmental concern (ACECs).

Piceance twinpod. Piceance twinpod is also endemic to the planning area. It is restricted to exposures of the Thirteen Mile Tongue and Parachute Creek member of the Green River Formation, on barren, white shale outcrops and steep colluvial slopes. Many of the occurrences are located in the Ryan Gulch, Dudley Bluffs and Yanks Gulch ACECs, but occurrences also occur outside of ACECs along lower Piceance Creek, Yellow Creek, and the west side of Calamity Ridge.

Ute ladies'-tresses orchid. This species has not been found in the planning area, but is known to occur in adjacent parts of Utah within Dinosaur National Monument, and in the monument north of the planning area in Colorado (Fertig, Black, and Wolken 2005). Suitable habitat consists of sub-irrigated alluvial soils along streams and in open meadows.

Graham beardtongue. Graham beardtongue occurs in the planning area only near Raven Ridge and along the Utah border. Most of the populations occur in Utah. Suitable habitat consists of sparsely vegetated desert shrub and pinyon/juniper communities on talus slopes and knolls of the Green River Formation, at elevations of 5,800 to 6,000 feet (Spackman et al. 1997). The larger occurrences of this species in the planning area are located within the Raven Ridge ACEC. This species has recently been dropped from the candidate list.

White River beardtongue. White River beardtongue occurs near Raven Ridge and westward along the White River into Utah, mainly on exposures of the Parachute Creek member of the Green River Formation. Suitable habitat consists of sparsely vegetated shale slopes at elevations of 5,000 to 7,800 feet (Spackman et al. 1997). This species was proposed for listing as a threatened species on January 19, 2006. The listing proposal was withdrawn and it was identified as not longer a candidate for listing under the Endangered Species Act, on December 19, 2006 (USFWS 2006).

Other Special Status Species

Other special status species include Colorado state endangered, threatened, and special status species; BLM sensitive species; and plant species ranked as critically imperiled (G1 or S1) or imperiled (G2 or S2) by the Colorado Natural Heritage Program (Table 2-25). Each of these species is discussed below.

Table 2-25
Other Special Status Animal and Plant Species

Name	Species	BLM Status	State Status	CNHP rank
Birds				
Northern goshawk	<i>Accipiter gentilis</i>	Sensitive	--	--
Burrowing owl	<i>Athene cunicularia</i>	--	Threatened	--
Barrow's goldeneye	<i>Bucephala islandica</i>	Sensitive	--	--
Ferruginous hawk	<i>Buteo regalis</i>	Sensitive	Special concern	--
Greater (northern) sage grouse	<i>Centrocercus urophasianus</i>	Sensitive	Special concern	--
Western snowy plover	<i>Charadrius alexandrinus nivosus</i>	Sensitive	Special concern	--
Mountain plover	<i>Charadrius montanus</i>	Sensitive	Special concern	--
Black tern	<i>Chlidonias niger</i>	Sensitive	--	--
American peregrine falcon	<i>Falco peregrinus anatum</i>	--	Special concern	--
Greater sandhill crane	<i>Grus Canadensis tabida</i>	--	Special concern	--
Long-billed curlew	<i>Numerus americanus</i>	Sensitive	Special concern	--
White-faced ibis	<i>Plegadis chihi</i>	Sensitive	--	--
Columbian sharp-tailed grouse	<i>Tympanuchus phasianellus Columbiana</i>	Sensitive	Special concern	--
Mammals				
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	Sensitive	Special concern	--
Spotted bat	<i>Euderma maculatum</i>	Sensitive		--
Wolverine	<i>Gulo gulo</i>		Endangered	--
River otter	<i>Lontra canadensis</i>		Threatened	--
Fringed myotis	<i>Myotis thysanodes</i>	Sensitive	--	--
Yuma myotis	<i>Myotis yumanensis</i>	Sensitive	--	--
Amphibians				
Boreal western toad	<i>Bufo boreas boreas</i>	Sensitive	Endangered	--
Northern leopard frog	<i>Rana pipiens</i>	Sensitive	Special concern	--
Great Basin spadefoot	<i>Spea intermontana</i>	Sensitive		--
Reptiles				
Midget faded rattlesnake	<i>Crotalus viridis concolor</i>	Sensitive	Special concern	--
Fish				
Bluehead sucker	<i>Catostomus discobolus</i>	Sensitive	--	--
Flannelmouth sucker	<i>Catostomas latipinnis</i>	Sensitive	Special concern	--
Mountain sucker	<i>Catostomas platyrhynchus</i>	Sensitive	Special concern	--
Plains topminnow	<i>Fundulus sciadicus</i>	Sensitive	--	--
Roundtail chub	<i>Gila robusta</i>	Sensitive	Special concern	--
Colorado River cutthroat trout	<i>Oncorhynchus clarki pleuriticus</i>	Sensitive	Special concern	--
Plants				
Park rockcress	<i>(Boechera fernaldiana)</i> <i>Arabis fernaldiana</i> var. <i>fernalidiana</i>	Sensitive	--	G3G4/S2
Debris milkvetch	<i>Astragalus detritalis</i>	Sensitive	--	G3/S2
Ligulate feverfew	<i>Bolophyta (Parthenium)</i> <i>ligulata</i>		--	G3/S2
Rollins cryptanth	<i>Cryptantha rollinsii</i> <i>(Oreocarya rollinsii)</i>	Sensitive	--	G2/S2
Ephedra buckwheat	<i>Eriogonum ephedroides</i>	Sensitive	--	G3/S1
Utah gentian	<i>Gentianella tortulosa</i>	Sensitive	--	G3?/S1
Narrowstem gilia	<i>Gilia stenothyrsa</i>	Sensitive	--	G2/S1

Table 2-25
Other Special Status Animal and Plant Species

Name	Species	BLM Status	State Status	CNHP rank
Piceance bladderpod	<i>Lesquerella parviflora</i>	Sensitive	--	G2/S2
Narrowleaf evening primrose	<i>Oenothera acutissima</i>	Sensitive	--	G2/S2
Hoary phacelia	<i>Phacelia incana</i>	--	--	G3G4/S1

Several species addressed in the 1997 White River ROD/RMP are no longer considered to be special status. These include loggerhead shrike, shale columbine (*Aquilegia barnebyi*), dragon milkvetch (*Astragalus lutosus*), Utah fescue (*Argillochloa dasyclada*), Yampa beardtongue (*Penstemon yampaensis*), hanging garden sullivantia (*Sullivantia purpusii*), and sun-loving meadowrue (*Thalictrum heliophilum*).

Birds

Northern goshawk. Northern goshawks are generally presumed to nest most frequently in large blocks of forested habitats above 7,000 feet in the southern and eastern portions of the planning area. There are six historic northern goshawk nests and nine more recent nests on BLM lands in the planning area. Most of the nests have been located in mature pinyon-juniper woodlands as low as 6,500 feet in the Piceance Basin. Goshawk breeding activity has also been observed in higher elevation pinyon-juniper woodlands, particularly those with intermixed stands of Douglas–fir, in the Piceance Basin, Douglas Creek, and Evacuation Creek basins. Mature aspen woodlands on Oak Ridge, Wilson Creek, and the upper Piceance and Douglas basins also provide suitable goshawk habitat.

Burrowing owl. Burrowing owls are uncommon summer residents, and are associated with the white-tailed prairie dog colonies. They also occasionally use burrows of badgers and ground squirrels. BLM has not conducted comprehensive surveys for these owls, but the WRFO wildlife staff is normally aware of a half dozen nest sites annually. Burrowing owl populations in the planning area have are thought to have remained stable over the past 5 years, although populations appear to be declining in western Colorado and only 20 pairs were found during intensive surveys throughout western Colorado in 2002 (Richter et al. 2004).

Barrow's goldeneye. Barrow's goldeneye nest on the Flat Tops Wilderness, which is the only known breeding location in Colorado and the southernmost portion of their breeding range (Richter et al. 2004). During the earlier portions of the winter, these birds occur on the river and ponds along the White River and Piceance Creek.

Ferruginous hawk. This species occurs from Elk Springs west to Dinosaur and south to Rangely. Their distribution coincides closely with that of white-tailed prairie dogs, which along

with cottontail rabbits, form the bulk of the birds' prey base. Based on a ferruginous hawk monitoring study conducted from 1981 through 1988, there were 94 nest sites distributed among approximately 45 breeding territories within the planning area, of which, an average of 18 were active annually. The most common nest sites were Utah junipers and artificial nest sites built from 1981-86 as part of a coal mine mitigation program. Dead junipers, ground nests, and promontories were also used. Nests were most likely to be occupied when there was little human activity within one mile.

Ferruginous hawk nesting effort and success are strongly correlated with their prey base and populations are prone to wide fluctuations. Surveys conducted by the USFWS in 1991 and 1992 along the U.S. 40 corridor documented 5 and 14 active nests, respectively. No comprehensive surveys for this population have been conducted recently. With no nests now attributable to artificial platforms, there are presumably fewer breeding territories available, but both prairie dog and cottontail populations have remained high and there have been no further land use influences which would be expected to suppress territory occupancy. Ferruginous hawks are also uncommon migrants and rare winter residents in the planning area.

Greater (northern) sage grouse. Sage grouse are considered special status because of large-scale reductions in suitable sagebrush habitats, significant declines in continental populations, and the near obligate relationship between these birds and sagebrush. A statewide greater sage grouse conservation plan is currently being prepared, along with regional plans for northwestern Colorado and the Piceance, Parachute and Roan Plateau area.

Sage grouse are scattered through the non-forested parts of the planning area, with the largest populations on the Piceance Rim/Roan Plateau and on Blue Mountain (Map 2-17). Blue Mountain supports the largest and most productive population and has the largest contiguous block of suitable habitat in the resource area. Most of the breeding and nest activities occur on Turner and Wolf Creeks. Blue Mountain's capacity for strong production and recruitment is largely attributable to an abundance of wet meadow habitats. In the Piceance Basin/Roan Plateau area, virtually all seasonal use functions take place on relatively narrow mid-elevation ridges (Map 2-18). The Piceance population appears to have undergone a significant decline since the 1980s, which may be related to the advanced successional status of the mountain shrub and sagebrush communities. The remaining habitat complexes are characterized by suboptimal or fragmented habitats that support low breeding densities. However, areas such as Wolf Creek and Crooked Wash have been documented to support hundreds of wintering birds.

Approximately 115 leks have been identified in the planning area, of which about 25 are currently active and the status of about 20 leks is unknown, because of limited or irregular use. The count of males at leks in the planning area in 2006 was 646 birds, and although the highest

total since 1989, is a figure that cannot be used as an accurate indicator of trend because of differences in survey effort. The production areas shown on Map 2-17 are mostly based on a 2-mile buffer zone around active leks. As shown on Map 2-18 for the Piceance Rim/Roan Plateau area, often only a small portion of the production area is suitable for nesting, and the extent of suitable nesting habitat may extend well beyond the 2-mile buffer (i.e., it is currently accepted that 80 percent of nesting occurs within a 4-mile radius of the lek).

Columbian sharp-tailed grouse. These grouse occurred historically across the east half of the planning area, but currently have a more restricted distribution, mostly on private lands and land-locked BLM parcels in Axial Basin and between SH 13 north of Meeker and the White River National Forest (Map 2-7). They have been recorded in aspen, mountain shrub, and sagebrush habitats in these areas. According to CDOW, habitats within the planning area include overall range, smaller areas of winter range, and one small production area at the northern edge of the planning area. Intensive surveys in 2000 found 2,454 sharp-tailed grouse and 127 leks (centers of breeding activity) in Moffat, Routt and Rio Blanco County, which is one the three largest remaining populations in the United States. They have increased in recent years due to availability of suitable habitat on lands placed in the Conservation Reserve Program and lands reclaimed from coal mining.

Western snowy plover. This is a rare spring migrant that has been recorded regularly (13 dates) from Rio Blanco Lake. There are no fall seasonal records from Colorado. There are 25 to 30 spring seasonal records from western Colorado. They occur on shorelines, sandbars and mudflats of lakes and large rivers.

Mountain plover. This species is a casual summer resident and spring and fall migrant. Several mountain plovers summered in Mormon Gap area along the Colorado/Utah state line in 1979-1980. When found in western Colorado, they are typically observed in flat areas of sparse desert shrublands and grasslands, usually in prairie dog towns.

Black tern. This is an uncommon spring migrant, rare fall migrant, and casual summer visitor. There are a number of spring records from Rio Blanco Lake and Divide Creek Reservoir. Migrant birds usually occur in flocks of 2 to 6. There is only one record of nesting in Colorado, from the Yampa River 8 miles north of Elk Springs in Moffat County. They primarily occur near larger ponds and reservoirs during migration.

American peregrine falcon. As of 2002, there were more than 100 nesting pairs of peregrine falcons in Colorado. Peregrines nest on cliffs and often near water, and they winter near riparian areas. Suitable habitat occurs along much of the White River Valley. Prior to 2007 there were no known peregrine nest sites within the planning area outside Dinosaur National Monument.

Persistent peregrine activity near the mouth of Piceance Creek over the last 8 years culminated in BLM documenting a breeding effort here in 2007.

Greater sandhill crane. About 100 pairs nest in western Colorado, primarily in Rio Blanco County near Meeker and in Routt County. Eight sandhill crane nests were recorded in 1997 and 1998 near Meeker and Milk Creek, on private agricultural land. Activities of the breeding population are concentrated in these areas, and on private and USFS holdings along portions of the upper White River and Lost Creek. BLM documented successive years nesting effort (2002-2004) at a single site on an isolated BLM parcel within the White River National Forest.

The entire Rocky Mountain population of about 18,000-20,000 birds migrates across the planning area during the spring and fall. Large autumn flights are consistently observed in western Rio Blanco County, particularly across Douglas Pass. Small groups of cranes make regular short-term use of irrigated meadows, sheetwater flats, broader drainage bottoms, and reservoir margins. Spring migration occurs primarily between mid-April and the end of May, and fall migration from mid-September to early December.

Long-billed curlew. This is a rare spring migrant and casual fall migrant in the planning area. BLM has records for shoreline habitat at Rio Blanco Lake, irrigated hayland in Piceance Creek, and the saltbush communities of Coyote Basin and lower Wolf Creek.

White-faced ibis. This is a common spring migrant in suitable habitat, especially the White River Valley. They occur in shallow pond and lake margins, and in irrigated hayland and wet meadows. Although a few ibis may be present in the summer, they primarily occur in April and May, and in August and September.

Mammals

Townsend's big-eared bat. This species occurs in a range of shrub and forest habitats, and roosts in abandoned mines and caves. They may occur in most of the planning area.

Spotted bat. This species is reported to in the Blue Mountain area and along the Yampa River in Dinosaur National Monument, and may occur in other areas such as the lower White River. They occur in arid canyons, cliffs, and riparian areas, and roost in cracks and crevices in rocky cliffs.

Wolverine. The current status of wolverine in Colorado is uncertain, however, unverified sightings persist from the central mountains. Ruggiero et al. 1994 presents information indicating that pre-settlement wolverine distribution at the southern edge of their range was likely limited to montane boreal regions. There are historical records from lower elevation

locations in the planning area, including the Grand Hogback and Danforth Hills, and several recent records (e.g., Blue Mountain). However, the Central Rocky Mountain Basins ecoprovince, which encompasses essentially all BLM-administered lands within the planning area, was specifically identified as a gap in historic wolverine distribution despite occasional records that likely represent subadult dispersal.

River otter. River otters occur along the Yampa River where it borders the planning area, and in the lower part of the White River, downstream from about Coal Ridge. Their habitat is large streams and lakes with fish.

Fringed myotis. This species occurs in conifer forest and shrubland. It forages near water and roosts in rock crevices and cliff walls. It is potentially present in much of the planning area.

Yuma myotis. This bat occurs in low elevation canyonlands and mesas. It forages in riparian zones, and roosts in rock crevices, buildings, caves, mines and swallow nests. It is most likely to occur along the lower White River and Yampa River.

Reptiles and Amphibians

Boreal western toad. This species occurs in marshes, wet meadows, streams and lakes, mostly at elevations of 8,500 to 11,500 feet and is likely to occur primarily on the White River National Forest. There are historic records and potential habitat in the Flat Tops Wilderness and upper White River. There are no known current breeding sites, but there are reports of toad observations in recent years, mostly from the Trappers Lake area, suggesting that one or more breeding sites may be located in this area (Livo and Loeffler 2003). No boreal toads are known to exist on BLM-administered lands within the planning area.

Northern leopard frog. This species occurs in permanent waters and associated wetland and moist upland vegetation. They are known to be well distributed along several of the lower elevation perennial and intermittent streams in the planning area, including the lower White River, Piceance Creek, Crooked Wash, Yellow Creek and Black's Gulch.

Great Basin spadefoot toad. This species occurs in pinyon/juniper woodlands, sagebrush and semi-desert shrublands at elevations below 7,000 feet, along canyons and stream floodplains. Breeding occurs in temporary pools, intermittent streams and pools formed by floodwaters along permanent streams, particularly those that support little vegetative cover along the margins. A small number (3) of Great Basin spadefoot toads have been recorded at widely scattered locations in the planning area. Although eggs hatch within days of laying and larvae develop quickly, the toads require waters that persist for at least 40 days for complete larval development. There is no evidence that this species was ever abundant or well distributed in the planning area.

Although occurring with some regularity across the Utah border, efforts by BLM to locate calling toads in the planning area's saltbush desert communities have not been successful to date.

Midget faded rattlesnake. The midget faded rattlesnake is a rare subspecies of the western or prairie rattlesnake. Differentiating this subspecies from the nominate form is difficult as the planning area apparently constitutes a zone of intergradation. This subspecies is thought to be generally confined to the Green River geologic formation in southeast Wyoming, eastern Utah and western Colorado, and appears to prefer rock outcrops encompassed by sagebrush communities. Midget faded rattlesnakes exist in small isolated groups and may exhibit classic metapopulation distribution.

Fish

Bluehead sucker. This species occurs in a wide range of habitats from headwater streams to large rivers, in areas of moderate to fast current and rocky substrate (Woodland 1985). Within the planning area, they are believed to be restricted to the White River and its larger tributaries, and the Yampa River.

Flannelmouth sucker. This species is generally restricted to larger streams and rivers, where it occurs in all habitat types including riffles, runs, eddies, and backwaters (Woodland 1985). It is present in the White and Yampa Rivers. Recent collections have documented the fish from Piceance Creek and most of its major tributaries, as well as lower Yellow Creek and Crooked Wash.

Mountain sucker. Mountain suckers occur in smaller rivers and streams, with gravel, sand and mud bottoms, in areas with undercut banks, eddies, small pools, and areas of moderate current (Woodland 1985). They are present and often among the most frequently collected fish in the White River, Yellow Creek, and in Piceance Creek and some of its tributaries, including Black Sulphur Creek, Fawn Creek, and Willow Creek.

Plains topminnow. This small minnow is native to the Great Plains, but is also present in the White River, where it is likely to be introduced rather than native. They occur in areas with abundant filamentous algae and still, clear water. It may also occur in stockponds and in larger perennial streams throughout the planning area.

Roundtail chub. This species occurs in larger rivers including the White and Yampa Rivers, in slow-moving waters adjacent to areas of faster water.

Colorado River cutthroat trout. This subspecies of cutthroat trout is affected by loss of habitat and hybridization with non-native trout. It is currently undergoing a 12-month review process by

USFWS in response to a petition for listing of the subspecies as threatened or endangered. As part of the review, a peer review will be completed for a range-wide status assessment conducted in 2005 (Hirsch et al 2006). This subspecies historically occurred in western Colorado, western Wyoming, eastern Utah, and northwestern New Mexico, with more than half of the historic habitat located in western Colorado. The planning area is located in one of the eight geographic management units evaluated in the status review, and includes three watersheds where Colorado cutthroat trout have historically occurred.

- The Upper White River has 75 miles of currently occupied streams, and more than 600 miles of historic stream miles. Most of the occupied streams are located on the White River National Forest, and the only stream on BLM land is Big Beaver Creek. Big Beaver Creek is reported to have a population of 151 to 400 fish per mile^s, of mostly cutthroat origin, and with good quality habitat. The BLM portion of the stream is short (about 0.5 mile), and Big Beaver Creek is managed mostly by the Forest Service. Other streams in this watershed with Colorado River cutthroat trout include Fawn Creek, Lost Creek, Hahn Creek, Snell Creek, Little Skinny Fish Creek, Marvine Creek, and Trappers Lake.
- The Piceance-Yellow Creek Watershed has 8 miles of currently occupied stream, and 62 miles of historic stream habitat. The only extant population is located along 8 miles of Black Sulphur Creek. There are reported to be 50 to 150 fish per mile, of hybrid origin, in a stream with fair habitat quality. The Black Sulphur Creek occurrence is identified as a conservation population because of unique life history. BLM manages 3.6 miles of this creek.
- The Lower White River watershed has 16 miles of currently occupied stream habitat and 81 miles of historic habitat. Colorado River cutthroat trout occupy several streams on BLM lands in the Douglas Creek drainage, including East Douglas Creek, Bear Park Creek, Bitter Creek, Cathedral Creek, Lake Creek, the Right Fork of Lake Creek, and Soldier Creek. Specific information on these streams is not presented in Hirsch et al 2006. These small headwater streams are generally in fair condition with static or improving trends, and although they persist in supporting self-sustaining populations of cutthroat, they all tend to suffer the effects of high channel gradients, low flow volumes, and bank vegetation that is not fully capable of resisting erosion events (Map 2-15).

Plants

Park rockcress. This species is endemic to Uintah County, Utah and Moffat County, Colorado. It occurs on limestone and sandstone outcrops in mixed desert shrub and pinyon/juniper

communities in Dinosaur National Monument. There are no known locations on BLM lands in the planning area.

Debris milkvetch. This species occurs in pinyon/juniper and mixed desert shrub communities, on alluvial terraces with cobbles, at elevations of 5,400 to 7,200 feet. It has been found at a number of small sites in the north half of the planning area, including sites near Massadona, Elk Springs Draw, School Gulch south of the White River, at Raven Ridge, and near Meeker.

Ligulate feverfew. Ligulate feverfew occurs on barren shale exposures of the Parachute Creek Member along Raven Ridge. Potential habitat also occurs along the White River just west of Raven Ridge and perhaps in Lower Evacuation Creek. There are no recorded locations on BLM lands in the BLM database.

Rollins cryptanth. Rollins cryptanth occurs on exposures of the Parachute Creek Member of the Green River Formation at elevations of 5,300 to 5,800 feet. It occurs along Raven Ridge in the Raven Ridge ACEC, and at one site in the Blue Mountain area. Potential habitat also occurs along the White River just west of Raven Ridge and perhaps in Lower Evacuation Creek.

Ephedra buckwheat. Ephedra buckwheat occurs on sparsely vegetated white shale outcrops of the Parachute Creek Member, mostly along Raven Ridge. Several occurrences of this species are located within the Raven Ridge ACEC.

Utah gentian. Utah gentian occurs in barren shale knolls and slopes of the Green River Formation, at several sites on the Cathedral Bluffs, the only known Colorado locations for this species. These sites are located within the Cathedral Bluffs ACEC.

Narrowstem gilia. This species occurs on silty to gravelly loam soils derived from the Green River or Uintah Formation, in grassland, sagebrush, mountain mahogany, or pinyon/juniper communities, at 5,000-6,000 feet elevation (Spackman et al. 1997). In the planning area, it has been observed in the lower part of Greasewood Creek and near Blue Mountain. The sites in lower Greasewood Creek are located within the Lower Greasewood ACEC.

Piceance bladderpod. Piceance bladderpod occurs on exposures of the Parachute Creek Member at elevations above 7,000 feet. It has been located at more than 20 sites around the rim of the Piceance Basin, on the eastern edge along Deer Gulch and Timber Gulch, on the western edge of the basin along Calamity Ridge, and on the southern edge along Cathedral Bluffs and the Roan Plateau.

Narrowleaf evening primrose. Within the planning area, this species is only known from the Blue Mountain area, where it occurs in intermittent shallow soil drainages above 7,000 feet

elevation. The drainages have fractured sandstone beds exposed in many areas, which creates a moist habitat associated with seeps or late spring flows. Only one occurrence is known from BLM lands within the planning area.

Hoary phacelia. This is a delicate annual that occurs in the early spring on desert hills (Weber and Wittman 2001). Although only known from Rio Blanco County in Colorado, it also occurs in Montana, Idaho, Nevada, and Utah. It has been reported from the Raven Ridge ACEC, but there are no known locations on BLM lands in the BLM database.

Trends

Populations of federally listed threatened or endangered species are expected to remain stable due to protections provided by the Endangered Species Act, or to increase from recovery activities. Bald eagle populations have increased greatly since listing of the species. Black-footed ferret reintroduction efforts are expected to continue until a self-sustaining population is established in the Wolf Creek management area. The four Colorado River fish species are supported by various recovery activities. However, recovery of Colorado pikeminnow in the White River above Taylor Draw Dam is unlikely, because the dam blocks fish migration. Populations and habitats of Dudley Bluffs bladderpod and Piceance twinpod are expected to remain intact.

Trends for other special status species are variable. Some species, such as greater sandhill crane and river otter are increasing in the planning area, and many appear to have stable populations such as the small native fish. Distribution, abundance, and habitat preference information for several BLM sensitive species (e.g., bats, herptiles) is poorly developed and requires refinement. In general, none of the special status species exhibit a range-wide trends that would lead to listing, with the possible exceptions of Colorado River cutthroat trout which is currently undergoing a 12-month review by USFWS, and greater sage grouse, which the USFWS found was not warranted for listing in 2005.

Populations and habitats of some of some sensitive species may be adversely affected by increasing resource extraction and industrial activity, and without appropriate attention could result in a trend toward listing as endangered or threatened. Existing protections may not be adequate to maintain some species in areas of more intensive development. Species associated with sagebrush and pinyon/juniper ecosystems may have the highest potential to be affected because these habitats occupy large portions of the planning area and much of the development will occur in them. In Colorado's Comprehensive Wildlife Conservation Strategy (CDOW 2005), sagebrush shrublands in Colorado were rated as poor and declining habitat conditions for birds and amphibians and reptiles and pinyon-juniper woodlands were rated as having poor and

declining habitat conditions for birds. Threats to these habitats include habitat conversion, fragmentation, invasive species, roadways, and resource extraction. Species or groups most likely to be affected include greater sage grouse, native fish, amphibians, and midget faded rattlesnake.

Forecast

Increasing industrial development in the planning area could increase pressure on some federally listed and candidate species and their habitats. Since these species are protected under the Endangered Species Act, federally approved developments would be subject to review under the Act, and to implementation of conservation measures to protect the species and their habitats. Because of these protections, significant impacts that would jeopardize the populations would not occur. However, additional or more rigorous conservation measures may be needed for some species or populations in order to avoid or offset direct or indirect effects of development.

Special status plants are likely to maintain their populations because occurrences can typically be avoided during siting of facilities on BLM land. Similarly, impacts to species that occur in relatively rare habitats can generally be avoided during facility siting. Special status fish are at risk from changes in water quality or flow patterns, and west slope streams are rated as declining in Colorado's Wildlife Conservation Strategy.

Key Features

Seven endangered or threatened animal species are known to occur in the planning area, including black-footed ferret, Canada lynx, and four Colorado River fish species. The only threatened or endangered species on BLM land include bald eagle, black-footed ferret, and Colorado pikeminnow. The presence of black-footed ferret is associated with a reintroduction program. Two federally threatened plant species are endemic to the planning area, Dudley Bluffs bladderpod and Piceance twinpod, and one candidate species, White River beardtongue, occurs on the periphery of the planning area, extending into Utah. Most of the occurrences of the plant species are on BLM land, and many of them are within a few ACECs.

Other special status species include BLM sensitive species and Colorado state listed species. Four special status bird species occur regularly and nest on BLM lands in the planning area, including northern goshawk, burrowing owl, ferruginous hawk, and greater sage-grouse. Eight other bird species nest on non-BLM lands in the planning area, or are seasonal migrants. Special status mammal species that are likely to occur regularly include Townsend's big eared bat, spotted bat, river otter, fringed myotis, and Yuma myotis. One additional mammal species, wolverine, is unlikely to occur on BLM lands. All six species of special status fish and ten species of special status plants are known to occur on lands managed by the BLM in the planning

area. Some of the fish occur only in the White River, while others, such as Colorado River cutthroat trout, are associated with small headwater streams. The majority of streams on BLM lands have one or more special status fish species in them. The special status plant species are globally restricted in distribution or vulnerable and are rare in Colorado, with relatively few occurrences in the planning area. Most have restricted habitats and occupy very small areas within the planning area.

2.2.9 Wild Horses

Indicators

Indicators include allotment evaluations, stream and vegetation monitoring, wild horse census and population projection data, applicable research studies, data from horse gathers, and other field observations.

Current Conditions

Wild horse management within BLM-administered lands of the WRFO planning area follows the Wild Free-Roaming Horses and Burros Act of 1971, as amended (Public Law 92-195) and 43 CFR 4700 (Protection, Management, and Control of Wild and Free-Roaming Horses and Burros). The 1975 *White River Resource Area Management Framework Plan* (MFP) identified two wild horse units: the Piceance Basin Herd Unit and Douglas Creek Herd Unit. The Douglas Creek Herd Unit included what is now the East Douglas portion of the Piceance/East Douglas Herd Management Area (HMA) and the West Douglas Herd Area (HA). The East and West Douglas areas were physically separated by completion of SH 139 right-of-way (ROW) fence in 1983. In 2005, BLM completed the *West Douglas Herd Area Plan Amendment* to the 1997 White River ROD/RMP to discontinue maintaining the wild horse population in the West Douglas HA. The wild horses are presently distributed among three wild horse units, the Piceance-East Douglas Creek HMA and the West Douglas and North Piceance HAs. A wild horse management plan for the Piceance-East Douglas HMA was approved in June 1981.

Wild horses presently occur in and are presently managed on a total of 357,850 acres of BLM land in the WRFO planning area (Map 2-20 and Table 2-26). Appropriate management levels (AMLs) for wild horses and burros are established in accordance with the 1975 MFP and objectives and management actions through Multiple Use Decisions. Multiple Use Decisions establish the minimum and maximum number (AML) of wild horses to be managed within each grazing allotment contained within an HMA or HA. Annual monitoring data are collected to evaluate progress toward meeting management objectives. AMLs are established based on “an intensive monitoring program involving studies of grazing utilization, trend in range condition, actual use, and climatic factors” (109 Interior Board of Land Appeals [IBLA] 120). The AML,

objectives, and management actions may be modified in future Multiple Use Decisions for the grazing allotments contained within an HMA. Wild horses that establish home ranges outside of HMA or HA boundaries are removed during gathers. Wild horses are removed from private lands at the request of the landowner and after reasonable efforts to keep the animals off private lands have failed.

Table 2-26
Wild Horse Herd Management and Herd Areas

Herd Management Area and Herd Areas	Acres				AML # for HMAs
	BLM	CDOW	Private	Total Acres	
Piceance-East Douglas HMA ¹	158,214	7,997	23,832	190,043	95-130
West Douglas HA	123,366	0	4,781	128,147	0
North Piceance HA	76,270	0	13,015	89,285	0
Total	357,850	7,997	41,628	407,475	95-130

SOURCE: BLM 2005a.

NOTE: ¹ Includes Greasewood Addition

Trends

Current conditions within the WRFO planning area show that wild horse populations continue to grow, with a number of HMAs exceeding AMLs (**Error! Reference source not found.**). The estimated population of wild horses was 356 in the fall of 2006 and 304 by fall of 2007.

Continued drought, past heavy grazing, wildfires, and population growth have adversely affected habitat and in some instances herd health. The trend for wild horses, however, is moving toward a desired condition as wild horse management efforts, including horse gathers to attain AMLs and fertility control methods, have moderated population growth and habitat degradation.

During 2007, fertility control was used on 28 mares that were returned to the Piceance-East Douglas HMA. Meeting standards for rangeland health have also improved habitat in most areas.

Table 2-27
Wild Horse Populations in Herd Management and Herd Areas

Population History	Herd Management or Herd Area			
	North Piceance HA	Piceance-East Douglas HMA	West Douglas HA	Outside HMA or HA ¹
Fall 1996	31	525	155	85
Spring 1997	31	286	95	55
Fall 1997	37	208	114	66
Fall 1998	42	242	65	10
Spring 1999	42	242	65	10
Fall 1999	14	198	78	12
Fall 2000	37	343	114	66
Spring 2002	39	294	77	44
Fall 2002	15	202	92	13
Fall 2003	17	242	111	16
Fall 2004	18	291	133	19

**Table 2-27
Wild Horse Populations in Herd Management and Herd Areas**

Population History	Herd Management or Herd Area			
	North Piceance HA	Piceance-East Douglas HMA	West Douglas HA	Outside HMA or HA ¹
Spring 2005	Not Censused	Not Censused	Not Censused	97
Fall 2005 ²	55	349	160	45
Spring 2006 ²	25	363	Not Censused	27
Fall 2006 ²	8	216	102	30

SOURCE: BLM WRFO GIS.

NOTES:

⁽¹⁾This area includes all of the wild horses in the Douglas Creek Basin area outside of the Piceance-East Douglas HMA.

⁽²⁾ Population for these periods is based on projections.

HA = herd area

HMA = herd management area

Forecast

Based on the assumption that funding for future wild horse gathers is sufficient, management actions to reach AMLs for the HMA and HA would be achieved. This would stabilize populations and habitat degradation, achieving desired future conditions.

Key Features

The key features of the wild horse herd in the planning area are their free roaming nature and their appearance. Horses in the planning area are likely to be descended from early explorers, settlers and North American breeds. Most horses in this area are dark colored, mostly bay, sorrel, brown, black and a few gray. The horses range from 14 to 14.2 hands and weigh between 700 and 800 pounds mature weight.

2.2.10 Wildland Fire Ecology and Management

Fire regime is an indicator of the role wildfire plays in an ecosystem. A fire regime is a combination of factors including fire frequency, predictability, intensity, seasonality, and extent characteristic of fire in an ecosystem. There are many ways to classify fire regimes. They can be based on the characteristics of the fire itself or on the effects produced by the fire (Agee 1993).

The five historic fire regimes (HFR) referred to in this section are classified based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation (Table 2-28).

Table 2-28
Historic Fire Regime Characteristics

Historic Fire Regime	Characteristics
I	0-35 year frequency and low (surface fires most common) to mixed severity (less than 75% of the dominant overstory vegetation replaced)
II	0-35 year frequency and high (stand replacement) severity (greater than 75% of the dominant overstory vegetation replaced)
III	35-100+ year frequency and mixed severity (less than 75% of the dominant overstory vegetation replaced)
IV	35-100+ year frequency and high (stand replacement) severity (greater than 75% of the dominant overstory vegetation replaced)
V	200+ year frequency and high (stand replacement) severity

SOURCE: FRCC 2007.

Wildfires in the WRFO planning area were either HFR III or IV. This means that wildfires generally occurred every 35-100 years. In some areas (HFR III), very little of the dominant overstory vegetation was replaced. In other areas (HFR IV), most of the dominant overstory vegetation was replaced. The distribution and extent of historic fire regimes in the WRFO are displayed on Map 2-21 (Historic Fire Regimes).

Current fire regime condition class (FRCC) indicates the degree of departure from the historic regime (Hann and Bunnell 2001) (Table 2-29). The classification is based on a relative measure describing the degree of departure from the historic natural fire regime in terms of either fire frequency or stand replacement. Extreme departure from the HFR results in changes to one or more of the following ecological components: vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated disturbances (e.g., insect and diseased mortality, grazing, and drought).

Table 2-29
Fire Regime Current Condition Classes

Condition Class	Attributes
Condition Class 1	<ul style="list-style-type: none"> • Fire regimes are within or near an historical range. • The risk of losing key ecosystem components is low. • Fire frequencies have departed from historical frequencies by no more than one return interval. • Vegetation attributes (species composition and structure) are intact and functioning within an historical range.
Condition Class 2	<ul style="list-style-type: none"> • Fire regimes have been moderately altered from their historical range. • The risk of losing key ecosystem components has increased to moderate. • Fire frequencies have departed (either increased or decreased) from historical frequencies by more than one return interval. This results in moderate changes to one or more of the following: fire size, frequency, intensity, severity, or landscape patterns. • Vegetation attributes have been moderately altered from their historical range.

**Table 2-29
Fire Regime Current Condition Classes**

Condition Class	Attributes
Condition Class 3	<ul style="list-style-type: none"> • 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, frequency, intensity, severity, or landscape patterns. • Vegetation attributes have been significantly altered from their historical range

SOURCE: FRCC 2007.

Fire regime alteration over time and space is vitally important to managing wildfire. HFR may be thought of as a backdrop against which current FRCC is described. An area can be described in terms of its HFR (Map 2-21) and its current FRCC (Table 2-29) to help understand fire’s role in the ecosystem. Restoration of HFR may, or may not be a goal within a particular area due to social and political constraints. However, by delineating FRCC within the context of HFR, land managers may be better able to predict fire extent, severity, intensity, and effects.

Current Conditions

Most of the WRFO planning area (72 percent) is in the FRCC 2 category. The remaining 28 percent of the planning area is in the FRCC 3 category. None of the planning area is in the FRCC 1 category (Map 2-22, Fire Regime Condition Classes).

The WRFO manages wildfire and fuels by categorizing certain areas into Fire Management Unit (FMU) polygons. Resource specialists delineate each FMU according to several characteristics including: (1) FRCC category (2) natural disturbance patterns based on fire history data and physical features such as land forms and vegetation; (3) areas of concern and limitations for fire management activities; (4) areas where wildland fire might be desired; (5) areas where use of wildland fire may be desirable but the threat to private property and life would preclude wildland fire use (WFU), such as in wildland-urban interface areas; (6) developed sites, such as recreational and cultural sites where any type of fire was not desired. The landscape of the WRFO is categorized into one of four FMU Categories (**Error! Reference source not found.**). The geographical extent of each FMU in the WRFO is displayed on Map 2-22.

**Table 2-30
Fire Management Unit Categories**

Category	Appropriate Management Response Strategy	WFU
A: Wildfire and prescribed fire not desired.	Full Suppression response utilizing Direct Strategy.	No
B: Wildfire not desired due to social, political and resource value protection. Prescribed fire desired.	Suppression oriented response utilizing Direct or Perimeter Strategy. Prescribed fire used to reduce fuels and to maintain ecosystem health.	No

Table 2-30
Fire Management Unit Categories

Category	Appropriate Management Response Strategy	WFU
C: Wildland fire desired but some constraints limit fire use potential. Limited prescription.	Conditional response utilizing Direct, Perimeter or Prescriptive Strategy.	Yes, limited prescription
D: Wildland fire desired with few constraints to limit fire use.	Unconditional response with emphasis on Prescriptive Strategy	Yes

SOURCE: USFS and USFWS 2006.

NOTE: WFU = Wildland Fire Use

Specific information about each FMU is displayed in Table 2-31. The FMU Category column in Table 2-32 corresponds to the polygon labels on Map 2-22.

Table 2-31
Fire Management Units in the White River Field Office

FMU Category	FMU Name	Historic Fire Regime	Fire Regime Condition Class	Suppression Priority	WFU	Fuels Treatment Priority	Resource Priorities	Community Assistance / Protection
B1	Blue Mountain	III	2	High	No	High	V	High
B2	Elk Springs	III	2	High	No	High	O; P	High
B3	Salt Desert Shrub	III	3	High	No	Low	V; S	Moderate
B4	Crooked Wash/ Indian Valley	III	2	High	No	Moderate	O; C; SG	High
B5	Douglas Creek	IV	3	High	No	Moderate	O; C	Moderate
B6	Yellow Creek	IV	2	High	No	High	C; TE	Moderate
B7	Piceance Creek	IV	3	High	No	Moderate	PL; TE	Moderate
B8	Magnolia	III	3	High	No	High	O	Moderate
B9	Meeker East	III	3	High	No	Low	PL	Moderate
B10	White River	III	2	High	No	Moderate	PL; V	Moderate
C1	Baking Powder/ Pinion Ridge	IV	2	Moderate	Yes	Moderate	C; S	Low
C2	Spooky Mountain	III	2	Moderate	Yes	Moderate	M	Moderate
C3	Spring Creek/ Big Ridge	IV	2	Moderate	Yes	Moderate	O; U	Moderate
C4	Rabbit Mt./ Dragon Trail	IV	2	Moderate	Yes	Moderate	O	Moderate
C5	Greasewood Creek	IV	2	High	Yes	Moderate	O; V	Low
C6	Lower Piceance Basin	IV	2	Moderate	Yes	Moderate	O; V	Moderate
C7	Evacuation/ Missouri Creeks	IV	2	Moderate	Yes	Moderate	O; C	Low
C8	Baxter/Douglas Pass	IV	2	Moderate	Yes	Moderate	V; R	Low
C9	Danforth Hills	IV	2	Moderate	Yes	Moderate	O; U	Moderate
C10	Fletcher	IV	2	Moderate	Yes	Moderate	O; U	Moderate

**Table 2-31
Fire Management Units in the White River Field Office**

FMU Category	FMU Name	Historic Fire Regime	Fire Regime Condition Class	Suppression Priority	WFU	Fuels Treatment Priority	Resource Priorities	Community Assistance / Protection
D1	Blue Mt./ Dinosaur Boundary	IV	2	Low	Yes	Low	-	Low
D2	Bull Canyon/ Skull Creek WSAs	IV	2	Low	Yes	Low	-	Low
D3	Citadel/Gray Hills	IV	2	Low	Yes	Low	-	Low
D4	Little Hills	IV	2	Low	Yes	Low	U	Low
D5	Cathedral Bluffs/ Roan Plateau	IV	2	Low	Yes	Low	U; R	Low

SOURCE: USFS and USFWS 2006.

NOTES:

WFU = Wildland Fire Use. Resource Priorities Classified as follows: O- Oil and Gas; C – Cultural; V – Vegetation;

P – Private Lands; S – Soils; SG – Sage grouse; TE – Threatened & Endangered Species Habitat; M – Mining; U – Utilities;

R – Riparian Habitat; W – Wilderness Study Areas

Rio Blanco County is among the top three highest counties in Colorado for probability of wildfire (Neuenschwander et al. 2000). Rio Blanco County conducted an emergency preparedness review that evaluated risk of wildland fire through geographic information systems analysis (Rio Blanco County [RBC] 2003a). This analysis involved overlaying fuels with community features, such as homes, oil and gas wells, roads, industrial facilities, electrical lines and wildlife habitat. The analysis revealed that electrical transmission lines that service mining, industrial, and oil and gas facilities had the most significant exposure to risk of wildland fire hazard in the county. Therefore, the county identified power line protection as a high priority in their Strategic Wildland Fire Management Program (RBC 2003b).

Resources of special significance are considered in wildfire management. Priorities will depend on the resource in question. Sensitive cultural sites or wildlife habitats may require minimum impact suppression techniques (MIST) be employed during suppression operations in order to avoid resource impacts. Further, these sites may be precluded from certain fuel treatments (mechanical or chemical) that have the potential to damage sensitive resources.

Trends

Fire History – Western portions of the NWCFMA (BLM’s Little Snake Field Office, White River Field Office) have moderate to high frequency of fires, averaging 251 fires and burning an average of 8,500 acres per year (USFS and USFWS 2006). The western zones of the NWCFMA have a high incidence of ignitions resulting generally from the weather and fuel conditions.

Frequent dry summer storms introduce lightning to an environment with dry vegetation. HFR in the area range from moderately long to frequent fire return intervals.

The fuel structure is gradually changing in portions of the WRFO due to management practices and incursion of non-native annual grasses, primarily cheatgrass (*Bromus tectorum*) (USFS and USFWS 2006). Fire frequency and size are increasing in low elevation shrub communities (sagebrush and salt desert shrub types) where cheatgrass becomes established because it provides a more continuous surface fuel than the historic vegetation community. In areas where fuels are continuous, fire spreads rapidly during the fire season. The fire season normally begins in late April and runs through early November with peak fire season occurring between May 1st and August 31st.

In the higher elevation sagebrush communities where mountain sagebrush (*Artemisia tridentatae vasayena*) often intermingles with early seral pinyon juniper, a combination of factors other than cheatgrass altered current FRCC. Under HFR I or II, relatively frequent wildfires promoted the mortality of pinyon juniper and regrowth of herbaceous vegetation in following years. Sagebrush moved in gradually afterwards as wildfire maintained a mosaic pattern of vegetation that displayed low incidences of pinyon juniper. Historic grazing practices reduced the herbaceous grasses and forbs which had historically carried wildfires through these communities. Meanwhile, fire suppression encouraged pinyon juniper, a species that does not tolerate fire. Without wildfire, pinyon juniper can create a canopy over low growing shrubs and grasses, effectively shading them out. This increase in woody vegetation and reduction in fine fuels do not carry wildfire as well. Therefore, fire extent has decreased and fire frequency has lengthened in some of these communities.

Fire suppression has not altered fire regimes in the late seral pinyon juniper (>100 years old). The growth form of this community creates a stand replacement fires that occur very infrequently, so recent fire suppression activities have not affected fire frequencies, extents, or severity in this woodland type.

In some ponderosa pine and Douglas fir forest types of the WRFO, fire suppression has altered fuel structure over time. Under historic conditions, relatively frequent wildfire of low intensity maintained a forest with little ladder fuels and a high canopy openness ratio. Wildfires rarely reached the forest canopy and if they did, they did not carry through the canopy due to a lack of continuity. Thirty years of effective fire suppression has increased the presence of ladder fuels in some of these forests and the tree canopy has become more continuous. In these instances, there is a greater probability of higher intensity stand replacement fires that occur less frequently. However, this alteration is not likely to result in a loss of key ecosystem components as indicated by the lack of FRCC 3 throughout the planning area. It should be noted that the ponderosa pine

and Douglas fir forest types of the WRRRA are relatively small. They have always displayed a high incidence of pinyon juniper which extended their historic fire regime relative to a “classic” ponderosa pine and Douglas fir forest (HFR 1).

Fire Occurrence – The NWCFMA averaged 270 fires during the 12 year period of 1993-2004, per year, burning 12,307 acres annually (USFS and USFWS 2006) (Table 2-32). Approximately 98.4 percent of these wildfires are Size Class A, B, C and D incidents (less than 300 acres in size).

Table 2-32
Fire Size Classes within the NWCFMA from 1993 to 2004

Size Class	A	B	C	D	E	F	G
# Fires	977	332	50	9	15	6	1
# Acres	117	547	1,486	1,568	6,151	13,094	73,121

SOURCE: USFWS 2006.

NOTES:

As to size of wildfire: Class A - one-fourth acre or less; Class B - more than one-fourth acre, but less than 10 acres; Class C - 10 acres or more, but less than 100 acres; Class D - 100 acres or more, but less than 300 acres; Class E - 300 acres or more, but less than 1,000 acres; Class F - 1,000 acres or more, but less than 5,000 acres; Class G - 5,000 acres or more.

Range of Potential Fire Behavior – The most critical fire conditions for the NWCFMA begin as early as mid June in the west and can last until widespread fall moisture occurs. Historically the largest fire events have been wind driven, especially in the brush types and pinion juniper. Canopy dominated fires have occurred particularly during very dry years and in the older stands of pinyon/juniper as well as the mixed conifer stands on the White River Forest. Rates of fire spread through the canopies of sagebrush can exceed 3 miles per hour, while spread through mixed conifer and pinyon/juniper stands of 0.5 mile per hour are not uncommon (USFS and USFWS 2006). Years with better than average moisture tend to keep the light fuels, usually grasses, green, which helps to curtail fire spread. The incursion of annual grasses, like cheat grass, are changing the fire environment. Light fuels available to burn through the height of the fire season are becoming more abundant by way of the species morphology.

Forecast

The primary drivers of fire frequency, fire size, severity, and intensity in the WRFO will continue to be weather, vegetation, topography and human interaction with the environment. The only drivers of wildfire which will be managed effectively in the WRFO are vegetation and human interaction. Natural and human caused fires will continue throughout the planning area. Although, the probability for human cause ignitions will increase as population increases, lightning will continue to be the primary driver for ignitions throughout the area. The majority of natural fires will be ignited by lightning every year from May to September. The size of these fires will depend on weather, topography, fuel characteristics, and management. Changes in the

structure and function of vegetation communities in the WRFO will be a major factor in how wildfire interacts in the WRFO.

An increase in roads and surface disturbance may affect wildfire frequency by facilitating establishment of invasive vegetation. Wildfires in the low elevation shrub-grassland vegetation types (sagebrush and salt desert shrub) may begin to occur more frequently where invasive annual vegetation (e.g., cheatgrass, noxious weeds) becomes established. Fire frequency and size in high elevation shrub sagebrush (*Artemisia vaseyana*) and mountain shrub communities is not as likely to be affected by invasive herbaceous vegetation so wildfire in the upper elevation shrub types would not be affected.

Fire frequency and severity in ponderosa pine and Douglas fir forest types is likely to remain skewed from the natural HFR as a result of previous fire suppression policies. Wildfire in these vegetation types is likely to be more severe than under historic fire regimes due to an accumulation of surface fuels and existing fuel structure (e.g., ladder fuels, continuity).

In areas where pinyon juniper has recently expanded into high elevation shrub communities, fire frequency is likely to lengthen as fine fuels are reduced. However, mature stands of pinyon juniper (>100 years old) are not affected.

Fuels treatments will begin to restore the historic fire regime in localized areas of these vegetation types. Fire frequencies treated areas will be more likely to resemble the historic natural fire regime, especially in those FMUs where WFU is considered appropriate, and prescribed fire is implemented. Fire severity may decrease in these areas to the extent that wildfire is introduced back into high elevation woodland and sub-alpine forest vegetation types. Fuels treatment activities could accelerate a return to HFR in high elevation woodland vegetation types where mechanical, biological, or chemical treatments accelerate an alteration of vegetation structure back to historic structure and fire is allowed to play a role in the ecosystem.

Wildland urban interface (WUI) areas could increase over the next 20 years if residential areas in the WRFO expand or increase. Fire suppression and fuels treatment priority areas could change to the extent that WUI areas increase in number and size over the next 20 years. The potential for human caused ignitions in new and existing WUI areas as well as new industrial areas is likely to increase as a result of human activities. Expect more communities to be listed on the Federal Register as communities at risk, as these communities complete community wildfire protection plans. As this designation process moves forward, more funding could be available for WUI fuels reduction projects and rural firefighting departments could be expanded. Community assistance firefighting programs could be enhanced as a result.

The need to control hazardous fuels and prevent wildfire ignitions around energy development infrastructure and facilities is likely to increase in the WRFO. Energy development will affect the management of fire and fuels in the following ways:

- Fuel build up around infrastructure and facilities (e.g., high-power electric lines)
- Flammability of infrastructure and facilities (e.g., wooden poles used for suspended transmission lines).
- Risk of fire damage to infrastructure and facilities
- Firefighter safety zones may be reduced in development areas. Firefighter safety affects the ability to fight fire in the vicinity of energy facilities and infrastructure. Fire and dense smoke are conductors of electricity. Electrical current can be transmitted through flame lengths and dense smoke. This is highly dangerous for firefighters near suspended electric transmission lines (BLM 2003).
- The loss of Wildland Fire Use due to industrial infrastructure and overwhelming amount of industrial works present throughout WFU areas.

Key Features

Describe the geographic location, distribution, areas or types of resource features that should guide land use allocation or management decisions. For example, certain areas may be particularly important to special status species habitat, or some soil types may be better able to support certain land uses than others.

The NWCFFMA Fire Management Plan will be a key for wildfire management to remaining adaptive to the changing environment. This document should continue to tier to the 1997 White River ROD/RMP and the RMPA. It should be updated at least every 2 to 5 years to reflect changes in resources that wildfires affect.

Wildland urban interface areas will remain among the highest priority areas for fire suppression and hazardous fuels treatments in the WRFO. WUI areas in the WRFO exist near the following communities:

- Dinosaur
- Rangely
- Meeker

Other priority areas for wildland fire suppression and hazardous fuels treatments include those FMUs with high densities of oil and gas development. The FMUs with high densities of oil and gas development are listed below:

- B2 – Elk Springs
- B4 – Crooked Wash/ Indian Valley
- B5 – Douglas Creek
- B8 – Magnolia

Wildfire and prescribed fire could be used to support wildlife habitat objectives in certain areas. Wild or prescribed fire in upper elevation vegetation types could benefit certain habitats such as aspen stands (Map 2-7):

- Elk Production Areas – Elk production areas are generally in those more fire-dependent vegetation types so periodic wildfire tends to maintain these habitats.

Other wildlife habitats may not benefit from wildfire and these could be targeted as high suppression priority areas (Map 2-7):

- Sagegrouse habitats in the WRFO
- Bald eagle nesting and perching areas along the White River

The challenge of reintroducing fire into fire-dependent ecosystems while protecting people and private property will be to educate the public about fire ecology and management in the WRFO. This challenge could be met through updates in the NWCFMA Fire Management Plan.

2.2.11 Cultural and Heritage Resources

Indicators

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. Cultural resources are contained within a definite location of human activity, occupation, or use identifiable through field inventories (i.e., surveys), historical documentation, or oral evidence (BLM Manual 8110). Archaeological resources, a subset of cultural resources, means any material remains of human life or activities that are at least 50 years of age, and that are of archaeological interest as further defined at 43 CFR 7.3. The term "cultural resource" also

includes historic, or architectural sites, structures, or places with important public and scientific uses, and may include definite locations (i.e., sites or places) of traditional cultural or religious importance to specified social and/or cultural groups (see Glossary: Traditional Cultural Property). Cultural resources are concrete, material places and things that are located, classified, ranked, and managed through the system of identifying, protecting, and utilizing for public benefit.

Resource condition is assessed by field observation, cultural resource inventories, and project review. The primary resource indicator is whether there is a loss of those characteristics that may qualify the property for listing on the National Register of Historic Places (NRHP) or would diminish the cultural value of areas important to Native American or other traditional communities. These characteristics can be affected by physical destruction, damage, or alteration of the resource; isolation of the resource; alteration of setting; neglect resulting in deterioration and destruction; or the transfer, sale, or lease of the resource. Specific indicators include the extent or intensity of natural weathering, erosion, wildfire, ground disturbance, grazing, recreation use, unauthorized collection, intrusions to setting, and vandalism. This loss affects the completeness and accuracy of the scientific information that can be derived from a resource, the aesthetic, historic, or interpretive value of the resource, and/or the importance of the resource in maintaining social and cultural traditions.

Current Conditions

The cultural resource databases maintained by the WRFO and the Colorado SHPO for the WRFO planning area are currently in the process of being reconciled and completion is anticipated in 2007. Until the reconciliation is complete, accurate and complete reflection of known cultural resources in the WRFO planning area is not possible. Therefore, this section uses information from the 1997 White River ROD/RMP, which may be partially inaccurate. When the data reconciliation is complete, cultural resource information will be updated and used in the current RMPA.

The region of influence for cultural resources is comprised of the WRFO planning area. A variety of cultural resource site types attributed to a range of culturally distinct chronological periods ranging from more than 10,000 years ago to present have been discovered in the WRFO planning area; and there is a potential for additional resources to be found. Historically, inventories have been implemented to support site-specific surface disturbing projects, such as mineral and energy development, to comply with the requirements of Section 106 of the NHPA and other cultural resource preservation laws. Additionally, academic institutions have performed some research excavations, although such scientific investigations have been limited. Implemented in this manner, previous cultural resource inventories have not resulted in the

investigation of the variety of environmental and ecological ranges present in the WRFO planning area. As a result, known cultural resource sites may not fully represent the cultural resources present.

A total of 4,000 cultural resource sites have been identified (BLM 1997). Cultural resources are classified into site types based on similar physical or cultural characteristics. At the broadest level, cultural resource sites are categorized as either prehistoric or historic types. Because geographic locations desirable for human use at one time could be desirable for human use at other times, the number of sites (whether historic/prehistoric or within prehistoric cultural affiliations) is not aggregate, as cultural material from one site may be attributable to several time periods. Prehistoric sites can be associated with one or more of four cultural traditions: Paleo-Indian, Archaic, Formative (Fremont), and Proto-historic. The majority of the previously recorded sites in the decision area are prehistoric. Some of the prehistoric site types include the following: lithic scatter, campsite, quarry, kill site, rock shelter, rock art, burial, tipi ring, wickiup, granary, and rock walls. Historic sites are cultural resources with a period of significance following A.D. 1880 and are organized either chronologically or functionally. Table 2-33 displays the cultural chronology represented in the decision area.

Table 2-33
Cultural Time Periods Represented in the Decision Area

Cultural Time Period	Timeframe	Characteristics
Paleo-Indian	Before 6400 B.C.	Big-game subsistence patterns. No dated sites from this period, although projectile points from this period have been recovered. Paleo-Indian sites are significant due to scarcity.
Archaic	6400 B.C. – A.D. 1	Nomadic lifestyle with small game hunting, seed, and nut-gathering subsistence patterns. Projectile points and camps have been found and further discoveries are possible. Archaic sites are scientifically important because of the differences between Colorado Plateau/Great Basin Archaic cultures and Northwestern Plains Archaic cultures in the WRFO planning area.
Formative	400 B.C. – A.D. 1300	Increased use of bow and arrow, ceramics, rock art, and farming with associated sedentary lifestyle and population growth. As a result, more permanent settlements and associated cultural resources remain from these cultures. Scientific uncertainty still remains concerning their origin and disappearance.
Proto-Historic	A.D. 1300 – A.D. 1881	Nomadic lifestyle with hunting-gathering traditions while retaining use of ceramics and small unnotched or side-notched projectile points. Later traits also include equestrian rock art motifs, European trade goods, wickiups, and a possible increase in the use of obsidian.
Historic	After ca. 1880	Euro-American settlement patterns associated with agriculture, homesteading, limited ranching and hay farming, minerals development, and transportation.

SOURCE: Reed and Metcalf 1999.

Prehistoric or historic cultural resource sites, structures, or objects listed in or eligible for listing in the NRHP are managed as directed by 36 CFR 800, *Protection of Historic Properties*. Additionally, those sites where data are insufficient to make an eligibility determination are treated as though they were eligible until supporting information shows otherwise.

Adherence to Section 106 of the 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 WRFO planning area's cultural resources based only on where disturbance has previously occurred, rather than where sites are likely to occur. Because recorded sites 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.

Trends

Condition has remained stable for cultural resources identified through compliance activities associated with Section 106 of the NHPA and the *State Protocol Agreement between the Colorado BLM and the Colorado State Historic Preservation Office*. Energy and mineral activities continue to be developed in proximity to cultural resources, but potential impacts are avoided or mitigated under current management measures. In these cases, the trend is toward a desired condition of conservation and protection. Qualitative observation indicates a downward trend in condition for recorded and unrecorded cultural resources that are not associated with formal surface disturbing management proposals. Illegal removal of artifacts, ground disturbance associated with recreational activity, limited law enforcement, and intensive grazing practices all contribute to the downward trend.

Forecasts

Based on current management practices, the potential for cultural resources being illegally removed or damaged will increase because of projected increases in recreational and commercial usage, and limited law enforcement presence. Current grazing practices will also continue to contribute to adverse impacts. Developing management actions to identify and protect sensitive areas and TCPs will help alleviate damage to cultural resources and places of Native American concern.

Key Features

Canyon Pintado National Historic District. Located in the Douglas Creek valley between Rangely and Fruita along SH 139 in T1N, R101W, T1N, R102W, T1S, R101W, T1S, R102W,

and T2S, R101W. Well preserved archaeological sites featuring early pictographs representing the eastern periphery of the Fremont culture.

Carrot Men Pictograph Site. Located southwest of Rangely in T1S, R102W. Prehistoric campsite with cliffs featuring Fremont rock art.

Collage Shelter. Located in the Rangely vicinity in T4S, R103W. Repeatedly used site that has the potential to yield important information about prehistoric land use patterns and population movements between core and marginal use areas.

Duck Creek Wikiup Village. Located 36 miles south of Meeker in T1S, R98W. Site is important for its use by Utes well into the late 19th century for annual fall and winter gathering of pinyon nuts.

Fremont Lookout Fortification Site. Located in the Rangely vicinity in T3S, R102W. Stone lookout site on the eastern periphery of the Fremont culture. Only known example of this site type in Colorado.

2.2.12 Paleontological Resources

Indicators

Paleontological resources constitute a fragile and non-renewable scientific record of the history of life on earth. BLM policy is to manage paleontological resources for scientific, educational and recreational values, and 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 will be managed according to the BLM 8270 Handbook and BLM *Manual for the Management of Paleontological Resources*.

Resource condition is assessed by field observations, paleontological reports, commercial site reports, and project review. The primary resource indicator is whether there is a loss of those characteristics that make the fossil locality or feature important for scientific use. Natural weathering, decay, erosion, improper collection, and vandalism can remove or damage those characteristics that make the paleontological resource scientifically important.

Current Conditions

Paleontological resources are integrally associated with the geologic rock units (i.e., formations) in which they are located. If extensive excavation on a certain formation in one geographic area results in significant paleontological resources, there is a potential that excavations throughout

the extent of the formation may produce fossil material as well. Approximately 116 known paleontological localities occur within the decision area (BLM 1997). Efforts to fully inventory fossil resources within the WRFO planning area have been spotty and limited in scope. The potential for paleontological resources is currently noted through the use of the following five class definitions:

- Class Ia—Fossils of scientific significance are known to be abundant in the formation within the area.
- Class I—Fossils of scientific significance are frequently found in the formation within the area.
- Class II—Fossils of scientific significance are occasionally found in the formation within the area.
- Class III—Fossils of some significance (usually due to fragmentary or poor preservation) are found in the formation within the area; or scientifically significant fossils are found in the formation outside the area; or fossils are not reported from this formation but the likelihood of fossils, based on sediment description and/or environment of deposition, remains.
- Class IV—Fossils are not known for this geologic unit and there is little likelihood of their occurrence.

Paleontological localities are areas of known paleontological resources with defined boundaries, usually associated with excavation and data recovery efforts. Although a comprehensive paleontological inventory has not been carried out for the decision area, government, academic, and private industry personnel have studied paleontological resources in various contexts, but principally in relation to surface disturbing development activities.

Trends

Qualitative observation indicates condition has remained stable for paleontological resources protected or mitigated through the permitting process and other standard operating procedures (e.g., pre-disturbance clearance) associated with federal management actions. In these cases, trend is toward conservation.

Trend is slightly downward for resources not associated with direct management actions. The primary contributors to this trend are unauthorized collection of fossils, limited law enforcement resources, and ground-disturbance associated with recreational activities.

Forecast

Projected increases in commercial and recreational use may increase the risk of damage and unauthorized collection in areas where paleontological resources are present. Management actions to identify and protect sensitive areas or to mitigate impacts to paleontological resources would reduce the nature and degree of these impacts.

Key Features

Black's Gulch. Approximately 10 miles northwest of Meeker in T2N, R96W. Important vertebrate fossil locality of Lysite (middle early Eocene) Age. Oil and gas leases should be issued with no surface occupancy stipulations.

Douglas Pass Insect Locality. Approximately 50 miles southwest of Meeker in T5S, R101W and T5S, R102W. Type locality for several fossil insects. Excellent preservation of fossil insects.

Coal Draw Area of Critical Environmental Concern. Located in East Douglas Creek. Known for a wide variety of important fossil resources.

2.2.13 Visual Resources

Indicators

Assessing scenic values across a landscape can be a subjective process. To increase objectivity and consistency, the Visual Resource Management (VRM) System describes and evaluates landscapes by using the basic design elements of form, line, color, and texture (BLM 2006e). Projects that repeat these design elements are usually in harmony with their surroundings, and those that do not create contrast. By adjusting project designs so that the existing elements of the surrounding landscape are repeated, visual impacts can be minimized. The VRM System provides a way to inventory and classify visual resources, describe characteristic landscapes, determine contrasts from proposed actions, and potential mitigation to impacts to visual resources.

Three landscape characteristics indicate visual resources across the landscape in the VRM System: scenic quality, sensitivity levels, and distance zones.

Scenic quality is a measure of the visual appeal of a tract of land within the planning area. The planning area is sub-divided into Scenic Quality Rating Units (SQRU) of similar visual character on a basis of: like physiographic characteristics; similar visual patterns, texture, color, variety, etc.; and areas which have similar impacts from man-made modifications. The size of the SQRU

may vary from several thousand acres to 100 or less acres, depending on the homogeneity of the landscape features, and the detail desired in the inventory. Seven key factors determine the scenic quality of a unit: landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications. Resource specialists consider these factors when ranking units for scenic quality (A = high, B = medium, C = low).

Visual sensitivity is a measure of public concern for scenic quality. Public lands are assigned high, medium, or low sensitivity levels for each by analyzing various indicators of public concern, such as: type of user, amount of use, public interest, adjacent land uses, and special areas such as wilderness. Sensitivity level rankings are not available for the proposed project area.

Landscapes can be divided into three distance zones based on relative visibility from travel routes or observation points. The three zones are: foreground-middleground, background, and seldom seen. The foreground-middleground zone includes areas seen from highways, rivers, or other viewing locations that are less than three to five miles away. The background zone is beyond the foreground-middleground zone, but usually less than 15 miles away. The seldom-seen zone includes areas not seen as foreground-middleground or background (i.e., hidden from view).

Current Conditions

Landscapes in the WRFO display a variety of characteristics depending on location, elevation, vegetation, and cultural modifications. The WRFO is in the Rocky Mountain Plateau physiographic province on the west side of the Continental Divide. The topography follows the basin and range pattern of most of the intermountain western United States. Expansive vistas are common. The region consists of high mountain ranges with deeply dissected, steep-sided valleys and canyons. These narrow canyons are comprised of irrigated fields flanked by rugged foothills and cliff features. Vegetation in the foothills creates a very irregular pattern caused by patches of grasses, low lying shrubs, or dark evergreen stands. This is a semi-arid appearing environment with colors mostly in the spectrum of muted greens, reds, browns, and yellows. White appears seasonally in the form of snow.

River corridors such as the White River, Douglas Creek, and Cathedral Creek provide high quality scenery with their diverse vegetation, water features, rock formations, and potential for wildlife viewing. The vegetation along these river corridors provides color variation from the more muted upland hues. Seasonal variation of color is also more dynamic along these rivers relative to the uplands as the light greens of spring and summer turn to golds, yellows, and reds of fall. Water features often dominate the view in the foreground.

Certain landforms such as Cathedral Bluffs present distinct visual characteristics in the WRFO planning area. These features often exhibit strong vertical lines in landscapes typically dominated by horizontal and shallow diagonals. Rock outcrops are sparsely vegetated, if at all, revealing the coarse texture and stratigraphy of the rock. The large scale of these features and their variations in texture and color tend to draw the observer's attention.

The WRFO is generally undeveloped and cultural modifications are sparse. The towns of Rangely, Dinosaur, and Meeker contain the highest concentrations of cultural modifications in the area. Houses and structures associated with small-scale farmlands in the river bottoms sparsely populate the landscape. Major roads include SH 139, US 40, SH 13, and SH 64. Interpretive structures (e.g., signage, pullouts, and facilities) are scattered in the WRFO with concentrations along the Canyon Pintado National Historic District (SH 139). Rangeland improvements (e.g., fences, cattle guards, and water developments) are also common features in the undeveloped areas of the WRFO. Utility lines are also scattered throughout the WRFO.

Oil and gas development equipment and infrastructure is scattered throughout the WRFO planning area due to prospectively valuable deposits on 1,941,550 acres (73 percent) of the resource area. The greatest concentration of oil and gas development equipment and infrastructure appears in five major areas: Rangely, Wilson Creek, Douglas Creek Arch, and Piceance Basin (Map 2-26, Oil and Gas Potential). These sites are typically localized but appear as industrial areas with associated infrastructure and equipment. Although localized these sites are often visible from far away due to the low growing vegetation and height of the structures involved (towers, pumps, drill rigs, etc). Mitigation efforts have helped reduce the visibility of these types of structures in some cases.

The BLM performed an inventory of visual resources in the WRFO planning area in 1978. This inventory provided the basis for the visual resource management objectives documented in the 1996 *White River Resource Area Proposed Resource Management Plan and Final Environmental Impact Statement (Proposed RMP/Final EIS)*. The objectives set forth in the 1996 Proposed RMP/Final EIS provide the visual management standards for the design and development of future projects and for rehabilitation of existing projects. Management objectives for visual resources are met by classifying the landscape into one of four VRM Classes (Map 2-23).

- **VRM Class I Objective:** To preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

- **VRM Class II Objective:** To retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
- **VRM Class III Objective:** To partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
- **VRM Class IV Objective:** To provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

Table 2-34
VRM Class Acreage in the WRFO Decision Area (BLM Ownership)

VRM Class	Acres
I	39,390
II	412,250
III	861,680
IV	146,100

SOURCE: BLM 1996.

Sixty-nine percent of the WRFO planning area is designated as VRM Class III and IV. Landscapes in these areas possess a combination of characteristics ranging from low scenic quality and low visual sensitivity. These areas may remain relatively unseen by the public due to accessibility or obstructed views. The VRM Class I areas are associated with Wilderness Study Areas (WSAs) recommended for wilderness designation. These areas are north of the town of Dinosaur and are referred to as Bull Canyon, Willow Creek and Skull Creek WSAs.

Table 2-35
VRM Class Associated with Major Oil and Gas Production Fields

Major Oil and Gas Production Area	VRM Class
Rangely	III and IV
Wilson Creek	III and II
Douglas Creek Arch	IV
Piceance Creek Basin	III

SOURCE: USDI 1996.

The Dinosaur Diamond Scenic Byway traverses the western portion of the WRFO planning area along SH 139 and SH 64, passing through the towns of Rangely and Dinosaur (Dinosaur Diamond Partnership, Inc. 2000). The Dinosaur Diamond Scenic Byway Corridor Management Plan strives to "...enhance, promote, and protect the dinosaur fossil and archaeological resources of the...Highway". The Plan sets forth recommendations and objectives to achieve its vision. The BLM was a cooperating agency in the development of the Plan. Motorists traveling along the Scenic Byway may be sensitive to visual contrasts.

The Canyon Pintado National Historic District is listed on the National Register of Historic Places. The District is located in the Douglas Creek Valley, between Rangely and Fruita on SH 139. The District is noteworthy as an area with high densities of rock art and archeologic sites. It represents a tourist attraction in the WRFO planning area and a potentially sensitive area in terms of visual contrast. The District coincides with that portion of the Dinosaur Diamond National Scenic Byway along SH 139, south of Rangely. The BLM has developed an interpretive plan for the District.

Trends

During the last 35 years, public land user groups have developed greater concern for visual resources, prompting development of a VRM System and mitigation techniques to reduce visual contrasts across the landscape. Mitigation became a high priority for applications that involved cultural modifications to the landscape, or long-term surface disturbance in areas of high visual quality or sensitivity. During the last 5 years, domestic energy policy and demand has created a favorable environment for oil and gas development. As a result, there has been an increase in the appearance of equipment and infrastructure associated with that industry in the WRFO planning area.

Residential communities in the Planning Area recognize aesthetic value in the landscape. These communities expect the BLM to be good neighbors in this regard and to take local viewsheds into consideration when planning land use activities. Although oil and gas development is part of their cultural heritage, the communities of Rangely, Meeker, and Dinosaur may be sensitive to additional visual impacts from highly visible infrastructure. Activities that may result in objectionable visual impacts might include additional electric transmission lines, infrastructure along surrounding ridge tops, or road cuts in surrounding hillsides.

The value of historic and scenic areas has been formalized by establishment of the Canyon Pintado National Historic District and Dinosaur Diamond National Scenic Byway Corridor. These designations have increased the appearance of cultural modifications (signage, pullouts, facilities, etc.) along SH 139. The corridor also has greater sensitivity to visual contrasts in those areas due to the increasing number of motorists who pass through experiencing

the scenery. Sensitivity may also be increasing along less developed travel routes since OHV user groups have expanded in the area.

Forecast

Increased demands for energy development, recreational, scenic and aesthetics values in the WRFO planning area are likely to continue into the future. These concurrent uses may lead to potential conflicts where energy infrastructure creates contrasts in landscapes favored by recreational user groups. Given the current direction of administration and market demand, it is likely that the appearance of cultural modifications in the WRFO planning area will increase. The demand for oil and gas, oil shale, and other mineral resources will drive the industry to develop greater infrastructure and place more equipment in the WRFO planning area. While older production facilities will be decommissioned and removed in the future, the appearance of new production facilities and equipment will outpace decommissioning and reclamation, resulting in a net increase in the appearance of cultural modifications over the short-term. Technological advances in extraction of oil and gas are not likely to reduce the appearance of these modifications over the short-term. In fact, technological advances are more likely to increase the appearance of oil and gas infrastructure and equipment as deposits become available that previously were not cost effective to remove.

Increases in oil and gas productivity in the WRFO planning area could increase the populations of Rangely and Meeker. New residents who seek recreational experiences are likely to visit the WRFO planning area. Temporary visitors to the WRFO planning area could increase as a result. Continuous management of the Dinosaur Diamond National Scenic Byway Corridor and the Canyon Pintado National Historic District will also draw limited increase in visitation to the WRFO planning area. Visual sensitivity associated with these areas is likely to increase in the future as visitation increases.

Key Features

VRM is not a pass/fail system and it is not used to restrict land use activities. The VRM System provides a tool for land managers to classify and describe visual resources across the landscape. It is structured to predict the degree of contrast from proposed actions and to develop mitigation and reclamation actions appropriate to the objectives for visual resources in a particular area.

Management of visual resources in adjacent BLM resource areas is not always consistent with those established within the WRFO planning area. Consider VRM Class objectives in the WRFO relative to those of adjacent resource areas. Conflicts could arise where VRM Class objectives are different, particularly if the border area is targeted for oil and gas development. For example, a single project proposed near the boundary of two resource areas may be visible

from both resource areas. Although the project would result in similar visual contrasts when viewed from either resource area, the difference in VRM Class objectives may require different levels of mitigation and reclamation, depending on perspective. The RMPA may provide an opportunity to rectify differences in VRM Class objectives between resource areas.

The RMPA will consider existing VRM Class objectives and the possibility of updates to the current VRM Classes based on changes in the indicators of visual resources since the last visual inventory. Management class objectives should be evaluated in light of reasonable foreseeable oil and gas development to determine if mitigations and stipulations in oil and gas leases will be sufficient to meet existing VRM Class objectives in the corresponding areas.

2.2.14 Wilderness Characteristics

Indicators

Areas with wilderness character can be identified by BLM as a part of managing the public lands or through external nominations by the public. Both methods require the same type of review to determine whether the area has wilderness characteristics. Information provided by the public concerning resources and other values will be considered along with all other resource information in the planning process. New information may be considered in the National Environmental Policy Act (NEPA) process as appropriate. BLM will continue to manage public lands according to existing land use plans while new information (e.g., in the form of new resource assessments, wilderness inventory areas or “citizens proposals”) would be considered in a land use planning effort.

Current Conditions

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 (CWP). The 1994 CWP included seven areas within the WRFO planning area: Pinyon Ridge and additions to all existing WSAs. In 2001, based on new citizen inventories, the CWP was expanded to include new areas found to be eligible for wilderness protection around the state, including additional acreage added to the existing CWP areas in the WRFO planning area (Map 2-35).

In November 1995, the Colorado BLM issued BLM Instruction Memorandum (IM-CO-96-010) requesting that field managers review certain CWP areas to determine if further analysis is needed for wilderness values. In December 1995, BLM field office response indicates portions of Vermillion may warrant additional wilderness evaluation. In May and June of 1997, respectively, Colorado BLM released policy (IM CO-97-044) to address CWP areas and hold

discretionary irreversible or irretrievable actions in temporary abeyance until wilderness issues raised by the Colorado Environmental Coalition could be resolved through the BLM planning process, and released CO policy (IM-CO-97-051) Colorado Wilderness Review Procedures to be used in conjunction with IM-CO-97-044. Pursuant to these policies, BLM began a multi-step process of reviewing six CWP areas on Colorado's western slope. WRFO inventoried Pinyon Ridge, which lies within the boundaries of both field offices. The BLM found the majority of all three CWP areas in the planning area to be roadless, but concluded that only Vermillion Basin warranted additional review. In a contested decision, the WRFO found that Pinyon Ridge was indeed roadless, but concluded that it failed to meet other criteria for wilderness.

Key Features

No areas are managed for wilderness characteristics in the Field Office.

2.3 RESOURCE USE

2.3.1 Livestock Grazing and Management

Indicators

The present authorized livestock grazing use on BLM rangelands in the WRFO planning area was refined and established in 1980 when the BLM published a Final Environmental Impact Statement and Record of Decision on the grazing management program for the WRFO planning area. Livestock grazing uses several resources directly and some resources indirectly. Livestock use rangeland vegetation for forage but also may use riparian areas and wetlands for sources of water and forage. Because of their dependence on rangeland vegetation, livestock also use soils, albeit indirectly. Therefore, livestock grazing is an activity that uses several resources and must be managed according to data that indicate a broad spectrum of those resources.

Livestock grazing management determines how many animals can be supported on the land available for livestock grazing. The amount of forage required by one animal unit (AU) for one month is called an Animal Unit Month (AUM). Livestock managers use rangeland production as an indicator of the capacity of an area to sustain livestock grazing. Rangeland production is expressed in terms of pounds (dry weight) of forage produced per acre, each year (i.e., pounds/acre/year). Rangeland production for rangelands in the WRFO planning area have been characterized by the Natural Resource Conservation Service (NRCS) in the Soil Surveys of the Rio Blanco County Area, Colorado (CO685), Moffat County Area, Colorado (CO686), and Douglas-Plateau Area, Colorado, Parts of Garfield and Mesa Counties (CO682).

Forage production fluctuates between years based on precipitation. Authorized AUMs fluctuate accordingly. Reduced use is activated when adverse weather conditions suppress plant growth and carryover forage is not available, such as in 1987 to 1994 and in 2002 to 2004. AUMs are more fully activated after several years of favorable weather restore forage and water availability.

The BLM recognizes that AUM production on its rangelands can only be sustained with proper management of livestock grazing activities. To keep its rangelands healthy and its AUM production sustainable the WRFO applies the Colorado Standards for Public Land Health (Standards) throughout the Field Office (Appendix A).

The Standards describe the desired conditions needed to sustain public land health. These Standards relate to all uses of the public lands and are applied on a landscape scale. The five standards for rangeland health in the WRFO are presented in Appendix A. Guidelines for livestock grazing management are a subset of the Standards, developed to help livestock managers promote progress toward the Standards. If resource specialists determine that livestock grazing is the cause of any grazing allotment failing to meet or to show significant progress toward achieving the Standards, then the resource specialist will recommend changes in livestock management practices within that allotment as per 43CFR 4180.2(c)(2). If resource specialists determine that livestock grazing is the cause of any grazing allotment failing to meet or to show significant progress toward achieving the Standards, then the resource specialist will recommend changes in livestock management practices within that allotment as per 43CFR 4180.2(c)(2). Livestock managers rate a series of rangeland health indicators against a reference ecological community to help them make determinations regarding the relationship between livestock grazing and the Standards.

The indicator approach has proven useful in rangeland management and has become the foundation of the Standards. The BLM Colorado State Office has established the Standards that may be applied on a landscape scale for various ecosystem components (see Appendix A). For example Standard 1, Upland Soils and Standard 2, Riparian Systems can be directly affected by livestock grazing. The BLM Colorado State Office adopted a specific strategy for increasing general ecological health by using indicators to determine if grazing is a factor in not meeting a standard.

Current Conditions

The 1997 White River ROD/RMP establishes 144 grazing allotments (Map 2-25) and provides allocation of livestock forage at 126,490 AUMs. Allotments vary in size from 40 to 134,602 acres of BLM land with grazing allocations ranging from 7 to 14,716 AUMs in each allotment.

The 1997 White River ROD/RMP (Final EIS) indicates 127 grazing permits in the planning area. Notice that some grazing allotments fall outside of the WRFO administrative boundary. The grazing permits issued for the WRFO planning area are included in Appendix D. Various classes of livestock graze the allotments but cattle are the most common. Ninety-five allotments (66 percent) in the WRFO planning area are permitted for cattle only. Thirty-eight allotments (26 percent) are permitted for sheep. One allotment is permitted for horses. Six allotments (4 percent) are permitted for both sheep and cattle. Four allotments (3 percent) are permitted for both horses and cattle. Total permitted numbers of AUMs, livestock classes, and seasons of use change frequently due to conversions of the class of livestock and changes in allotment or livestock management. Adjustments in livestock grazing levels, as a result changes in available forage or permit renewal application follow procedures outlined in 43 CFR 4110.

The 1997 White River ROD/RMP places each grazing allotment into one of three management categories: (1) improve, (2) custodial, and (3) maintain. The categories define rangeland management objectives and are intended as a tool for prioritizing funding and resources where management is needed most and to resolve the most serious resource conflicts. The categories and criteria are defined below:

Improve (I) May include one or more of the following criteria:

- Present range condition is unsatisfactory.
- Allotments have moderate to high resource production potential, but are producing at low to moderate levels.
- Resource use conflicts or controversy exist.
- Opportunities may exist for positive economic return from BLM investments.
- Opportunities exist to achieve the allotment's potential through changes in management.
- Allotments with high or medium riparian potential with greatest opportunity to develop that potential.

Custodial (C) May include one or more of the following criteria:

- Present range condition is not a factor.
- Allotments have low resource production potential and are producing near their potential.
- Limited resource use conflicts or controversy may exist.

- Opportunities for positive economic return from BLM investments do not exist, or are constrained by technological or economic factors.
- Present management is accomplishing the desired results.
- Allotments containing small acreages of BLM land in comparison to the total acreage of the allotment.

Maintain (M) May include one or more of the following criteria:

- Present range condition is satisfactory.
- Allotments have moderate to high resource production potential and are producing near their potential.
- No significant resource use conflicts or controversy exist.
- Opportunities may exist for positive economic return from BLM investments.
- Present management is accomplishing the desired results.
- Allotments with high or medium riparian potential contain satisfactorily functioning riparian systems.

Allotment Management Plans (AMPs) provide greater detail in terms of livestock management than the terms and conditions in the general grazing permit or lease. AMPs describe the location, amount, and timing of permitted grazing use, and incorporate planned grazing systems with minimum rest requirements. Not all allotments have an AMP. An AMP may not be appropriate in small pastures where options for livestock management are limited or in allotments categorized for maintenance (M) or custodial (C). AMPs are generally prioritized for those allotments designated for improvement (I).

Active grazing use authorization and management actions in each allotment are monitored and evaluated, based on existing data, and adjustments are made by agreement or decision in accordance with legislation, regulations, and policy to ensure that public land resources are maintained or improved for future commodity and non-commodity values. The current evaluation schedule is based primarily upon expiration of 10-year permits.

Most pastures have portions which are only slightly used by livestock due to topography, distance from water, limitations caused by natural barriers or for other reasons. These areas of limited livestock use within allotments provide many valuable benefits to meet other resource

management objectives though livestock grazing remains an allocated use. Some areas are naturally inaccessible to livestock (although technically within allotment boundaries) or have been formally excluded from grazing allotments through designation of allotment boundaries and construction of exclosures.

Rangeland improvement projects have been implemented in certain areas of the WRFO to better distribute livestock. Specific actions that have increased forage conditions are listed below for the East Douglas and Smith – Crawford allotments.

E. Douglas (# 06356)

- Bull Draw allotment was changed from a winter/spring use to winter use only. This allowed growing season rest every year and improved forage condition and productivity.
- Approximately 1,000 acres of pinyon/juniper, in Bull Draw have burned under wildfire conditions. These burns were all seeded providing increased carrying capacity of approximately 100 AUMs.
- Approximately 3,500 acres of pinyon/juniper chainings, in East Douglas Creek have been prescribed burned under prescription. These burns have recovered with increased carrying capacity of approximately 350 AUMs.
- Stock ponds have been approved which will improve use of the chainings in Texas Camp pasture and allow improvement of the valley bottoms.
- Weed control on the summer ranges have allowed ranges infested with houndstongue and Kentucky bluegrass to develop into brome/needlegrass with a three fold increase in forage productivity. (300 pounds to 900+ pounds).

Smith-Crawford (#06625)

- Twenty-six small pit reservoirs will be constructed to improve livestock distribution.
- Grazing permit was amended in 2005 (CO-110-2005-011-EA) because the 1985 AMP did not meet the minimum rest requirements established by the 1997 White River ROD/RMP. The new AMP permitted different levels and seasons of use occurred to promote certain pastures meeting the Standards for Public Land Health, especially in the Danforth pasture.

Wolf Creek Allotment (#06323)

Prescribed burns and wildfires have occurred on Blue Mountain within the Wolf Creek allotment that have shifted these burn areas from a mountain big sagebrush and pinyon-juniper woodland dominated regions to a grass dominated area (early seral-fire). These burned sites offer a significant increase in available forage for wildlife (i.e., elk) and/or livestock.

- The northern portion of the Skull Creek Pasture (below Skull Creek Rim), which burned pinyon-juniper woodlands and shifted to a needle-and-thread and western wheatgrass community (Box Canyon fire - 1989).
- Johnson Draw and Serviceberry Draw of the Johnson Draw pasture, which burned a sagebrush community and shifted to a needle-and-thread grass community (Tank Fire-Z066, 2400 total acres, 1987).
- Bear Valley and ¼ mile north of Wasson Draw along MC road 95 of the Bear Valley Pasture (mostly private land burns), which burned a sagebrush area and shifted to a needle-and-thread grass community (Bear Valley-V990, 1100 total acres, 1988; Watson-Z014, 820 acres, 1988).
- Disappointment Draw and Badger Flat of the Disappointment Draw pasture, which burned a sagebrush community and shifted toward a needle-and-thread and western wheatgrass community.
- Sandhills of the Upper and Lower Sandhills pastures burned a sagebrush and bitterbrush (*Purshia tridentata*) community and shifted to a needle-and-thread and Indian ricegrass community (Bear Canyon fire-Z066, 1069 total acres, 1995).

Trends

Precipitation in the WRFO planning area has been below average in the years 2000, 2002, 2003, 2004, and 2006. This has created a drought situation of lowered vegetative growth and reduced forage availability, especially in the lower elevation allotments where cheatgrass and other non-native vegetation has displaced the native vegetation. In 2005, the area received favorable moisture levels and timing that bolstered plant production and produced abundant forage in the early spring. Nearly every business in every geographic region of Colorado was impacted by the drought in one way or another. Drought conditions have recently had a negative impact on livestock operators by reducing the availability of forage and water for livestock production. In some cases, operators cut production or supplemented animals with water and feed, which drives

costs up. Drought conditions in the WRFO planning area have lead to a trend of decreased forage and water availability.

There are a number of methods livestock managers use to evaluate rangeland health which can reveal trends in the composition of the plant community or the productivity of a plant community. Rangeland monitoring occurs throughout the WRFO planning area as part of the landscape health assessment process. Some methods yield qualitative data while other methods are quantitative. Rangeland monitoring sites are shown in Map 2-24, which represents only a snapshot of monitoring locations. Additional trend monitoring sites are continually being established in the WRFO planning area but their locations were not available at the time of publication. Quantitative data are available at the Daubenmire points (green and blue). Only qualitative data (photographs and notes) are available at the other locations.

Trends in rangeland condition and forage availability can be described generally in terms of elevation gradients. Conditions at different elevations have different trends that can be put into one of two categories. The trends are different according to the 6,000-foot elevation line which traverses north to south through the WRFO planning area. Cheatgrass (*Bromus tectorum*) and certain noxious weeds have become prevalent in those allotments below the 6,000 foot line. These allotments are generally dominated by big sagebrush and salt desert shrub vegetation types. Cheatgrass invasion exposes allotments to greater annual fluctuations in forage availability because cheatgrass production is so heavily dependent on precipitation. Pastures that have become dominated by cheatgrass produce little forage in drought years, but abundant forage in exceptional water years. This fluctuation would not be as pronounced in pastures where cheatgrass has not displaced the native herbaceous plant community.

Regardless of the annual precipitation, the seasonal availability of forage in pastures dominated by cheatgrass has been reduced as a result of its expansion. Cheatgrass is only palatable for livestock when it is actively growing (late winter and early spring). By the summer season cheatgrass has cured and provides little nutritional value for livestock. Native perennial pastures provide greater flexibility to manage livestock because plant diversity is greater and photosynthetic activity occurs over an extended period throughout the year, resulting in greater seasonal availability of forage.

Allotments dominated by forest and woodland vegetation types (e.g., pinyon/juniper, ponderosa pine) may be experiencing slight reductions in forage production over the last seventy years due to the effects of fire exclusion practices. These allotments are generally above 6,000-foot elevation. Fire exclusion in these vegetation types may be resulting in localized reductions in herbaceous species production and an increase in woody vegetation cover.

Forecast

Livestock grazing will continue in the WRFO planning area in a response to public demand and local culture. Most livestock operators in the WRFO planning area depend on the forage public lands grazing offers for at least part of the year. A predicted increase in development of mineral resources (i.e., oil and gas, coal, sodium, oil shale, etc.) in the WRFO planning area will increase the presence of energy development related infrastructure and machinery (e.g., roads, pipelines, well pads, compressor stations, mine portals, haul roads, conveyor belts, railroad loading facilities, railroad lines, derricks, injection wells, compressor stations, processing facilities, and a variety of vehicular traffic).

Construction of new facilities necessary to extract mineral resources will directly reduce the availability of forage to the extent that these facilities require removal of existing vegetation. A typical oil well pad for example, may result in a loss of vegetation on 4 to 6 acres not including associated access roads or pipelines. Further indirect loss of available forage may occur as the increased infrastructure and traffic constrain livestock movements. Most of these forage reductions would be short-term to the extent that terms and stipulations of mineral leases include restoration of disturbed vegetation communities. Long-term forage losses would be reduced as successful interim reclamation occurs and minimized as industrial areas are removed and vegetation is restored.

Key Features

The terms and conditions placed on grazing permits and leases will be key features to reconciling traditional livestock grazing practices with energy development. Certain terms and conditions are mandatory, others are discretionary. These terms and conditions are pursuant to CFR 4130.3, 4130.3-1, and 4130.3-2.

- Mandatory terms and conditions.
 - The authorized officer shall specify the kind and number of livestock, the period(s) of use, the allotment(s) to be used, and the amount of use, in animal unit months, for every grazing permit or lease. The authorized livestock grazing use shall not exceed the livestock carrying capacity of the allotment.
 - All permits and leases shall be made subject to cancellation, suspension, or modification for any violation of these regulations or of any term or condition of the permit or lease.
 - Permits and leases shall incorporate terms and conditions that ensure conformance with the Colorado Standards for Public Land Health.

- Other terms and conditions - The authorized officer may specify other terms and conditions in grazing permits or leases which will assist in achieving management objectives, provide for proper range management, or assist in the orderly administration of the public rangelands. These may include but are not limited to:
 - The class of livestock that will graze on an allotment;
 - The breed of livestock in allotments within which two or more permittees or lessees are authorized to graze;
 - Authorization to use, and directions for placement of supplemental feed, including salt, for improved livestock and rangeland management on the public lands;
 - A requirement that permittees or lessees operating under a grazing permit or lease submit within 15 days after completing their annual grazing use, or as otherwise specified in the permit or lease, the actual use made;
 - The kinds of indigenous animals authorized to graze under specific terms and conditions;
 - Provision for livestock grazing temporarily to be delayed, discontinued or modified to allow for the reproduction, establishment, or restoration of vigor of plants, provide for the improvement of riparian areas to achieve proper functioning condition or for the protection of other rangeland resources and values consistent with objectives of applicable land use plans, or to prevent compaction of wet soils, such as where delay of spring turnout is required because of weather conditions or lack of plant growth;
 - The percentage of public land use determined by the proportion of livestock forage available on public lands within the allotment compared to the total amount available from both public lands and those owned or controlled by the permittee or lessee; and
 - A statement disclosing the requirement that permittees or lessees shall provide reasonable administrative access across private and leased lands to the BLM for the orderly management and protection of the public lands.
- Modification of permits or leases - Following consultation, cooperation, and coordination with the affected lessees or permittees and the state having lands or responsibility for managing resources within the area, the authorized officer may modify terms and conditions of the permit or lease when the active use or related management practices:

- Do not meet management objectives specified in:
 - ❖ The land use plan;
 - ❖ The pertinent allotment management plan or other activity plan; or
 - ❖ An applicable decision issued under §4160.3; or
- Do not conform to the Colorado Standards for Public Land Health

AMPs will also be key features to successful livestock management. AMPs will prescribe the livestock grazing practices necessary to meet specific resource objectives. They may consider natural conditions such as rangeland production potential, seral stage and soil type but also consider various social/political constraints such as recreation, mineral use, Threatened & Endangered Species, when developing and implementing grazing plans. Therefore, certain allotments that are not currently a priority for an AMP may become a higher priority or require adjustments in management in light of recent requests for mineral leases due to potential land use conflicts.

AMPs may be developed by permittees or lessees, other Federal or State resource management agencies, interested citizens, and the BLM. When such plans affecting the administration of grazing allotments are developed, the following provisions apply:

- An allotment management plan shall be prepared in careful and considered consultation, cooperation, and coordination with affected permittees or lessees, landowners involved, the resource advisory council, any state having lands or responsible for managing resources within the area to be covered by such a plan, and the interested public. The plan shall become effective upon approval by the authorized officer. According to 43CFR4120.2, the plans shall:
 - Prescribe the livestock grazing practices necessary to meet specific resource objectives;
 - Specify the limits of flexibility, to be determined and granted on the basis of the operator's demonstrated stewardship, within which the permittee(s) or lessee(s) may adjust operations without prior approval of the authorized officer; and
 - Provide for monitoring to evaluate the effectiveness of management actions in achieving the specific resource objectives of the plan.

2.3.2 Energy and Mineral Resources

Mineral and energy resources are discussed in the following subsections to describe fluid and non-fluid leasable, locatable, and salable minerals.

- Leasable minerals is a legal term that, for federal lands or a federally retained mineral interest in lands in the United States, defines a mineral or mineral commodity acquired through the Mineral Leasing Act of 1920, as amended, the Geothermal Steam Act of 1970, as amended, or the Acquired Lands Act of 1947, as amended. Acquisition of leasable minerals is by application for a government lease and permits to mine or explore after lease issuance. Examples of leasable minerals include oil, gas, coal, oil shale, sodium, potash, and phosphate.
- Locatable minerals is a legal term that, for federal lands in the United States, defines a mineral or mineral commodity that is acquired through the General Mining Law of 1872, as amended. These are the base and precious metal ores, ferrous metal ores, and certain classes of industrial minerals. Acquisition of locatable minerals is by staking a mining claim (location) over the deposit and then acquiring the necessary permits to explore or mine. Examples of locatable minerals include, but are not limited to, gold, silver, platinum, copper, lead, zinc, magnesium, nickel, tungsten, bentonite, barite, feldspar, uranium, and uncommon varieties of sand, gravel and dimension stone. Uncommon variety minerals are deposits that have distinct and special properties making them commercially valuable for use in manufacturing, industrial, or processing operations.
- Salable minerals is a legal term that, for federal lands, defines mineral commodities sold by sales contract from the federal government. The applicable statute is the Mineral Materials Sale Act of 1947, as amended. Salable minerals are generally common varieties of construction materials and aggregates, such as, sand, gravel, cinders, roadbed, and ballast material. Common variety minerals do not have a distinct, special value beyond normal use. On federal lands such minerals are considered salable and are disposed of by sales or by special permits to local governments.

2.3.2.1 Leasable Mineral Resources

Leasable minerals include conventional oil and gas, coal bed methane (CBM), coal, oil shale, and sodium minerals.

Oil and Gas

Current Conditions

There currently are 454 new well permit locations, most of which are in gas fields targeting the Mesaverde Formation. Four-hundred of the new locations are in the south and central portions of the WRFO planning area in the northern Piceance Basin. Of the remaining 54 new locations, most are in the Douglas Creek Arch and Rangely Field areas. As development of the Piceance

Basin continues, downhole well spacing in some areas has been reduced to 10-acre spacing, and likely will occur in most areas. Most future Mesaverde wells will be drilled from multi-well drilling pads. Some pads occupy up to 5 to 8 acres and up to 9 wells are currently being drilled from each pad.

The WRFO planning area has a long history of petroleum exploration. Drilling for oil and gas began in the late 1800s with the discovery of the White River Field while drilling near surface oil seeps. The White River Field produces from sandstone in the Tertiary Wasatch Formation and has an estimated ultimate recovery of 12 billion cubic feet of gas (BCFG). The field also produces from sandstone in the Upper Cretaceous Mesaverde Group with an estimated ultimate recovery of 4.5 BCFG (Spencer 2006). Oil and gas fields occur throughout most of the planning area; however, the majority of the producing oil and gas fields are located on the Douglas Creek Arch, the Piceance Basin, and the Axial Basin Uplift as shown on Map 2-26. According to the Colorado Oil and Gas Conservation Commission (COGCC), there currently are more than 60 oil and gas fields within the WRFO planning area (COGCC 2006). The producing zones include Pennsylvanian, Permian, Jurassic, Triassic, lower and upper Cretaceous, and Tertiary age rocks.

Within the WRFO planning area, there are 12 oil fields and 51 gas fields as shown on Map 2-26. The majority of the oil is produced from the Rangely and Wilson Creek Fields, and accounted for over 96 percent of the oil produced in 2006.

Rangely Field is located on the Douglas Creek Arch and is the largest oil field in the WRFO planning area. Oil was found near surface oil seeps on the Rangely Anticline in 1902, in shallow fractured shales of the Upper Cretaceous. Deeper drilling discovered oil and gas in the Permian-Pennsylvanian Weber Sandstone in 1933. The Weber Sandstone reservoir has an estimated ultimate recovery of 955 million barrels of oil and 706 BCFG (Spencer 2006). The field was unitized in 1957 and a secondary recovery program began. From 1964 to 1986 injection wells were drilled on 20-acre and 10-acre spacings to boost recovery. Carbon dioxide (CO₂) gas injection was initiated in 1986 as a tertiary recovery method to recover the residual oil. The CO₂ project is expected to recover an additional 107 million barrels of oil.

The Wilson Creek Field is located on the Axial Basin Uplift and is the second largest oil field in the WRFO planning area (BLM 1994). It produces oil from the Jurassic Sundance and Morrison Formations.

Approximately 29 percent of the gas production in the WRFO planning area occurs in 35 gas fields located on the Douglas Creek Arch. The gas occurs in structural and stratigraphic traps, which produce from the Permian-Pennsylvanian Weber Sandstone, Jurassic Entrada and

Morrison Formations, Lower Cretaceous Dakota Formation, and Upper Cretaceous Mancos, Mesaverde, Castlegate, and Ohio Creek Formations (BLM 1994).

By the end of 2006, the Piceance Basin supplied the remaining 71 percent of natural gas production in the WRFO planning area has 16 gas fields that produce primarily from northwest-to-southeast trending folds. This gas is produced primarily from the Mesaverde/Williams Fork Formations with moderate production also from the Wasatch Formation. Additional gas may be produced from the Pennsylvanian Minturn Formation, Permian-Pennsylvanian Weber Sandstone, Lower Cretaceous Dakota Formation, and Upper Cretaceous Mancos Formation (BLM 1994).

Well and production summaries were generated from the COGCC database for the WRFO planning area. Approximately 5,800 wells have been drilled in the area as a result of exploration and development activities: 1,806 producing wells, 317 injection wells, 12 water disposal wells, more than 2,500 plugged and abandoned wells, 271 shut in wells, 65 temporarily abandoned wells, and 36 wells waiting on completions (COGCC 2007). The 1,806 producing wells produced a total of 47,716,491 barrels of oil and 273,602,232 thousand cubic feet of gas (MCFG) from 1999 to 2006 (COGCC 2007). Table 2-36 shows the oil, gas, and water produced for that 8-year period. Oil production has declined over the 8-year period, while gas production and the produced water volume have increased over the same time period, primarily as a result of bringing new Mesaverde natural gas wells online in the past two years.

Table 2-36
Oil, Gas, and Water Produced from 1999 to 2006

Year	Oil (Barrels)	Gas (MCF)	Water (Barrels)
1999	6,651,586	27,936,756	96,858,745
2000	6,514,386	31,136,487	96,373,175
2001	6,237,208	31,372,895	95,347,723
2002	5,884,964	35,920,570	89,841,114
2003	5,604,271	34,126,800	85,177,701
2004	5,511,331	33,430,676	97,877,565
2005	5,675,879	36,594,928	101,297,487
2006	5,636,866	43,083,120	105,021,318
Total	47,716,491	273,602,232	767,794,828

SOURCE: COGCC 2007.

Trends

Areas designated for potential mineral development (e.g., natural gas, shale oil, sodium resources, etc.) overlap areally within the planning area. The potential for concurrent development of multiple resources in the same local area can be identified. For example, operators of shale oil Research, Development, and Demonstration (RD&D) projects have indicated that commercial development may be initiated in the planning area beginning in 2012.

Gas producers in the same area plan to develop gas reserves located at greater depths from the surface. Resource development planning should consider and allow for concurrent development.

Forecast

Because the obvious and easily identifiable structural traps have been drilled, future exploration in the WRFO planning area will likely focus on stratigraphic traps and drilling to depths up to 16,500 feet within the areas identified as having potential for oil and gas production (BLM 1994). It is estimated that between 17,800 and 21,200 new wells will be drilled in the WRFO planning area over the next 20 years (BLM 2007b). The majority of the wells will be constructed for gas production from the low permeability Mesaverde Group or Interval. New development will likely occur based on exploratory drilling programs now being implemented within the WRFO planning area.

Key Features

The majority of the WRFO planning area (2,675,360 acres) has been classified as having potential for oil and gas development. Approximately 1,940,553 acres have been classified as having high potential for further oil and gas development, 109,799 acres have been classified as having medium potential, 464,007 acres have been classified as having low potential, and 160,752 acres have been classified as having no potential for oil and gas development. Map 2-26 presents the oil and gas potential of the WRFO. The current subsurface mineral lease ownership for the WRFO includes 2,224,499 acres owned by the federal government, 993,010 acres privately owned, and 71,025 acres owned by the State of Colorado. Map 2-27 presents the distribution of subsurface lease ownership. Map 2-28 also presents the current oil and gas leases. Currently 1,335,223 acres are leased for oil and gas exploration and development. The acreage includes 1,364,486 acres managed by the BLM, 10,285 acres within the Dinosaur National Monument, 41,611 acres owned privately, and 6,508 acres on USFS land. Because most of the structural traps have been drilled, future exploration in the WRFO planning area will likely focus on stratigraphic traps within those areas identified as having potential for oil and gas production (BLM 1994).

Coal Bed Natural Gas/Coal Bed Methane

Current Conditions

Exploration for coal bed natural gas began in the Piceance Basin during the early 1980s. Commercial production was finally achieved in 1989 in the Parachute Field, operated by Barrett Resources. Other operators soon followed, including Fuelco at White River Dome Field in the northern part of the basin, and Conquest Oil Company near Barrett Resource's production in the central part of the basin. However, not all operators were successful in locating or producing

coal bed natural gas. Ultimately, Barrett found the sandstones to be far more productive than the coal beds, and attempts to complete the wells in the coalbeds were abandoned (EPA 2004).

Within the WRFO planning area, coal bed natural gas production has been established in the Piceance Basin in the White River Dome. Coal bed natural gas is produced from zones as deep as 7,500 feet. The produced gas is wet, and waxy oil is produced with the gas. Up to 30 percent CO₂ is produced with the gas.

CBM drilling near the Utah border in the Douglas Creek Arch area has not yet proven to be economic due to the large volumes of produced water (400 to 500 barrels per day per well) and the inability to economically dispose of the water. As a result, the wells are only producing approximately 5 to 50 MCFG per day (BLM 2006c).

A 12- to 14-well CBM drilling program near the Rangely Field has recently begun. The wells will be drilled to the Upper Mesaverde at approximately 2,800 feet.

Forecast

The WRFO has received a request for a *permit to shoot* a 120-square-mile, 3-dimensional seismic survey in the Douglas Creek Arch area. Coal bed natural gas and CBM drilling activity over the next 20 years is expected to include an additional 400 to 450 wells (BLM 2006c).

Key Features

In the Piceance Basin, suitable targets for coal bed natural gas exploration and development include significant coal deposits in the Upper Cretaceous Iles Formation and the overlying Upper Cretaceous Williams Fork Formation. The majority of the coal within the William Fork Formation occurs in the lower portion called the Cameo-Fairfield Coal Zone. The coal-bearing zone occurs in all but the southeast portion of the basin. Net coal thickness averages from 35 feet up to 144 feet in the basin (Johnson et al. 2006). Depths to the Upper Mesaverde coal bearing zones range from outcrop to greater than 12,000 feet.

Within the WRFO planning area, the northeastern flank of the Piceance Basin has potential for additional coal bed natural gas reserves. Production rates from the White River Field is as high as 400 MCFG per day. This may be due to the natural fracturing and enhanced permeability as a result of the folding and faulting in the area (Johnson et al. 2006).

High coal bed natural gas productivity requires optimal geologic and hydrologic conditions. These conditions are not optimal throughout much of the Piceance Basin because of the absence of dynamic groundwater flow and the low permeability of the host rocks.

Water produced from coal bed natural gas production and CBM extraction in the Piceance Basin is generally of such low quality that it must be disposed of in evaporation ponds, re-injected into the formation from which it was produced, or re-injected at even greater depths.

Coal

Current Conditions

Deserado Mine is currently producing coal in the White River Field near Rangely. Coal potential exists in two major fields in the WRFO planning area. The Danforth Hills Field north of Meeker contains an estimated 416 million tons of recoverable coal reserves. The White River Field is in the general vicinity of Rangely and contains an estimated 327 million tons of recoverable coal reserves. The main coal-bearing beds in both fields are the Iles and Williams Fork Formations of the Upper Mesaverde Group. Colowyo Coal Company mines coal from the Danforth Hills Field. Active mining is north of the WRFO planning area in Moffat County and is administered by the Little Snake Field Office. Although grading from the open pit mine extends into Rio Blanco County, no additional coal extraction is projected for the WRFO planning area.

Map 2-29 shows the locations of the White River and Danforth Hills coal field areas and acreage designated as either suitable or not suitable for coal leasing. The coal lease areas are designated as: suitable for both surface and subsurface coal mining, suitable for subsurface but not surface mining, or not suitable for either surface or subsurface coal mining.

Forecast

Several closed coal mines in the Danforth Hills Field have the potential to reopen if the economics become favorable. Future coal mining activities are likely in the WRFO decision area based on market-driven prices of coal, transportation and the desire to reduce dependency on foreign oil.

Key Features

The White River Field near Rangely and the Danforth Hills Field north of Meeker are areas classified as prospectively valuable for coal. The Deserado Mine is an underground mine located near Rangely in Townships 2N and 3N and Range 101W, and is the only active mine in the WRFO planning area. In the WRFO, there are currently 9 federal coal leases containing approximately 17,000 acres as shown in Table 2-37. Deserado accounts for 7 of the 9 leases.

**Table 2-37
Existing Coal Leases**

Lease Number	Acres
C8425	720.00
C8424	2,672.32
C023703	2,557.22
D047201	513.00
C0126669	259.06
C44693	344.31
C51551	1,320.00
C0126998	5,101.90
C093713	3,512.32
Total	17,000.13

Oil Shale

Current Conditions

Oil shale is prevalent in the western states of Colorado, Utah, and Wyoming. The resource potential of these shales is estimated to be the equivalent of 1.5 to 1.8 trillion barrels of oil in place (Bartis et al. 2005). Resource potential within the Piceance Basin totals approximately 1.0 trillion barrels of oil in place (Smith 1980). The Parachute Creek Member of the Green River Formation contains most of the oil shale. The Parachute Creek Member is 900 to 1,200 feet thick at the southern and western margins of the basin and nearly 1,900 feet in the depositional center. The Mahogany zone (Parachute Member) consists of kerogen-rich strata and averages 100-200 feet thick. This zone extends to all margins of the basin and is the richest oil shale interval in the stratigraphic section.

The area available for oil shale leasing is located in the WRFO decision area are shown on Map 2-28. Because oil shales have not proven economically recoverable, they are considered a contingent resource. High-grade oil shale in the White River decision area contains more than 25 gallons of oil per ton of shale (Dyini 2003).

Federal interest in oil shale dates back to the early 20th Century, when the Naval Petroleum and Oil Shale Reserves were set aside. After a second oil embargo in the 1970s, Congress created a synthetic fuels program to stimulate large-scale commercial development of oil shale. A number of commercial-scale oil shale mining and retort projects were initiated in the WRFO decision area after the second embargo. The federal program proved short-lived, and commercially backed oil shale projects ended in the early 1980s when oil prices began declining. Attempted development of the oil shale has occurred at prototype lease Tracts C-a (5,089.7 acres) and C-b (5,093.9 acres). Tract C-a was leased to show feasibility of open pit mining techniques and Tract

C-b was leased to be developed as an underground mining operation with above ground retorting of the oil shale. C-a tract has been reclaimed and relinquished and Tract C-b has been reclaimed and is in the process of being relinquished.

No mining method yet applied has provided a viable method for the profitable extraction of shale oil. However, with economic and potential crises bringing periodic renewed interest, oil shale will continue to be regarded as a valuable potential resource.

Interest in commercial development of oil revived with the current higher oil prices and, in August 2005, the U.S. Congress enacted the Energy Policy Act of 2005, Public Law (P.L.) 109-58. In Section 369 of this Act, also known as the “Oil Shale, Tar Sands, and Other Strategic Unconventional Fuels Act of 2005,” Congress declared that oil shale and tar sands (and other unconventional fuels) are strategically important domestic energy resources that should be developed to reduce the Nation’s growing dependence on oil from politically and economically unstable foreign sources. In early 2005, the BLM solicited the nomination of parcels to be leased for research, development and demonstration of oil shale recovery technologies in Colorado, Utah, and Wyoming. Three companies are in the process of demonstrating new technology on five BLM 160 acre RD&D lease tracts in the White River decision area.

Forecast

Development of commercial oil shale operations will be dependent on the cost to recover oil from the oil shale and the price of oil.

Key Features

New technologies for recovery of kerogen, a petroleum-like liquid derived from oil shale, are being developed. The ICP developed by Shell is an example of the new approach for recovering hydrocarbons from oil shale. The ICP process involves drilling holes up to 2,000 feet deep, inserting electrical heaters, and heating the shale to 650 to 700 degrees Fahrenheit over a period of months. The ICP converts the kerogen to gas and oil-like liquids. Shell reports extracting a 34-degree API gravity product (Andrews 2006). The RD&D programs in Colorado plan to demonstrate various approaches for recovery of kerogen using in situ processes.

The Piceance Basin of northwestern Colorado contains substantial oil shale resources on Public Lands. The Department of the Interior identified that more intensive research and development is needed on a pilot-scale to test the technical, economic, and environmental feasibility of extracting liquid fuels from oil shale resources on public lands.

Sodium

Current Conditions

The Piceance Basin contains the world's largest and most economically significant nahcolite resource (naturally occurring sodium bicarbonate). Most of the significant deposits of oil shale and all of the sodium carbonate resources are found in the Parachute Creek Member of the Green River Formation.

The sodium resource in the basin was estimated at 32 billion short tons (Dyni 1974) and 29 billion tons (Beard et al. 1974).

There are presently eight sodium leases, approximately 16,560 acres, on BLM land in northwestern Colorado (BLM 2006). Solution mining operations have been constructed on two of these leases in Rio Blanco County. One solution mining operation was mothballed in 2004 due to market issues. The other mine has been operating since 1991 and produces approximately 90,000 - 100,000 tons of sodium bicarbonate annually. The sodium deposits located in the WRFO planning area are shown on Map 2-28.

Forecast

Future development of sodium resources is likely in the WRFO planning area. The development will depend on the results of continued improvement of solution mining technology, and market-driven prices of sodium bicarbonate.

Geothermal Resources

Current Conditions

BLM and the National Renewable Energy Laboratory (NREL) issued a report in 2003 that identified public lands most suitable for increased development of renewable energy, including geothermal resources. Findings of the report indicated that the WRFO was not among the 25 highest rated areas for potential development of geothermal power.

Forecast

BLM studies indicated that the WRFO is not considered to have high potential for geothermal power development.

Wind Energy Resources

Current Conditions

NREL completed several studies regarding potential development of wind power in western Colorado. An update of these studies provided by NREL and DOE in April 2004 indicated that potential for wind power in the WRFO planning area is predominantly “poor” with a few isolated “marginal” areas.

Forecast

Development of wind power resources is not anticipated for the WRFO planning area.

2.3.2.2 Locatable Minerals

Within the WRFO planning area the rock formations are primarily sedimentary in origin and are not a likely source for significant deposits of locatable minerals such as precious metals (i.e., gold or silver). There are no current or past mining areas in the WRFO planning area associated with precious metal or other locatable metal minerals other than uranium discussed below (BLM 2006b).

Uranium

Current Conditions

Uranium is designated as a strategic locatable mineral. Interest in uranium exploration has been cyclic and is influenced by war, the threat of war, shortages, temporary surpluses, poor planning, and a fear of environmental hazards. To date there has not been any development of potential uranium reserves within the WRFO planning area.

Forecast

With uranium prices going up, interest in uranium exploration in the WRFO planning area has recently started to increase. Uranium mining claims have been staked recently in the northwestern portion of the WRFO planning area north of Rangely near SH 40 (BLM 2006b).

2.3.2.3 Salable Minerals

Sand and Gravel

Current Conditions

Sand and gravel provide raw materials for most construction and paving activities. Sand and gravel deposits are found along the White River and major tributary valleys. Other sources include glacial wash, widespread colluvial deposits at the base of rock outcrops, and alluvial fans. Large sand and gravel reserves occur near Meeker in the vicinity of Agency Park, and in the Little Beaver area.

Forecast

With the projected increase in oil and gas activities over the next 20 years, the need for additional sand and gravel resources for road improvements and other construction related activities will likely increase.

2.3.3 Recreation

2.3.3.1 Recreation Use

Current Conditions

Recreation opportunities on BLM land in the WRFO planning area generally are managed as the White River Extensive Recreation Management Area (ERMA). The general recreational setting consists of minimally developed, resource-dependent, recreational opportunities that are subject to custodial management. This type of setting is typical of an area that is largely undeveloped and where nature-based recreation predominates. Recreational activities in the decision area are varied and include hunting, fishing (cold and warm water), boating (open canoeing and rafting), camping, hiking, backpacking, mountain biking, and off-highway-vehicle (OHV) use.

The White River Valley supports elk, mule deer, coyote, bear and mountain lion hunting. Fishing is common on the White River, Douglas River, Piceance Creek, Lake Avery, Meadow Lake, Trappers Lake and Vaughn Lake. Hunting is the most prominent recreational use and occurs throughout the WRFO planning area (Map 2-30). The fall hunting season is the busiest time of the year. The CDOW manages hunting primarily through licensing and law enforcement. The CDOW provides and enforces state rules and regulations. However, the BLM issues special recreation permits to hunting and fishing outfitters to operate within the planning area). During the hunting season of 2000, over 65 percent of the hunters were non-resident (USFWS 2001).

Approximately 200 miles of mountain biking trails have been developed, and many others follow established dirt and paved roads. Other motorized and non-motorized trails on BLM-managed land may be found at, but not limited to: Rangely Loop, Dinosaur, Ute, Dominguez-Escalante, Scenery Gulch, Cathedral Bluffs, China Wall, Lion Canyon, and Lobo Mountain trails.

Designated routes and OHV areas where the public may access public land with different types of vehicles are indicated on Map 2-30. Areas which are open to OHV use support the hunting that occurs on public land, although OHV use is also associated with other recreational pursuits.

The WRFO, in coordination with the Town of Rangely and local organized off-road groups, has designated a 525-acre rock-crawling area southwest of Rangely. Rock-crawling is an emerging OHV sport in which highly modified vehicles are driven over particular geologic features to provide a challenging experience for off-road enthusiasts. The large number of rock outcroppings in the area appeal to enthusiasts of this sport, and subsequently there are a high proportion of participants for this sport in this area (BLM 2006). In accordance with NEPA, BLM performed an Environmental Assessment (EA) for the Rangely Rock Crawling Park in November of 2006, and a finding of no significant impact (FONSI) resulted.

BLM policy requires that concentrated recreation use areas be designated as special recreation management areas (SRMA) through the RMP process. No SRMAs are designated in the planning area.

Specially designated areas provide primitive recreation settings for hiking, nature study, and wildlife viewing. The Blue Mountain GRA and the White River ACEC are managed in part to provide specific recreation activity opportunities and settings for targeted recreation experiences; such as, trophy big game and upland bird hunting, mountain biking, scenic viewing, horseback riding, pleasure driving, wildlife viewing, hiking and backpacking, river float-boating, fishing, and camping.

There are many opportunities for cultural and archaeological recreation in the planning area, namely in Canyon Pintado. The Canyon Pintado National Historic District, a property listed on the National Register of Historic Places, is located in northwest Colorado in the Douglas Creek Valley, between Rangely and Fruita on SH 139 (BLM 2007a). Examples of rock art from prehistoric cultures are located throughout the canyon.

The planning area includes a portion of the Dinosaur Diamond National Scenic Byway, a major attraction to the area. National Scenic Byways are designated by the Federal Highway Administration based on their archaeological, cultural, historic, natural, recreational, and scenic qualities. The Dinosaur Diamond National Scenic Byway combines opportunities to see

dinosaur bones being excavated and prepared by paleontologists for museum display (BLM 2007a).

Special recreation permits (SRP) are issued for commercial uses, organized groups, competitive events, and recreation use in special areas. Within the WRFO planning area, on BLM land, nearly all SRPs are issued for big game hunting.

Characterization

Indicators to measure trends in recreation include visitor use levels, user conflict levels, impacts to resources, and compliance with commercial authorization.

Concentrated camping use is increasing across the planning area during the fall hunting seasons, and in the spring and summer due to OHV use. The impacts include soil compaction and vegetation loss at campsites, rock fire rings, user created routes, littering, and vandalism of signs. As OHV use continues to increase, potential conflicts with users will increase and impacts to wildlife, archeological resources, and soil and vegetation will increase. The need for OHV management tools and active OHV management is becoming increasingly obvious.

Recreation use overall is likely to increase, especially motorized-based recreation. Additionally, opportunities for interpretive recreation at cultural sites are likely to increase.

The most current available data on visitation to BLM-managed land within the planning area are provided in the 1996 *White River Resource Area Proposed RMP/Final EIS*. Visitor use on BLM-managed land in the planning area totals 150,000 annually. Hunting is the most common recreational use, and accounts for 64,000 visitor days annually, and about 75 percent of this use is big game hunting (BLM 1996). The WRFO is currently monitoring recreation use to update visitation trends. All visitors to BLM lands are expected to adhere to federal regulations and to use “leave no trace” ethics.

2.3.3.2 Recreation Opportunity Spectrum

Current Conditions

Recreation Opportunity Spectrum (ROS) Classes are designated by BLM to establish management objectives related to the type of recreation setting and opportunities that will be maintained. ROS is a system of inventorying and classifying the range of recreational experiences, opportunities, and settings available on public land. BLM primarily manages for five of the six ROS classes, including primitive, semiprimitive nonmotorized, semiprimitive motorized, roaded natural, and rural. The urban ROS classification does not typically require BLM management restrictions. The primitive, semiprimitive, and roaded natural classifications

are designed to provide certain types of recreation settings and may require restrictions on use to meet management objectives.

ROS inventories were completed for some portions of the planning area as part of the 1996 *White River Resource Area Proposed RMP/Final EIS*. The northern Blue Mountain Geographic Reference Area (GRA) includes semi-primitive non-motorized, semi-primitive motorized, rural natural and rural class settings. The southern Blue Mountain GRA includes primitive, semi-primitive non-motorized, semi-primitive motorized, rural natural and rural class settings. The White River ACEC includes rural natural and rural class settings (BLM 1996).

Characterization

The trend over the last decade has been for ROS conditions to shift from more primitive to more developed, semiprimitive settings and from thence to more developed rural setting. This occurs as local populations and developments increase and the demand for primitive settings exceeds availability.

BLM Recreation Policy now requires that a Benefits Based Recreation Planning system be used in RMP revisions that identifies and manages for particular recreation opportunities. This system requires the designation of three different intensity scales of SRMAs, and funding for recreation developments will be focused on these SRMAs. Funding for recreation developments in ERMAs will be discouraged except for route and destination signing. ROS objectives can still be set through RMP revisions which will provide an additional management tool to meet recreation goals and assess impacts to recreation resources.

2.3.3.3 Forecast

Past recreation trends have favored hunting and fishing in the RMPPA, and recreation within the planning area is on the rise (USFWS 2001). However, OHV uses also are gaining popularity. These trends are expected to continue and increase with increasing population. The U.S. Census Bureau indicates an increase of 1.5 million residents to the State of Colorado by the year 2030, a 34.7 percent increase over 2000 population levels (U.S. Census Bureau 2006a). The U.S. Census Bureau also designated six counties within Colorado as part of America's 100 fastest growing counties (U.S. Census Bureau 2006b).

Recreation uses may decrease or increase in correlation with increased oil and gas discovery and extraction. Decreases may be seen in hunting if a reduction in suitable wildlife habitat occurs. Increases may be seen in OHV use as access is increased in the decision area as a coincident effect of oil and gas development activities.

2.3.3.4 Key Features

Recreation uses vary but are predominantly hunting, fishing, and OHV use. These uses can be found throughout the decision area. Dinosaur National Monument, Canyon Pintado, Dinosaur Diamond National Scenic Byway and White River National Forest provide additional regional recreational opportunities to BLM-managed lands. Recreation in the decision area is managed primarily by licensing, permitting fees, and enforcement of federal regulations. Human population projections predict increases within Colorado, which may translate to increased recreational uses and pressures.

2.3.4 Lands and Realty

Current Use

Land Status

The WRFO includes Rio Blanco, Moffat, and Garfield counties in northwestern Colorado. Generally, public land within the WRFO planning area covers much of western and eastern Rio Blanco County, northeastern Garfield County, and southwestern Moffat County. Many isolated parcels of State Trust Land and private land are dispersed throughout the decision area and interspersed with the public land. Dinosaur National Monument is located on the northwestern portion of the WRFO planning area, while the White River National Forest encompasses the eastern portion. South of Dinosaur National Monument is the Town of Rangely and approximately 40 miles east is the Town of Meeker. Oil and gas wells are clustered throughout Rio Blanco County excluding the White River National Monument area. Extending 10 miles west from the Town of Rangely, there is a significant cluster along County Road 64. There is a large oil shale basin with six oil shale research and development leases in Rio Blanco County. Most of Rio Blanco County is designated as a coal field, excluding the White River National Forest. There is also a coal field in Moffat County.

The existing surface management pattern within the decision area is shown on Map 2-31. Surface management within all three counties is summarized in Table 2-38. Table 2-38 indicates the acreage of public lands that have been withdrawn for particular uses and the existing surface administrator. As illustrated in Table 2-38, the BLM manages most of the WRFO at 1,455,900 total surface acres. Mineral estate is discussed in Section 2.3.2.

Table 2-38
Surface Management in the WRFO Planning Area

Surface Manager	Rio Blanco County (acres)	Moffat County (acres)	Garfield County (acres)	Total (acres)	Percent of Planning Area
BLM	1,151,999	231,747	70,743	1,454,489	54.4%
National Park Service	0	71,089	0	71,089	2.7%
USFS	247,039	0	128,722	375,761	14.0%
State of Colorado	777.7	19,738	0	20,515.7	0.8%
CDOW	45,620.7	0	319.3	45,940	1.7%
County	220.9	0	0	220.9	0.01%
Private	478,541	99,562	129,148	707,251	26.4%
TOTAL	1,924,198.3	422,136	328,932.3	2,675,266.6	100.0%

Land Tenure

The 1997 White River ROD/RMP designated areas for retention and areas for disposal to maintain lands of particular resource and/or use value and to provide for orderly disposition, respectively. Retention areas are generally relatively concentrated blocks of public land that include scattered or isolated parcels of State Trust Land, or special designations, such as WSAs and ACECs. Disposal areas include tracts of land that are economically difficult to manage, and/or parcels that could serve important public objectives, including, but not limited to, expansion of communities and economic development. The 1997 White River ROD/RMP identified approximately 9,128.14 acres of disposal land, approximately 243,676 acres of land to be retained in federal ownership, and approximately 1,282,195 acres that have not yet been designated as disposal or retention areas and will be evaluated on a case-by-case basis (BLM 1997).

Utility Corridors, Exclusion Areas, and Avoidance Areas

The WRFO manages ROWs through a system of designated corridors and designated ROW exclusion and avoidance areas (Map 2-32). The WRFO has encouraged the placement of new facilities within established corridors. Deviations from designated corridors have been permitted based on the type and need of the proposed facility, and lack of conflicts with other resource values and uses. Overlapping or adjacent ROWs are issued whenever possible. Generally, the use of designated ROW corridors for ROW grants are actively encouraged by the BLM; however, the presence of a designated ROW corridor or a system of ROW corridors does not preclude the granting of a ROW on public land outside the designated corridor, whenever appropriate.

In addition to designated corridors, the Western Utility Group (an ad hoc organization of major western gas, electric, and telecommunication companies) developed the *Western Regional Corridor Study* in 1993 to promote ongoing interagency dialogue regarding future utility corridor needs (Western Utility Group 1993). The *Western Regional Corridor Study*, which will be

considered by the BLM and USFS during planning efforts, identifies the segments of thirteen potential utility corridors within the decision area. The *West-wide Corridor Study*, currently being prepared by the Department of Energy, will re-examine current and identify potential utility corridors. Utility corridors within the WRFO include the following. The first two corridors are located in Moffat County. The first corridor extends eastbound along CO 40 where it breaks northeast into a second corridor along with the interstate. From the northwestern corner of Rio Blanco County, a third utility corridor travels southeast to the Town of Rangely along the White River riparian. The fourth and fifth parallel corridors emerge from this corridor to connect with the third corridor traveling along CO 40. From Rangely, there is a sixth diagonal utility corridor in a southwest/northeast direction. From the northeast section, the utility corridor splits into two corridors, the seventh and the eighth, in a northwest/southeast direction. From the southwest section, the ninth utility corridor emerges traveling eastbound, eventually connecting with the seventh and eighth corridor. The eighth corridor continues southbound to the boundary line of Garfield County. At township 3S along the eighth corridor, a short tenth corridor emerges creating an eleventh corridor parallel to the eighth corridor. From the eighth corridor at township 2S, a twelfth corridor travels northeast past the Town of Meeker. The thirteenth corridor is located in Garfield County emerging from the west, just south of Rio Blanco County.

BLM may establish exclusion and avoidance areas to guide decisions about ROW locations. Right-of-way exclusion areas are areas where ROWs may be granted only when mandated by law (BLM 1997). ROW avoidance areas are areas where ROWs may be granted only when no feasible alternative route or designated ROW corridor is available (BLM 1997). Within the WRFO planning area, exclusion areas have been established for approximately 107,420 acres of public land and avoidance areas include approximately 205,740 acres of public land.

The WRFO, which is responsible for a three-county area, received requests for approximately 219 land use transactions each year; a majority of these are ROWs. Generally, most of these transactions are request for ROWs for roads, utilities, pipelines, and telecommunication facilities. Such transactions include a fiber optic line and various interstate pipelines ranging from 24 to 42 inches in diameter. Eight separate companies hold interstate pipeline ownership: Colorado Interstate Gas Company, TransColorado Gas Transmission Company, WIC/El Paso, Questar Pipeline Company, Williams Northwest Pipeline, MAPCO/Enterprise, Rocky Mountain Pipeline Company, and Entrega/Rockies Express Pipeline, LLC. Several small pipelines and gathering systems are located throughout the WRFO.

Communication Sites

The WRFO issues ROW for communication sites on public land. Rights-of-way for communication sites are limited to currently occupied sites although exceptions would be

granted for “non-commercial, private mobile, or microwave facilities by pipeline/power companies or land management entities, in support of their primary business, where no existing site can be shown to meet the applicant’s needs” (BLM 1997). Additional authorizations will not be granted for the communication site located on Moosehead Mountain.

Renewable Energy Sites

There are no renewable energy sites in the decision area.

Forecast

Land tenure adjustment could change the amount of public land managed by the BLM within the WRFO planning area, but based on past trends, changes to land tenure would not significantly increase or decrease the proportion of land that is administered by the BLM. Future growth, particularly within Rio Blanco County, is already increasing pressure on public land to provide for both community growth and open space; this trend is expected to continue. During this planning process, the BLM intends to review which public lands currently are allocated for retention and which for disposal and determine whether those allocations are appropriate, or if those lands should be retained, recognizing that the supply of private land within the decision area is limited and that opportunities for growth and/or preservation may need to be accommodated through use of either State Trust Land or public land. Changes to the land tenure adjustment allocation would affect which public lands potentially could be developed and/or preserved as open space.

Key Features

Areas of high potential for future developed land uses include public lands identified for disposal, designated corridors, or existing utility alignments and/or ROWs, existing communication sites, and the existing renewable energy sites.

Public lands in the decision area that have been identified for disposal or as available for land use authorizations represent key features to accommodate demands related to expected growth pressures occurring in this area.

Developed areas within the WRFO planning area include the towns of Meeker, Rangely, and Dinosaur.

2.3.5 Transportation and Access

Current Use

The outcome of the 2000 Energy Policy and Conservation Act (EPCA) reauthorization has generated unprecedented interest in the development of oil and gas resources within the Piceance Basin. Major drilling activity is currently visible in the more easily accessible areas surrounding the I-70 Corridor in Garfield County and is now migrating northward into the more remote areas within Rio Blanco County. As this recent interest in hydrocarbon development continues to expand, impacts to the existing transportation system serving this area can be expected, and in particular to the system of BLM roads that provide access to the more remote areas of the basin.

Currently, the 1997 White River ROD/RMP provides travel management guidance based upon the historic experience that recreation is the primary activity for BLM land use. It states the objectives for motorized vehicle travel on public lands, but mostly provides current restrictions and conditional uses for various geographical areas within the WRFO. The 1997 White River ROD/RMP recognized the need for a higher level of planning effort, but could not have foreseen the significant increase in demand for new oil and gas activity.

Current policy for travel management is comprised of a set of designations that will remain in effect until a site-specific Travel Management Plan is completed. Current travel policy outlined in the 1997 White River ROD/RMP is as follows:

- No areas will be designated as open to OHV use at this time.
- Winter snowmobile use will remain open, except within the Moosehead road closure area, Oak Ridge State Wildlife Area, and the six Wilderness Study Areas.
- Motorized vehicles will be limited to existing roads, ways, and trails on most of the public lands from October 1 through April 30.
- Motorized vehicle travel will be limited to existing roads, way and trails all year in identified fragile soil areas, the black-footed ferret reintroduction areas, the Texas-Missouri-Evacuation Creek cultural resource area, and in areas with potential habitat for Threatened and Endangered or sensitive plant species.
- Motorized vehicle use will be limited to designated roads and trails in: ACECs, the Indian-Valley/Deep Channel area, and the Canyon Pintado National Historic District.
- The Cow Creek/Timber Gulch/Hay Gulch areas will be closed to motorized vehicle use from August 15 through November 30.

- All six wilderness Study Areas (WSAs) are designated as closed.
- Public lands in the Moosehead Mountain Road Closure Area and Oak Ridge State Wildlife Area will be designated as closed.

BLM Roads. BLM numbered roads are under of the jurisdiction of the WRFO and are open to public travel at all times, subject to any limitations or restrictions outlined in the 1997 White River ROD/RMP (Map 2-33). These roads are concentrated west of SH 13, and many connect directly to state highways and county roads. BLM numbered roads range from two-track roads to 30-foot improved roads and vary in design standard. Some BLM road clusters are discontinuous to other BLM roads where they cross private land and appear to have no means of access to the public highway system.

New access road construction is directly related to the migratory drilling practices inherent in energy development and to some extent the new areas of anticipated activity are not well known. As drilled wells become producers, expanded road width and rights-of-way are necessary to support pipeline and long-term maintenance travel. Energy companies that use BLM numbered roads also provide the necessary maintenance to ensure travel reliability at all times of the year. For those roads that are not maintained by the oil and gas companies through lease agreements, the responsibility for maintenance lies with the BLM. Commercial use of BLM roads and the demand for new access may require the upgrade of existing BLM roads or the construction of new roads. Upgraded roads could include the conversion of two-track roads to roads of a higher design standard that can reliably support energy traffic at all times of the year. There are currently over 300 numbered BLM roads totaling in excess of 1,680 miles (Table 2-39) and new road construction is evolving through a random and as-needed manner.

Other “Routes.” These are travel routes that were created by others (Map 2-34). Routes are designated as private, state, county, or federal, and roads/trails found on federal lands are classified into motorized or non-motorized categories. The BLM has recently completed a GIS mapping inventory of the “Routes” system (Table 2-39) within the planning area. “Private” routes and routes designated as “Open Motorized” comprise the majority of this system. The “Open Motorized” designation allows for all types of vehicle use at all times, subject to operating regulations and vehicle standards. There are approximately 2,100 miles of roads that are designated as “Private” and 2,047 miles designated as “Open Motorized.”

Table 2-39
Summary of “BLM Roads” and “Other Routes”

Classification	Length (miles)
I. BLM Numbered Roads	1686.1
II. Other Routes	--
ATV and Below	7.3
BLM: No Motor Vehicle	161.6
BLM: Open Motorized	2,047.4
BLM: Other	429.2
BLM: Restricted Aug.-Nov.	40.1
CO Dept of Wildlife	95.1
National Park Service	40.2
Outside RA	2.3
Private	2,103.7
State	55.1
USFS	258.5
Other Routes Subtotal	5,240.4
TOTAL	6,926.5

Source: BLM WRFO GIS data, titled BLM_roads and BLM_routes, dated 2006.

Vehicle Count Data. The BLM recently collected vehicle traffic data for eight different sites, primarily located within the westerly areas of the region. The time period for data collection ran from August through November, 2006, and included Cow Creek and Sprague Gulch, Wilson Creek, and five sites along SH 139 within the Canyon Pintado National Historic District boundary. The highest volumes of traffic recorded were at Cow Creek and Sprague Gulch and totaled 2,584 and 3,517 vehicles per week respectively during mid-October 2006. This data will serve to develop a baseline of the current level of travel volume as input to the new Travel Management Plan and can be compared at a later date to new count information to track changes in travel demand.

Regional Highway System. Regional access is currently served through a network of transportation facilities including state highways and county roads. Since a significant number of travel trips are generated from outside of the White River resource area to access BLM roads, the recent focus on hydrocarbon development affects all travel within the planning area.

The State Highway system consists of two-lane rural paved highways including US 40, SH 139, SH 13, and SH 64 (Map 2-33). Collectively, the state system provides important regional access linking the I-70 corridor to northwest Colorado and regional centers within northeastern Utah. It also provides linkage to the towns and population areas within the resource area and supports the connectivity to other county and local roads. US 40 is part of the National Highway System (NHS) and a designated truck route. It carries a higher functional class than SH 13, SH 64, and SH 139 and supports interregional, intra-regional, and intercity travel. SH 13, SH 64, and SH 139 are not part of the NHS system and by themselves do not normally provide for

significant regional, state, or interstate travel. SH 13 and SH 64 are also designated truck routes. SH 139, also known as the Dinosaur Diamond National Scenic Byway, is part of a major scenic byway loop that travels through the Canyon Pintado National Historic District.

Rio Blanco County contains a total of 921 miles of maintained roads, of which 173 miles are paved roads (Map 2-33). Garfield County and Moffat County also serve the White River Resource Area and in aggregate the county road system primarily provides local access for residential, commercial, and recreational uses. Both the state and county system of highways allow vehicle weights of 85,000 lbs. gross vehicle weight. In addition to weight maximums, other public and commercial restrictions apply such as allowable width and length. For any vehicle travel that exceeds these standards, a special use permit is required from the respective ownership authority. Vehicle weight is an important consideration relating to travel management since these oversize/overweight vehicles are often intended for travel on BLM roads to transport large equipment to remote areas for energy development. New travel management policy should address the potential impacts resulting from the transport of any oversize/overweight vehicles on BLM managed roads. One of the more important county roads in the region is Rio Blanco County Road 5. This county road connects SH 13 to SH 64 and provides access to other county roads and many of the BLM roads that serve the various energy development activities within the region.

Forecast

New road construction within the WRFO planning area can be directly correlated with the demand for new energy development. Long-term projections for drilling activity will necessitate new road construction to access the more remote areas of the Piceance Basin. At the time this study is being conducted, the number of drilling permits for the resource area are forecast to range from 13,000 to 17,000 permits over the next 20 years representing a long-term and sustained demand for new oil and gas well development. Previously constructed roads may also require an upgrade in width and ROW as drilling operations are converted to collection and producing facilities. Conversely, recreational demand is forecast to generate a very small amount of new road construction. Only about two miles of road have recently been constructed solely for the purpose of recreational use.

While the number of forecasted well permits are a key indicator of future road construction, there are other factors which can influence the need for new access roads such as; 1) well density, 2) new technologies and drilling practices such as directional drilling, and 3) the rate of drilling activity in terms of the number of wells proposed to be drilled within a specified time period due to economic market conditions. While these factors may lead to some variation in the level of

travel activity at any given time, the trend is still upward and the objective of travel management should remain the same – the safe and orderly development of a road system.

The forecasted increase in oil and gas development creates a resource-sensitive challenge for the managed use of public lands. As energy development progresses through the resource area, the truck and travel demand needed to support expanding drilling and producing activities will likely have an impact on the experience of other recreational activities. Travel use, particularly from heavy trucks, will also generate an increased need for maintenance. While the oil and gas companies currently maintain the roads they use, the BLM will need to rely on these companies to maintain these roads for the duration of their use. In the long term, these roads will either need to be reclaimed or maintained by others, since the BLM road maintenance budget has been historically limited and not expected to increase in proportion to the anticipated increase in new road miles they are likely to inherit.

Key Features

Dinosaur Diamond National Scenic Byway. This 512 mile scenic byway is a two-state loop that is located in both Colorado and Utah. The 130-mile segment that lies within Colorado was designated the Dinosaur Diamond National Scenic and Historic Byway by the Colorado Transportation Commission on October 27, 1997 and was further designated a National Scenic Byway by the Secretary of the Department of Transportation on June 13, 2002. Within the planning area, this national scenic byway travels through the Canyon Pintado National Historic District where the BLM maintains two picnic sites, two rest rooms, and dozens of interpretive panels along with several hiking trails to assist the visitor in understanding the unique resources the Canyon Pintado area has to offer.

2.4 SPECIAL DESIGNATIONS

2.4.1 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 historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes, or to protect life and safety from natural hazards. BLM prepared regulations for implementing the ACEC provisions of FLPMA. These regulations are found at 43 CFR 1610.7-2(b).

There are currently 16 ACECs within BLM-administered lands of the WRFO, totaling 99,523 acres (Map 2-35). The size of each area and the values it is designed to protect are listed in

Table 2-40. The values for which these 16 ACECs were designated are still present and require continued management attention.

Table 2-40
Areas of Critical Environmental Concern

ACEC	Area (in acres)	Values
Blacks Gulch	803	Paleontology
Coal Draw	1,835	Paleontology
Coal Oil Rim	3,212	Small aspen clones and other biologically diverse plant communities, riparian habitats
Deer Gulch	1,806	T&E plants; Sensitive plants and remnant vegetation associations
Duck Creek	3,430	T&E plants and cultural resources
Dudley Bluffs	1,630	T&E plants; Sensitive plants and remnant vegetation associations
East Douglas Creek	47,613	T&E plants
Lower Greasewood Creek	205	T&E plants and remnant vegetation associations
Moosehead Mountain	8,939	Important biologically diverse plant communities, riparian habitats and cultural resources.
Oil Spring Mountain	18,258	Spruce-fir and important biologically diverse plant communities
Raven Ridge ^a	4,979	T&E plants and paleontology
Ryan Gulch	1,438	T&E plants
South Cathedral Bluffs ^b	1,760	T&E plants and remnant vegetation associations
Upper Greasewood Creek	2,434	T&E plants and remnant vegetation associations
White River Riparian	935	Important biologically diverse plant communities, Bald Eagle roosts, federally listed Colorado squawfish below Taylor Draw dam.
Yanks Gulch	246	T&E plants and remnant vegetation associations
TOTAL	99,523	

SOURCE: BLM 1997.

NOTES:

a – Includes Raven Ridge Additions

b – Includes South Cathedral Bluffs Addition

T&E = threatened and endangered

Restrictions that arise from an ACEC designation are determined at the time the designation is made, and are designed to protect 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 RMPA will identify a reasonable range of alternatives that will include current management for these areas.

Oil and gas leasing has taken place for some lands within the existing ACECs. In addition, several of these existing leases have experienced some level of oil and gas exploration and development. Although as mentioned previously, the values for which these ACECs were designated are still present and managed for, some of the ACECs have experienced ground disturbance related to oil and gas activities. This is in accordance with the management outlined for ACECs in the 1997 White River ROD/RMP which allows for multiple uses of ACECs while

maintaining the special values for which the ACEC was designated. The 1997 Record of Decision (ROD) for the White River RMP included surface stipulations of no surface occupancy (NSO) for ACECs. Leases in ACECs that were effective before the 1997 ROD do not necessarily carry a NSO stipulation, unless required for some other resource protection purpose. Table 2-41 lists the total acreage within each ACEC that is leased for oil and gas, and breaks out that acreage into acres leased before or after the 1997 ROD. The number of existing producing wells is also listed to provide a measure of the existing oil and gas activity within the ACECs.

Table 2-41
Leased Acreage within ACECs

ACEC	Total Area (acres)	Total Area Leased (acres)	Leased Acres (Before 1997 ROD)	Leased Acres (After 1997 ROD)	No. of Producing Oil or Gas Wells ¹
Blacks Gulch	803	803	720	83	0
Coal Draw	1,835	1,835	1,835	0	8
Coal Oil Rim	3,212	104	104	0	0
Deer Gulch	1,806	1,802	0	1,802	0
Duck Creek	3,430	3,417	843	2,574	0
Dudley Bluffs	1,630	1,607	766	841	0
East Douglas Creek	47,613	44,336	38,413	5,923	42
Lower Greasewood Creek	205	205	0	205	--
Moosehead Mountain	8,939	Pending	Pending	Pending	--
Oil Spring Mountain	18,258	9,692	9,692	0	1
Raven Ridge ^a	4,979	1,257	156	1,101	--
Ryan Gulch	1,438	1,435	576	859	2
South Cathedral Bluffs ^b	1,760	827	780	47	--
Upper Greasewood Creek	2,434	230	0	230	--
White River Riparian	935	647	237	410	1
Yanks Gulch	246	207	0	207	0
Total	99,523	68,404	54,122	14,282	54

NOTE: ¹ Includes only producing wells as described in the COGCC database. Areas may also have dry, plugged, abandoned, or shut-in wells.

2.4.2 Wilderness Study Areas

Wilderness Study Areas (WSA) are areas that contain wilderness characteristics such as naturalness, solitude and opportunities for primitive and/or unconfined recreation and are managed to preserve those values until Congress either designates them as wilderness or releases them for other uses. This applies to the six WSAs in the WRFO. A discussion of the current resource values and uses found in each WSA, established in 1980 under the authority of Section 603 (c) of FLPMA, can be found in the *Colorado BLM Statewide Wilderness Study Report* (BLM 1991).

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 National Park Service (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.

In 1980, BLM completed the wilderness inventory of BLM-administered lands within the WRFO, finding six areas that possess wilderness character. Following completion of the inventory in 1980, BLM designated six WSAs. Three have been recommended to Congress for wilderness, and three have been recommended for uses other than wilderness. All of the WSAs were studied under Section 603 of the FLPMA. They were included in the *Craig District Final Wilderness Environmental Impact Statement* published November 5, 1990, and in the *Craig District Study Areas Wilderness Study Report* published October 1991. The attributes of each WSA are described in these two documents.

Table 2-42
Wilderness Study Areas in the White River Field Office

Proposal Name	Area (in acres)*	Recommended for Wilderness
Bull Canyon	13,909	Yes
Willow Creek	14,081	Yes
Skull Creek	13,978	Yes
Black Mountain	10,179	No
Windy Gulch	12,376	No
Oil Spring Mountain	18,247	No
TOTAL	82,770	

SOURCE: BLM 1991.

These WSAs, established under the authority of Section 603(c) of FLPMA, are being managed to preserve their wilderness values according to the interim management policy (IMP), and will continue to be managed in that manner until Congress either designates them as wilderness or releases them for other uses. Should any of these WSAs be released from wilderness consideration by Congress and subsequently released from management under the IMP, subsequent planning documents will prescribe how these lands will be managed. There are no congressionally designated wilderness areas within the WRFO.

Management of WSAs is similar but generally less restrictive than management of designated wilderness. Examples of some of the activities that are allowed in WSAs include hunting, fishing, camping, hiking and horseback riding, livestock grazing, and travel with motorized vehicles on existing routes. 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.
- 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 WRFO resource management planning process and an amendment to 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 One, Pages 1-168, Craig District Study Areas (BLM 1991).

During the interim period between the inventory that identifies suitable and eligible areas appropriate for wilderness designation and the actual congressional designation of a wilderness (which can be many years), designated WSAs require special management practices to preserve the wilderness characteristics that make an area appropriate for designation.

Current management of the six WSAs listed above will continue as described in the 1997 White River ROD/RMP. Increased use of these areas will continue, which could require additional restrictions to be determined through this planning process in order to preserve the wilderness characteristics of each area. According to WSA monitoring reports since 1999, no major impairment has occurred to the WSAs. Minimal vehicle traffic and fire suppression activities were noted. Based on this information, current management is successfully protecting the wilderness characteristics found within these three WSAs as well as non-recommended WSAs.

The six designated WSAs in the WRFO planning area will continue to be managed to preserve the wilderness characteristics. In 1996, the State of Utah, Utah School Institutional Trust Land Administration, and the Utah Association of Counties (collectively Plaintiffs) filed suit

challenging BLM's authority to reinventory lands for possible wilderness study area designation in Utah. A settlement to this suit, as amended, was reached in April 2003 between the Department of the Interior and the Plaintiffs. Consistent with BLM policies for the identification, management and protection of multiple uses, terms of the settlement will be applied Bureau-wide. This settlement states that any land use plans completed after April 14, 2003 will not designate any new WSAs, nor manage any additional lands under the Section 603 non-impairment standard.

However, areas with wilderness character can be identified by BLM as a part of managing the public lands or through external nominations by the public. Both methods require the same type of review to determine whether the area has wilderness characteristics. Information provided by the public concerning resources and other values will be considered along with all other resource information in the planning process. New information may be considered in the NEPA process as appropriate. BLM will continue to manage public lands according to existing land use plans while new information (e.g., in the form of new resource assessments, wilderness inventory areas or "citizens proposals") would be considered in a land use planning effort.

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 CWP. In November 1995, the Colorado BLM issued BLM Instruction Memorandum (IM-CO-96-010) requesting that field managers review certain CWP areas to determine if further analysis is needed for wilderness values. WRFO had one area, Pinyon Ridge, which was inventoried as a result. More information on CWP areas can be found in Section 2.2.14, Wilderness Characteristics.

2.5 CURRENT SOCIAL AND ECONOMIC CONDITIONS AND TRENDS

This section describes the current social and economic conditions of the northwestern Colorado study area. It includes data from the ExxonMobil Piceance Development Project Environmental Assessment Socioeconomic Technical Report (USDI BLM White River Field Office 2006), as well as new information obtained through research and coordination with the WRFO and the BLM Colorado State Office.

The socioeconomic study area for this AMS includes the area depicted on Map 2-36. This study area includes Rio Blanco, Garfield, and Moffat counties in Colorado, which contain land the WRFO manages. Two adjacent counties are also included in the socioeconomic study area—Mesa County, Colorado, and Uintah County, Utah—because they are the regional centers of oil and gas industry employment.

The AMS socioeconomic study provides a snapshot of the counties directly impacted by oil and gas activities in the Field Office. In response to concerns voiced by the State and other socioeconomic stakeholders, BLM is considering the scope of the analysis in terms of geography and effects of oil and gas development on the social structure and economies of these communities over time. These issues will be resolved and an appropriate course of action taken for the RMPA/EIS.

2.5.1 Employment, Labor Force and Income

Table 2-43 presents total employment for the WRFO planning area and energy-related counties. The data include jobs by place of work estimated by the U.S. Bureau of Economic Analysis (BEA).² The economy of the planning area and related counties, as measured by total employment, grew by 18 percent from 2001 to 2006 and now comprises 150,310 jobs. Rio Blanco County's share of total employment relative to the area total was an estimated 5 percent in 2006. However, Rio Blanco County grew fastest in this group from 2001 to 2006 and gained an estimated 4 percent share of the employment growth in this area as a whole.

Table 2-43
Total Employment Change in the WRFO and Related Counties

County	2001	2002	2003	2004	2005	2006 (est)	Percent Change 2001-2006	Share of Total in 2006	Share of Change 2001-2006
Rio Blanco, CO	4,203	4,273	4,242	4,372	4,713	5,360	28%	4%	5%
Garfield, CO	29,851	29,907	30,841	32,031	34,235	37,390	25%	25%	33%
Mesa, CO	71,601	73,457	74,373	76,752	79,284	81,630	14%	54%	43%
Moffat, CO	7,331	7,326	7,305	7,427	7,695	7,920	8%	5%	3%
Uintah, UT	14,129	13,934	14,420	15,130	16,141	18,010	27%	12%	17%
Total	127,115	128,897	131,181	135,712	142,068	150,310	18%		

SOURCE: USDOC, Bureau of Economic Analysis 2007a.

NOTE: 2006 estimated by Lloyd Levy Consulting.

² BEA's estimates of state and local employment consist of the number of wage and salary jobs, sole proprietorships, and general partners. Employment "by place of work" means jobs tallied by location of the payroll reporting establishment. The employment numbers indicate size and industrial structure of an area's economy rather than the income of the area's residents. The employment numbers are estimates of how many jobs there are in a county, not number of workers who perform the jobs, so they represent the county's industrial base instead of the work activities of the residents of the county. Because of data limitations, BEA assumes that place-of-work and place-of-residence are identical for nonfarm proprietors. About 93 percent of the wage and salary employment reported by BEA comes from unemployment insurance (UI) reports filed by employers. The gap between UI employment and total wage and salary employment is mostly jobs at railroads and the military, which have a different system for handling unemployment. Sometimes employers group very small establishments into a single "statewide" report that ignores county designation. This can affect BEA's county level employment estimates, but BEA makes adjustments that generally offset this kind of error.

Table 2-44 presents employment data for the “mining” super-sector, a grouping of industries for economic analysis that includes jobs in oil and gas production, drilling and field services, plus all other jobs in mining and mining support. The mining super-sector is a convenient index of the impact of oil and gas development on this area, though not a perfect one because it omits jobs in construction, technical services and other fields that are involved in oil and gas. From 2001 to 2006, employment in the mining sector more than doubled in the entire study area, grew seven-fold in Garfield County, five-fold in Mesa County and almost doubled in Rio Blanco and Uintah counties. This is an important shift in the structure of these economies.

Table 2-44
Mining Employment in the WRFO and Related Counties

County	2001	2002	2003	2004	2005	2006 (est)	Pct. Change	Share of Change	Share of Total in 2006
Rio Blanco, CO	504	525	505	608	742	956	90%	8%	11%
Garfield, CO	301	364	402	432	1544	2181	625%	35%	25%
Mesa, CO	365	389	453	809	1214	1817	398%	27%	21%
Moffat, CO	509	543	518	499	555	629	24%	2%	7%
Uintah, UT	1690	1612	1846	2092	2519	3188	89%	28%	36%
Total	3,369	3,433	3,724	4,440	6,574	8,771	160%		

SOURCE: Colorado Department of Labor; Utah Department of Workforce Services (a).

NOTE: 2006 estimated by Lloyd Levy Consulting.

Unemployment in the WRFO planning area has historically moved up and down with the state average, and this is still generally true in terms of the general direction of change. However, the unemployment rate in the WRFO planning area plus related energy counties—which historically has been higher than the state average—has been running lower average since 2000, the last, most recent year of higher than average unemployment. The data that illustrate this change in the regional labor market relative to the state are presented in Table 2-45.

Table 2-45
Unemployment Rates in the WRFO and Related Counties (percent)

County	2000	2001	2002	2003	2004	2005	2006
Rio Blanco, CO	2.9	2.7	3.5	4.7	4.3	3.6	2.6
Garfield, CO	2.7	3.0	4.7	5.4	4.4	3.7	2.9
Mesa, CO	3.2	3.5	4.9	5.7	5.1	4.7	3.9
Moffat, CO	3.5	3.7	5.0	6.4	5.3	4.6	3.7
State of Colorado	2.7	3.8	5.7	6.1	5.6	5.0	4.3
Uintah, UT	4.2	4.4	6.0	5.8	5.1	3.8	2.5

SOURCE: Colorado Department of Labor; Utah Department of Workforce Services (b).

The absolute number of unemployed persons residing in the local area is currently small, especially in the Rio Blanco County, which had an average of 127 residents who were unemployed and actively looking for during 2006. Table 2-46 presents civilian labor force data for 2006 in the planning area and related counties. The entire planning area and the related

counties had an unemployment rate of 3.5 percent in 2006, which was 0.8 percentage points lower than the Colorado state average of 4.3 percent.

Table 2-46
Labor Force Conditions in the WRFO and Related Counties in 2006

County	Labor Force	Employed Persons	Unemployed Persons	Unemployment Rate (%)
Rio Blanco, CO	4,826	4,699	127	2.6
Garfield, CO	33,646	32,671	975	2.9
Mesa, CO	74,880	71,935	2,945	3.9
Moffat, CO	8,464	8,149	315	3.7
Uintah, UT	15,911	15,521	390	2.5
Total	137,727	132,975	4,752	3.5

SOURCE: Colorado Department of Labor (b); Utah Department of Workforce Services (b).

Oil and gas employment has tended to raise the earnings potential of jobs located in the WRFO planning area and related counties by stimulating employment growth (as shown above). Oil and gas employment also pays relatively high wages, which in turn exerts upward pressure on wages in general. This is reflected in Table 2-47, which summarizes the wage trend from 2001 to 2006 for all employment covered by unemployment insurance. The wage data are presented after an adjustment for inflation of 13.4 percent for the period.

Table 2-47
Wage Trend in the WRFO and Related Counties, 2001 to 2006 (2006 dollars)

County	Average Weekly Wage			% Change, 2001 to 2006 (adjusted for inflation)
	2001 (in 2001 \$)	2001 (in 2006 \$)	2006 (in 2006 \$)	
Rio Blanco, CO	\$600	\$680	\$795	16.9%
Garfield, CO	\$581	\$659	\$723	9.7%
Mesa, CO	\$504	\$571	\$635	11.1%
Moffat, CO	\$563	\$638	\$680	6.5%
Uintah, UT	\$520	\$590	\$729	23.6%

SOURCE: Colorado Department of Labor (a); Utah Department of Workforce Services (a).

NOTE: Wages paid by jobs in each county are reported only on for those industries that are covered by unemployment insurance. Inflation adjustment by Lloyd Levy Consulting LLC using the Gross Domestic Product Implicit Price Deflator (GDPDEF) published by the U.S. Department of Commerce, Bureau of Economic Analysis.

Real wage growth can benefit real per capita personal income, a broad measure of economic well being. Personal income is calculated by tallying all types of income of persons who live in a particular place, not the earnings of those holding the local jobs. Local personal income is reduced when in-commuters or temporary residents hold jobs. Per capita personal income growth implies that income keeps pace with the growth of population, so new population and labor force that does not immediately find work would dilute per capita income growth. On the plus side, the earnings of self-employed persons and the income that local households receive from dividends, interest, rent, and government transfers adds to total personal income. Finally,

for personal income to lift the purchasing power of the local labor force, its growth must keep up with inflation.

As shown in Table 2-48, the BEA estimates released in April 2007 indicate that per capita personal income (PCPI) grew in real terms from 2000 to 2005 in most of the WRFO planning area and the counties related to the WRFO energy industry.³ Real PCPI growth has occurred in Rio Blanco County, up about 10 percent for the 5-year period; Mesa County, up 2.6 percent; Moffat County, up 15.5 percent; and Uintah County, Utah, up 24.9 percent. In Garfield County, PCPI was down by about 1 percent in 2005 from 2000 after inflation.

Table 2-48
Per Capita Personal Income Trend in the WRFO and Related Counties

County	Per Capita Personal Income					
	2000 (in 2000 \$)	County as % of State	2000 (in 2005 \$)	2005 (in 2005 \$)	County as % of State	% Change, 2000 to 2005 (adjusted for inflation)
Rio Blanco, CO	26,601	79.7%	30,014	32,993	88.0%	9.9%
Garfield, CO	28,047	84.1%	31,645	31,460	83.9%	-0.6%
Mesa, CO	24,920	74.7%	28,117	28,854	76.9%	2.6%
Moffat, CO	22,353	67.0%	25,221	29,133	77.7%	15.5%
Uintah, UT	16,922	70.9%	19,093	23,851	87.3%	24.9%
State of Colorado	33,367		37,648	37,510		-0.4%
State of Utah	23,874		26,937	27,321		1.4%

SOURCE: USDOC, Bureau of Economic Analysis 2007b.

NOTE: Per capita personal income was computed using U.S. Census Bureau midyear population estimates. Estimates for 2000-2005 reflect county population estimates available as of March 2007. Inflation adjustment by Lloyd Levy Consulting LLC using the Gross Domestic Product Implicit Price Deflator (GDPDEF) published by the BEA.

2.5.2 Population

Population growth in the five-county planning area began to accelerate after the recession of 1973–1974, stimulated by high-energy prices, federal synfuels policies and investment in northwestern Colorado oil shale. Growth was unaffected by national recessions of 1980 and 1981–1982, but Exxon’s closure of the Colony Oil Shale Project in 1982 dealt the region a setback. Total combined population for the planning area fell 9 percent from 1983 to 1987 before resuming growth at a pace comparable to the long run annual average of 2.6 percent per year. It was not until sometime after 1992 that the total population of the planning area again reached what had been the previous peak population and began to grow beyond it. Figure 2-6 illustrates the population trend from 1970 to 2004 using aggregated data for all five counties.

³ Per capita personal income is calculated as the personal income of residents of a given area divided by the resident population of the area. In computing per capita personal income, BEA uses the Census Bureau's annual midyear population estimates.

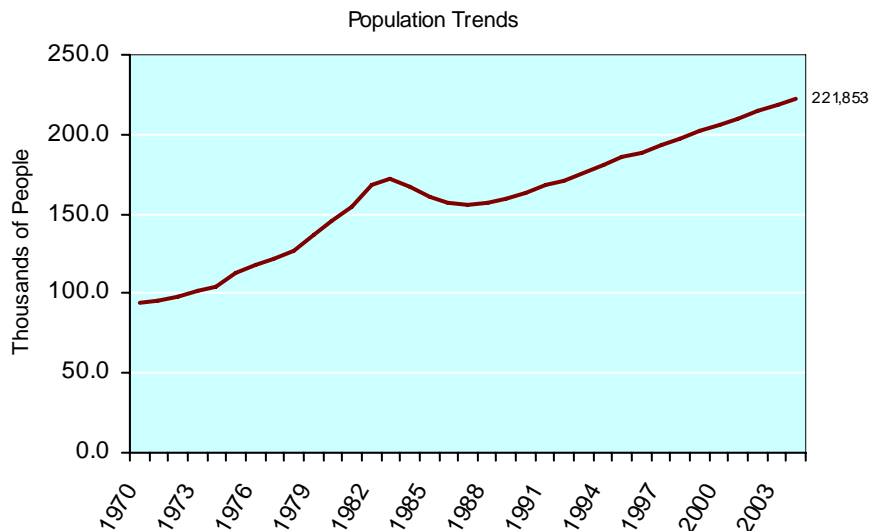


Figure 2-6. Aggregate Population Trend in the WRFO Area and Related Counties, 1970 to 2004

SOURCE: Sonoran Institute 2004.

NOTE: Data are for Uintah UT, Rio Blanco CO, Moffat CO, Mesa CO, and Garfield CO combined.

From 1970 to 2003, Rio Blanco County’s population grew by 1,163, a 24 percent increase (Figure 2-7). Although this equates to growth of 0.7 percent per year, Rio Blanco County’s population either responds to events that cause change or it remains relatively stable, as shown in Figure 2-7. Energy development in the region, including oil shale projects on the Piceance Plateau, caused Rio Blanco County’s population to rise 46 percent (to 7,150 from 4,900) from 1977 to 1983. Following the Exxon reversal and closure of other projects, county population fell to 6,010 in 1990, a decrease of 16 percent. Since 1990 population in Rio Blanco County has wavered around 6,000, with the most recent estimate being 6,073 in 2005 (CDOLA 2006).

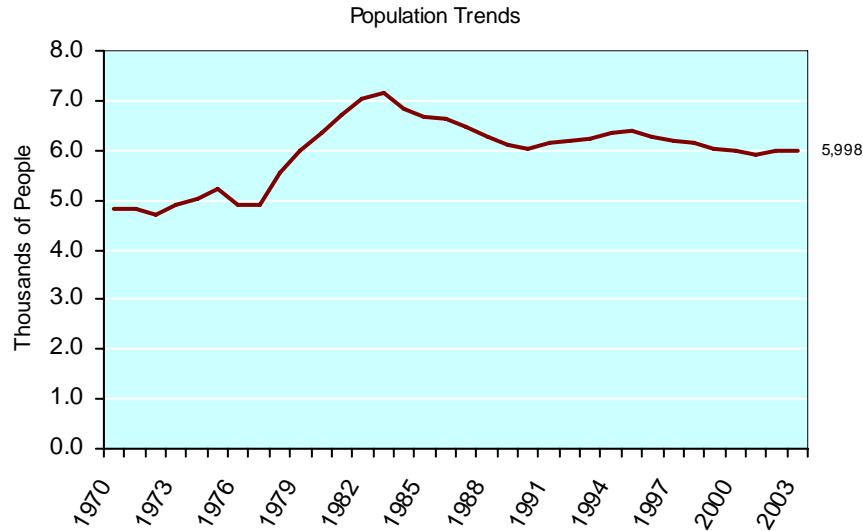


Figure 2-7. Population Trend in Rio Blanco County, 1970 to 2003

SOURCE: Sonoran Institute 2004.

NOTE: Data are for Rio Blanco CO.

Moffat County population also has responded dramatically to economic events (Figure 2-8). County population more than doubled from 1972 to 1983 during construction of three units of the Craig Electric Generating Station. Following the project’s completion, population fell to 11,290 by 1989, a decrease of 22 percent. Since 1990, population in Moffat County has grown steadily, though at a lower rate than the average annual implied rate of 2.2 percent per year from 1970 to 2004, which includes the boom growth that accompanied the power plant construction project. The most recent estimate of Moffat County population is 13,430 in 2005 (CDOLA 2006).

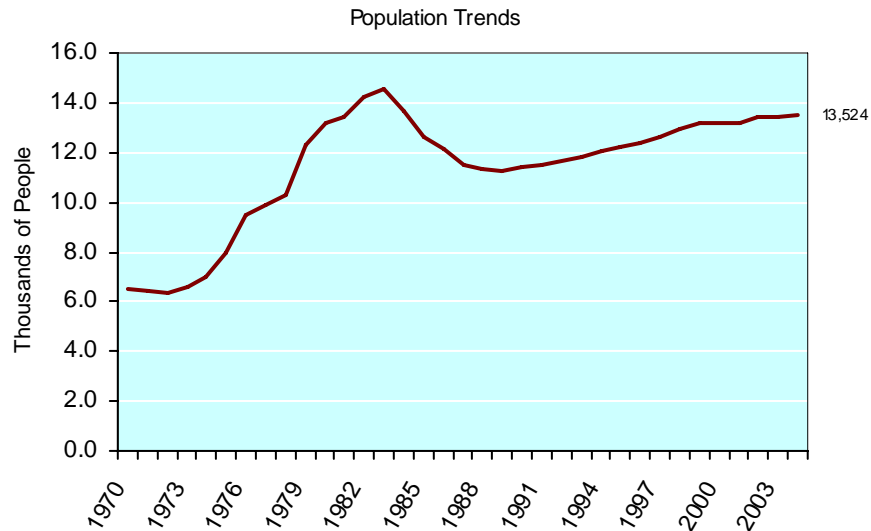


Figure 2-8. Population Trend in Moffat County, 1970 to 2004

SOURCE: Sonoran Institute 2004.

NOTE: Data are for Moffat CO.

In Garfield County, energy development is combined with a longstanding recreation economy, so recent growth in western Garfield County is being driven by a combination of energy development and the demand for more affordable housing by people who work in the recreation economies of Glenwood Springs, and the Roaring Fork River Valley south of Glenwood Springs (which also includes parts of Eagle and Pitkin counties) and the I-70 corridor east of Glenwood Springs (which includes Vail and other resort towns in Eagle County). Garfield County’s population grew by 33,504 people from 1970 to 2004, a 224 percent increase. This equates to long-term growth of 3.5 percent per year. As shown in Figure 2-9, growth rates near the long-term rate have been typical for Garfield County throughout the period, except when the previous energy boom and bust cycle caused population to surge at rates of up to 14 percent per year from 1978 to 1982 and then to decline by 7 percent in the 2 years from 1982 to 1984.

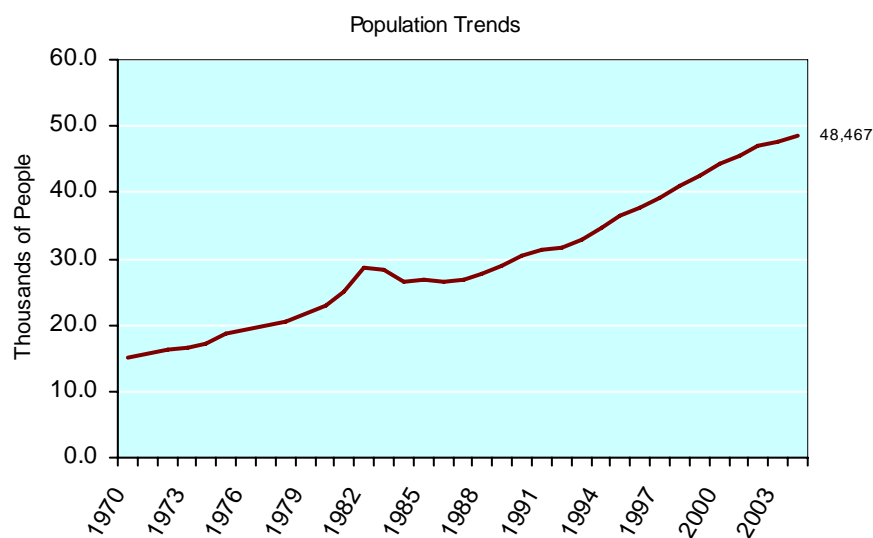


Figure 2-9. Population Trend in Garfield County, 1970 to 2004

SOURCE: Sonoran Institute 2004.

NOTE: Data are for Garfield CO.

The population impact of the growth and decline cycle of the late 1970s and early 1980s brought a similar pattern to the WRFO area and its energy-related counties. The details of the “boom and bust” cycle differed from county to county depending on relative size, exposure to different energy activities, the length of the phases of the cycle, and whether other economic drivers contributed to growth at the same time. For each county, Table 2-49 summarizes the magnitude and speed of population change that occurred during the previous energy boom cycle and compares it to the experience of each county from the beginning of the recovery through the present.

Table 2-49
Previous Boom and Bust in the WRFO and Related Counties

County	Rio Blanco, CO	Garfield, CO	Moffat, CO	Mesa, CO	Uintah, UT
Initial Population (year)	4,904 (1977)	14,963 (1970)	6,389 (1972)	54,479 (1970)	12,799 (1970)
Boom Years	1977-1983	1970-1982	1972-1983	1970-1983	1970-1984
Population Change	+2,240	+13,547	+8,152	+41,533	+13,162
Average Annual Change	6.5%	5.5%	7.8%	4.5%	5.2%
Bust Years	1983-1990	1982-1987	1983-1989	1983-1986	1984-1989
Population Change	-1,142	-1,535	-3,255	-8,626	-3,978
Average Annual Change	-2.5%	-1.1%	-4.1%	-3.1%	-3.3%
End of Bust to 2005					
Population Change	62	23,698	2,140	43,276	49,00
Average Annual Change	0.1%	3.6%	1.1%	2.1%	1.3%

SOURCE: Sonoran Institute 2004.

NOTE: Data are for Uintah UT, Rio Blanco CO, Moffat CO, Mesa CO, and Garfield CO.
Analysis by Lloyd Levy Consulting LLC.

Table 2-50 presents population trends since 1970 for communities that are the residential and service centers for any energy development that would occur in the WRFO planning area. These include communities in the energy-related counties. From a tally of 1,597 in 1970, Meeker's population rose 48 percent to 2,356 in 1980, fell 11 percent to 2,098 in 1990, and rose 7 percent to 2,242 in 2000. Meeker's 2005 population was estimated at 2,275, up 1.4 percent from 2000. Rangely's population 2,361 in 1996 (Town of Rangely 2004). The 2005 estimate was 2,068, down 12.4 percent since 1996. From 2000 to 2005, Rifle's population rose 19.7 percent to 8,118, and Grand Junction's population rose to 17.7 percent to 49,422.

Table 2-50
Population in Communities with Residential and Service Linkage to Energy Development in the WRFO

	Meeker (Rio Blanco County)	Rangely (Rio Blanco County)	Rifle (Garfield County)	Grand Junction (Mesa County)	Vernal (Uintah County, UT)
1970	1,597	1,591	2,150	20,170	NA
1980	2,356	2,113	3,215	27,956	NA
1990	2,098	2,353	4,858	32,893	6,644
2000	2,242	2,096	6,784	41,986	7,702
2001	2,234	2,096	7,079	44,788	7,745
2002	2,272	2,108	7,349	45,675	7,857
2003	2,263	2,088	7,541	46,850	7,853
2004	2,291	2,099	7,760	48,314	7,908
2005	2,273	2,068	8,118	49,422	7,960
Change 1970-80	47.5%	32.8%	49.5%	38.6%	NA
Change 1980-90	-11.0%	11.4%	51.1%	17.7%	NA
Change 1990-2000	6.9%	-10.9%	39.6%	27.6%	15.9%
Change 2000-05	1.4%	-1.3%	19.7%	17.7%	3.3%

SOURCE: CDOLA, Division of Local Government, State Demography Office 2006; U.S. Census Bureau, Population Estimates Program.

NOTE: Vernal, Utah, data are from the U.S. Census Bureau.

Table 2-51 analyzes the minority population of Rio Blanco County, Meeker, Rangely, Garfield County and Rifle, according to data from the 2000 Census.⁴ None of these areas is disproportionately high in minorities, as the table shows. In 2000, minorities were a very low fraction of the population proportion of Rio Blanco County and its sub-areas, compared to the Colorado's overall average of 25 percent minorities. Even in absolute terms, Rio Blanco County had few minority residents in 2000—just 136 individuals. In the county's Census Block-Group 2 (in Census Tract 9511)—which defines a geographical area where most of the county's gas drilling has occurred recently and could occur in the future—minorities were only 4 percent of the population in 2000. Rifle, which has grown because of recent energy development, had 8.5 percent minorities in 2000, compared to 19 percent in Garfield County as a whole. Recent growth trends, which include both resort-related and energy-related growth, have grown Garfield County's minority representation to near the Colorado average.

Table 2-51
Percentages of Minorities in the State of Colorado, Rio Blanco
and Garfield Counties, and Selected Areas

	Minority Persons in 2000 as % of Total Population	Percentage Points Above/Below the State Average
Colorado	25.5	-
Rio Blanco County	7.4	-18.1
Meeker CCD ⁵	6.1	-19.4
Block Group 2 (Census Tract 9511)	4.0	-21.5
Meeker	6.1	-19.4
Rangely	8.3	-17.2
Garfield County	19.0	-6.5
Rifle	8.5	-17.0

SOURCE: U.S. Census Bureau (a).

NOTE: Cited in USDI, BLM, White River Field Office 2006.

Table 2-52 shows the percentage of persons in poverty in Rio Blanco County, its communities and some places nearby. According to the 2000 Census, persons in poverty are 10.7 percent of the Meeker Census County Division (CCD), which comprises the eastern half of the county. This is 1.4 percentage points higher than the overall rates for Rio Blanco County and the State of Colorado. However, the area that excludes the Town of Meeker is closer to the county-wide average.

⁴ This analysis uses the definition of minority in Instruction Memorandum No. 2002-164, Guidance to Address Environmental Justice (EJ) in Land Use Plans and Related National Environmental Policy Act (NEPA) Documents: "Individual(s) classified by OMB's Directive No. 15 as Black/African American, Hispanic, Asian and Pacific Islander, American Indian, Eskimo, Aleut, and other non-white persons." In Census Bureau categories this comprises Hispanic or Latino persons of any race, non-Hispanic persons of the white race in combination with other non-white races, and non-Hispanic persons of other non-white races alone.

⁵ Census county divisions (CCDs) are geographic statistical subdivisions of counties established cooperatively by the Census Bureau and officials of state and local governments. The boundaries of a CCD may follow governmental boundaries by they have no local political standing.

Table 2-52
Percentages of Persons in Poverty in the State of Colorado, Rio Blanco and
Garfield Counties, and Selected Areas Percentages of Persons in Poverty in
the State of Colorado, Rio Blanco and Garfield Counties, and Selected Areas

	Persons in Poverty in 1999 as % of Total Population	Percentage Points Above/Below the State Average
Colorado	9.3	-
Rio Blanco County	9.6	0.3
Meeker CCD	10.7	1.4
Meeker Town	11.4	2.1
Remainder of Meeker CCD	9.5	0.2
Rangely CCD	8.1	-1.2
Rangely Town	9.8	0.5
Remainder of Rangely CCD	0.7	-8.6
Garfield County	7.5	-1.8
Rifle CCD	6.9	-2.4
Rifle City	7.4	-1.9
Remainder Rifle CCD	7.8	-1.5

SOURCE: U.S. Census Bureau (b).

NOTES: Cited in USDI, BLM, White River Field Office 2006. Data on poverty status are not available for small areas like Rio Blanco County Census Block Group 2 (Tract 9511).

The Colorado State Demography Office prepares population projections for counties within the state. As shown in Figure 2-10, Rio Blanco County population is projected to grow from 6,048 in 2005 to 8,384 in 2030, about 39 percent during the 25-year period. For the same period, the State of Colorado is projected to grow by 55 percent. These projections do not fully reflect the population change that the county has experienced recently from specific energy projects. The remaining WRFO and energy-related counties have a similar growth outlook, though projections may change as the Colorado State Demography Office assesses emerging information about prospects for energy development in the future.

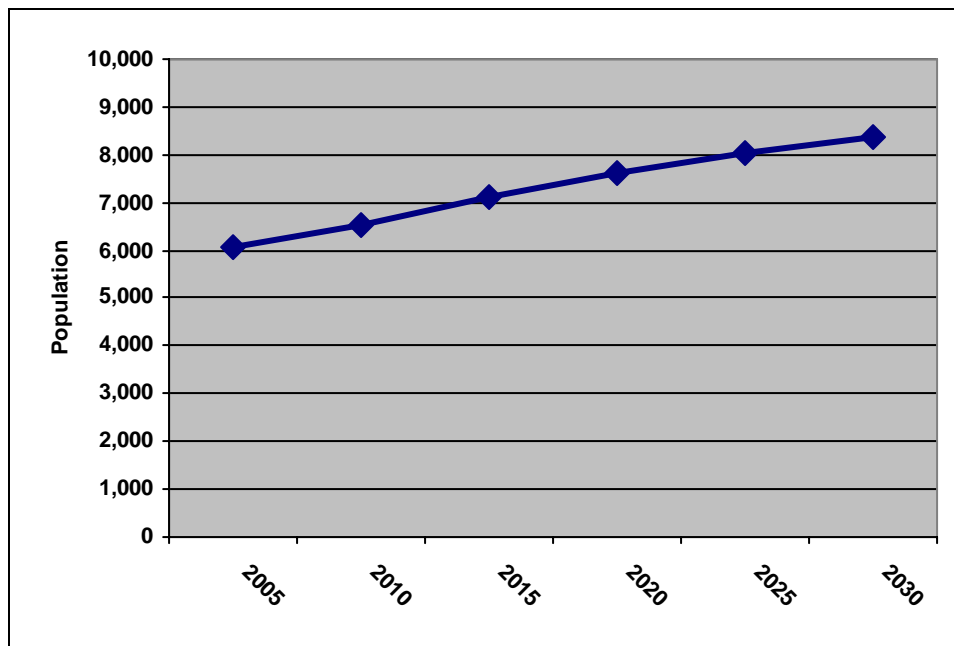


Figure 2-10. Rio Blanco Population Forecasts for 2005 to 2030

SOURCE: CDOLA, Division of Local Government, State Demography Office 2005a.

2.5.3 Housing

The total number of housing units in Rio Blanco County increased by about 4 percent between 2000 and 2005, from 2,855 to 2,977 units. Total housing units in Meeker grew by about 4 percent, from 1,054 to 1,095, and by one percent in Rangely, from 899 to 908. In contrast, total housing units in Rifle grew about 20 percent over the five-year period, from 2,586 units to 3,110 (Table 2-53).

**Table 2-53
Total Housing Units, Rio Blanco County, Meeker and Rangely: 2000-2005**

	2000	2001	2002	2003	2004	2005	% Change
Rio Blanco County	2,855	2,872	2,897	2,915	2,938	2,977	4.3
Meeker	1,054	1,056	1,069	1,076	1,085	1,095	3.9
Rangely	899	904	905	906	907	908	1.0
Rifle	2,586	2,675	2,795	2,889	2,974	3,110	20.3

SOURCE: CDOLA, Division of Local Government, State Demography Office 2005b.

The Colorado State Demography Office estimates that 21 percent of total Rio Blanco housing units were vacant during 2005, with a 15 percent vacancy in Meeker and 19 percent in Rangely. Vacancy rates in Rifle were reported at less than 4 percent in 2005. A portion of vacant housing units includes second and seasonally occupied homes. The greatest number of vacant housing units in Rio Blanco County was located within the unincorporated portions of the county, which is consistent with the idea that many vacancies are second homes. In contrast to the 2005 state statistics, local officials reported almost no vacancies in rental housing during the fall of

2005/winter 2006, when several major natural gas pipelines were under construction (Neumann 2005, Day 2005, Stewart 2005, Sturgeon 2006).

Rental housing in and around Meeker and the 81 pads in the town's 5 mobile home parks were completely occupied during the fall of 2005. Construction crews occupied many mobile home spaces for the Entrega and WIC pipeline projects, which have since been completed. Additionally, the long-established seasonal demand from hunters, drilling crews, and the loss of capacity following a fire that destroyed a motel combined to absorb other temporary housing resources (motels and RV parks). Meeker has a total of 4 motels with about 90 rooms, two recreational vehicle (RV) parks with 29 spaces, eight seasonal campgrounds with 149 campground and RV spaces, 19 RV spaces in mobile home parks and 10 in a town park, which have a 15-day time limit.

Two temporary RV parks had been developed near Meeker to house pipeline workers, one with 90 RV pads and one with 25 pads. These construction worker RV park facilities were operating under county temporary use permits and not intended for long-term use (Neumann 2006). The Town of Meeker has also approved the renting of rooms in private residences, as long as the activity does not impact residential (R1) zones. There has recently been some residential subdivision activity within the town, including plans to open 100 new lots in the Sanderson subdivision for development (Day 2005). However, few houses have recently been offered for sale in Meeker and when houses come on the market they are quickly purchased for the full asking price and sometimes more (Neumann 2006).

There were virtually no vacant rental units in Rangely during the fall of 2005, and many rental properties had waiting lists. There are 200 mobile home/RV spaces within the town and recent occupancy has averaged 30 to 40 percent. Rangely has three motels with a total of about 90 rooms. Recent motel occupancy has averaged an estimated 80 percent (Stewart 2005).

Rifle had an estimated vacancy rate of about 2 percent across all types of units in the fall of 2005 (Sturgeon 2005). With the opening of two new motels in 2006, Rifle will have six motels with 387 rooms and two RV parks with 57 pads; existing motels were frequently full during fall of 2005.

2.5.4 Local Government Facilities and Services

Oil and gas development would affect most Rio Blanco County government services to some degree, but those likely to be affected most in the early stages of impact would be law enforcement, emergency management and response, fire suppression and ambulance, and county road maintenance. Transportation and road maintenance are addressed in Section 2.3.5 Transportation and Access. Some Garfield County services would also be affected, primarily

law enforcement and emergency response services along US 13 north from Rifle to the Rio Blanco County line. Municipal services in Meeker, Rangely and Rifle would also be affected.

County Services

Most Rio Blanco County Services are headquartered in Meeker. Some services also maintain satellite offices in Rangely.

Law Enforcement. The Rio Blanco County Sheriff's Office provides law enforcement services to the unincorporated portion of Rio Blanco County. The Sheriff's Office, as of January 2006, consisted of nine law enforcement officers, 10 persons in the county detention facility, and eight in the Rio Blanco County Communications Center.

Current demand for law enforcement and emergency response services in the county is high, particularly in the areas accessed from Rio Blanco County Road 5 along Piceance Creek. During the past 3 years, calls for service during the first 6 months of each year have increased by over 400 percent, from 69 calls to 355. About 68 percent of all calls in 2005 were traffic or motor vehicle related. Responses to traffic accidents on both highways that provide access to the Piceance Basin have also increased substantially in recent years; between 2003 and 2005, accident responses increased 142 percent on SH 64 and 101 percent on SH 13.

The patrol sergeant and deputies based in Meeker provide law enforcement coverage to the areas adjacent Rio Blanco County Road (RBCR) 5; response times to the Piceance Creek area can run to an hour or more because of the distance from Meeker. Response times have tended to increase under the pressure of higher demand for service and reduced staffing.

The Rio Blanco County Detention Center was constructed in 1937 and is designed to hold 18 prisoners. Recent daily jail populations have averaged in the mid-20s. There are no dedicated cells for females, and if a female is incarcerated, an entire cellblock must be used. There are no juvenile holding facilities either, and juvenile prisoners must be transported to the state's juvenile center in Grand Junction. This activity removes a detention deputy from the county for about 8 hours. In the not too distant past, the jail routinely had excess capacity and the county generated revenue by hosting prisoners from other counties. Over the last several years the situation has reversed, and Rio Blanco County must now often transport inmates and pay other counties to house inmates when the jail is full. The county is currently conducting a feasibility study to determine the configuration, location, and cost for a new jail facility. If the commissioners decide to construct a new jail, construction would probably begin in 2008.

The Rio Blanco County Communications center provides dispatch service for the Sheriff's Office, Meeker Police Department, Town of Meeker, Meeker Fire and Rescue, the local office of

the Colorado Department of Wildlife, White River Electric Company and, on occasions, the Colorado State Patrol. There are currently large areas of dead spots for cell phone and radio communication coverage in the Piceance Creek area, resulting in delayed response times for accidents and crimes in those areas.

The Garfield County Sheriff Department provides law enforcement on the portion of SH 13 from I-70 to the Rio Blanco County line. In the past several years, energy traffic has increased dramatically on the highway, resulting in a corresponding increase in complaints and calls for service. Although the Colorado State Highway Patrol provides patrol services on the rural portion of the highway from Rifle north to the Rio Blanco County line, the Garfield County Sheriff's Department does respond to complaints, incidents, and accidents in that area (Templon 2006).

Emergency Management and Response. The Rio Blanco Emergency Manager, a Sheriff's Office employee, coordinates emergency response planning and training functions for emergency response agencies in the county. Emergency response agencies in the county face a variety of obstacles to providing timely service — the large size of the county, numerous backcountry roads, the large number of recreation visitors, the proliferation of energy exploration and development sites, and extensive communications dead spots.

Rio Blanco County does not have a dedicated hazardous materials response team and must rely on agencies in Glenwood Springs, Craig, and Grand Junction for assistance.

Meeker Fire and Rescue District provides fire suppression services in the eastern portion of the County. BLM's White River Field Office in Meeker also provides range and wild land fire response. Some Meeker Fire and Rescue District vehicles are older and in need of replacement.

Meeker also provides ambulance services for the eastern part of the county. Air ambulance services are also available when weather conditions allow. Patients are transported to Pioneers Medical Center in Meeker or hospitals in Rifle, Grand Junction and Denver, depending on the type and severity of the injury and the location of the accident (Hutchins 2005).

The Rifle Fire Department provides Garfield County emergency management and response services (including fire suppression and ambulance) for the area along SH 13.

Hospital and Medical Services. Pioneers Medical Center provides hospital and medical services for Meeker and the eastern portion of Rio Blanco County. It operates a 15-bed hospital and provides 24-hour emergency medical, pulmonary, laboratory, radiological, surgical, acute care and rehabilitative services. Pioneers also operates an attached 33-bed skilled convalescent and long-term care facility, the Walbridge Wing. The hospital is designated as a Level IV trauma center and provides advanced cardiac and life-support trauma services.

Pioneers also operates the Meeker Family Health Center, which offers a variety of medical care for children, adults and families. Rio Blanco County owns Pioneers Hospital, and a seven-person Board of Trustees serves as the governing body for the facility (Pioneers Medical Center 2005). Four resident physicians provide services through the Meeker Family Health Center and staff the hospital and emergency room. The physicians also provide medical direction to Emergency Medical Technicians (EMTs) who staff the ambulance service and provide training to law enforcement and emergency response personnel in the county. The medical center offers industrial medicine services and is currently exploring options for offering on-site medical services for energy companies. In addition to the four primary care physicians, another eight or nine physicians visit from neighboring communities and use Pioneers clinic to provide specialized care.

In recent years, hospital occupancy has averaged about 45 to 50 percent of the 15-bed capacity, although at times the hospital has been nearly full. The skilled nursing/long-term care facility has averaged about 80 to 85 percent occupancy. During 2004, the medical center treated 1,600 emergency room patients, about 100 more than the previous year. It appears that 2005 emergency room visits will be somewhat higher than the 2004 level. The primary care clinic had about 13,000 visits in 2004 and is likely to exceed that level by 400 to 500 visits in 2005 (Omer 2005).

Although the Medical Center and its facilities are adequate for current needs, the core hospital building is 55 years old and the Walbridge Wing is 45 years old. Pioneers intends to develop a new master facilities plan and explore funding options to replace these aging facilities (Omer 2005).

Public Health. Rio Blanco County Nursing Service is the public health agency serving all of Rio Blanco County and surrounding areas, from clinics in Meeker and Rangely. Essential services provided include: monitoring of the health status of the population and identification of community health problems; prevention and control of the spread of communicable disease; promotion of positive health behaviors and environmental practices; mobilization of community partnerships to solve identified health problems; enforcement of laws and regulations that protect public health; and assurance of access to personal health services. A description of Nursing services and programs can be found at www.co.rio-blanco.co.us/healthnurse/.

Social Services. From offices in Meeker and Rangely, the Rio Blanco County Social Services Department administers the following programs: Food Stamp Program, Colorado Works Program, Medical Assistance Program, Families in Transition, Child Support Enforcement, Child Protection, Adult Protection, Child Care Services, Old Age Pension (OAP), Aid to the Needy Disabled (AND), Long-Term Care (LTC), Colorado Employment First, and Senior Nutrition. A description of these programs can be found on the Rio Blanco County website at: <http://www.co.rio-blanco.co.us/socialservices/>.

Town of Meeker

Meeker is the county seat of Rio Blanco County and the county's largest town, with an estimated 2004 population of 2,291. The community's population has grown slightly in recent years and the town's facilities and services are generally adequate for the existing population and have capacity to accommodate some growth (Day 2005). As noted in Section 2.4.3, rental housing in Meeker has been absorbed in recent years. Temporary housing resources (hotels, motels, RV parks, and temporary construction worker housing facilities) were full much of the time during the last few years.

The Town of Meeker provides water service through an enterprise fund. Currently, the Town has water system capacity to accommodate current needs and some population growth. Although the 1.5 million gallon maximum daily output of the water treatment plant is fully used during peak summer days, the town has about 2.5 million gallons of storage (Town of Meeker 2005).

The Meeker Sanitation District, a separate taxing entity, provides wastewater collection and treatment in Meeker and the immediately adjacent area. The sewerage treatment plant is capable of treating 500,000 gallons per day (GPD) of effluent. Current peak flows are 230,000 to 300,000 GPD. However, the treatment facility is approaching discharge limits for certain effluent constituents and it is likely that the District will have to make a substantial investment to meet effluent standards in the near future. The District's sewage collection system also requires improvement.

Town of Rangely

The Town of Rangely, with an estimated 2004 population of 2,099, is approximately the same size as Meeker. The town is several hundred people below its 1996 peak population and the community's water and sewer systems were designed to accommodate a population of 10,000. Rangely has utility capacity to accommodate substantial growth, although water and sewer mains would have to be extended to new subdivisions. The biggest constraint to growth in Rangely is housing. Rental housing was fully occupied in the fall of 2005 although there were motel rooms and RV spaces available. To date, Rangely has experienced little growth from energy development along Piceance Creek although a substantial workforce commutes from Vernal, Utah, to Piceance Creek through Rangely every day (Stewart 2005).

City of Rifle

The City of Rifle, located in Garfield County, is about 45 to 50 miles from the Piceance Basin. Rifle and its surrounding area had an estimated 2004 population of 7,760. Rifle has little available rental housing, and motels and RV spaces are typically fully occupied by energy employees. Rifle is currently going through a comprehensive planning process as well as

planning studies for the sewer and water systems. At present growth rates, capacities of both the water and sewage treatment systems may be exceeded in 3 years (Sturgeon 2005), but the City hopes to have expanded sewer and water facilities on line by that time (Deussen 2006).

2.5.5 Public Schools

Rio Blanco County is served by two school districts: Meeker RE-1 serves Meeker and the eastern part of the county; Rangely RE-4 serves Rangely and the western part of the county.

Meeker School District RE-1

Meeker School District RE-1 operates three schools, including an elementary school, a middle school and a high school, all located in Meeker. During the 2003-04 school year, District RE-1 had 36.1 full time equivalent (FTE) classroom teachers and a pupil/teacher ratio of 17.3/1. Meeker RE-1 total fall enrollment fell from 687 students in 2000 to 624 in 2002, a loss of 63 students or 9 percent. Total fall enrollment rose to 637 students in 2004 and 659 in 2005. The previous underlying trend in enrollment reductions has been in part attributable to an aging population, a limited supply of well-paid jobs, and few affordable housing options for young families. In the past several years, the increase in enrollment has in part been attributable to energy development in the eastern part of the county. During the peak of the previous energy boom, District RE-1 enrollment was substantially higher than current levels; consequently the district has excess physical capacity in all three schools. The school facilities are aging however and the district will likely renovate the elementary and high schools during the next three to eight years (Evig 2005).

Rangely District RE-4

Rangely District RE-4 also operates three schools (one elementary, one middle, and one high school), with a 2003/2004 school-year total of 29.8 FTE classroom teachers and a pupil/teacher ratio of 19.6/1. District RE-4 total fall enrollment fell from 643 in 2000 to 517 in 2004, a loss of 126 students or about 20 percent of 2000 enrollment. District RE-4 has excess physical capacity; a school building was recently closed as a result of declining enrollment.

Garfield District RE-2

This district serves the communities of Rifle, Silt, and New Castle with a total of eight schools (four elementary, two middle and two high schools). In the 2003/2004 school year, District RE-2 had a total of 212.3 FTE classroom teachers and a pupil/teacher ratio of 17.9/1.

Garfield District RE-2 enrollment climbed from 3,568 students in the fall of 2000 to 3,879 in the fall of 2004, an increase of 311 or about 9 percent. However, District RE-2's growth accelerated between 2004 and 2005, when enrollment reached 4,200 students, an increase of 321 students or

8 per cent in 1 year. The district anticipates a 4 to 6 percent growth rate over the next 5 years, based on Colorado State Demography Office and Garfield County Planning Department projections. The growth appears to be driven by a combination of energy development and people who work in Glenwood Springs and the Roaring Fork Valley seeking more affordable housing. This rapid rate of growth has resulted in enrollment levels that exceed the capacity of District RE-2's six schools, even though the district recently completed a \$55-million expansion program. The district may have to acquire modular classrooms to accommodate the anticipated growth on an interim basis (Peck 2006).

2.5.6 Local Government Fiscal Conditions

This section summarizes fiscal conditions for the potentially affected units of local government. The primary focus is on Rio Blanco County government. The municipalities of Meeker, Rangely, and Rifle (in Garfield County), and the Meeker RE-1 and Rangely RE-4 school districts are also addressed. It describes fiscal conditions in terms of trends in assessed valuation and retail sales, two key determinants of local revenues. Other revenues, expenditures, and staffing levels of Rio Blanco County are summarized. Finally, this section provides overviews fiscal conditions for the selected communities and school districts.

Property Tax - Assessed Valuation and Revenue

Property tax revenues are a major source of funding for local governments in Colorado. One direct link between energy resource development and local fiscal conditions is the effect of energy development on the local ad valorem, or property, tax base. In Colorado, the value of natural gas production, along with the value of gas field collection, processing, and transmission facilities, is subject to ad valorem taxes levied by the affected jurisdictions. Such jurisdictions always include the host county and school districts, and may include special service districts, such as fire protection, parks and recreation, and library districts.

Total assessed valuation on taxable property in Rio Blanco County has increased sharply in the past several years. Climbing by \$191.4 million, or nearly 79 percent since the year 2000, the county's total assessed valuation stood at \$434.6 million in 2005 (Table 2-54). A surge in oil and gas sales prices, first registered in 2001, is responsible for most of the increase. Despite recent gains, Rio Blanco's tax base remains smaller than those of several neighboring counties, which have also experienced dramatic energy resource development.

Table 2-54
Valuation, Selected Northwest Colorado Counties: 2000 - 2005 (Millions)

County	2000	2001	2002	2003	2004	2005	Pct. Change
Rio Blanco	\$243.2	\$358.7	\$339.6	\$304.9	\$339.8	\$434.6	78.7%
Oil & Gas Share	\$145.3	\$228.6	\$208.6	\$176.4	\$226.6	\$303.6	108.9%
Garfield	\$612.6	\$816.4	\$918.3	\$922.0	\$1,255.1	\$1,772.9	189.4%
Moffat	\$303.8	\$315.1	\$321.0	\$296.1	\$341.4	\$390.3	28.5%
Mesa	\$807.1	\$907.4	\$955.7	\$1,012.6	\$1,054.2	\$1,243.5	54.1%

SOURCE: CDOLA, Division of Property Taxation; Nielson 2006.

Changes in the ad valorem tax base affect local school districts as well. Two school districts cover the majority of Rio Blanco County; Meeker School District RE-1 (Meeker RE-1) and Rangely School District RE-4 (Rangely RE-4). Meeker RE-1 covers about the eastern two-thirds of the county, including the Piceance Creek Project area. Both districts have been affected by energy resource development; Rangely RE-4 more so than Meeker RE-1, with total assessed valuations of the two districts at \$297.7 million and \$136.8 million, respectively in 2005. The value of oil and gas production accounts for virtually all of the difference and has also accounted for most of the recent growth; \$40.9 million in Meeker RE-1 and \$56.7 million in Rangely RE-4 between 2000 and 2004.

Local municipalities typically experience little direct effect from energy resource development in terms of their ad valorem tax base because most of the production and the capital facilities are located in unincorporated areas. Instead, the effects are indirect as the tax base grows in response to rising real estate values and new residential and commercial development stimulated by population growth and increased business activity. This pattern is evident in the study area where Meeker, Rangely, and Rifle have 2005 assessed valuations of \$14.7 million, \$10.7 million and \$78.8 million, respectively. These values were relatively small fractions of the respective county totals. The current values reflect more modest increases over the past five years as compared to their respective countywide changes.

The ad valorem tax base serves as a basis for local property tax receipts, although the amount of tax revenue collected also reflects local decisions regarding the type and level of services to be provided, the availability of other revenue sources, and in some instances the effects of state and federal statutory and regulatory requirements. The various influences are reflected in the mill levy (tax rate)⁶ established by each taxing entity. Applying these tax rates to the respective assessed valuations yielded nearly \$3.2 million for Rio Blanco County and more than \$2.1 million each for the two school districts. Property tax revenues for the municipalities ranged from \$99,291 for Rangely to \$332,805 for Rifle (Table 2-55).

⁶ The mill levy is the amount of tax per thousand dollars of property value. For example, a property with an assessed value of \$50,000 located in a taxing district with a mill rate of 20 mills would have a property tax bill of \$1,000.00 per year.

Table 2-55
2004 Property Tax Rates and Revenues, by Entity

	2004 Assessed Valuation (Millions)	2004 Property Tax Mill Levy	Total Property Tax Revenue
Rio Blanco County	\$ 339.8	9.377	\$ 3,186,164
Town of Meeker	\$ 12.7	8.746	\$ 111,307
Town of Rangely	\$ 9.9	10.000	\$ 99,291
City of Rifle	\$ 63.3	5.261	\$ 332,805
Meeker RE-1	\$ 106.4	19.754	\$ 2,101,574
Rangely RE-4	\$ 233.3	9.667	\$ 2,254,988

SOURCE: CDOLA, Division of Property Taxation.

Gross and Retail Sales Trends: Gross and retail sales by local merchants are an important indicator of local economic vitality and health. Sales tax levied on many retail transactions and use tax levied on certain commodities purchased elsewhere but brought into a local taxing jurisdiction are a second major source of revenues for communities and some counties. Table 2-56 displays recent trends in gross, retail, and taxable retail sales.

Table 2-56
Annual Gross, Retail and Taxable Sales, 2000 - 2004 (Millions) ¹

	2000	2001	2002	2003	2004	Percent Change
Rio Blanco County						
Gross Sales	\$ 84.6	\$ 88.7	\$ 101.0	\$ 189.7	\$ 324.6	284%
Retail Sales	\$ 76.5	\$ 81.1	\$ 91.6	\$ 169.8	\$ 294.6	285%
Taxable Sales	\$ 43.8	\$ 52.6	\$ 47.8	\$ 52.5	\$ 59.0	35%
Town of Meeker ²						
Gross Sales	\$ 34.0	\$ 34.5	\$ 34.9	\$ 35.1	\$ 37.6	11%
Retail Sales	\$ 28.7	\$ 30.2	\$ 28.8	\$ 31.1	\$ 33.4	16%
Taxable Sales	\$ 15.9	\$ 20.2	\$ 18.7	\$ 20.0	\$ 19.6	23%
Town of Rangely ²						
Gross Sales	\$ 24.0	\$ 23.1	\$ 22.3	\$ 21.9	\$ 22.4	-7%
Retail Sales	\$ 22.2	\$ 21.7	\$ 21.0	\$ 19.7	\$ 20.9	-6%
Taxable Sales	\$ 13.0	\$ 12.7	\$ 11.2	\$ 9.0	\$ 10.2	-22%
City of Rifle						
Gross Sales	\$ 166.8	\$ 178.9	\$ 188.3	\$ 200.6	\$ 264.1	58%
Retail Sales	\$ 159.4	\$ 164.6	\$ 171.6	\$ 185.9	\$ 252.1	58%
Taxable Sales	\$ 61.0	\$ 72.0	\$ 73.9	\$ 83.5	\$ 122.8	101%

SOURCE: CDOLA, Division of Property Taxation.

NOTES:

⁽¹⁾Gross refers to the total sales of all businesses with a retail sales license, retail sales excludes wholesale sales from the gross sales, and taxable sales excludes the value of items exempt from sales tax, e.g., groceries, food sold through vending machines and machinery

⁽²⁾Sales in Meeker and Rangely are also included in the Rio Blanco County totals.

Gross sales in Rio Blanco County have increased dramatically with the upsurge in energy development activity, climbing from about \$85 million in 2000 to almost \$325 million in 2004. The vast majority of those sales have been retail sales, but involved commodities that are tax exempt. Thus, while total retail sales increased by 285 percent to approximately \$295 million,

taxable sales increased by only 35 percent to \$59 million, representing 18 percent of total gross sales.

The majority of the gross sales in Rio Blanco County were by businesses not located in Meeker or Rangely. Less than 20 percent of the total gross or total retail sales and just over 50 percent of the total taxable sales occurred within the two communities. In the 5 years from 2000 to 2004, sales in Meeker increased modestly across all three categories, while sales in Rangely declined. However, the combined taxable sales within the two counties have remained around \$30 million per year. That level of total sales is indicative of the relatively limited scale of the retail sectors in the two communities, which is also apparent when sales in those communities are compared to the levels of sales activity in Rifle. Total gross and retail sales in Rifle are more comparable to countywide sales and the taxable retail sales are more than double those in Rio Blanco County.

All four of the affected local governments derive significant revenues from sales and use taxes. Rio Blanco County has budgeted more than \$2.15 million in its 2005 budget, approximately 60 percent of which is sales taxes revenue. At the same time, the county anticipates collecting \$850,000 in use tax receipts in 2005 from vehicles and building materials purchased elsewhere but brought into the county for use (see Table 2-57). Revenues derived from both sources have increased in recent years.

Table 2-57
Sales and Use Tax Revenues

	2003 (Actual)	2004 (Actual)	2005 (Estimated)	Percent Change
Rio Blanco County				
Sales Tax	\$ 899,260	\$ 1,444,596	\$ 1,335,804	49%
Use Tax	\$ 669,894	\$ 720,990	\$ 1,400,000	109%
Total sales and use	\$ 1,569,154	\$ 2,165,586	\$ 2,775,804	77%
Town of Meeker				
Total sales and use	\$ 808,957	\$ 783,217	\$ 870,000	8%
Town of Rangely				
Sales Tax	\$ 497,981	\$ 535,759	\$ 571,000	15%
Use Tax	\$ 158,447	\$ 172,738	\$ 120,000	- 24%
Total sales and use	\$ 656,428	\$ 708,497	\$ 691,000	5%
City of Rifle				
Sales Tax	\$ 1,626,012	\$ 2,093,392	\$ 2,751,246	35%
Use Tax	\$ 419,126	\$ 457,644	\$ 599,540	469%
Total sales and use	\$ 2,045,138	\$ 2,551,036	\$ 3,350,786	64%

SOURCE: Rio Blanco County 2005; Rio Blanco County 2006, Town of Meeker, 2005(b), Town of Rangely 2005; City of Rifle 2005; City of Rifle 2006.

Annual sales and use receipts in Meeker are estimated at \$870,000 in the 2006 budget, approximately 8 percent above receipts in 2003. Total estimated sales and use taxes collected in Rangely are \$691,000 in 2005, about \$35,000 or 5 percent above collections in 2003. The City of Rifle is anticipating strong growth in its sales taxes related to on-going energy resource

development, with a combined budget of \$3.4 million in sales and use taxes in 2005, approximately \$1.3 million or 64 percent higher than receipts in 2003.

Rio Blanco County Fiscal Conditions

Rio Blanco County provides a broad spectrum of public administrative, public safety, health and welfare and other services for residents, businesses and visitors in the county. The property, sales, and use tax receipts described above are important revenue sources funding the ongoing operations of the county. This section summarizes fiscal conditions for Rio Blanco County.

In recent years, the county's annual expenditures have risen dramatically, from about \$12.2 million in 1997 to a budgeted \$23.7 million in 2005, with the increases occurring in two distinct periods. The first, in the late 1990s, saw spending increase to \$16.2 million. The second has occurred in the last 2 years as annual operating expenditures climbed by \$6.2 million, as shown in Table 2-58. Increases in expenditures have occurred across all the major funds. However, four major funds account for the overwhelming majority of the county's annual expenditures:

- General Fund – covers most of the administrative, public safety, public works and health and welfare functions, excluding the county-operated hospital.
- Road and Bridge Fund – covers maintenance of the county's extensive road and bridge network.
- Hospital Fund – includes the operations of the Pioneers Medical Center, Meeker Family Health Clinic, and the Walbridge Long-Term Skilled Nursing Care facility.
- Use Tax Fund – which supports senior transportation, aviation, public welfare, and other programs.

Table 2-58
Rio Blanco County Expenditures, by Major Fund: 2003 - 2005

	2003 (Actual)	2004 (Actual)	2005 (Budget)	CHANGES	
				Absolute	Percent
General Fund	\$ 3,690,638	\$ 3,865,260	\$ 4,700,982	\$ 1,010,344	27.4%
Road and Bridge Fund	\$ 4,249,572	\$ 4,068,258	\$ 5,044,656	\$795,084	18.7%
Capital Expenditures	\$ 330,672	\$ 321,971	\$ 916,844	\$586,172	177.3%
Hospital Fund	\$ 6,975,227	\$ 7,554,254	\$ 8,615,030	\$ 1,639,803	23.5%
Use Tax Fund	\$ 904,404	\$ 952,819	\$ 2,915,375	\$ 2,010,971	222.4%
Other Funds ¹	\$ 1,374,193	\$ 1,523,240	\$ 1,527,896	\$153,703	11.2%
Total – All Funds	\$17,524,706	\$18,285,802	\$23,720,783	\$ 6,196,077	35.4%

SOURCE: Rio Blanco County 2005; Rio Blanco County 2006.

NOTE: ⁽¹⁾Includes the social services, Fairfield complex, weed and pest control, and solid waste landfill funds.

The single largest fund in terms of expenditures has been the Hospital Fund, the majority of the funding for which comes from charges for services received from patients and health care insurance providers. The second largest fund is the road and bridge fund at \$5.0 million. The 2005 budget includes several one-time large capital expenditures. Consequently, future budgets may decline as compared to the current year's budget.

Payroll and personnel benefit costs are typically among the largest categories of expenditures for local governments. In Rio Blanco County, the 2005 budgeted expenditures for such costs are \$11.0 million, about 47 percent of the total, based on planned staffing of 127.59 FTEs, excluding staff directly associated with the Pioneer Hospital, health clinic and long-term care center. Nonetheless, Rio Blanco County's total staffing has declined by 7.4 FTE workers, or 5 percent, since 2001. Reductions have occurred across all major functions, with the largest decrease in the road and bridge department (Table 2-59).

Table 2-59
Rio Blanco County Staffing Levels (FTEs¹): 2001 - 2005

	2001	2002	2003	2004	2005	Absolute Change
General Fund	64.00	63.39	61.59	62.78	62.32	-1.68
Road and Bridge Fund	34.43	34.81	32.50	31.40	31.40	-3.03
Social Services	11.73	11.35	11.35	10.05	10.20	-1.53
Use Tax Fund	11.78	12.69	12.07	11.14	10.79	-0.99
Other ²	13.06	12.77	12.49	13.38	12.88	-0.18
Totals	135.00	135.01	130.00	128.75	127.59	-7.41

SOURCE: Rio Blanco County 2005.

NOTES:

⁽¹⁾FTEs = full-time equivalent workers (equal to the total number of hours worked, divided by 2,080, the number of hours worked by a full-time worker, including allowances for paid holidays, vacation and sick leave.)

⁽²⁾Includes fleet maintenance, Fairfield complex, weed control and solid waste landfill, but excludes direct employment of the hospital and nursing care facility.

Factors underlying the growth in annual outlays over the past 3 years include increased property, sales and use tax revenues associated with energy resource development and a favorable economic climate, higher intergovernmental receipts, including one-time grants, and the use of retained fund balances accrued in past years. Charges for services have also risen sharply, although those revenues are not generally available to support other governmental functions (Table 2-60).

In addition to the ad valorem property taxes on production and oil and gas facilities and equipment, Rio Blanco's 2005 budget includes \$543,750 in Federal Mineral Royalties (FMR), \$30,000 in severance tax distributions, and \$284,122 in payments-in-lieu-of taxes (PILT). FMR revenues and severance tax receipts are responsive to the level and value of production; PILT

revenues do not respond to the level and value of production because they are based solely on the acreage of certain federal lands.⁷

Table 2-60
Rio Blanco County Revenues, by Major Source: 2003 - 2005

Revenue Source	2003 (Actual)	2004 (Actual)	2005 (Budget)	CHANGES	
				Absolute	Percent
Property Taxes ¹	\$ 2,943,064	\$ 2,642,067	\$ 3,078,206	\$135,142	4.6%
Specific Ownership Tax	\$ 233,139	\$ 233,376	\$ 246,292	\$13,153	5.6%
Sales & Use Tax	\$ 1,569,154	\$ 2,165,586	\$ 2,154,160	\$585,006	37.3%
Charges for Services	\$ 7,222,058	\$ 7,343,313	\$ 8,354,800	\$1,132,742	15.7%
Intergovernmental	\$ 5,273,313	\$ 5,852,586	\$ 7,270,283	\$1,996,970	37.9%
Other ²	\$865,588	\$898,648	\$848,825	(\$16,763)	-1.9%
Total – All Funds	\$18,106,316	\$19,135,576	\$21,952,566	\$3,846,250	21.2%

SOURCE: Rio Blanco County 2005; Rio Blanco County 2006.

NOTES:

⁽¹⁾Includes receipts of delinquent taxes from previous years.

⁽²⁾Includes licenses, permits, miscellaneous, fines, forfeits, and fees.

Municipal Fiscal Conditions

Table 2-61 summarizes the annual budgets for the three primary communities that would potentially be affected by the project. General fund expenditures, which cover administrative, safety, streets, and various community facilities and services, ranged from \$1.26 million in Meeker to \$6.02 million in Rifle. The range in expenditures approximately mirrors the differences in population between the communities. Other operating funds, which in these communities include one or more of the following enterprise activities: water, wastewater, sanitation, gas distribution, housing authorities or community and economic development programs, had combined budgeted expenditures ranging from \$538,878 in Meeker to \$5.0 million in Rifle.

Table 2-61
Municipal Budgeted Revenues and Expenditures: 2005

	Town of Meeker	Town of Rangely	City of Rifle
General Fund			
Revenues	\$ 2,282,596	\$ 2,989,072	\$ 6,422,442
Expenditures	\$ 1,264,312	\$ 2,895,417	\$ 6,022,442
All Other Funds			
Revenues	\$ 538,878	\$ 3,772,785	\$ 4,040,993
Expenditures	\$ 538,878	\$ 3,577,795	\$ 5,034,101
Capital Improvements & Outlays	\$ 1,018,284	\$ 2,313,800	\$ 4,538,447
Total Expenditures¹	\$2,821,474	\$8,787,012	\$15,594,990
Total Employees	22	41	67

SOURCE: Town of Meeker 2005 and Town of Rangely 2005.

NOTE: ⁽¹⁾Total expenditures include general fund, other funds, and capital improvements and outlays.

⁷ PILT is a federal program administered by the BLM that makes annual payments to local governments, mainly counties, based on acres of federal lands within their jurisdictional boundaries. PILT payments are meant to offset lost local revenue due to the presence of nontaxable federal land. PILT may be used for all governmental purposes and are not required to be distributed further to other local governments, such as school districts or cities.

In addition to funding the ongoing administrative and enterprise activities, each of the three communities has budgeted outlays for major non-recurrent capital projects. Such funding ranges from \$1.02 million in Meeker, to \$2.3 million in Rangely and \$4.5 million in Rifle. The major projects in the respective communities include water system improvements in Meeker, streets, facility renovation and business park improvements in Rangely, and street improvements in Rifle.

The primary revenue sources for each community are summarized below:

Meeker – Sales and use tax, state-shared mineral royalties and severance taxes, property taxes, motor vehicle registration fees, charges for services associated with the water system, and a one-time energy impact assistance grant.

Rangely – Sales and use tax, state-shared mineral royalties and severance taxes, energy impact assistance grants, and charges for utility services.

Rifle – Sales and use tax, property taxes, state-shared mineral royalties and severance taxes, charges for utility service, energy impact assistance grants, and the proceeds from a sale of long-term bonds.

Intergovernmental revenues for local municipalities include revenues based on energy and mineral development activity that occurs within their respective counties. These revenues are derived primarily from allocations of the state severance taxes based on the value of production and the residency patterns of workers directly employed in the mining industry, defined for this purpose to include oil and gas production. In 2005, Meeker received \$138,583 in intergovernmental revenues, Rangely \$459,257 and Rifle \$442,159.

School District Fiscal Conditions

Changes in local fiscal conditions brought about by energy resource development tend to have relatively little direct effect on the fiscal conditions of local school districts. That is because the funding of school operations in Colorado is largely governed by the Public School Finance Act of 1994 (amended), which provides for a higher degree of funding equalization for all districts across the state, regardless of the size of the local tax base. As a result, the primary influence of changes in local tax base is to vary the share of the total allowable expenditures that are generated locally and the share provided by the state. As a consequence, many districts are more concerned about the indirect consequences of such development on enrollment, facility adequacy and capacity, the ability to recruit faculty and staff, and the cost of living as it affects both district operations and its staff.

Table 2-62 summarizes key fiscal conditions for the two school districts. In many ways they are comparable, each operating three schools, with similar size student bodies. The overall per pupil program funding levels are also comparable, yielding total district program funding of \$3.78 million for Meeker RE-1 and \$ 3.32 million for Rangely RE-4. However, the local mill levies to fund public education, excluding those for debt service, transportation, and other overrides, are considerably higher in Meeker RE-1 than in Rangely RE-4. The net consequence is that local sources fund 42 percent of the total school district operations in Meeker RE-1, compared to 30 percent of the total in Rangely RE-4.

Table 2-62
School District Budgeted Revenues and Expenditures: 2005-06

	Meeker School District RE-1	Rangely School District RE-4
Total Funded Pupil Count	585.6	502.9
Total Approved District Program Funding	\$ 3,782,441	\$ 3,233,423
Total Program Per-Pupil Funding	\$ 6,459	\$ 6,430
District Property Tax Levy (Operating)	11.791 mills	2.903
Locally Derived Property and Specific Ownership Taxes	\$ 1,571,623	\$ 975,278
State Revenues	\$ 2, 210,818	\$ 2,258,145
Shares: Local / State	42% / 58%	30% / 70%

SOURCE: Colorado Department of Education 2005.

2.5.7 Oil and Gas Activity

Rio Blanco County hosts a substantial portion of statewide oil and gas production. Examples of recent and ongoing natural gas drilling and infrastructure development in the county and surrounding area include the EnCana Figure Four Natural Gas Project (USDI BLM 2004), the Enterprise (originally EnCana) Meeker pipeline and gas plant project west of Meeker, and the Entrega and WIC interstate natural gas pipelines. The Exxon Mobil Piceance Development Project near Meeker was approved in April 2007.

As of the end of April 2007, there were 2,599 active oil and gas wells in the county, about 8 percent of all active wells in Colorado (CDNR Oil and Gas Conservation Commission 2005a). Production data from 1995 through 2006 (Figure 2-11) show that Rio Blanco county's gas production is growing and even accelerating from year to year while oil production is leveling out at about 10 percent of its level in 1995. Gas production in 2006 was 43.1 trillion cubic feet (TCF), up 56 percent from the recent low of 27.6 million MCF in 1999.

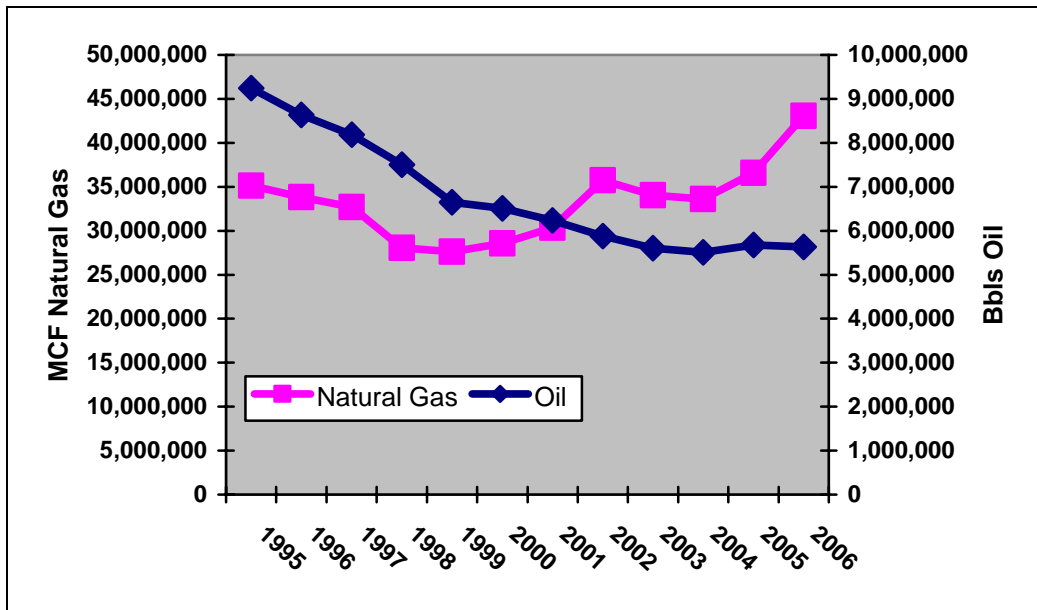


Figure 2-11. Rio Blanco County Natural Gas and Oil Production Trend

SOURCE: CDNR Oil and Gas Conservation Commission 2005a; CDNR Oil and Gas Conservation Commission 2005b.

Figure 2-12 shows the number of permits to drill oil and gas wells that were approved for Rio Blanco County in each year from 1999 to 2006. Approved drilling permits within the county increased from 35 in 1999 to 201 in 2001 and ranged between 100 and 200 permits a year for the last 4 years. Another 76 permits to drill were issued through April of 2007, which is about the pace of 2006 on an annualized basis. Approved drilling permits are a good indicator of drilling activity that has occurred, but it is an imperfect measure since the drilling activity may or may not begin immediately at an approved location.

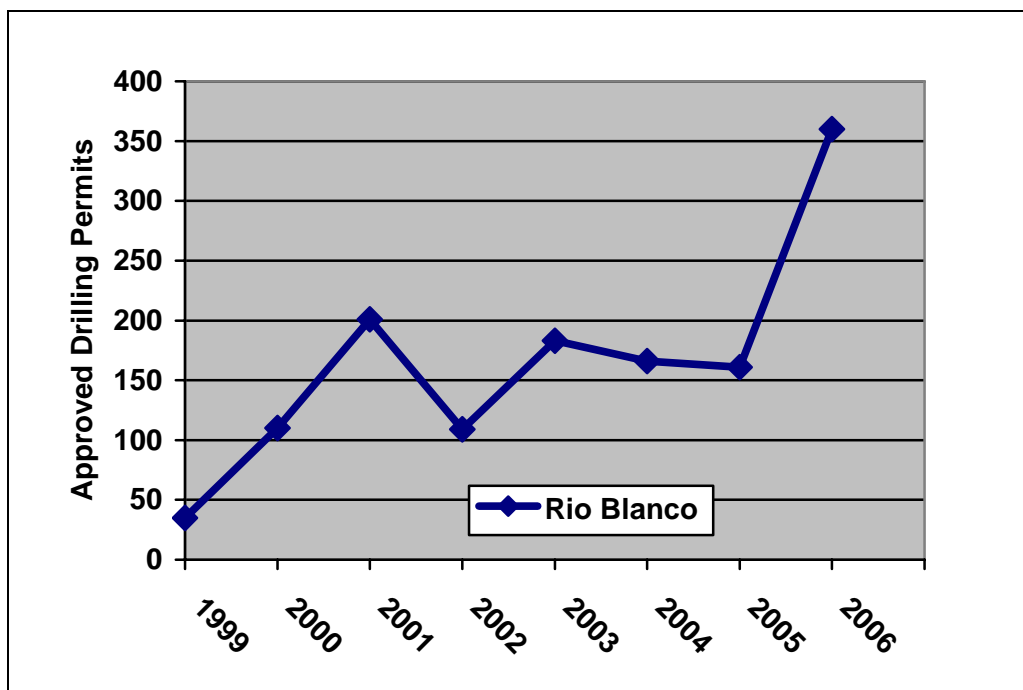


Figure 2-12. Trend in Rio Blanco County Approved Permits to Drill Oil and Gas Wells
 SOURCE: CDNR Oil and Gas Conservation Commission 2005c.

Approved permits to drill lead authorize drilling activity, leading to the presence of drill rigs in the WRFO area, which in turn generate immediate impacts. Intervening factors that determine how many rigs are running at any given time include operator decisions, rig and labor availability, and the rate of wells drilled per rig per year, which depends on geology but has tended to increase for the industry as a whole as new rig technologies emerge. Figure 2-13 presents actual data on the number of rigs in the field for Rio Blanco County with the trend in the data overlaid as a linear trend line (in red) fitted using Microsoft Excel. The Rio Blanco County trend is occurring in the context of higher rig deployment throughout the state. At the end of April 2007, 118 rigs were running in Colorado, compared to 62 at the beginning of 2005. A similar trend is occurring nearby, with 55 rigs running in Garfield County at the end of April, which is up from 33 rigs at the beginning of 2005.

The per farm average of \$8,237 in government payments was up 33 percent from \$6,205 per farm in 1997. A new Census of Agriculture is underway in 2007, but reporting of data typically lags by 2 years.

Hunting and fishing are important to the economy of Rio Blanco County. During 2002, hunting and fishing resulted in \$1.63 million in direct expenditures, \$2.85 million in total economic activity and 360 jobs or 8.3 percent of all jobs in Rio Blanco County, according to the Colorado Division of Wildlife (CDOW 2004). Hunting in the project area is customary for many local residents, and the project area contains sites used frequently as hunting camps. BLM data on numbers of recreation visits and outfitters with Special Recreation Permits on BLM land are reported elsewhere in the Area Profile.

Other minerals activity in the WRFO decision area involves deposits of nahcolite and oil shale. Nahcolite mining is not ongoing, but it has recently been mined commercially. The BLM recently approved five applications for oil shale research, development, and demonstration leases, which are meant to prove the potential for commercial oil shale development using existing technology.

Part of the WRFO planning area benefits from tourism attracted to Dinosaur National Monument (NM), which is located in Moffat County. According to the National Park Service Public Use Data (cited in Stynes 2006), Dinosaur NM generated 374,876 visits in 2005, including 58,189 overnight stays. For the same period, visitor spending was estimated to be \$12.9 million, with about 94 percent of visitor spending attributable to “non-local” visitors. NPS estimated the economic impact of non-local visitor spending to be 288 jobs in local economies, \$4.2 million in personal income, and \$6.8 million in value added.⁸ The local economy as defined in Stynes (2006) as 50-mile radius representing the primary impact region around most parks. The radius is closer to 30 miles for parks in urban areas and is as large as 100 miles for some western parks. Economic multipliers are based on regions defined as groupings of counties to approximate a 50-mile radius of the park.

2.5.9 Community and Economic Development and Surface Ownership

Surface ownership of land in the WRFO planning area has tended to constrain community and economic development in the town of Rangely during periods of growth. The opportunities for community and economic growth and development are limited in Rangely because of public ownership of land. About 88 percent of the WRFO planning area is Federal or State land, which

⁸ Value added is a region’s yield to local persons, businesses and institutions from the total sales value of the production of all of its businesses. The components of value added are employee compensation (wages plus benefits), the earnings of self-employed persons, personal income from rents, royalties, dividends and profits, and payments of excise, sales and similar taxes by individuals to businesses.

is not available for private residential and commercial development. Rangely's land position is even more restricted because Federal and State ownership "landlocks" the town and practically prevents it from extending the city limits.

2.5.10 Social Conditions

The public scoping meetings for the WRFO RMPA/EIS process identified aspects of BLM decisions about oil and gas development that would potentially affect social conditions in the WRFO planning area. These include impacts to wildlife, government costs and revenues, economic growth and change, housing markets, community development and planning, commercial recreation and tourism, community aesthetics and quality of life, and local institutions (USDI BLM White River Field Office 2007). These concerns focus attention on the communities of the planning area as residential and commercial centers and on the rural areas as having a traditional character with its own potentials for exposure to impact.

With fewer than 3,000 residents each, the Rio Blanco County communities of Meeker (the county seat) and Rangely are of a size where a small amount of change in population and other aspects of growth can affect social well being along in terms of community satisfaction, attachment to the community, and social integration. The latter is expressed by such personal behaviors how many local friends people have or how frequently residents have primary social interactions like neighborly borrowing (Brown et al. 1989). Dinosaur in Moffat County, which had only an estimated 330 residents in 2005, would perhaps potentially be at greater risk for similar effects and has the added dimension of being a "gateway community" to Dinosaur National Monument.

With respect to Rio Blanco County communities, a recent characterization of various material conditions that affect residents' feelings of satisfaction with services and with the quality of life, observed limitations with respect to accommodating potential growth from energy development without disruption. "The social infrastructure of the cities and counties affected have [sic] not been able to keep pace with the rapid growth in the oil and gas industry and demands upon law enforcement, emergency response, community services, and road and bridge maintenance have increased substantially. Aging facilities are at, or near, capacity, transportation networks and community services are in need of upgrading and/or repair, and current staffing is not adequate for managing the increased activity. This creates a financial and logistical burden on local governments attempting to maintain the level of service expected within the communities..." (USDI 2006b:159).

Rural areas of Rio Blanco County and other WRFO planning area counties demand a lower level of services. However, the county governments of the planning area, which are the primary

provider outside the municipalities, may find it difficult to match expectations when they potentially face rapid growth in demand across the board as the energy industry expands. These concerns on the part of local governments have already been disclosed in the same source as above: “The smaller communities in the region would experience the greatest impact resulting from sudden population growth. Meeker, Rangely, Parachute, DeBeque, and Rifle do not presently have sufficient housing, emergency response capabilities, community services, or correctional facilities to accommodate a substantial population increase, and city and county governments in the area are reluctant to increase spending on community services and housing requirements for energy production growth as a result of previous experience with the historic boom and bust nature of the oil and gas industry” (USDI 2006b:160).

The values held by the public in the WRFO planning area and by groups with special interests are another part of the potentially affected social environment where higher levels of energy development could be disruptive. Any debate over the use of resources and access to land that is in a “natural condition” is likely to elicit views on a spectrum from protection to exploitation. To measure the width of the spectrum and find where the “middle” lies in the communities of the WRFO planning area would require studies that have not been conducted.

There has been some discussion of development policy for jurisdictional lands by the Rio Blanco County Planning Commission and the Rio Blanco County Board of County Commissioners. The result was a statement on quality of life in the county Land Use Resolution, as amended in 2002. The standard in the resolution expresses the goal as, “prevent[ing] deterioration of ... quality of life and the deleterious effects that can occur from unplanned use of the various resources and natural conditions of the county while maintaining the viability of each various interrelated activity” (Rio Blanco County, Board of County Commissioners 2002). This statement defines the standard for multiple use development as being permissive of resource use for different activities, whether energy development, ranching, recreation, tourism, or resident lifestyles, while at the same time seeking a continuation of the quality of life afforded to Rio Blanco County by each and every use.

2.6 TRIBAL INTERESTS

In compliance with the American Indian Religious Freedom Act of 1978, National Historic Preservation Act of 1966, Archaeological Resources Protection Act of 1979, Native American Graves Protection and Repatriation Act of 1990, as well as other Executive and Secretarial Orders, BLM has initiated consultation with Native American Tribes. This consultation is to assist BLM in identifying and designing management for significant religious or cultural locations or properties (traditional cultural properties); to understand tribal concerns; to identify public land places, resources, uses, and values that are important to the tribes and/or tribal members (including traditional values and traditional use areas); and to identify land management procedures that conflict with Native Americans' religious observances. In November 2006, BLM sent letters to the Northern Ute Tribe, Shoshone Tribe (Eastern Band), Southern Ute Indian Tribe, and Ute Mountain Ute Tribe to initiate consultation. To date, Native American entities have not identified traditional use areas or traditional cultural properties in the planning area. The BLM will continue to consult with the tribes, as directed by BLM Manual 8120, Tribal Consultation Under Cultural Resources, and BLM Handbook 8120, General Procedural Guidance for Native American Consultation.

2.7 PUBLIC SAFETY

Current Use

Motor Vehicle Operations

The risk of a single or multiple vehicle accident or a collision between a vehicle and a pedestrian or bicyclist is potentially associated with the operation of motor vehicles in any location. Except for 15,560 acres that are closed to public motorized vehicle travel, the entire White River Planning Area is open to both on- and off-road travel (BLM 1994). There are no designated off-highway vehicle recreation areas on BLM lands within the WRFO planning area. Motorized vehicle travel use consists of 2- and 4-wheel drives, tractor trailers, small trucks, drill rigs, and large vehicles related to mineral resource extraction and development for production of natural resources (i.e., oil shale, natural gas, etc.). In addition, motorized vehicle use includes ATVs, motorcycles, and snowmobiles generally involved with hunting activities, sightseeing, and firewood gathering. Mountain bicycles also travel both on and off roads. Motor vehicle use is particularly concentrated during the hunting season when local and out-of-state hunters arrive. Camping and off-highway vehicle use occurs mainly related to hunting.

Hunting and Recreation

Big game hunting is a substantial contributor to the local economies during the fall hunting season. It is the primary activity enjoyed by approximately 60,000 hunters from around the nation each year. The use of weapons for hunting purposes bears the risk of accident or injury if proper safety precautions are not followed. Related activities to big game hunting include snowmobiling, hiking, viewing wildlife, camping, and small game hunting (BLM 1994). All of these activities bear the risk of injury from participation or from inadvertent exposure to firearm activity.

Remoteness and Natural Hazards

Also inherent in any activity conducted within the WRFO planning and decision area (i.e., mineral resource extraction and development activities as well as recreational activities) is the risk of exposure to natural hazards such as inclement weather, rough terrain, and dangerous animals. Proper equipment and adequate planning should be taken prior to conducting activities within the WRFO in order to prepare for the remoteness and natural hazards present in much of the planning area.

Abandoned Mines and Prospects

Abandoned mines and prospects are found throughout the planning area. Workers conducting natural resource extraction and development may encounter hazardous, abandoned mine sites. In addition, visitors often find abandoned mines and prospects attractive to explore and may be exposed to hazards at these sites. Features that could pose public safety hazards at abandoned mining sites include open and unstable shafts, adits, drifts, pits, tailings piles, wells, or other excavations; dilapidated and unstable buildings or other structures; collapsed buildings or other structures; mining implements or construction debris; and hazardous or toxic materials. According to the Colorado Division of Reclamation, Mining and Safety (DRMS), approximately 23,000 abandoned mines are located in Colorado, and of those, only 6,127 have been made safe by the DRMS (DRMS 2006). Most of the identified safe mines and mine tours are located near the center of the state, but some mines are located within the planning area. There is one identified mining area, the Mantle-Jamison mining area, which is located adjacent to the southern boundary of Dinosaur National Monument. This area consists of a concentration of abandoned mines and prospects. Small amounts of lead and zinc ore were removed from small fissure veins. In addition, occasional mining activity has occurred in the vicinity of the Skull Creek anticline for uranium and vanadium. Finally, abandoned mines have been identified in the Uranium Peak District where many abandoned mines remain today (BLM 1994).

Solid Waste

Solid waste issues include illegal dumping (either in conjunction with a residence or simply at a convenient location), dumping in abandoned mines, and littering along roadsides and in areas frequented by ATV users. While some dumping sites are commonly known, no database detailing the locations of all the solid waste sites has been compiled. In Rio Blanco County, there are two landfills for solid waste trash disposal. The landfill located near Rangely in the western portion of the state is scheduled for closure (BLM 2006a).

Hazardous Materials

Hazardous materials sites are locations on or near public land where hazardous or regulated materials are used, stored, or disposed. Air, soil, surface water, and groundwater contamination are typically found at hazardous materials sites. Hazardous materials are defined as substances or mixtures of substances that have the capability of either causing or significantly contributing to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness, or posing a substantial present or potential risk to human health or the environment. Hazardous wastes are defined as wastes or combination of wastes that, because of quantity, concentration, or physical, chemical, or infectious characteristics, may either cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible illness, or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed. Hazardous wastes are products or by-products of hazardous materials. No comprehensive database of hazardous materials sites was available for the public lands within the decision area. Typically, however, the main location where hazardous materials are found is where mining materials and chemicals are stored and used. If required, permits for storage and maintenance would be obtained and tracked by the appropriate environmental agency.

Hazardous materials and wastes are a by-product of oil well development. Oils and additives are used during well development, and well debris is produced during the process. Additives contained in mud systems used during drilling are often kept in sacks or drums at the sites. Methane transport occurs through a network of pipelines buried 36 to 48 inches deep. Use of 6- to 8-inch pipelines is common from the well sites, but pipelines ranging from 24 inches to 36 inches are more typical for interstate transport (BLM 2006a).

Management of hazardous materials, substances, and waste (including storage, transportation, and spills) would be conducted in compliance with 29 CFR 1910 (*Occupational Safety and Health Standards*), 49 CFR 100-185 (*Pipeline and Hazardous Materials Safety Administration*, Department of Transportation), 40 CFR 100-400 (*Protection of the Environment*, U.S. Environmental Protection Agency), Comprehensive Environmental Response Compensation and

Liability Act (CERCLA), Resource Conservation and Recovery Act (RCRA), Toxic Substances Control Act (TSCA), Clean Water Act (CWA), and other Federal and state regulations and policies regarding hazardous materials management.

Forecast

As population growth increases, a greater need for natural resource use, especially natural gas, will also increase. A recent increase in requests for oil and gas development within the WRFO planning area indicates that these natural resource opportunities will be pursued. Estimates identified in the 1997 White River ROD/RMP indicated that about 1,000 oil and gas wells would be sufficient for development in the planning area between 1997 and 2017. However, the oil and gas industry is now indicating that the potential exists to develop significantly more oil and gas wells in the Piceance Basin over the next 20 years. The trend for population growth and urban development will likely translate into the need for additional natural resources such as natural gas to support this growth.

Currently there are approximately 1,000 oil wells located within the decision area, with miles of pipeline installed to transport the natural gas to other areas. The BLM Reasonable Foreseeable Development (RFD) scenario projects greater than 17,000 wells (BLM 2007). This would likely create an intricate web of additional pipelines that would be needed to transport the natural gas, posing dangers of overlapping and potential leaks and explosions. Potentially, there would also be conflicts between recreational users and well site developers and workers, as well as between land surface and mineral rights owners. The existing road network would have to expand to allow for construction and maintenance of projected wells, and traffic would likely increase proportionately.

CHAPTER 3

CURRENT MANAGEMENT DIRECTION

CHAPTER 3 CURRENT MANAGEMENT DIRECTION

Chapter 2 of the *White River Record of Decision (ROD) and Approved Resource Management Plan (RMP)* (referred to as the 1997 White River ROD/RMP), authorized in July 1997, provides a framework for managing and allocating BLM administered lands and resources. This RMP Amendment (RMPA) is intended to modify the oil and gas component of the existing 1997 White River ROD/RMP. Therefore, this chapter of the Analysis of the Management Situation (AMS) describes the current management direction for managing oil and gas resource uses within the White River Field Office (WRFO) and is being accomplished to reflect changing conditions and oil and gas resource use demands. These decisions become the basis for the No Action Alternative in the Draft RMPA/Environmental Impact Statement (EIS). All management direction documents are available at the BLM WRFO.

Oil and gas is defined as a resource use that involves activities that utilize the natural, biological, and/or cultural components of the WRFO planning area. Oil and gas activities could affect recreation, livestock grazing, socioeconomics, and all of the other resources in the WRFO. However, this AMS considers management decisions for oil and gas and does not analyze the adequacy of management decisions for other resources or resource uses.

3.1 OIL AND GAS DECISIONS

3.1.1 Management Objective

Objective

The single oil and gas management objective contained in the 1997 White River ROD/RMP is the following (page 2-5):

Make federal oil and gas resources available for leasing and development in a manner that provides reasonable protection for other resource values.

Management and Implementation

Resource use is managed under the multiple-use concept, by integrating ecological, economic, and social principles in a manner that safeguards the long-term sustainability, diversity, and productivity of the land. The 1997 White River ROD/RMP defines the following management tools for the three categories of land that affect the availability of BLM-administered oil and gas estate (page 2-5):

1. Non-discretionary no lease areas (83,720 acres). The non-discretionary lands include the six Wilderness Study Areas (WSAs) and the National Park Service's Harper's Corner Road withdrawal. See Map 2-2 in the 1997 White River ROD/RMP;
2. Areas available for leasing with special stipulations (1,552,958 acres). The special stipulations include 143,083 acres of no surface occupancy, 912,455 acres of timing limitations, and 725,339 acres of controlled surface use. Overlap commonly occurs between the acreages of these three types of stipulations. See Maps 2-3, 2-4, and 2-5 in the 1997 White River ROD/RMP; and
3. Areas available for leasing utilizing standards lease terms (168,486 acres). The standard lease terms and conditions are included on the lease form and give the Area Manager the authority to modify operations at the time they are proposed.

Lease notices have been developed to alert prospective leasees of special resources that may be present that need consideration when planning operations. These items are typically limitations that already exist in law, regulation, or operational order.

Implementation decisions generally constitute BLM's final approval allowing on-the ground actions to proceed. Implementation of oil and gas leasing and development is handled administratively and described in the 1997 White River ROD/RMP (pages 2-5 and 2-6). The implementation decisions relative to oil and gas are described below:

- "Surface stipulations and lease notices will be entered into a computer database by legal description. The BLM Colorado State Office leasing section personnel will then utilize the database to append applicable stipulations and notices to new leases.
- The appropriate Conditions of Approvals contained in Appendix B of the 1997 White River ROD/RMP can be used to mitigate site-specific impacts resulting from Applications for Permit to Drill and surface disturbance associated with Sundry Notices (SN).
- An environmental analysis document will be prepared for all Applications for Permit to Drill (APD) and SN proposing new surface disturbance or unique and unusual downhole workover operations. A decision will be made, based on the environmental document, whether to deny or approve the planned operation, or to exempt, modify or waive an existing lease stipulation. Exemptions will be handled administratively in accordance with the language included in the specific stipulation. It should be noted that a stipulation could be excepted, modified, or waived as stated in the stipulation, without preparing an RMP Amendment."

3.1.2 Status of Management Objective

The management actions outlined in Section 3.1.1 represent current management of BLM-administered lands within the WRFO and will form the basis of the No Action Alternative in the RMPA /EIS. An analysis of the ability of current oil and gas management direction to achieve desired conditions and address resources and demands for use of the resources is included in Chapter 4 of this AMS.

CHAPTER 4

MANAGEMENT ADEQUACY AND OPPORTUNITIES

CHAPTER 4 MANAGEMENT ADEQUACY AND OPPORTUNITIES

This chapter provides a comprehensive list of the management opportunities identified for all resources included in the 1997 *White River Record of Decision (ROD) and Approved Resource Management Plan (RMP) (1997 White River ROD/RMP)*. The tables presented in this Chapter include many decisions that were not carried forward into the alternatives development process because it was determined that the option for change was more appropriate for an RMP Revision, not an Oil and Gas Amendment for which this Analysis of the Management Situation (AMS) was prepared. Opportunities identified in this Chapter will ultimately help guide the Bureau of Land Management (BLM) White River Field Office (WRFO) in the development of alternatives for managing oil and gas activities in the WRFO planning area.

4.1 RESOURCES

4.1.1 Air Quality

Objective: BLM actions shall be implemented in a manner to minimize impacts to air quality.

Table 4-1
Adequacy of Current Management Direction and Options for Change for Air Quality

Decision	Is Decision Adequate?	Remarks	Options for Change
Comply with all applicable federal, state, and local air quality laws, regulations and implementation plans. Review site specific project plans affecting BLM and adjacent lands to assure air quality impacts are minimized (1997 ROD/RMP, p. 2-1).	Yes	The current decision is appropriate to meet air quality goals and objectives.	No change is necessary.
Cooperate with the State of Colorado to meet the goals identified in the State Implementation Plan (1997 ROD/RMP, p. 2-1).	Yes	The current decision is appropriate to meet air quality goals and objectives.	No change is necessary.

**Table 4-1
Adequacy of Current Management Direction and Options for Change for Air Quality**

Decision	Is Decision Adequate?	Remarks	Options for Change
Limit unnecessary emission from existing and point or non-point pollution sources (1997 ROD/RMP, p. 2-2).	No	May not help achieve objectives for oil and gas development and exploration. The term "limit unnecessary emission" will need to be clarified.	Changes may be needed to ensure oil and gas facilities meet local emissions standards. Other conditions or mitigation may be needed to meet BLM objectives. This should be addressed as an implementation decision or included on a list of Best Management Practices (BMPs).
Prevent significant air quality deterioration in selected areas (1997 ROD/RMP, p. 2-2).	No	Specific air quality protection measures should be identified. To prevent significant air quality deterioration in selected areas, BLM first needs to clarify what would be considered significant deterioration. Identify air quality standards/thresholds for different areas (e.g., visibility threshold for Flattops Wilderness).	As a result of scoping, several Class I airsheds were listed within approximately 100 kilometers of the WRFO planning area. These airsheds should be described and mapped in the WRFO RMPA.
Assess potential impacts from future BLM actions prior to implementation (1997 ROD/RMP, p. 2-2).	No	This decision does not apply to the management of oil and gas facility exploration and / or operation. BLM may consider a policy to set thresholds.	This decision would require implementation on a case-by-case basis prior to a specific BLM action; therefore, this decision should be removed from the WRFO RMPA.
Incorporate mitigating measures into project proposals when necessary to reduce potential impacts (1997 ROD/RMP, p. 2-2).	No	Specific mitigation measures should be identified.	This decision would require implementation on a case-by-case basis prior to a specific BLM action; therefore, this decision should be removed from the WRFO RMPA.

4.1.2 Geologic Resources

Management of geology, caves, and karsts are combined under Geologic resources.

**Table 4-2
Adequacy of Current Management Direction and Options for Change for Geology, Caves and Karsts**

Decision	Is Decision Adequate?	Remarks	Options for Change
No previous specific decisions exist for geology, cave, and karst resources.	No	Conservation of geologic features is largely accomplished through management prescriptions for other resources, such as soils, or visual resources, and through the designation of special management areas (e.g., WSA or ACEC).	Management decisions that could be developed for the WRFO RMPA could include the identification of significant caves (as mandated by Federal Cave Resources Protection Act of 1988 using significant cave criteria as set forth in 43 CFR 37.11) if they were discovered during oil and gas exploration or development. Once identified and evaluated, management prescriptions for significant caves should be outlined; this may include designation of a special management area. The RMPA could include guidelines for management of oil and gas resources, however a more specific activity or implementation plan may be warranted.

4.1.3 Soil Resources

Objective: Prevent impairment of soil productivity due to accelerated erosion and physical or chemical degradation resulting from surface use activities. Management actions support the goals provided as indicators in Standard One of the Standards for Public Land and Health (See Appendix C of the 1997 ROD/RMP).

**Table 4-3
Adequacy of Current Management Direction and Options for Change for Soil Resources**

Decision	Is Decision Adequate?	Remarks	Options for Change
Analyze all proposed surface-disturbing activities to determine suitability of soils to support or sustain such activities (1997 ROD/RMP, p. 2-2).	Yes	This decision adequately supports the soil resources objective.	This is a site- and project-specific decision that would be evaluated on a case-by-case basis. This decision should be addressed as an implementation decision or included as a BMP.
Identify treatments for fragile watershed areas that are contributing to the water quality problems (accelerated erosion and salt contributions) in the Colorado River Basin (1997 ROD/RMP, p. 2-2).	Yes	This decision allows a variation of measures to be presented during alternatives development.	No change(s) necessary. Update fragile watersheds, may develop new stipulations/COAs for areas of intense oil and gas development.
Minimize surface disturbance in sensitive areas by identifying additional ACECs or NSO areas based on soil erosive potential, salinity, and proximity to perennial surface waters.	Yes		Consider revising decision if developing ACECs is not an option with this RMPA.
Appropriate stipulations and conditions of approval listed in Appendices A and B of the 1997 ROD/RMP will be used in the design of all BLM-initiated surface-disturbing activities and for developing conditions for all new land use authorizations (1997 ROD/RMP, p. 2-2).	No	This decision adequately supports the soil resources objective.	These measures should be addressed as an implementation decision or included as a BMP. Consider modifying existing COAs and BMPs to include language created by the WRRRA Reclamation Team. Revisions to Appendices A and B of the 1997 ROD/RMP may be needed to make this decision adequate.

**Table 4-3
Adequacy of Current Management Direction and Options for Change for Soil Resources**

Decision	Is Decision Adequate?	Remarks	Options for Change
Identify and eliminate unnecessary access roads (including two-tracks) located on steep slopes (over 35%), on sensitive soils (CSU-1), or those that are actively altering natural surface water flow paths by channeling water and/or delivering sediment/salt to Waters of the US (defined in 33 CFR Section 328.3).	Yes	This decision adequately supports the soil resources objective.	Development of a additional COAs and BMPs would be needed to supplement this decision. The BLM would also need to clearly define what "unnecessary access roads" are. Coordinate with the travel management and wildlife resource staff.
Legal descriptions for the acreage identified in the soil related stipulations in Appendix A of the 1997 ROD/RMP will be placed in a computer data base. The database will be used by CSO personnel to attach special surface stipulations to all new oil and gas leases (1997 ROD/RMP, p. 2-2).	Yes	This decision adequately supports the soil resources objective.	If the database were completed, as stated in the 1997 ROD/RMP, the WRFO RMPA could disclose special stipulations associated with specific locations within the planning/decision area.
Soil and watershed treatments will be developed in integrated activity plans (IAPs) or Watershed Activity Plans (WAPs) (1997 ROD/RMP, p. 2-2).	Yes	This decision adequately supports the soil resources objective.	This is not a land use plan decision; rather, a measure that could be implemented on a project-specific basis. Phased development should be considered. It should also identify areas with intense development. New BMPs/COAs should be applied (e.g., reclamation).
Treatments will be implemented that stabilize soils and rehabilitate watersheds that exhibit accelerated erosion and degraded soil conditions (1997 ROD/RMP, p. 2-2).	Yes	This decision adequately supports the soil resources objective.	This is not a land use plan decision; rather, a measure that could be implemented on a project-specific basis.

4.1.4 Water Resources

Management opportunities for water resources include hydrology, surface water, groundwater and water rights. Riparian resources are addressed under vegetation.

4.1.4.1 Surface Water

Objective: Maintain and improve water quality and quantity in order to be compatible with existing and anticipated uses, to comply with applicable state and federal water quality standards, and to meet the goals contained in Standard Five of the Standards for Public Land Health (see Appendix C of the 1997 ROD/RMP).

**Table 4-4
Adequacy of Current Management Direction and Options for Change for Surface Water**

Decision	Is Decision Adequate?	Remarks	Options for Change
BLM actions and authorization affecting surface waters will be conducted in compliance with state and federal law, including the State of Colorado's National Pollutant Discharge Elimination System (NPDES), Anti-Degradation Policy, State Water Quality Standards and the Army Corp of Engineers, Section 404 permit requirements and section 319 (Non-point Source Management Program) of the Clean Water Act (1997 ROD/RMP, p. 2-2).	Yes	Decision is adequate when considering the management of watersheds to protect ecosystems and to ensure public health and safety or facilitate other public uses.	No change necessary, however, the decision could include a reference to FLPMA.
Implement decisions developed in existing WAPs (See Table 2-1, Appendix D) (1997 ROD/RMP, p. 2-2 and 2-3).	No	Decision is adequate when considering the management of watersheds to protect ecosystems and to ensure public health and safety or facilitate other public uses.	The list of watershed activity plan (WAPs) may need to be updated since implementation of the 1997 ROD/RMP. New WAPs must be developed based on existing conditions. Existing baseline hydrologic conditions will need to be established first.

**Table 4-4
Adequacy of Current Management Direction and Options for Change for Surface Water**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>The perennial streams listed in Table 2-2 Appendix D, do not meet state water quality standards. These streams are contributing to increased sediment and salinity in the Colorado River Basin and have been identified as the highest priority to receive special treatments and management considerations (1997 ROD/RMP, p. 2-3).</p>	<p>No</p>	<p>Decision is adequate when considering the management of watersheds to protect ecosystems and to ensure public health and safety or facilitate other public uses.</p>	<p>Review current impacts to surface water and current mitigation measures. Table 2-2 in Appendix D of the 1997 ROD/RMP will need revision to include changes to severity listings, existing conditions and possibly areas that will be the focus of energy development.</p>
<p>Design projects that will maintain or improve the condition of fragile watersheds identified as contributors of sediment and salinity to the Colorado River system. (1997 ROD/RMP, p. 2-3).</p>	<p>Yes</p>	<p>Implementation decision is adequate when considering the management of fragile watersheds to protect ecosystems and to ensure public health and safety or facilitate other public uses.</p>	<p>Review current impacts from oil and gas development to surface water and current mitigation measures. BLM could develop standards for sedimentation limits for future management opportunities.</p>
<p>Minimize surface disturbance in sensitive watersheds by identifying additional ACECs or NSO areas based on prominence of perennial flow, stream type, channel stability (Pfrankuch rating), and riparian conditions (PFC rating).</p>	<p>Yes</p>	<p>Riparian and wildlife (aquatic) sections should develop decisions that would not contradict this decision.</p>	<p>The RMPA will not change the areas managed as an ACEC. This decision could be revised if developing ACECs is not an option as part of this RMPA. Prior to surface disturbing activities, consider requiring the proponent to provide a bond in sensitive watersheds for surface water quality/quantity, and morphology monitoring.</p>
<p>All BLM initiated projects will be designed using the appropriate COAs listed in Appendix B. Applicants will also be required to use the COAs or develop suitable substitute mitigation when designing their proposed projects. Surface stipulations listed in Appendix A will be applied to all new oil and gas leases and other new surface disturbing activities (1997 ROD/RMP, p. 2-3).</p>	<p>No</p>	<p>The implementation decision is adequate when considering the management of watersheds to protect ecosystems and to ensure public health and safety or facilitate other public uses. However the COAs in Appendix B of the 1997 ROD/RMP may not address all resource issues adequately.</p>	<p>BLM will review the COAs in Appendix B of the 1997 ROD/RMP. BLM may develop additional COAs to include the newly developed reclamation COAs.</p>

**Table 4-4
Adequacy of Current Management Direction and Options for Change for Surface Water**

Decision	Is Decision Adequate?	Remarks	Options for Change
Fragile watersheds will be identified as needed for new WAPs and incorporated into integrated activity plans (1997 ROD/RMP, p. 2-3).	Yes	Decision is adequate when considering the management of watersheds to protect ecosystems and to ensure public health and safety or facilitate other public uses.	The list of WAPs may need to be updated since implementation of the 1997 ROD/RMP.
The establishment of an association of public land uses will be encourages to help coordinate, monitor and recommend mitigation measures for action affecting water resources.	Yes	Decision is adequate when considering the management of watersheds to protect ecosystems and to ensure public health and safety or facilitate other public uses.	No change necessary.
Identify and eliminate unnecessary access roads (including two-tracks) located in identified fragile watersheds, on steep slopes (over 35%), on sensitive soils (CSU-1), or those that are actively altering natural surface water flow paths by channeling water and/or delivering sediment/salt to Waters of the US (defined in 33 CFR Section 328.3).	No	Development of a additional COAs and BMPs would be needed to supplement this decision. The BLM would also need to clearly define what “unnecessary access roads” are. Working with the travel management folks as well as the wildlife people needs to be done.	The current list of fragile watersheds may need revision.

4.1.4.2 Ground Water

Objective: Ensure that the quantity and quality of aquifer system integrity is maintained and the goals contained in Standard Five of the Standards for Public Land Health are met (see Appendix C of the 1997 ROD/RMP).

**Table 4-5
Adequacy of Current Management Direction and Options for Change for Ground Water**

Decision	Is Decision Adequate?	Remarks	Options for Change
Analyze activities that may affect aquifer systems. Develop and apply COAs that will protect ground water integrity, quality and quantity (1997 ROD/RMP p. 2-3).	Yes	Decision is adequate when considering the management of watersheds to protect ecosystems and to ensure public health and safety or facilitate other public uses.	Review existing COAs and stipulations. Consider revision to existing or develop new COAs and stipulations. Multi-well pads must have ground water monitoring associated with them on site. Consider monitoring individual wells.
Lessees/operators/applicants will be required to use the appropriate COAs listed in Appendix B in designing their proposed projects (1997 ROD/RMP p. 2-3).	Yes	Implementation decision is adequate when considering the management of watersheds to protect ecosystems and to ensure public health and safety or facilitate other public uses.	Review existing COAs and stipulations. Consider revision to existing or develop new COAs and stipulations. Update existing COAs.
Place appropriate COAs on groundwater usage and disposal actions. All activities and associated mitigation will be designed to be consistent with State and Federal laws (1997 ROD/RMP, p. 2-3).	Yes	Implementation decision is adequate when considering the management of watersheds to protect ecosystems and to ensure public health and safety or facilitate other public uses.	Review existing COAs and stipulations. Consider revision to existing or develop new COAs and stipulations. Update existing COAs.

4.1.4.3 Water Rights

Objective: Secure adequate water rights, from the State of Colorado, on springs, wells and stream flows necessary to support public resource programs.

**Table 4-6
Adequacy of Current Management Direction and Options for Change for Water Rights**

Decision	Is Decision Adequate?	Remarks	Options for Change
Conduct instream flow surveys on the streams identified in Table 2-3 in Appendix D (1997 ROD/RMP, p. 2-3).	Yes	Decision is adequate when considering the management of watersheds to protect ecosystems and to ensure public health and safety or facilitate other public uses.	The list of instream flow surveys may need to be updated since implementation of the 1997 ROD/RMP. Table 2-3 from the 1997 ROD/RMP will need to be updated. Expand existing COAs in areas of high oil & gas potential.
All BLM-permitted projects will be designed in accordance with the appropriate BLM manual(s). The appropriate COAs listed in Appendix B will be applied as minimum standards.	Yes	Implementation decision is adequate when considering the management of watersheds to protect ecosystems and to ensure public health and safety or facilitate other public uses.	Review existing COAs and stipulations. Consider revision to existing or develop new COAs and stipulations. Expand on existing COAs.
Depleted or dry oil and gas wells that could provide an adequate source of water for livestock and wildlife will be reviewed for conversion to a water well at the time a Notice of Intent to abandon the well has been submitted. Operators/Lessees of the identified wells may be liable for plugging-back the well to the desired aquifer zone. Liability for the well will then be assumed by BLM (1997 ROD/RMP, p. 2-4).	Yes	Implementation decision is adequate when considering the management of watersheds to protect ecosystems and to ensure public health and safety or facilitate other public uses.	No change necessary.

**Table 4-6
Adequacy of Current Management Direction and Options for Change for Water Rights**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>A comparison of decreed water rights versus cumulative water demand will be conducted as required on allotment, recreation, wildlife and/or wilderness planned actions. In locations where land management demands exceed the decreed supply by more than 25 percent, water right filings will be initiated to bring demand in line with supply.</p>	<p>No</p>	<p>Include oil and gas explorations and development activities in the evaluation of land management demands on water supply.</p>	<p>Consider including areas with oil and gas exploration and development in the comparison of decreed water rights versus cumulative water demand. Clarify that this decision will protect BLM uses. The requirement in areas where land management demands result in a 25% exceedance of water supply is would be data intensive. A new decision should be developed to account for oil and gas demands on fresh water resources. Create a new table that outlines what streams the BLM currently has ISF water rights on and what streams have pending water rights.</p>

4.1.4.4 Water Depletions

Objective: Assure BLM administered projects are in compliance with US Fish and Wildlife Service’s Programmatic Biological Opinion for minor water depletions in the Colorado River Basin.

**Table 4-7
Adequacy of Current Management Direction and Options for Change for Water Depletions**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Calculate depletions in the upper Colorado River Basin resulting from BLM-permitted projects using guidelines listed in Table 2-4 of Appendix D. [Compensation for depletion will consist of a one-time dollar amount for each project (1997 ROD/RMP p. 2-4)]</p>	<p>No</p>	<p>Decision is adequate when considering the management of watersheds to protect ecosystems and to ensure public health and safety or facilitate other public uses.</p>	<p>The list of watershed activity plan (W/APs) may need to be updated since implementation of the 1997 ROD/RMP. Calculations may change. This decision may be more useful if it was a bit more general. Compensation for depletion will remain consistent with the Biological Opinion (Ed could add to this) No change necessary. Combine this decision with the bracketed portion of the first decision.</p>
<p>Compensations for depletions will be required to be made to the Recovery Implementation Program for endangered fish species in the upper Colorado River Basin (1997 ROD/RMP p. 2-4).</p>	<p>No</p>	<p>The implementation decision is adequate when considering the management of watersheds to protect ecosystems and to ensure public health and safety or facilitate other public uses.</p>	<p>No change necessary, however BLM may prepare a Programmatic EA or EIS to comply.</p>
<p>Water depletions resulting from existing BLM approved projects will be exempt from compensation so long as progress continues to be made in the recovery of the endangered fish species (1997 ROD/RMP p. 2-4).</p>	<p>No</p>	<p>The implementation decision is adequate when considering the management of watersheds to protect ecosystems and to ensure public health and safety or facilitate other public uses.</p>	<p>No change necessary.</p>
<p>The NEPA document prepared for the proposed project will calculate depletions and make a determination as to whether formal Section 7 consultation will be required. The water depletion will be recorded in the resource area office, and a report listing the annual water depletions will be submitted annually to the BLM Colorado State Office. Only those projects for which BLM has discretionary decision-making authority will be recorded.</p>	<p>Yes</p>	<p>The implementation decision is adequate when considering the management of watersheds to protect ecosystems and to ensure public health and safety or facilitate other public uses.</p>	<p>No change necessary.</p>

4.1.5 Hazardous Materials

Objective: To protect the public lands from contamination by hazardous materials.

**Table 4-8
Adequacy of Current Management Direction and Options for Change for Hazardous Materials**

Decision	Is Decision Adequate?	Remarks	Options for Change
The BLM will comply with all federal and applicable state environmental laws and regulations pertaining to hazardous substances.	Yes	The implementation decision is adequate when considering the management of watersheds to protect ecosystems and to ensure public health and safety or facilitate other public uses.	No change necessary.
Actions will be taken to prevent pollution from being generated, released, or disposed of on BLM lands through conditioning of use authorizations.	Yes	The implementation decision is adequate when considering the management of watersheds to protect ecosystems and to ensure public health and safety or facilitate other public uses.	No change necessary.
Develop and implement strategies to minimize waste and prevent pollution on BLM lands and facilities.	Yes	The implementation decision is adequate when considering the management of watersheds to protect ecosystems and to ensure public health and safety or facilitate other public uses.	No change necessary.
The use of BLM lands for disposal of solid wastes or the treatment, storage, or disposal of hazardous wastes will be prohibited.	Yes	The implementation decision is adequate when considering the management of watersheds to protect ecosystems and to ensure public health and safety or facilitate other public uses.	No change necessary.
The BLM will avoid generating or accumulating hazardous waste.	Yes	The implementation decision is adequate when considering the management of watersheds to protect ecosystems and to ensure public health and safety or facilitate other public uses.	No change necessary.
BLM land users will be urged to include pollution prevention considerations into the siting, design, construction, and operation of their facilities. Disclosure of the use and disposal of hazardous materials will be required for all BLM actions and authorized uses of the BLM lands.	Yes	The implementation decision is adequate when considering the management of watersheds to protect ecosystems and to ensure public health and safety or facilitate other public uses.	No change necessary.

**Table 4-8
Adequacy of Current Management Direction and Options for Change for Hazardous Materials**

Decision	Is Decision Adequate?	Remarks	Options for Change
Wastes will be disposed of only at treatment/storage/disposal facilities that are on the Environmental Protection Agency's most current list of approved facilities. The BLM will keep up-to-date inventories of applicable hazardous materials and will closely coordinate with appropriate local emergency planning committees.	Yes	The implementation decision is adequate when considering the management of watersheds to protect ecosystems and to ensure public health and safety or facilitate other public uses.	No change necessary.
Suitable sites will be identified for bio-remediation activities as applications are received. These sites will likely be located near major oil and gas development areas such as the White River Dome, Elk Springs, and Rangely oil field. Sites will only be approved where geologic, hydrologic, and soil-related conditions are conducive to effective bio-remediation activities and where other resource values will not be adversely affected.	Yes	The implementation decision is adequate when considering the management of watersheds to protect ecosystems and to ensure public health and safety or facilitate other public uses.	No change necessary.

4.1.6 Vegetation Communities

Objective: Maintain healthy, diverse and sustainable rangeland and woodland plant communities.

Sustain a landscape composed of plant community mosaics that represent successional stages and distribution patterns that are consistent with natural disturbance and regeneration regimes, and compatible with the goals identified in Standard Three of the Standards for Public Land Health (See Appendix C of the 1997 ROD/RMP).

**Table 4-9
Adequacy of Current Management Direction and Options for Change for Vegetative Communities**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Activities will be analyzed to determine whether the objectives for a particular plant community could be met. Activities will be considered if they can meet the plant community objective. Activities that can not meet the plant community objective will be denied or modified so that they can meet the objective (1997 ROD/RMP, p. 2-12).</p>	<p>No</p>	<p>This decision adequately ensures the protection of desired plant communities through analysis of individual activities.</p>	<p>Activities associated with oil and gas production may require some type of exemption or the implementation of mitigation measures if desired plant community decisions cannot be met. Develop desired vegetative community objectives and resource goals. Develop management opportunities/BMPs to address issue of bare ground management that industry is trying to achieve through weed/vegetation spraying (consider in hazardous materials decisions).</p>
<p>Vegetation in selected areas will be disturbed by permitted surface-disturbing activities or will be manipulated to achieve an improved ecological condition and/or improved forage production. These acreages and treatment methods identified in the table are only estimates of what could be treated and the method of treatment. The actual acreage treated and treatment method to be utilized will be identified during development of activity plans and evaluated in a site specific environmental analysis. Ecological status will be determined by use of BLM ecological site inventory procedures. Specific objectives and/or DPCs for plant communities will be developed in integrated activity plans (IAP). Priorities for inventory will be the same as those for implementation of IAPs (1997 ROD/RMP, p. 2-12).</p>	<p>No</p>	<p>This decision adequately protects the protection of vegetative communities.</p>	<p>Identify project-specific BMPs to clearly identify mitigation for surface disturbance. Revise Table 2-8 of the 1997 ROD/RMP that specifies acres of disturbance (i.e., make more general), or consider not carrying Table 2-8 forward into RMPA. Clearly define operator success rate for interim and final reclamation. Explore options for minimizing disturbance (i.e., acreage limits/thresholds for disturbance at any given time, phased development based on watershed/allotment?)</p>

**Table 4-9
Adequacy of Current Management Direction and Options for Change for Vegetative Communities**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Surface disturbances or vegetation manipulations will be identified in project plans or activity plans and analyzed in a NEPA document (1997 ROD/RMP, p. 2-12).</p> <p>Use of native or non-native plant species in reclamation will be addressed in site-specific project analysis (1997 ROD/RMP, p. 2-12).</p>	<p>Yes</p>	<p>This decision supports vegetative community's decisions.</p>	<p>Policy, no change necessary.</p>
<p>Changes in the 1981 forage allocations will be identified in allotment management plans or integrated activity plans. The average 50 percent above ground annual forage production available for allocation is based upon the following grazing utilization levels on key forage plant species, averaged on a grazing allotment basis: Key Species-Grass 40 percent averaged utilization for the grazing period from April 1 to June 15 each grazing year. 40 to 60 percent averaged utilization for the grazing period from June 15 to September 15 each grazing year. 60 percent averaged utilization for the grazing period from September 15 to March 31 each grazing year. Key Species-Browse 40 percent averaged utilization for the grazing period from April 1 to September 30 each grazing year.</p>	<p>No</p>	<p>Revegetation that required at oil and gas activity sites would be addressed for the individual projects.</p>	<p>Develop a range of alternatives to consider the use of native and non-native species during reclamation. This could be based on site-specific conditions that consider ecological site, potential natural vegetation, or the integrity of the surrounding community. This could require specific analyses to determine use of native vs. non-native species.</p>
<p>Changes in the 1981 forage allocations will be identified in allotment management plans or integrated activity plans. The average 50 percent above ground annual forage production available for allocation is based upon the following grazing utilization levels on key forage plant species, averaged on a grazing allotment basis: Key Species-Grass 40 percent averaged utilization for the grazing period from April 1 to June 15 each grazing year. 40 to 60 percent averaged utilization for the grazing period from June 15 to September 15 each grazing year. 60 percent averaged utilization for the grazing period from September 15 to March 31 each grazing year. Key Species-Browse 40 percent averaged utilization for the grazing period from April 1 to September 30 each grazing year.</p>	<p>Yes</p>	<p>The decision supports the vegetative community's objectives.</p>	<p>No change necessary.</p>

**Table 4-9
Adequacy of Current Management Direction and Options for Change for Vegetative Communities**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>50 to 60 percent averaged utilization for the grazing period from October 1 to March 31 each grazing year. It is recognized that these utilization levels are used as averages to identify an appropriate allocation mix among grazing/browsing animals. Site specific occurrences of over utilization may occur and may create resource conflicts that can not be resolved by changing the forage allocation mix. Specific resource conflicts will be identified and corrective management sought through development of allotment management plans or integrated activity plans (1997 ROD/RMP, p. 2-13).</p>	No	<p>The decision supports the vegetative community's objectives. Big game population expansion is not expected in the face of large scale energy development.</p>	<p>Forage allocations in area with oil and gas development may change.</p>
<p>Interim increased forage needs for wild horses will come from current livestock forage allocations within affected herd areas (1997 ROD/RMP, p. 2-13).</p>	Yes	<p>The decision supports the vegetative community's objectives.</p>	<p>Use of lands for oil and gas exploration and development may reduce the amount of land reserved for forage allocations. If such conflict arises, an evaluation of the individual site will be necessary to determine impacts to forage lands. Clarify why this is not being carried forward, i.e., this is a policy-level decision.</p>

**Table 4-9
Adequacy of Current Management Direction and Options for Change for Vegetative Communities**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>In collaboration with private landowners and state and local governments, use all available integrated pest management techniques including biological, mechanical and chemical methods for the management and control of noxious weeds.</p> <p>Management actions will be consistent with the Record of Decision for the Vegetation Treatment on BLM Lands in the Thirteen Western States Environmental Impact Statement.</p> <p>A key element of management will include the preventative measure of designating weed-free zones (1997 ROD/RMP, p. 2-13).</p>	<p>Yes</p>	<p>The decision supports the vegetative community's objectives.</p>	<p>Explore measures to control noxious weeds on oil and gas exploration and/or development sites.</p> <p>Develop additional BMPs and COAs to control weeds in oil and gas areas, i.e., expand weed free stipulations to entire resource area.</p>
<p>In accordance with the White River Resource Area Noxious Weed Management Plan, manage noxious weeds with particular emphasis on a coordinated, cooperative approach. Implement practices that prevent or reduce the extent and occurrence of noxious and problem weeds throughout the Resource Area (1997 ROD/RMP, p. 2-14).</p>	<p>Yes</p>	<p>The decision supports the vegetative community's objectives.</p>	<p>Explore measures to control noxious weeds on oil and gas exploration and/or development sites.</p>

**Table 4-9
Adequacy of Current Management Direction and Options for Change for Vegetative Communities**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Three contiguous areas encompassing 497,900 acres will be designated as weed free zones upon approval of the 1997 ROD/RMP (See Map 2-8). Weed management will be emphasized in these areas through cooperation with private land owners and state and county governments. The areas will be identified on the ground with signs. The following special conditions will be attached to use authorizations approved within these areas:</p> <ol style="list-style-type: none"> 1) All construction equipment and vehicles will be cleaned prior to entering BLM Weed Free Zones 2) All hay, straw, unprocessed feed, and seed used in BLM Weed Free Zones must be certified free of specified noxious weeds listed in Colorado Weed Free Forage Certification Standards. 3) All authorized users of disturbed areas will be required to inventory for noxious weeds in both the spring and fall (1997 ROD/RMP, p. 2-14). 	<p>No</p>	<p>This decision may or may not affect areas of proposed oil and gas activities.</p>	<p>Change areas that are undergoing oil and gas leasing, or broaden BMPs and requirements. Implementation level concepts – implementing eradication or other BMPs, i.e., expansion of weed free requirements.</p>

4.1.6.1 Forests and Woodlands

No specific objective provided in the 1997 ROD/RMP.

**Table 4-10
Adequacy of Current Management Direction and Options for Change for Forests and Woodlands**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Only native plant species will be used for reseeding of disturbed areas within the Blue Mountain/Moosehead geographic reference area (GRA), within wilderness study areas (WSAs), and within designated areas of critical environmental concern (ACECs). Native plant species will be encouraged in the remainder of the resource area for reseeding disturbed areas that are not threatened by establishment of exotic or noxious plant species. Naturalized plant species will be allowed for reseeding on "at risk" and "unhealthy" rangelands and grazable woodlands (1997 ROD/RMP, p. 2-11).</p>	<p>Yes</p>	<p>The decision supports the vegetative community's objectives.</p>	<p>If oil and gas development and exploration activities are proposed in the Blue Mountain/Moosehead geographic reference area, WSAs, and ACECs, any activities that require reseeding would be restricted to native plant species only. Redefine the non-native species to include cover crop. Consider defining by soil type or ecological type. "Feasible" is not appropriate to use in the decision. Revise the reference to using native species in ACECs and broaden the use of all species in ACECs. Consider erosion control in oil and gas control and the use of native & non-native species. Management could include protection of T&E species outside of ACECs.</p>
<p>An average of 50 percent of the annual above ground forage production will be reserved for maintenance of the plant's life cycle requirements, watershed protection, visual resource enhancement, and food and cover requirements of small game and nongame wildlife species. The remaining 50 percent of the forage base will be allocated among predominant grazing users (1997 ROD/RMP, p. 2-11).</p>	<p>Yes, to a limited degree.</p>	<p>Surface disturbing activities during oil and gas exploration and development could reduce the area of available above ground forage.</p>	<p>This decision does not directly address impacts from surface disturbing activities related to oil and gas exploration. This is an RMP-level decision. Leave this decision as it is stated or possibly tie into to other decisions/management opportunities. Identify on an area-wide basis, the amount of forage available in areas of oil and gas development. Consider revising to include a desired ecological condition rather than a percentage of forage reserved.</p>

Table 4-10
Adequacy of Current Management Direction and Options for Change for Forests and Woodlands

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Increased forage needs for the increase in big game populations experienced since the 1981 allocation will be provided, as long as the rangelands and grazable woodlands upon which the increased allocation will be based, are in a "healthy" or "at risk" rating with all "at risk" lands having an improving trend index (1997 ROD/RMP, p. 2-11).</p>	<p>Yes</p>	<p>The decision supports the vegetative community's objectives.</p>	<p>Depending on the location of oil and gas exploration and development locations, forage needs could be reduced as a result of associated activities. Coordination will need to occur early in the siting process to ensure no conflicts arise. Consider including additional BMPs and COAs by geographic area that could improve implementation of the decision.</p>
<p>Ecological site inventories will be conducted on rangeland and woodland plant communities to determine ecological status. The inventory will be used to determine the potential plant communities that could be supported on a specific site (1997 ROD/RMP, p. 2-11).</p>	<p>Yes</p>	<p>The decision supports the vegetative community's objectives.</p>	<p>Depending on the results of the ecological site inventories, if high quality plant communities are located in areas proposed for oil and gas exploration and development, mitigation measures may be required to protect communities with ecological importance. This is policy level, therefore no need to change this decision.</p>
<p>Site specific Desired Plant Communities (DPCs) will be determined in integrated activity plans or similar activity plans prepared following publication of this approved Record of Decision. The goal in determining a DPC will be to develop a plant community mosaic that represents successional stages and distributional patterns consistent with natural disturbances and regeneration regimes. At a minimum, the selected DPC will have to conserve the potential of the site to produce vegetation on a sustainable basis. The DPC will also provide a combination of plant species that achieve a healthy system as determined</p>	<p>Yes</p>	<p>The decision supports the vegetative community's objectives.</p>	<p>Oil and gas exploration activities, if located within a designated DPC, would require management stipulations that maintained the integrity of the DPC. Consider including additional BMPs and mitigations in terms of oil and gas development.</p>

**Table 4-10
Adequacy of Current Management Direction and Options for Change for Forests and Woodlands**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>by the rangeland health evaluation matrix (Table 2-6 of Appendix D) (1997 ROD/RMP, p. 2-11).</p> <p>Decisions for the pinyon-juniper woodland plant community include: Manage present plant composition as DPC within: (a) ACECs, WSAs, RVAs, (b) deer winter ranges to meet animal cover requirements, (c) woodland raptor nesting habitat. Manage forage-producing plant communities on pinyon-juniper woodland sites that have been treated or burned. Retreatment of these areas will be subject to appropriate wildlife mitigation. Reduce the pinyon-juniper tree component where pinyon or juniper has dominated or is invading other ecological sites (1997 ROD/RMP, p. 2-12).</p>	<p>Yes</p>	<p>The decision supports the vegetative community's objectives.</p>	<p>Depending on the abundance of pinyon-juniper woodland plant species within the areas of activity, actions would be subject to these decisions. Additional mitigation measures for old growth (old growth retention requirements). Manage old growth pinyon/juniper woodlands to retain large trees; retain large dead standing and down logs; retain natural stand boundaries; and maintain feathered edges. Old growth pinyon/juniper will be defined as having a minimum of eight trees per acre with age exceeding 250 years and larger than 12 inches in diameter. These stand would have downed logs in various sizes and decay classes; abundant tree cavities; and relatively undisturbed by man. Additional mitigation would include: avoidance, narrowing of rights-of-ways, and modification of road and pipeline routes.</p>

4.1.6.2 Rangelands

The 1997 ROD/RMP does not contain a specific objective for rangelands in the vegetative resources section.

**Table 4-11
Adequacy of Current Management Direction and Options for Change for Rangelands**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Decisions for the Ponderosa, Douglas-fir and aspen plant community include:</p> <p>BLM projects and land use approval actions will be designed to maintain a site above its conservation threshold (a point below which soil erosion accelerates beyond the site's ability to maintain natural productivity).</p> <p>Any plant cover or community which is capable of maintaining the site above the conservation threshold while meeting other land use objectives will be considered a desired plant community (DPC).</p> <p>Acceptable DPCs will be managed in an ecological status of high-seral or healthy mid-seral for all rangeland plant communities. An exception may be</p>	<p>Yes</p>	<p>Options for change are the proposed decisions and would adequately protect these forest types.</p> <p>This decision adequately protects ensures the protection of vegetative communities.</p>	<p>Manage ponderosa pine in the Piceance and Cathedral, and Danforth/Jensen Geographic Reference Areas (GRAs) for retention of this species. Designate areas Remnant Vegetation Associations (RVAs).</p> <p>Manage old growth Douglas-fir stands for maintenance of old growth conditions including; large tree retention older than 120 years and 14 inches in diameter. Where forest health treatments are needed these would be identified and analyzed under a separate NEPA analysis.</p> <p>Manage aspen stands for retention of this species. Where forest health treatments are needed these would be identified and analyzed under a separate NEPA analysis.</p> <p>Additional mitigation would include: avoidance, narrowing of rights-of-ways, and modification of road and pipeline routes.</p> <p>Incorporate additional language that ties this decision to Land Health Standards.</p> <p>No change is necessary. Incorporate additional language that ties this decision to Land Health Standards.</p>

**Table 4-11
Adequacy of Current Management Direction and Options for Change for Rangelands**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>provided for wildlife habitat areas where specific cover types are needed. The required cover type in those wildlife habitat areas will be the DPC. The ecological status of a DPC in specified wildlife habitat areas could be lower than the high seral. In which case, the DPC will be managed, at a minimum, to maintain an at risk rating (Table 2-6 of Appendix D) and have a stable to improving trend in ecological status (1997 ROD/RMP, p. 2-10).</p>	<p>No</p>	<p>This decision adequately protects ensures the protection of vegetative communities.</p>	<p>Areas identified for oil and gas development and exploration could reduce ideal DPC areas. Development could be restricted in ideal DPC areas. This could be expanded to include protection or maintenance of desired plant communities. Consider including this decision in forest and woodlands.</p>
<p>Manage present plant composition as DPC on all areas classified as: a) the potential natural community (PNC), high-seral and healthy mid-seral; b) sagebrush rangelands with a high- to mid-seral plant community providing suitable habitat for deer winter range, sage grouse, and antelope (1997 ROD/RMP, p. 2-11).</p> <p>Improve the present plant species composition on unhealthy or at risk rangelands to a healthy plant community within 10 years on all areas with a mid-seral and within 20 years on all areas with a low-seral plant community (1997 ROD/RMP, p. 2-11).</p>	<p>Yes</p>	<p>This decision adequately protects ensures the protection of vegetative communities.</p>	<p>The areas proposed for improvement with mid-seral and low-seral plant communities could be reduced depending on oil and gas development and exploration sites. BLM oil and gas activities could be restricted in these areas. A new decision is needed here to address limiting the expansion of annual rangelands as related to surface disturbing actions.</p>

**Table 4-11
Adequacy of Current Management Direction and Options for Change for Rangelands**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>DPC goals for rangelands with mountain shrub plant communities include: Manage present plan composition on all areas occupied by PNC, high-seral, or healthy mid-seral plant communities as DPC (1997 ROD/RMP, p. 2-11). Manage mature vigorous stands of deciduous shrubs on all blue grouse ranges and on all deer critical summer ranges as the DPC. Manage younger age stands of deciduous shrubs on 30 percent of this plant community as DPC through use of compatible treatment methods. Improve plant composition to a healthy plant community within 10 years for all low-seral plant communities.</p>	<p>Yes</p>	<p>This decision adequately protects ensures the protection of vegetative communities.</p>	<p>No change is necessary.</p>
<p>All mineral development/ oil and gas related disturbances will be revegetated using recommended seed mixes (Refer to Appendix B in the 1997 ROD/RMP) (1997 ROD/RMP, p. 2-12 and 2-13).</p>	<p>No</p>	<p>This decision adequately protects ensures the protection of vegetative communities.</p>	<p>This decision applies directly to oil and gas activities. Recommended seed mixes should be utilized to meet the goal of this decision. The first half of this is adequate as perhaps a stand alone decision related to in-house projects. Exceptions to this would have to be granted on a case-by-case basis for oil and gas development.</p>

4.1.6.3 Riparian and Wetlands

**Table 4-12
Adequacy of Current Management Direction and Options for Change for Riparian and Wetland Resources**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Improve 640 acres of high and medium priority riparian areas to proper functioning condition (1997 ROD/RMP, p. 2-14).</p>	<p>No</p>	<p>This decision may or may not affect areas of proposed oil and gas activities.</p>	<p>Does not protect riparian areas affected by oil and gas leasing. Depending on the specific location, oil and gas development and exploration may reduce the amount of high and medium priority riparian areas or it may increase the areas defined as riparian. Management could be implemented that avoids riparian areas. Change from acres to miles. Reprioritize systems.</p>
<p>Wildlife habitat improvements recommended for riparian areas in the Piceance Basin Habitat Management Plan (HMP) will continue to be developed (1997 ROD/RMP, p. 2-14).</p>	<p>No</p>	<p>Improvements implicated by this decision would need to be determined.</p>	<p>Adopted wildlife habitat improvements would need to be determined and incorporated into BLM activities. This decision does not need to be carried forward.</p>
<p>All potentially impacting land use activities will be required to avoid priority riparian habitats, unless it is determined through an environmental analysis that: (a) The activity will not degrade or forestall attainment of the proper functioning condition of the riparian area; (b) Impacts could be mitigated in a manner that will meet minimum objectives for the system if the riparian areas could not be avoided (1997 ROD/RMP, p. 2-14 and 2-15).</p>	<p>Yes</p>	<p>This decision adequately ensures the protection of vegetative communities.</p>	<p>BLM may need to update or re-prioritize the list of priority riparian habitats.</p>

**Table 4-12
Adequacy of Current Management Direction and Options for Change for Riparian and Wetland Resources**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Existing activity and/or facilities that are negatively affecting the proper functioning condition of a riparian or wetland habitat may be required to undertake remedial mitigation, or relocate activities outside the high and medium priority riparian habitat upon authorization renewal or amendment (1997 ROD/RMP, p. 2-15).</p>	<p>No</p>	<p>This decision adequately ensures the protection of vegetative communities.</p>	<p>This decision would not apply to future activities associated with oil and gas development and exploration. If oil and gas development and exploration activities are proposed near wetland or riparian habitats, BLM should examine potential restoration, protection, or improvement methods that could be applied.</p> <p>Develop a range of alternatives based on priority rating of system for riparian habitat.</p> <p>Develop additional BMPs (e.g., to reduce sediment reaching riparian systems).</p> <p>Re-evaluate high, medium, low- priorities categories of riparian and wetland areas.</p>
<p>Existing roads may be required to be relocated in those circumstances where the road is having an adverse impact upon the proper functioning condition of the riparian or wetland area (1997 ROD/RMP, p. 2-15).</p>	<p>Yes</p>	<p>This decision adequately ensures the protection of vegetative communities.</p>	<p>No change necessary.</p>
<p>Development of springs, seeps, and other project improvements will be designed to maintain or improve the ecological and hydrological values of those sites (1997 ROD/RMP, p. 2-15).</p>	<p>Yes</p>	<p>This decision adequately ensures the protection of vegetative communities.</p>	<p>If BLM actions would occur on sites with hydrological importance, values of these sites would need to be maintained.</p> <p>BLM may need to develop additional COAs.</p>
<p>All high and medium riparian areas will be inventoried to determine their ecological status, functioning condition, and potential riparian plant community. The desired riparian plant community will be developed in activity plans or integrated activity plans. Tables 2-9 and 2-10 in Appendix D, list high and medium priority riparian habitats,</p>	<p>-No</p>	<p>This decision adequately ensures the protection of vegetative communities.</p>	<p>Consider re-evaluating the high, medium, low priority area categories of riparian and wetland areas; expand the application of protections for riparian and wetland areas (e.g., larger setbacks); and re-evaluate the riparian/wetland inventory system.</p>

**Table 4-12
Adequacy of Current Management Direction and Options for Change for Riparian and Wetland Resources**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>respectively. Table 2-11 in Appendix D lists the low priority riparian habitats (1997 ROD/RMP, p. 2-15).</p> <p>Site specific resource management practices for riparian habitats will be developed as integrated activity plans or individual activity plans (allotment management plan) are developed. The plans will outline the management needed to meet riparian area objectives. The order in which management actions will be applied are based on the following criteria:</p> <ul style="list-style-type: none"> Fisheries present Special status species habitat Potential for system improvement Potential for persistent water flow System, condition, trend, and vulnerability Management potential Amount of BLM land Presence of other riparian dependent values (1997 ROD/RMP, p. 2-15). 	<p>Yes</p>	<p>This decision adequately protects ensures the protection of vegetative communities.</p>	<p>No change is necessary.</p>

**Table 4-12
Adequacy of Current Management Direction and Options for Change for Riparian and Wetland Resources**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Where assessments or monitoring data reveal that key resources or watershed functioning requirements are not being met because of livestock overuse, the Field Manager will adjust grazing use and may require total rest on all non-functioning riparian habitats and all high and medium priority habitats functioning at risk (1997 ROD/RMP, p. 2-15).</p>	<p>Yes</p>	<p>This decision adequately protects ensures the protection of vegetative communities.</p>	<p>This decision may apply to activities associated oil and gas development and exploration if activity is so great that it forces cattle to concentrate in smaller areas.</p>
<p>Grazing practices (such as the COAs identified in Appendix B) that protect public health and welfare; maintain, restore, and/or improve water quality; and result in water quality that meets or exceeds state water quality standards, will be implemented through approvals of permits and leases on all high and medium priority and all non-functional low priority riparian habitats (1997 ROD/RMP, p. 2-16).</p>	<p>Yes</p>	<p>This decision adequately protects ensures the protection of vegetative communities.</p>	<p>This decision may apply to activities associated oil and gas development and exploration if activity is so great that it forces cattle to concentrate in smaller areas.</p>
<p>Activities proposed within riparian habitats will be analyzed to determine whether the identified management objectives could be met. Those activities that do not meet the objectives will be modified to meet the objectives or will be denied (1997 ROD/RMP, p. 2-16).</p>	<p>Yes</p>	<p>This decision adequately protects ensures the protection of vegetative communities.</p>	<p>Coordination with appropriate permitting agencies is recommended during the planning stage of proposed projects to ensure appropriate mitigation measures to protect riparian habitat are implemented.</p>
<p>The need for additional exclosures and other riparian improvement projects will be identified during development of activity plans or allotment management plans. These plans will address the improvement objectives developed for priority riparian habitats. These plans will also incorporate the best management practices needed to achieve the desired improvement on a particular riparian habitat (1997 ROD/RMP, p. 2-16).</p>	<p>Yes</p>	<p>This decision adequately protects ensures the protection of vegetative communities.</p>	<p>Coordination with appropriate permitting agencies is recommended during the planning stage of proposed projects to ensure appropriate BMP measures to protect riparian habitat are implemented.</p>

**Table 4-12
Adequacy of Current Management Direction and Options for Change for Riparian and Wetland Resources**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Use of residual vegetation targets will be established through activity plans for all high and medium priority and all non-functioning riparian habitats to accomplish the following:</p> <ul style="list-style-type: none"> (a) Maintain, improve, or restore both herbaceous and woody species to healthy and vigorous condition and facilitate reproduction and maintenance of different age classes in the desire riparian-wetland and aquatic plant communities; (b) Leave enough vegetation biomass and plant residue (including woody debris) to allow adequate sediment filtering and dissipation of stream energy for bank protection (1997 ROD/RMP, p. 2-16 and 2-17). 	<p>Yes</p>	<p>This decision adequately protects ensures the protection of vegetative communities.</p>	<p>No change is necessary.</p>
<p>Forest product permits and mineral material disposal permits will not be issued within riparian or wetland areas (1997 ROD/RMP, p. 2-17).</p>	<p>Yes</p>	<p>This decision adequately protects ensures the protection of riparian communities.</p>	<p>This decision would not apply to activities associated oil and gas development and exploration.</p>

4.1.7 Fish and Wildlife

Management opportunities for fish and wildlife contain the decisions from the 1997 ROD/RMP for Wildlife Habitat. Decisions regarding special status species are included under Special Status Species Section 4.1.8.

4.1.7.1 Wildlife Habitat for Big Game

Objective: Ensure that big game habitats provide components and conditions necessary to sustain big game populations at levels commensurate with multiple-use objectives and state-established population objectives.

**Table 4-13
Adequacy of Current Management Direction and Options for Change for Wildlife Habitat for Big Game**

Decision	Is Decision Adequate?	Remarks	Options for Change
Maintain or enhance the productivity and quality of preferred forages on all big game ranges (1997 ROD/RMP, p. 2-26).	Yes	The decision supports the wildlife habitat objectives.	Creating additional COAs or other mitigation to maintain or enhance preferred forages may need to be developed in areas with oil and gas exploration and development.
Provide the forms, distribution and extent of vegetative cover and forage that satisfy the physiological and behavioral requirements of big game (1997 ROD/RMP, p. 2-26).	Yes	The decision supports the wildlife habitat objectives.	Creating additional COAs or other mitigation to maintain or enhance preferred forages may need to be developed in areas with oil and gas exploration and development. Consider changing timing/stipulations in big game habitat with oil and gas development. Develop a new protocol for oil and gas leases to contribute funding for compensatory mitigation to offset reductions in forage base.

Table 4-13
Adequacy of Current Management Direction and Options for Change for Wildlife Habitat for Big Game

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Reduce the duration, extent and intensity of manageable forms of animal harassment during crucial timeframes and avoidance-induced disuse of suitable habitat considered limited in supply and/or critical in fulfilling special functions (1997 ROD/RMP, p. 2-26).</p> <p>Reference timing limitation: stipulations listed in Appendix A (1997 ROD/RMP, p. 2-29, 2nd paragraph).</p>	<p>Yes</p>	<p>The decision supports the wildlife habitat objectives.</p>	<p>To reduce avoidance-induced disuse of suitable habitat could result in changes to timing limitation stipulations for oil and gas leasing. See above comment (add timing limitations).</p> <p>In consideration of new drilling technology that substantially reduces the surface footprint of development facilities, options involve altering the application of traditional timing limitations, e.g., prioritizing deferrals to clump development or concentrate near existing forms of disturbance.</p> <p>Promote multi-phase gathering concepts, remote well head monitoring to reduce vehicle use in developed fields.</p> <p>Access and road management alternatives: gating of individual well access roads versus “systemic” control of unregulated use of road networks in gas development areas.</p>
<p>Habitat conditions sufficient to support a minimum winter deer population of 24,900 on BLM land in the Piceance Basin will be maintained as a critical threshold. Once development has met or exceeded this threshold, limitations to further development may occur (1997 ROD/RMP, p. 2-27).</p>	<p>No</p>	<p>Specific big game population numbers may not accommodate land health standards.</p>	<p>Consider new decision that acknowledges development will reduce capacity to sustain current long-term population objectives, and will require a mutually acceptable minimum population threshold/objective that ensures short term viability for long term recovery.</p>

Table 4-13
Adequacy of Current Management Direction and Options for Change for Wildlife Habitat for Big Game

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>The production, quality or availability of preferred big game forage will be enhanced as necessary to accommodate prescribed big game population objectives. Forage deficiencies will be remedied, where possible, through various habitat treatments and livestock management techniques (1997 ROD/RMP, p. 2-27).</p>	<p>Yes</p>	<p>Reference to using livestock management techniques should remain as current management and does not require modification. The implementation decision supports the wildlife habitat objectives but may not adequately address surface disturbance associated with increased oil and gas exploration and development. Consider new decision that acknowledges development will reduce capacity to sustain current long-term population objectives, and will require a mutually acceptable minimum population threshold/objective that ensures short term viability for long term recovery.</p>	<p>Consider developing additional COAs or other mitigation to address forage deficiencies in areas with oil and gas exploration and development. Consider development of additional stipulations, COAs or mitigation measures. Develop protocol for leases to contribute funding for population monitoring and/or compensatory mitigation to offset reductions in habitat capacity. Establish with State and industry an adaptive method (based on monitoring) to quantify direct/indirect effects on big game as basis for compensating loss of capacity</p>

**Table 4-13
Adequacy of Current Management Direction and Options for Change for Wildlife Habitat for Big Game**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Significant reductions in essential winter forage bases will be minimized by limiting cumulative treatment of suitable sagebrush forage types on deer winter ranges and pronghorn overall ranges. Cumulative reductions of suitable forage types will be limited to 50 percent of suitable habitat within a one mile radii, and not exceed 20 percent of the total type within individual GRAs. Treatment of suitable sagebrush forage types on deer severe winter range and pronghorn winter ranges will be confined, where possible, to suboptimal stands and excess cover types. Cumulative reductions of suitable forage types on deer severe winter range and pronghorn winter range will be limited to 20 percent within one mile radii where involvement is unavoidable.</p>	<p>No</p>	<p>The implementation decision supports the wildlife habitat objectives but may not adequately address surface disturbance associated with increased oil and gas exploration and development.</p>	<p>Consider developing additional COAs or other mitigation to address cumulative impacts to winter forage in areas with oil and gas exploration and development. The intent of the decision is adequate, but consider revising specific thresholds. The decision should apply at an RMP-level. Options may involve offsite enhancements to compensate for localized transgressions.</p>
<p>All vegetation manipulation will be subject to the following design guidelines to maintain or enhance favorable distribution of big game cover: achieve an approximate 60:40 forage to cover ration on the basis of 1.0 mile radii across all deer and elk ranges. Distribute cover such that 600-1,200 feet of effective security cover remains available within 600 feet of any point in the treatment area; reserve or allow development of coniferous canopies \geq 70 percent (or densest available) and >300 feet in width on \geq10 percent of all severe winter ranges on the basis of one mile radii; and retain a minimum 300 feet of untreated buffers</p>	<p>Yes</p>	<p>The implementation decision supports the wildlife habitat objectives but may not adequately address surface disturbance associated with increased oil and gas exploration and development.</p>	<p>Consider developing additional COAs or other mitigation to address cumulative impacts to winter forage in areas with oil and gas exploration and development. Decision adequate. Modify or develop a range of alternatives in coordination with CDOW for these specific prescriptions related oil and gas leasing. (see above). Prescribed avoidance of habitats or features with special function or in limited supply, e.g., aspen, conifer forest, cover types/corridors in close proximity to water.</p>

**Table 4-13
Adequacy of Current Management Direction and Options for Change for Wildlife Habitat for Big Game**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>interconnected with other forms of cover around specialized use areas and travel lanes.</p> <p>Long-term seral or type conversion of aspen, Douglas-fir, spruce-fir and deciduous shrub communities will be avoided to the extent practicable. Where unavoidable, special stipulations will be applied requiring reclamation measures necessary to maintain site potential and restore the desired composition and seral stage of the former community. Seral manipulations of Douglas-fir, spruce-fir and aspen will be limited to those projects specifically designed or conditioned to achieve objectives pertaining to stand perpetuation, enhancement of inter-stand diversity, and riparian improvement. A CSU stipulation (see Appendix A) will be imposed on all land use activities that involve aspen, serviceberry, and chokecherry communities north of Highway 40 as a means of maintaining the distribution, condition and functional capacity of high priority wildlife habitats (1997 ROD/RMP, p. 2-28).</p>	<p>Yes</p>	<p>The implementation decision supports the wildlife habitat objectives but may not adequately address surface disturbance associated with increased oil and gas exploration and development.</p>	<p>Consider developing additional COAs or other mitigation to address seral stage distribution and to preserve wildlife habitat functionality in areas with oil and gas exploration and development. See above (develop range of alternatives). Extend to mature pinyon-juniper woodlands. Recognize need to accommodate linear features and/or option of using 200 meter relocations to remove development features from aspen and spruce-fir, and avoid mature pinyon/juniper woodlands and deciduous shrubs where practical.</p>
<p>Big game habitat treatment and management objective will be incorporated with the planning and development of all integrated activity plans. Similarly, road density objective will be developed through a travel management plan or integrated activity plan. The Piceance Basin Habitat Management Plan will be revised incrementally through development of an integrated activity plan (1997 ROD/RMP, p. 2-29).</p>	<p>No</p>	<p>The implementation decision supports the wildlife habitat objectives but may not adequately address surface disturbance associated with increased oil and gas exploration and development. First sentence is a restatement of BLM policy.</p>	<p>Consider developing additional COAs or other mitigation to address impacts to wildlife habitat from oil and gas exploration and development in the Piceance Basin. First sentence is a policy statement. Not adequate because this HMP no longer applies. Last sentence not applicable since HMP obsolete.</p>

**Table 4-13
Adequacy of Current Management Direction and Options for Change for Wildlife Habitat for Big Game**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>A NSO stipulation will be applied to the Oak Ridge State Wildlife Area as a means of precluding the effects of mineral development on locally significant big game habitats and populations. Mitigation measures will be applied as conditions of approval (COA) to existing land use authorization involving surface-disturbing activities to emulate the intent of these stipulations to the extent allowable.</p>	<p>No</p>	<p>The implementation decision supports the wildlife habitat objectives but may not adequately address surface disturbance associated with increased oil and gas exploration and development.</p>	<p>General road density objectives are already established – application and implementation would occur on project specific basis and would vary depending on terrain and access associated with other resource objectives. Consider developing additional COAs or other mitigation to address impacts to wildlife habitat from oil and gas exploration and development in the Piceance Basin or other areas with high mineral potential. Consider developing a range of alternatives for NSO areas. Consider expanding to Jensen SWA and Yellow/Duck Creek valleys of Piceance SWA.</p>
<p>Permitted land use activities that may disrupt animal behavior or habitat utility during sensitive time frames will be subject to timing limitations on severe winter ranges (all species), elk and pronghorn production areas, and deer and elk summer ranges designated as critical habitat. Exception and modification provisions (See Appendix A) provide some flexibility in implementing the stipulations and allows site-specific tailoring of prescriptions to gain effective protection of identified values without unnecessarily hindering other forms of public land use (1997 ROD/RMP, p. 2-29).</p>	<p>No</p>	<p>The implementation decision supports the wildlife habitat objectives and adequately addresses surface disturbance associated with increased oil and gas exploration and development.</p>	<p>The decisions could be modified to provide flexibility in application of stipulations to manage seasonal development activity across all big game ranges and take advantage of multi-well technology to reduce long-term surface occupation</p>

**Table 4-13
Adequacy of Current Management Direction and Options for Change for Wildlife Habitat for Big Game**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Road abandonments and seasonal closures during periods of animal occupation will be used, to the extent practical, to limit effective road densities to an average maximum 1.5 miles per square mile on big game critical habitats and 3 miles/square mile on remaining big game ranges. Restrictions could be temporarily excepted to achieve special management needs (e.g., increase harvest). These road density objectives will be developed through site specific travel management or integrated activity plans. Special conditions of approval will be applied through the environmental analysis process to preclude or discourage continued vehicular traffic on linear rights-of-way within closed areas (1997 ROD/RMP, p. 2-29).</p>	<p>No</p>	<p>The implementation decision supports the wildlife habitat objectives but may not adequately address surface disturbance associated with increased oil and gas exploration and development.</p>	<p>Consider developing additional COAs or other mitigation to address impacts to wildlife habitat from oil and gas exploration and development in the Piceance Basin or other areas with high mineral potential. Develop a COA that addresses road density. Develop a range of alternatives. Expand to consider access restrictions coordinated in a manner that allows development of secure travel corridors through intensive development, intermittent parcels (several hundred acres) of effective refugia among development areas, with flexibility to adjust restriction areas with changes in development pressures or based on monitored influences on animal distribution. Could establish limits on restrictions that allow acceptable levels of unregulated public access. Consider expanding language precluding vehicle use on right-of-ways (pipeline/ powerline) to any corridor not specifically designed to accommodate vehicle use, and/or require facility designs that do not require vehicular access for monitoring.</p>

4.1.7.2 Raptors

Objective: Maintain the short-term utility and promote the continued long-term development and availability of suitable raptor habitats. This includes prey base, nest sites, and other special habitat features necessary to help stabilize or allow increases in regional raptor populations.

**Table 4-14
Adequacy of Current Management Direction and Options for Change for Raptors**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Land use activities that involve long-term, undesirable reduction or fragmentation of aspen, spruce-fir, Douglas-fir or oakbrush communities will be avoided to the extent possible. This can be accomplished through relocation and design modifications developed on a site-specific basis. Where unavoidable, special reclamation measure will be required to accelerate reestablishment of former plant community characteristics.</p>	<p>Yes</p>	<p>Although the decision supports the wildlife objectives for raptors, the increased amount of surface disturbance from oil and gas explorations may not be adequately addressed at a landscape level.</p>	<p>Exploration and development to oil and gas resources in aspen and other special use habitats raptors could be restricted. Expand to include mature pinyon-juniper woodlands. Options may include strict use of 200 meter moves to avoid identified habitats (rather than generally deferring to well spacing needs of operator).</p>
<p>Permitted land use activities within ¼ mile of functional nest sites of cavity, cliff and ground nesting species and within ½ mile of special status and tree-nesting species, will be subject to relocation or design modifications to preclude or reduce to acceptable levels, long-term reduction or deterioration of nest and foraging habitat (1997 ROD/RMP, p. 2-30).</p>	<p>Yes</p>	<p>The decision supports the wildlife habitat objectives and adequately addresses surface disturbance associated with increased oil and gas exploration and development.</p>	<p>No change necessary. Options may include strict use of 200 meter moves to avoid identified habitats (rather than generally deferring to well spacing needs of operator), or limiting provisions to active nests only.</p>
<p>Where practical, trees suitable for long and short-term cavity excavation will be reserved during woodland clearing or thinning practices at levels equal to or greater than the following: within pinyon-juniper: one 12” diameter tree/acre within other conifer types, two-12” diameter trees/acre or comparable, and</p>	<p>Yes</p>	<p>Although the decision supports the wildlife objectives for raptors, the increased amount of surface disturbance from oil and gas explorations may not be adequately addressed at a landscape level Exploration and development to oil and</p>	<p>Not applicable. Carry forward; no change necessary.</p>

Table 4-14
Adequacy of Current Management Direction and Options for Change for Raptors

Decision	Is Decision Adequate?	Remarks	Options for Change
within aspen: three-12" diameter trees/acre or comparable.		gas resources in aspen and other special use habitats of raptors could be restricted.	
Disruptive land use activities will not be allowed within the following specified radii of active raptor nest sites during the period from nest territory establishment to dispersal of young from nest: non-special status species: ¼ mile; and special status species: ½ mile.	Yes	The decision supports the wildlife habitat objectives and adequately addresses surface disturbance associated with increased oil and gas exploration and development.	Focus on functionality of a stand.
Disruptive surface occupation or adverse habitat modification will be prohibited within ¼ mile of functional nest sites of special status species (i.e. listed, proposed, candidate and BLM sensitive) and 1/8 mile of other members of the raptor group.	Yes	The implementation decision supports the wildlife habitat objectives and adequately addresses surface disturbance associated with increased oil and gas exploration and development.	Allow surface occupation, only to the extent that long-term utility of nest habitat is maintained. Additional COAs or reclamation measures may need to be developed to reduce impacts.
Habitat treatment and management guidelines will be applied during the NEPA process as mitigation measures or conditions of approval.	Yes	This decision is a BLM policy statement.	Exploration and development to oil and gas resources in wildlife habitat could be restricted.
NSO and TL stipulations will be applied, where appropriate (See Appendix A), to all permitted surface use activities through various use authorizations or leasing processes. These protective stipulations will be applied to surface use activities associated with existing land use authorizations as mitigation measures or COAs during the NEPA process.	Yes	The implementation decision supports the wildlife habitat objectives but may not adequately address surface disturbance associated with increased oil and gas exploration and development.	Consider developing additional COAs or other mitigation to address impacts to wildlife habitat from oil and gas exploration and development in the Piceance Basin or other areas with high mineral potential. Opportunity for refining this decision. Develop range of alternatives or revising the application of buffers with a species-specific emphasis.

**Table 4-14
Adequacy of Current Management Direction and Options for Change for Raptors**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Exception and modification provisions (See Appendix A) provide some flexibility in implementing the stipulations. They also allow site-specific tailoring of prescriptions to gain effective protection of identified values without unnecessarily hindering other forms of public land use. These provisions provide the opportunity to integrate new or innovative technologies and information to better manage, protect or compensate for wildlife related values. They will also promote the accumulation of information necessary to better identify, assess, and manage wildlife values.</p>	<p>Yes</p>	<p>The implementation decision supports the wildlife habitat objectives and adequately addresses surface disturbance associated with increased oil and gas exploration and development.</p>	<p>No change necessary.</p>
<p>Development proponents will be required to perform raptor nest inventories in affected nest habitat when proposed land use influence exceeds 100 acres. When possible, inventories will allow for a full nesting sequence for investigation prior to project implementation.</p>	<p>No</p>	<p>The implementation decision supports the wildlife habitat objectives but may not adequately address surface disturbance associated with increased oil and gas exploration and development.</p>	<p>Consider developing additional COAs or other mitigation to address impacts to wildlife habitat from oil and gas exploration and development in the Piceance Basin or other areas with high mineral potential. Suggest dropping the 100-acre aspect of this decision. Develop range of alternatives.</p>

4.1.7.3 Grouse

Objective: Restore, maintain or enhance habitat conditions and features conducive to the maintenance or expansion of native grouse populations. Reduce disruption of important seasonal use activities associated with production and recruitment.

**Table 4-15
Adequacy of Current Management Direction and Options for Change for Grouse**

Decision	Is Decision Adequate?	Remarks	Options for Change
Suitable sage grouse habitats (See Map 2-16) will be enhanced by manipulating suboptimal sagebrush stands, or converting stands with undesirable composition to suitable cover types.	Yes	The decision supports the wildlife habitat objectives and adequately addresses surface disturbance associated with increased oil and gas exploration and development.	Options may include creating a fund where energy-related leases contribute using an established formula to support mitigation and monitoring efforts.
Riparian, livestock and water management techniques will be designed to enhance riparian and wet/mesic meadow habitat on all grouse brood ranges.	No	Although the decision supports the wildlife objectives for grouse, the increased amount of surface disturbance from oil and gas explorations may not be adequately addressed at a landscape level.	Develop additional or revise existing COAs and stipulations for oil and gas exploration and development in wet/mesic meadow habitat on all grouse brood ranges. Incorporate management actions utilizing the National Sage-Grouse Habitat Conservation Strategy. Include vegetation and big game management as techniques. Incorporate management actions and strategies consistent with National GRSG Conservation Strategy, Colorado Greater Sage-Grouse Conservation Plan and local conservation plans (i.e., Northwest Colorado and Piceance/Parachute/Roan Plateau).
Surface occupation and long term conversion or adverse modification of the following sage grouse habitat will be avoided: sagebrush stands with ≤ 50 percent canopy and $\leq 30''$ in height and ≤ 2 miles from a lek; sagebrush stands with ≤ 30 percent canopy and $\leq 30''$ in height > 2 miles from a lek on occupied summer ranges; any sagebrush stand on slopes ≤ 20 percent in defined winter concentration areas; and sagebrush stands on slopes ≤ 20 percent showing evidence of winter use.	No	Decision may not correspond with newly accepted habitat guidelines as per National GRSG Conservation Strategy, Colorado Greater Sage-Grouse Conservation Plan and local conservation plans (i.e., Northwest Colorado and Piceance/Parachute/Roan Plateau)	Review BLM sage grouse management guidance and revise the criteria for habitat management avoidance where necessary in areas with oil and gas exploration and development.

**Table 4-15
Adequacy of Current Management Direction and Options for Change for Grouse**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Long-term seral or type conversions of all aspen, Douglas-fir, spruce-fir and deciduous shrub communities should be avoided. Where unavoidable, special stipulations requiring reclamation measures to maintain site potential, restore desired plant composition, and/or accelerate development of the community's desired seral state will be applied. Seral manipulations of aspen and conifer types will be limited to those specifically designed to enhance or perpetuate stand diversity or achieve riparian management objectives. Where practical, manipulation extent will maintain a minimum of 50 percent individual stands in mature to over-mature age class.</p>	<p>No</p>	<p>Although the decision supports the wildlife objectives for grouse the increased amount of surface disturbance from oil and gas explorations may not be adequately addressed at a landscape level. Provide reference to CSU-4 which is specific to deciduous shrub and aspen communities north of Highway 40.</p>	<p>Develop additional or revise existing COAs and stipulations for oil and gas exploration and development in to maintain stand diversity and riparian functioning conditions. This decision pertains to blue and sharp-tailed grouse. Options may involve modification of allowable conversion figure or strict use of 200 meter allowance to avoid these parcels rather than current practice of generally accommodating desired well spacing.</p>
<p>Disruptive surface use activities will be prohibited in the following areas during the seasonal use periods identified: winter concentration areas (December 16 through March 15); nesting habitats, when 10% or more of suitable nesting habitat associated with an individual lek is adversely influenced (April 15- July 7).</p>	<p>No</p>	<p>The management decision could lessen the impact and decline of sage grouse habitat and populations.</p>	<p>Develop management actions to prevent or limit disruption in key habitat areas. Concept in the decision should remain intact to help protect wildlife habitat. Consistency with various sage-grouse plans desirable. To prevent progressive decline in secure habitat available for recovery, timing limitations applied to nest habitat should be applied to active and inactive leks, with possible mitigating provisions (e.g., allow evaluation on population basis or managing disturbance to promote grouse use of areas not subjected to heavy development pressures), OR, expanding application of timing limitation to suitable habitat within 4 miles of active lek. Potential option: Where important seasonal uses are coincident, and in coordination with CDOW, priority will be extended to seasonal use considered most important.</p>

**Table 4-15
Adequacy of Current Management Direction and Options for Change for Grouse**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Disruptive surface occupation or adverse habitat modification within ¼ mile of active strutting grounds will be prohibited.</p>	<p>No</p>	<p>Although the decision supports the wildlife objectives for grouse the increased amount of surface disturbance from oil and gas explorations may not be adequately addressed at a landscape level.</p>	<p>Incorporate management actions consistent with National GRSG Conservation Strategy, Colorado Greater Sage-Grouse Conservation Plan and local conservation plans (i.e., Northwest Colorado and Piceance/Parachute/ Roan Plateau). Need to specify avoidance dates for active lekking activity in lieu of NSO application. Options involve expanding avoidance buffers on active leks to 0.5 mile.</p>
<p>Vegetation treatment widths should generally not exceed 200 feet. Treatment areas should be interspersed with equal or larger intervals of suitable cover. Cumulative adverse manipulations will not be allowed to exceed 10 percent of suitable nest habitat within 2 miles of a lek.</p>	<p>No</p>	<p>Although the decision supports the wildlife objectives for grouse the increased amount of surface disturbance from oil and gas explorations may not be adequately addressed at a landscape level.</p>	<p>Incorporate management actions consistent with National GRSG Conservation Strategy, Colorado Greater Sage-Grouse Conservation Plan and local conservation plans (i.e., Northwest Colorado and Piceance/Parachute/Roan Plateau). Options may involve revising thresholds or expanding nest habitat buffer to 4 miles, or alternatively, allowing localized violation of standards if adequately compensated.</p>
<p>Adapted forms of succulent forbs should be included in seed mixes applied to surface disturbances on grouse brood ranges. See mixes will be subject to reseeding conditions established for each GRA and identified in Appendix B.</p>	<p>Yes</p>	<p>The decision supports the wildlife habitat objectives and adequately addresses surface disturbance associated with increased oil and gas exploration and development.</p>	<p>Options include using native forms as general rule, but where lacking or beneficial, using species that have no demonstrated tendency to disperse beyond the treatment area.</p>

**Table 4-15
Adequacy of Current Management Direction and Options for Change for Grouse**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Comparable or superior varieties of sagebrush should be established within occupied sage grouse ranges in those instances where sagebrush conversion or removal has exceeded 500 acres. The extent and level of reestablishment effort will not exceed 20 percent of converted acreage at mature canopy densities of ≥ 15 percent.</p>	<p>Yes</p>	<p>The decision supports the wildlife habitat objectives and adequately addresses surface disturbance associated with increased oil and gas exploration and development.</p>	<p>Modifications may involve removing minimums or targets and expanding use to linear features and all sagebrush steppe communities. Options may involve limiting seed to that collected on-site (direct material or seed propagated from "local" collections), unless specifically authorized exceptions in coordination with CDOW.</p>
<p>NSO, TL and CSU stipulations will be applied, where appropriate, to all permitted surface use activities through various use authorizations and leasing processes. These protective stipulations will be applied to surface use activities associated with existing land use authorizations as mitigation measures or COAs during the NEPA process. COAS will not violate the exercise of valid existing rights.</p>	<p>No</p>	<p>Although the decision supports the wildlife objectives for grouse the increased amount of surface disturbance from oil and gas explorations may not be adequately addressed at a landscape level.</p>	<p>Develop additional or revise existing COAs and stipulations for oil and gas exploration and development in to maintain stand diversity and riparian functioning conditions. Incorporate management actions consistent with National GRSG Conservation Strategy, Colorado Greater Sage-Grouse Conservation Plan and local conservation plans (i.e., Northwest Colorado and Piceance/Parachute/ Roan Plateau). Options may involve revising dates, seasonal habitat definitions, or application criteria.</p>
<p>A CSU stipulation will be applied to all permitted land use activities that involve the modification of aspen, service berry and chokecherry communities north of Highway 40. This will be a means of maintaining the distribution, condition and functional capacity of high priority grouse habitats.</p>	<p>No</p>	<p>Although the decision supports the wildlife objectives for grouse the increased amount of surface disturbance from oil and gas explorations may not be adequately addressed at a landscape level.</p>	<p>Develop additional or revise existing COAs and stipulations for oil and gas exploration and development in to maintain the distribution, condition and functional capacity of high priority grouse habitats. Establish management actions to maintain or restore conditions in key habitats. Although this decision pertains primarily to blue and peripherally to sharp-tailed grouse, options may include extending the concept to sagebrush steppe habitats for greater sage-grouse.</p>

**Table 4-15
Adequacy of Current Management Direction and Options for Change for Grouse**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Exception and modification provisions (see Appendix A) provide some flexibility in implementing the stipulations. They also allow site-specific tailoring of prescriptions to gain effective protection of identified values without unnecessarily hindering other forms of public land use. These provisions provide the opportunity to integrate new or innovative technologies and information to better manage, protect or compensate for wildlife related values. They will also promote the accumulation of information necessary to better identify assess, and manage wildlife values.</p>	<p>No</p>	<p>Although the decision supports the wildlife objectives for grouse the increased amount of surface disturbance from oil and gas explorations may not be adequately addressed at a landscape level.</p>	<p>Develop additional or revise existing COAs and stipulations for oil and gas exploration and development in to maintain stand diversity and riparian functioning conditions. Incorporate management actions consistent with National GRSG Conservation Strategy, Colorado Greater Sage-Grouse Conservation Plan and local conservation plans (i.e., Northwest Colorado and Piceance/Parachute/Roan Plateau)</p>

4.1.7.4 Fisheries

Objective: Improve current and potential stream fisheries to help increase populations of sport and native fishes.

Develop and maintain facilities capable of supporting warm-water fisheries.

Increase recreational fishing opportunities within the Resource Area.

Table 4-16
Adequacy of Current Management Direction and Options for Change for Fisheries

Decision	Is Decision Adequate?	Remarks	Options for Change
Acquisition of water rights to meet minimum instream flow requirements of public land cold water fisheries will be pursued in cooperation with Colorado Division of Wildlife and Colorado Division of Water Resources.	Yes	The decision meets the objective for improving current and potential stream fisheries.	Coordinate with CDOW and state water engineer to protect instream flow in sport and native fisheries habitat in areas with oil and gas exploration and development. Expand program to acquire in-stream flow appropriations for either strictly native populations, including speckled dace, or limit to BLM-sensitive species, e.g., flannelmouth and mountain sucker
Suitable stream segments that are greater than or equal to 0.25 mile in length, will have riparian/channel conditions improved to no less than fair condition within 10 years (1997 ROD/RMP, p. 2-33).	No	Refine definition	Re-establish objective timeframes, establish evaluation method, identify applicable streams; Expand CSU-6 provisions to streams supporting native and/or BLM sensitive species

4.1.8 Special Status Species

Objectives: Increase special status species populations (Black footed ferret, Bald eagle, and Colorado River cutthroat trout), and the suitable extent and/or utility of their habitats on public lands in an effort to ultimately remove these species from special status consideration (See Appendix C, Standard Four of the 1997 ROD/RMP). Consistent with BLM policy, the same objective would extend to populations of BLM sensitive animals and the habitats on which they depend.

Ensure that federally authorized actions do not adversely disrupt or compromise important biological activities or contribute to increased mortality or depressed production or recruitment into a breeding population.

Maintain or improve bank, channel and floodplain processes associated with designated critical habitats for listed and candidate fishes of the Upper Colorado River Basin.

4.1.8.1 Black-footed Ferret

The 1997 ROD/RMP does not have a specific objective for the Black-footed ferret.

**Table 4-17
Adequacy of Current Management Direction and Options for Change for the Black-footed Ferret**

Decision	Is Decision Adequate?	Remarks	Options for Change
Black-footed ferret recovery areas will be designated on 52,050 acres of BLM-administered surface in the Lower Wolf Creek drainage and 6,740 acres of BLM-administered surface in Coyote Basin. Designated recovery areas will be available for the reestablishment of viable black-footed ferret populations.	Yes	This decision will be carried forward as part of continuing management.	No change to this decision is necessary.
Land use actions on federal lands that affect the overall extent or distribution of prairie dog ecosystems, or that alter the effective continuity or general densities of prairie dogs within prairie dog complexes, will be allowed as long as the integrity of prairie dog ecosystems for associated species will be maintained.	Yes	This decision will be carried forward as part of continuing management.	Possible incorporation of pertinent management actions presented in Prairie Dog Conservation Plan.
Prairie dog complexes located outside the designated recovery areas will be available as habitat for ferret dispersal and colonization provided conflicts with valid existing rights are reconciled.	Yes	This decision will be carried forward as part of continuing management.	No change to this decision is necessary.

**Table 4-17
Adequacy of Current Management Direction and Options for Change for the Black-footed Ferret**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>The direct reintroduction of black-footed ferrets will be contingent on a final habitat suitability analysis and the successful development of a ferret reintroduction and management plan. Plan development will involve the mutual and cooperative efforts of all affected stakeholders (e.g., landowners and land use interests). These areas are depicted on Map 2-17 of the 1997 ROD/RMP.</p>	<p>Yes</p>	<p>The reintroduction has been completed. This decision will be carried forward as part of continuing management.</p>	<p>No change to this decision is necessary.</p>
<p>BLM lands within these designated ferret recovery areas will be managed to enhance black-footed ferret survival and recruitment, and geared toward maintaining or enhancing the capability of the sites to achieve ferret recovery objectives.</p>	<p>Yes</p>	<p>This decision could include an express link to CSU-3 from Appendix B of the 1997 ROD/RMP.</p>	<p>Options for modifying or changing this decision include incorporating management prescriptions developed and adopted in the Wolf Creek ferret management plan by the local work group.</p>
<p>Motorized vehicle use in ferret recovery areas will be limited to existing roads and trails prior to development of a travel management plan. Development of a travel management or integrated activity plan will implement effective road and trail density goals of 1.5 miles per square miles within the ferret recovery areas.</p>	<p>Yes</p>		<p>Options include changing classification to designated roads and trails or routes.</p>
<p>Subsequent approval of the reintroduction plan may supersede or modify certain land use decisions and objectives included in the 1997 ROD/RMP.</p>	<p>Yes</p>	<p>This decision is a restatement of BLM policy.</p>	<p>No change to this decision is necessary.</p>
<p>Conservation measures necessary to avoid black-footed ferret mortality and maintaining or enhancing habitat suitability in prairie dog habitats lying outside designated ferret recovery areas will be provided through lease notices, mitigation measures, or COAs attached to permitted uses.</p>	<p>No</p>	<p>The decision could include an express link to provisions included in Lease Notice.</p>	<p>Incorporate management prescriptions developed and adopted in the Wolf Creek ferret management plan by the local work group. Options include incorporating management strategies presented in Prairie Dog Conservation Plan.</p>

Table 4-17
Adequacy of Current Management Direction and Options for Change for the Black-footed Ferret

Decision	Is Decision Adequate?	Remarks	Options for Change
Predator control agreements within these areas will be stipulated to preclude losses of non-target wildlife, including black-footed ferret.	Yes	This decision is consistent with APHIS policy.	No change to this decision is necessary.

4.1.8.2 Bald Eagle

The 1997 ROD/RMP does not have a specific objective for the Bald Eagle.

Table 4-18
Adequacy of Current Management Direction and Options for Change for the Bald Eagle

Decision	Is Decision Adequate?	Remarks	Options for Change
Mature cottonwood canopies suitable for bald eagle roost, perch, and nest substrate will be developed or maintained.	No	Need to define on which BLM-administered lands this decision applies.	No change to this decision is necessary.
Federal land actions within the White River ACEC will be conducted in a manner consistent with the maintenance or enhancement of bald eagle riverine habitat suitability and utility.	Yes	Provide link to CSU-2 and CSU-5.	No change to this decision is necessary.
Riverine habitats along the White River that possess high potential for cottonwood “potential natural community” as bald eagle nest and roost substrate will be given a high priority for possible acquisition from willing land owners.	Yes	This decision will be carried forward as a part of continuing management.	No change to this decision is necessary.
Disruptive forms of permitted land uses that will occur within ½ mile of identified winter roosts and concentration areas and active nest sites during respective use periods will not be allowed. No surface occupancy stipulations will be applied to areas within ¼ mile of functional nest sites and identified	Yes	Exception and modification language provides flexibility for linear features. Reference CSU-2 and CSU-5.	Buffer distances could be enlarged consistent with prescriptions of adjoining state and federal wildlife agencies, but unlikely to be reduced with current status as threatened.

**Table 4-18
Adequacy of Current Management Direction and Options for Change for the Bald Eagle**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>winter roosts and concentration areas. Authorized surface disturbance or use within the White River ACEC will be contingent on the following conditions:</p> <ol style="list-style-type: none"> 1. mature and regenerating cottonwood communities will be avoided; 2. special reclamation techniques will be required to accelerate recovery and /or reestablishment of habitat commensurate with deterioration; 3. long-term site potential as a properly functioning riverine riparian community will be maintained or restored; and 4. short and long term utility as bald eagle habitat will be maintained 			

4.1.8.3 Colorado River Cutthroat Trout

The 1997 ROD/RMP does not have a specific objective for the Colorado River cutthroat trout.

**Table 4-19
Adequacy of Current Management Direction and Options for Change for the Colorado River Cutthroat Trout**

Decision	Is Decision Adequate?	Remarks	Options for Change
Channel and riparian conditions on streams occupied by Colorado River cutthroat trout will be improved from poor to fair condition within five years and to good condition within 10 years of approval of this Record of Decision.	No	The timeframe in the decision needs to be amended.	Options could involve: Recognizing BLM-administered portions of Black Sulphur Creek above Yankee Gulch as CRCT recovery water. Expanding decision to streams that support native fisheries or BLM sensitive species.
BLM authorized land uses that adversely affect long term riparian, channel, or aquatic conditions associated with Colorado River cutthroat trout fisheries will be prohibited.	No	Need to establish link between this decision and application of CSU-6 (Colorado River cutthroat trout habitat).	Carry this decision forward with link to CSU-6. Options include recognizing BLM-administered portions of Black Sulphur Creek above Yankee Gulch as CRCT recovery water and subject to CSU-6.
A 47,610-acre ACEC is established on that portion of the east Douglas Creek watershed encompassing 90 percent of the Resource Area's BLM-administered Colorado River cutthroat trout fisheries	Yes	This decision will be carried forward as part of continuing management.	No change to this decision is necessary.
Acquisition of water rights necessary to meet minimum instream flow requirements of Colorado River cutthroat trout will be pursued in cooperation with the state.	Yes	This decision will be carried forward as part of continuing management.	No change to this decision is necessary.
Stream habitats suitable as Colorado River cutthroat trout fisheries will be given a high priority for possible acquisition through exchange from willing surface owners.	Yes	This decision will be carried forward as part of continuing management.	No change to this decision is necessary.

**Table 4-19
Adequacy of Current Management Direction and Options for Change for the Colorado River Cutthroat Trout**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Development of a travel management plan or integrated activities plan will include the establishment of an effective road density limit of 1.5 miles per square mile within the East Douglas ACEC. Site specific ACEC management will be identified through development of an integrated activity plan.</p>	<p>No</p>	<p>This decision will be carried forward as a part of continuing management, but specific road management prescriptions may be developed and established in NEPA documents other than the 2 vehicles explicitly mentioned, i.e., travel management plan or integrated activity plan.</p>	<p>Alternate road management prescriptions could be considered as options, including abandonment or restrictive use of roads that contribute to stream degradation (e.g., sediment source that degrades spawning bed conditions or destabilizes lateral stability).</p>
<p>Management objectives specifically directed at improving riverine habitats will be achieved primarily through:</p> <ol style="list-style-type: none"> 1. modified livestock grazing practices; 2. installation of limited fencing and in-stream structures; 3. reestablishment of riparian vegetation; 4. controlling beaver populations 5. upland vegetation treatments (see Table 2-19 in Draft RMP); 6. increasing the availability of upland livestock waters; 7. modification of project designs or facility location; and 8. imposing special reclamation techniques as mitigation measures or COAs on surface disturbing activities. 	<p>Yes</p>	<p>Some treatments for improving habitat are not associated with oil and gas development (i.e., 1, 4, 6).</p>	<p>No change to this decision is necessary, however additional COAs or BMPs may be developed for 2, 3, 5, 7 and 8.</p>

4.1.8.4 Special Status Species (General)

The 1997 ROD/RMP does not have a specific objective for Special Status Species (General).

**Table 4-20
Adequacy of Current Management Direction and Options for Change for Special Status Species (General)**

Decision	Is Decision Adequate?	Remarks	Options for Change
BLM will continue to consult with the USFWS on federally authorized actions that may affect listed or proposed threatened or endangered species. Project-specific conservation measures derived through the consultation process will be applied to BLM-permitted actions as COAs through BLM's various permitting processes.	Yes	This decision is a restatement of BLM policy.	No change to the decision is necessary.
NOS, TL and CSU stipulations associated with black-footed ferret, bald eagle, Colorado River cutthroat trout, ferruginous hawk and northern goshawk (see Appendix A), will be applied, where appropriate, to all use authorizations and leasing processes. These protective stipulations will also be applied on a case-by-case basis during the NEPA process to surface use activities associated with existing land use authorizations as mitigation measures or COAs.	Yes		Additional oil and gas leasing stipulations could be developed and applied to populations or habitats of BLM sensitive species.
Exceptions and modification provisions (see Appendix A in the 1997 ROD/RMP) provide some flexibility in implementing the stipulations. This also allows site-specific tailoring of prescriptions to gain effective protection of identified values without unnecessarily hindering other forms of public land use. These provisions provide an opportunity to integrate new or innovative technologies and information, in an effort to better manage, protect, or compensate for wildlife related values.	Yes	This decision will be carried forward as part of continuing management.	No change to the decision is necessary.
Habitat treatment guidelines and improvement guidelines and improvement objectives will be applied during NEPA planning and analysis of individual project proposals.	No	This decision is a restatement of BLM policy.	No change to the decision is necessary.

**Table 4-20
Adequacy of Current Management Direction and Options for Change for Special Status Species (General)**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>BLM projects will normally be implemented through approved activity plans. Special status species habitat treatment and management objectives will be incorporated into the planning and development of these plans, and integrated with other resource management concerns. The management of important habitat features and components associated with candidate and BLM sensitive species that are not specifically addressed (e.g., sharp-tailed grouse, loggerhead shrike, candidate non-game fishes) will be considered during the NEPA process or during the activity plan process.</p>	<p>No</p>	<p>BLM projects more commonly implemented through EAs and not activity plans. The remaining verbiage is policy.</p>	<p>Revise decision to clarify habitat treatments and reclamation guidelines would be incorporated into EAs for oil and gas development.</p>
<p>Road density objectives, where appropriate to fishery and wildlife issues, will be implemented through a Travel Management Plan or integrated activity plans developed subsequent to this RMP.</p>	<p>No</p>	<p>This decision will be carried forward as part of the continuing management guidance, but not specific to special status species management.</p>	<p>Specific road density prescriptions may be established in NEPA documents other than the 2 vehicles explicitly mentioned in the decision, i.e., travel management plan or integrated activity plan.</p>

4.1.8.5 Threatened and Endangered Plant Species

The 1997 ROD/RMP does not have a specific objective for Threatened and Endangered plant species.

**Table 4-21
Adequacy of Current Management Direction and Options for Change for Threatened and Endangered Plant Species**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>A No Surface Occupancy (NSO) stipulation will be placed on known and potential habitat of federally-listed and candidate T/E plants (approximately 45,400 acres). New T/E plant habitat mapped as a result of future surveys will also be protected by a NSO stipulation. This stipulation will apply to all surface disturbing activities within these areas (1997 ROD/RMP, p. 2-17).</p>	<p>Yes</p>	<p>This decision adequately supports the protection of T/E plant species.</p>	<p>Evaluate areas possessing potential habitat of federally-listed and candidate T/E plants and consider limiting oil and gas activities demonstrating sensitive plant species. Identify allowable uses and surface restrictions to avoid potential adverse effects.</p>
<p>Known and potential T/E habitat will be closed to mineral material disposal actions (1997 ROD/RMP, p. 2-17).</p>	<p>Yes Chapter 2</p>		<p>Consider if this decision applies to activities relating to oil and gas development/exploration.</p>
<p>All known and potential T/E habitat, including ACECs, will be exclusion areas for new Rights-of-Way Authorizations (1997 ROD/RMP, p. 2-17).</p>	<p>Yes</p>	<p>This decision adequately supports the protection of T/E plant species.</p>	<p>If new rights-of-ways are proposed in support of BLM actions, potential T/E habitat would need to be identified to ensure development does not occur in these areas. Need to resolve contradiction between lands and realty decision on p. 2-50 of the 1997 ROD/RMP to include all surface disturbing activities. An alternative to correct may be appropriate.</p>
<p>Six areas (Dudley Bluffs, Yanks Gulch/Upper Greasewood Creek, Ryan Gulch, Raven Ridge Addition, Duck Creek and Raven Ridge) totaling 14,660 acres of BLM land that are occupied by T/E plants or candidate T/E plants will be designated as ACECs (1997 ROD/RMP, p. 2-17).</p>	<p>Yes Chapter 2</p>	<p>This decision adequately supports the protection of T/E plant species.</p>	<p>If areas of oil and gas exploration activities are proposed in any of these areas, permitted uses and activities need to be identified by BLM to ensure no adverse impacts to T/E plant species.</p>

**Table 4-21
Adequacy of Current Management Direction and Options for Change for Threatened and Endangered Plant Species**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Motorized vehicle travel within ACECs for T/E plants will be limited to designated roads and trails (see Maps 2-23A through 2-23F). Roads or trails in these areas not designated for use will be abandoned and reclaimed. Off road motorized vehicle travel will be prohibited in these areas (1997 ROD/RMP, p. 2-17).</p>	<p>Yes Chapter 2</p>	<p>This decision adequately supports the protection of T/E plant species.</p>	<p>To reduce adverse impacts to habitats with T/E plants, transportation associated with BLM activities would be restricted to designated roads and trails in these areas.</p>
<p>BLM will place a high priority on securing, through exchange with willing surface owners, known habitat for T/E plants and T/E plant populations occurring on private lands (1997 ROD/RMP, p. 2-17).</p>	<p>Undetermined, vague</p>	<p>Implications of this decision would further the protection of areas with T/E plant species.</p>	<p>BLM should identify specific areas where private ownership land exchange would be appropriate. Potential for partnership with NGO's such as the Nature Conservancy, NatureServe, etc.</p>
<p>As part of the recovery plan for <i>Lesquerella congesta</i> and <i>Physaria obovata</i>, a high priority will be placed on acquiring surface and subsurface ownership of known habitats on private and state lands adjacent to ACECs (1997 ROD/RMP, p. 2-17).</p>	<p>Undetermined, vague</p>	<p>Implications of this decision would further the protection of areas with T/E plant species.</p>	<p>BLM should identify specific areas where private ownership land exchange would be appropriate. Potential for partnership with NGO's such as the Nature Conservancy, NatureServe, etc.</p>
<p>Prior to approving surface disturbing or potentially impacting activity within known or potential habitat for listed, proposed, or candidate plant species, a plant inventory conducted by a qualified botanist, and environmental analysis will be completed on the action. Based on the results of the plant survey, informal consultation with the U.S. Fish and Wildlife Service (USFWS) may be conducted during preparation of the environmental analysis. Formal consultation with the USFWS will occur if the environmental analysis indicates a finding of possible impact to a listed species and the proposed</p>	<p>Yes</p>	<p>This decision adequately supports the protection of T/E plant species.</p>	<p>No change is necessary.</p>

**Table 4-21
Adequacy of Current Management Direction and Options for Change for Threatened and Endangered Plant Species**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>action cannot be moved to avoid the impact (1997 ROD/RMP, p. 2-17 and 2-18).</p> <p>The BLM Colorado State Office will place a NSO stipulation on new oil and gas leases issued in both known and potential T/E habitat. The Area Manager will attach the NSO stipulation to all other surface-disturbing land use authorizations approved in these habitat areas. New plant habitat may be identified through the requirement to conduct on-the-ground plant surveys prior to approving surface disturbing activities. All newly-identified habitat will be added to the NSO data base maintained in the Resource Area and State offices.</p> <p>The above NSO stipulation may be exempted by the Area Manager if an environmental analysis and the results of an on-the-ground survey indicate that no sensitive plants will be impacted or affected by the action (1997 ROD/RMP, p. 2-18).</p>	<p>Yes</p>	<p>This decision adequately supports the protection of T/E plant species.</p>	<p>No change is necessary.</p>
<p>Existing roads and public utility Right-of-Ways (ROW's) (i.e., pipelines, power lines, and communication facilities) within known T/E habitat may be relocated if a determination is made that the relocation action will benefit and promote the recovery and will not further impact a T/E plant species (1997 ROD/RMP, p. 2-18).</p>	<p>Yes</p>	<p>This decision adequately protects ensures the protection of vegetative communities.</p>	<p>This decision would not apply to future activities associated with oil and gas development and exploration, unless existing roads or public utility ROWs are anticipated to service BLM activities.</p>

Table 4-21
Adequacy of Current Management Direction and Options for Change for Threatened and Endangered Plant Species

Decision	Is Decision Adequate?	Remarks	Options for Change
BLM will cooperate with the Colorado Natural Areas Program, the Colorado Natural Heritage Program, and the USFWS to evaluate species status and distribution and to monitor effectiveness of protection and conservation measures for T/E and special status plant species (1997 ROD/RMP, p. 2-18).	Yes	This decision adequately supports the protection of T/E plant species.	No change is necessary.

4.1.8.6 Sensitive Plants and Remnant Vegetation Associations

The 1997 ROD/RMP does not contain a specific objective for this resource.

Table 4-22
Adequacy of Current Management Direction and Options for Change for Sensitive Plants and Remnant Vegetation Associations

Decision	Is Decision Adequate?	Remarks	Options for Change
Thirteen areas (Deer Gulch, Lower Greasewood Creek, South Cathedral Bluffs, Dudley Bluffs, Yanks Gulch/Upper Greasewood Creek, Soldier Creek, South Cathedral Addition, Raven Ridge Addition, White River Riparian, Coal Oil Rim, Moosehead Mountain, Oil Spring Mountain and Raven Ridge) that are occupied by BLM sensitive plants and RVAs (totaling 54,870 acres), will be designated as ACECs. NSO stipulations will be attached to all use authorizations encompassing these areas. A NSO stipulation will also be placed on known and potential habitat (approximately 4,520 acres) of	Yes	This decision adequately supports the protection of sensitive plants and remnant vegetation associations.	If areas of oil and gas exploration activities are proposed in any of these areas, permitted uses and activities need to be identified by BLM to ensure no adverse impacts to sensitive and remnant vegetation associations. Identify new RVAs, and consider developing a COA that is similar to managing an area with an NSO leasing stipulation for activities related to these RVAs which would become NSO when lease is released. Look at tightening exception criteria. These new areas should be looked at as exclusion areas.

**Table 4-22
Adequacy of Current Management Direction and Options for Change for Sensitive Plants and Remnant Vegetation Associations**

Decision	Is Decision Adequate?	Remarks	Options for Change
BLM sensitive plants and remnant vegetation associations (RVA) occurring outside ACECs (1997 ROD/RMP, p. 2-18).			
BLM sensitive plants and RVA locations will be closed to the disposal of mineral materials (1997 ROD/RMP, p. 2-18)	Yes		The WRFO should consider the applicability of this decision to oil and gas development and exploration.
Motorized vehicle travel within designated ACECs will be allowed only on designated roads and trails. Motorized vehicle travel within known locations of sensitive plants and high priority RVAs that are located outside the areas designated as ACECs, will be limited to existing roads and trails. Road not designated for use within ACECs will be abandoned and reclaimed (1997 ROD/RMP, p. 2-18 and 2-19).	Yes	This decision adequately supports the protection of T/E plant species.	To reduce adverse impacts to habitats with sensitive and remnant vegetation associations, transportation associated with BLM activities would be restricted to designated roads and trails in these areas. Identify roads in the White River ACEC and any new potential RVAs that could be developed as the result of oil and gas leasing.
The BLM Colorado State Office will attach a NSO stipulation to new oil and gas leases issued within the above identified ACECs, and the known and potential habitat for sensitive plant and RVA locations. The Area Manager will also attach a NSO stipulation to all surface-disturbing use authorizations proposed within these sensitive plant and RVA locations (1997 ROD/RMP, p. 2-19).	No	This decision adequately supports the protection of sensitive and remnant vegetation associations.	Identify all new RVA and attach COA in lieu of NSO.
In order to meet the exception criteria established for the NSO stipulations, on the ground surveys, conducted by a qualified botanist, will be required prior to the approval of surface disturbing activities within areas of know or potential habitats and ACECs developed for these species. The Area Manager can exempt the NSO stipulation if the results of the on-the-ground survey and the	Yes	This decision adequately supports the protection of sensitive and remnant vegetation associations.	No change is necessary. Include the following language: not likely to adversely effect.

**Table 4-22
Adequacy of Current Management Direction and Options for Change for Sensitive Plants and Remnant Vegetation Associations**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>environmental analysis conducted on the proposed action indicates (1997 ROD/RMP, p. 2-19). New sensitive plant locations, mapped as a result of future surveys, will be added to the data bases maintained for the NSO stipulations (1997 ROD/RMP, p. 2-19).</p>	<p>Yes</p>	<p>This decision adequately supports the protection of sensitive and remnant vegetation associations.</p>	<p>In support of oil and gas exploration activities, BLM could contribute to the state databases as individual field investigations occur. Add table of sensitive plants that occur in the resource area and description of habitat type.</p>
<p>Reclamation of surface disturbance resulting from authorized activities within ACECs and RVAs will use only locally gathered, or genetic stock from locally gathered, native species. In cases where locally gathered native species are not available, the impact of using non-local native species on the genetic integrity of native species will be evaluated and mitigated through site specific environmental analysis (1997 ROD/RMP, p. 2-19).</p>	<p>No</p>	<p>This decision adequately supports the protection of sensitive and remnant vegetation associations.</p>	<p>No change is necessary. Consider requiring collection and propagation of native species before implementation of disturbing activities. Address failure related to drought or poor germination, collection compliance. Require site specific reclamation plans for activities considered with RVAs or ACECs. Develop lease notice addressing these additional requirements.</p>
<p>High priority sensitive plant species and RVAs occurring on private or state-owned land adjacent to ACECs may be identified for possible acquisition through exchange. Known locations of high priority sensitive plant species and RVAs within ACECs will not be available for disposal (1997 ROD/RMP, p. 2-19).</p>	<p>Undetermined</p>	<p>Implications of this decision would further the protection of areas with T/E plant species. This decision will be carried forward as part of continuing management.</p>	<p>BLM should identify specific areas where private ownership land exchange would be appropriate.</p>
<p>The BLM will cooperate with the Colorado Natural Areas Program, or other interested parties, to monitor the effectiveness of conservation and protection measures for BLM and Colorado sensitive plants and high priority RVAs (1997 ROD/RMP, p. 2-19).</p>	<p>Yes</p>	<p>This decision adequately supports the protection of sensitive and remnant vegetation associations.</p>	<p>No change is necessary, but may be policy.</p>

4.1.9 Wild Horses and Burros

Objective: Manage for a wild horse herd of 95 – 140 animals on 190,130 acres within the Piceance-East Douglas Herd Management Area (HMA) so that a thriving ecological balance is maintained for all plant and animal species on that range.

**Table 4-23
Adequacy of Current Management Direction and Options for Change for Wild Horses and Burros**

Decision	Is Decision Adequate?	Remarks	Options for Change
Wild horses will be managed to provide a healthy, viable breeding population with a diverse age structure.	Yes	The decision adequately addresses multiple-use management.	Consider developing additional COAs, stipulations, or mitigation to reduce the potential effect of oil and gas exploration and development on wild horse herd habitat and populations.
The North Piceance and West Douglas Herd Areas will be managed in the short-term (0-10 years) to provide forage for a herd of 0 to 50 horses in each herd area. The long term objective (+10 years) will be to remove all wild horses from these areas (See Map 2-10 of the 1997 ROD/RMP) (1997 ROD/RMP, p. 2-26).	Yes	This decision supports the wild horses and burros objectives.	No change is necessary.
The boundary of the Piceance-East Douglas HMA will be expanded to include the Greasewood allotment (presently a part of the North Piceance Herd Area) (1997 ROD/RMP, p. 2-26).	Yes	This decision supports the wild horses and burros objectives.	Oil and gas exploration and development activities could be restricted within the Piceance-East Douglas HMA boundary.
Develop a cooperative management agreement with the private surface owner of 13,900 acres of patented oil shale claims that lie within the Boxelder Allotment and Pasture C of the Square S Allotment (1997 ROD/RMP, p. 2-26).	Yes	This decision supports the wild horses and burros objectives.	This area should be assessed as a likely location for oil and gas development and exploration.
Update and revise the Piceance-East Douglas Herd Management Area Plan (1997 ROD/RMP, p. 2-26).	No	This decision is too general.	Specific decisions will need to be identified concerning wild horse and burro management in this area.

Table 4-23
Adequacy of Current Management Direction and Options for Change for Wild Horses and Burros

Decision	Is Decision Adequate?	Remarks	Options for Change
Monitoring studies will be conducted and the long term appropriate management level (AML) for the Herd Management Area will be adjusted based on the results of this monitoring (1997 ROD/RMP, p. 2-26).	Yes	This decision supports the wild horses and burros objectives.	Areas identified for oil and gas development and exploration should identify appropriate wild horse and burros management practices to ensure no conflict with BLM actions.

4.1.10 Wildland Fire Ecology

Objective: Manage fire to protect public health, safety and property as well as allowing fire to carry out important ecological functions.

Table 4-24
Adequacy of Current Management Direction and Options for Change for Wildland Fire Ecology Management

Decision	Is Decision Adequate?	Remarks	Options for Change
Develop suppression priorities, identify management restrictions, and determine appropriate fire suppression strategies. Utilize prescribed fire, both natural and management ignited, to protect, maintain and enhance ecosystems, economic values, and multiple use resource management programs (1997 ROD/RMP, p. 2-55).	Yes	This Wildland Fire Management decision meets the objectives of wildland fire ecology.	Exploration and development to oil and gas resources should be coordinated throughout BLM to determine if these locations would conflict with areas prescribed for fire management.
The following constraints will be applied to all fires on public lands: Fire lines will be placed outside existing riparian areas on both intermittent and free flowing streams. On streams without riparian habitat, the fire lines	Yes	This Wildland Fire Management decision meets the objectives of wildland fire ecology.	No change is necessary.

**Table 4-24
Adequacy of Current Management Direction and Options for Change for Wildland Fire Ecology Management**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>will not be constructed across the stream. Blackline will be used as fire lines in these areas.</p> <p>Fire lines will be rehabilitated to the satisfaction of a designated resource advisor. Rehabilitation will be designed to prevent gully formation and runoff collection and to discourage animal trailing. Rehabilitation will also include water barring, the placement of woody material on the fire line, seeding and recontouring.</p> <p>Areas within riparian zones that have been completely burned with an intense fire will be reseeded to achieve vegetation objective as identified in the vegetation section.</p> <p>Stream crossing locations will be limited to existing roads and trails.</p> <p>Burns in fragile soils and watershed areas (see Soils and Water decisions) will be reseeded with seed mixtures identified in Appendix B of the 1997 ROD/RMP.</p> <p>The use of heavy equipment for fire line construction will be implemented only upon approval by the Field Manager. Prior to fire suppression in Canyon Pintado Historical District or the Texas Creek/Evacuation Creek cultural area, an archaeologist will be consulted concerning hand line construction or base camp location (1997 ROD/RMP, p. 2-55).</p>			

**Table 4-24
Adequacy of Current Management Direction and Options for Change for Wildland Fire Ecology Management**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Management priorities and restrictions identified above will be considered in the development of the new Fire Management Activity Plan (FMAP). A fire operational plan will consider the location of natural barriers, historical burn scars, hazardous fuel build-up areas, and natural and man-made features which would be considered in determining whether a control, confine or contain strategy will be employed. The plan will to assist fire managers in fire budgeting by identifying cost plus resource net value changes. The FMAP will be reviewed and revised on a five year interval unless deemed necessary to complete a revision in less than 5 years (1997 ROD/RMP, p. 2-56).</p>	<p>Yes</p>	<p>This Wildland Fire Management decision meets the objectives of wildland fire ecology.</p>	<p>IAA is a dated program, and the current management program used is (NIFMS) National Interagency fire Management System.</p>
<p>Prescribed fire will be a tool to use and help mitigate fuels and hazards and to benefit other natural resource programs (1997 ROD/RMP, p. 2-56).</p>	<p>Yes</p>	<p>This Wildland Fire Management decision meets the objectives of wildland fire ecology.</p>	<p>This decision provides an opportunity to coordinate oil and gas development and exploration with desired goals associated with fire ecology.</p>

**Table 4-24
Adequacy of Current Management Direction and Options for Change for Wildland Fire Ecology Management**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Prescribed fire, which includes both management and natural ignition sources, may be used to achieve land or resource management objectives as defined in the prescribed fire plans. These fires will be conducted under prescription, and in a predetermined area that will produce the intensity of heat and rate of spread required to accomplish specific management objectives. Prescribed fires will be conducted by qualified personnel and with a pre-approved prescribed fire plan. Prescribed fires will be monitored to ensure that objectives are achieved and the fire would not exceed the prescription (1997 ROD/RMP, p. 2-56).</p>	<p>Yes</p>	<p>This Wildland Fire Management decision meets the objectives of wildland fire ecology.</p>	<p>This decision provides an opportunity to coordinate oil and gas development and exploration with desired goals associated with fire ecology.</p>
<p>Approximately 639,573 acres have been tentatively identified as Prescribed Natural Fire (PNF) areas (See Map 2-28 of the 1997 ROD/RMP). Activity plans will identify areas and conditions where PNF will be managed to achieve resource objectives. Prescriptions will be prepared for these areas, and natural burning will be managed within prescription. Burns outside the prescription will be suppressed as wildlife as per current USDI and BLM manual guidance. Prescribed burn plans, including NEPA documentation, will be approved for specific fire dependent species and/or fuel reduction objectives. In all cases, management ignited and PNF will be monitored to ensure that the prescription achieved the identified objective (1997 ROD/RMP, p. 2-56).</p>	<p>No</p>		<p>Language in this decision should read Wildland Fire Use (WFU) Management options for changing this decision could include a review of phased reductions in opportunity as development occurs or temporary closure of WFU opportunity during high levels of oil and gas development. Consider changing the acres to reflect those in the Colorado Statewide Fire Management Plan.</p>

4.1.11 Cultural Resources

Objectives: Encourage responsible scientific utilization of cultural resources.

Protect and preserve examples of cultural and historical resources in accordance with existing laws and regulations.

Develop a program for the recreational and educational use of cultural resources.

**Table 4-25
Adequacy of Current Management Direction and Options for Change for Cultural Resources**

Decision	Is Decision Adequate?	Remarks	Options for Change
All federal undertakings, as defined by regulation at 36 CFR 800, shall be subject to review to consider cultural resources (1997 ROD/RMP, p. 2-47). Designate the Canyon Pintado National Register Historic District (CPHD), as an avoidance area for major new rights-of-way for powerlines, pipelines, roads, etc. to protect cultural resources. Revise the boundaries of CPHD to conform to aliquot part legal descriptions and the extent of known cultural resources. The boundary adjustment will be consistent with the original nomination (See Map 2-25) (1997 ROD/RMP, p. 2-47).	Yes	The current decision is appropriate to meet cultural resources goals and objectives.	No change is necessary.
Establish and implement a patrol/protection plan for cultural resources occurring within 1/2 mile of all designated roads and trails, county roads and State highways (1997 ROD/RMP, p. 2-47).	No	The current decision is appropriate to meet cultural resources goals and objectives. Specific actions related to patrol and protection of culturally sensitive areas should be disclosed. Specifying patrol schedules is inappropriate.	If it is determined that the CPHD has value toward oil and gas resources, BLM could restrict development in this area. To protect resources from low frequency vibrations there will be no new compressor stations. There will be no gravel pits. If oil and gas development and exploration were to occur in or near areas with cultural resources within 1/2 mile of all designated roadways, ensure operation activities comply with the patrol/protection plan. Those become specific conditions of approval to each well pad or right-of-way. Develop controlled surface stipulations for Canyon Pintado.

**Table 4-25
Adequacy of Current Management Direction and Options for Change for Cultural Resources**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Increase protection of cultural resources in the Texas-Missouri-Evacuation Creek areas with a controlled surface use stipulation or conditions of approval to control placement of surface developments (1997 ROD/RMP, p. 2-47).</p>	<p>Yes</p>	<p>The current decision is appropriate to meet cultural resources goals and objectives.</p>	<p>If it is determined that the Texas-Missouri-Evacuation Creek areas have value toward oil and gas resources, ensure appropriate mitigation is implemented where necessary. An inventory of cultural sites within this area will be conducted prior to surface disturbing activity per 36 CFR 8800.</p>
<p>The cultural review process includes a records search and/or field inventory, as needed, to identify and evaluate any cultural resources that may be affected by the proposed undertaking. All cultural resources identified will be evaluated in consultation with the State Historic Preservation Officer (SHPO) and/or Advisory Council on Historic Preservation (ACHP), as appropriate, to determine their significance in American history or prehistory. Evaluation criteria are listed at 36 CFR 60. Consultation shall be carried out under the terms of the Programmatic Agreement (PA) between the SHPO, BLM, and ACHP. The PA and 36 CFR 800 specify that consultation shall be completed prior to approving expenditure of federal funds or prior to issuing any licenses or permits (1997 ROD/RMP, p. 2-47).</p>	<p>Yes</p>	<p>The current decision is appropriate to meet cultural resources goals and objectives.</p>	<p>This decision should include the State Protocol for cultural resource management.</p>
<p>All ground disturbing activities outside of existing disturbance within the Canyon Pintado National Register District will be monitored by an approved and qualified archaeologist under the following conditions: Activity occurs in the vicinity of known resources;</p>	<p>Yes</p>	<p>The current decision is appropriate to meet cultural resources goals and objectives.</p>	<p>No change is necessary.</p>

**Table 4-25
Adequacy of Current Management Direction and Options for Change for Cultural Resources**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Activity occurs in the alluvial bottoms along Douglas Creek and its tributaries; and Activity occurs in deep alluvial soils (1997 ROD/RMP, p. 2-47).</p>	<p>Yes</p>	<p>The current decision is appropriate to meet cultural resources goals and objectives.</p>	<p>If it is determined that the Texas-Missouri-Evacuation Creek areas have value toward oil and gas resources, ensure appropriate mitigation is implemented where necessary. BLM will determine appropriate mitigation as part of consultation with SHPO.</p>
<p>Protect cultural resource values in the Texas-Missouri-Evacuation Creek area by: limit OHV use to existing roads and trails designate the area as an avoidance area for major new rights-of-way for pipelines, powerlines, etc. apply Controlled Surface Use stipulations to surface disturbing action in the area (1997 ROD/RMP, p. 2-47).</p>	<p>Yes</p>	<p>The current decision is appropriate to meet cultural resources goals and objectives.</p>	<p>No change is necessary.</p>
<p>Permits will be required for all third party consultants conducting work in the field. Applications for permits must meet the eligibility requirements at 43 CFR 7.6 and BLM manual 8151 (1997 ROD/RMP, p. 2-48).</p>	<p>Yes</p>	<p>The current decision is appropriate to meet cultural resources goals and objectives.</p>	<p>No change is necessary.</p>
<p>Permits for excavation shall be awarded to applicants meeting requirements of 43 CFR 7.6 and BLM manual 8151. Excavation will only be permitted for sites immediately threatened by development that are subject to uncontrolled vandalism, cannot be preserved in place, or are threatened by serious natural erosion. All site excavations must be performed in accordance with an approved plan as specified by the Secretary of Interior's Standards as published in 48 FR 44716 et seq. (1997 ROD/RMP, p. 2-48).</p>	<p>Yes</p>	<p>The current decision is appropriate to meet cultural resources goals and objectives.</p>	<p>No change is necessary.</p>

Table 4-25
Adequacy of Current Management Direction and Options for Change for Cultural Resources

Decision	Is Decision Adequate?	Remarks	Options for Change
In cooperation with the recreation program, develop an interpretation and public education program (1997 ROD/RMP, p. 2-48).	Yes	The current decision is appropriate to meet cultural resources goals and objectives.	This decision would not likely apply to activities associated with oil and gas development and exploration. However, if cultural resources are identified on any site operated by BLM for such uses, BLM should consider implementing an interpretation / educational feature in the immediate area.
Approximately 3 acres in and around the Duck Creek Wickiup Village, listed on the National Register of Historic Places, shall be protected with a no surface occupancy stipulation (1997 ROD/RMP, p. 2-48).	Yes	The current decision is appropriate to meet cultural resources goals and objectives.	It would be in the BLM's best interest to avoid this area to ensure the protection of the Duck Creek Wickiup Village.

4.1.12 Paleontological Resources

Objectives: Identify and protect scientifically noteworthy paleontological resource values from indiscriminate loss.

Make paleontological resources available for scientific, educational, and appropriate recreational purposes.

Table 4-26
Adequacy of Current Management Direction and Options for Change for Paleontological Resources

Decision	Is Decision Adequate?	Remarks	Options for Change
A Paleontological survey will be required on surface disturbing activities occurring within Class I, fossil bearing formations known to contain noteworthy fossils (1997 ROD/RMP, p. 2-48).	Yes	The current decision is appropriate to meet air quality goals and objectives.	No change is necessary.

**Table 4-26
Adequacy of Current Management Direction and Options for Change for Paleontological Resources**

Decision	Is Decision Adequate?	Remarks	Options for Change
Identify areas suitable for the noncommercial collection of common fossils (1997 ROD/RMP, p. 2-48).	Undetermined	These areas need to be specifically identified.	Oil and gas development and exploration areas may reduce the amount of land available for the non-commercial collection of common fossils. The WRFO has not identified area(s) for the non-commercial collection of Paleontological resources. WRFO should consider identifying these areas.
All third party consultant must be permitted to conduct work on BLM administered lands, in accordance with applicable laws and regulations (1997 ROD/RMP, p. 2-48).	Yes	The current decision is appropriate to meet paleontological goals and objectives.	No change is necessary.
Designate the Black's Gulch fossil site as an ACEC to protect scientifically important fossil resources. Designate the Coal Draw Paleontological locality/site as an ACEC to protect scientifically important fossil resources. Designate an addition to the exiting Raven Ridge ACEC as a paleontological ACEC to protect scientifically important fossil resources (1997 ROD/RMP, p. 2-48).	Yes	The current decision is appropriate to meet paleontological goals and objectives.	If any activity associated with oil and gas development and exploration is proposed in any ACECs listed in this decision, allowable uses and surface restrictions will need to be identified. Currently, there is no surface occupancy period identified. The WRFO should consider creating additional COAs or management decisions.
Excavation of noteworthy fossils shall be by permit only (Scientifically noteworthy fossils shall include but not necessarily be limited to vertebrate fossils and may plant or invertebrate fossils as determined from the appropriate Paleontological literature and in consultation with paleontologists knowledgeable about the fossils under consideration) Permit applications must meet minimum qualifications as specified by the BLM (1997 ROD/RMP, p. 2-48).	Yes	The current decision is appropriate to meet paleontological goals and objectives.	No change is necessary.

**Table 4-26
Adequacy of Current Management Direction and Options for Change for Paleontological Resources**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>All collected materials discovered during inventory or excavation shall be curated in facilities that meet the DOI requirement of DM 411, and appropriate requirement at 36 CFR 79 (1997 ROD/RMP, p. 2-49).</p>	<p>Yes</p>	<p>The current decision is appropriate to meet paleontological goals and objectives.</p>	<p>No change is necessary.</p>
<p>Scientifically noteworthy fossil bearing formations shall include but not necessarily be limited to: the Chinle, Glen Canyon, Morrison, Cedar Mountain, Mowry Shale, Parachute Creek member of the Green River Formation, Wasatch and Browns Park Formation. Also, in the Rangely area, the Mesaverde Group and Uinta Formation are noteworthy. Formation or members of formations may be added or removed from this list as additional data become available (1997 ROD/RMP, p. 2-49).</p>	<p>Yes</p>	<p>The current decision is appropriate to meet paleontological goals and objectives.</p>	<p>If areas of oil and gas exploration activities are proposed in any of these areas including Douglas Creek, Iles and Williams Fork, which are condition 1 formations, permitted uses and activities need to be identified by BLM to ensure no adverse impacts to paleontological resources. The existing COA in Appendix B of the 1997 ROD/RMP details the process for monitoring and mitigating impacts from oil and gas exploration.</p>
<p>Excavation permits will be issued under authority of the FLMPA of 1976 to paleontologists, museums or universities, for scientific and educational purposes (1997 ROD/RMP, p. 2-49).</p>	<p>Yes</p>	<p>The current decision is appropriate to meet paleontological goals and objectives.</p>	<p>No change is necessary.</p>
<p>Class I formations having good, safe outcrops likely to produce scientifically important fossils shall be surface surveyed prior to authorizing disturbance. Survey will not be required in Class I areas having vertical to near vertical (unsafe) slopes, areas of soil development and areas covered with much vegetation as these areas are unlikely to produce recoverable fossils (1997 ROD/RMP, p. 2-49).</p>	<p>Yes</p>	<p>The current decision is appropriate to meet paleontological goals and objectives.</p>	<p>Evaluate areas possessing paleontological resources and consider limiting oil and gas activities in areas where scientifically important fossils are likely to be located. If it is determined a proposed oil and gas development and exploration site falls within an area with Class I formations, activity should be restricted. During oil and gas exploration, monitoring and inventory and mitigation will be completed on resources exposed.</p>

4.1.13 Visual Resources

Objective: Manage public lands in a manner that will maintain the quality of scenic and visual resources.

**Table 4-27
Adequacy of Current Management Direction and Options for Change for Visual Resources**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>VRM classifications correspond to the management objectives in an area and indicate the level of acceptable change that could occur within the class. Class I is the most restrictive. The VRM classes are shown on Map 2-19 of the 1997 ROD/RMP.</p> <p>The following is a list of the number of acres within each class:</p> <p>Class I : 39,390 acres Class II: 412,250 acres Class III: 861,680 acres Class IV: 146,100 acres</p> <p>Within each classification, management actions or projects should repeat the basic element of line, form, color, and texture to help them maintain the VRM class or level of change to the landscape (1997 ROD/RMP, p. 2-39).</p>	<p>Yes</p>	<p>The current decision is appropriate to meet visual resources goals and objectives.</p>	<p>Any activities associated with oil and gas development and exploration should be mitigated to ensure the long-term preservation of unique backcountry landscape and other Class I and II areas (including the viewshed of Dinosaur National Monument).</p> <p>Oil and gas development should conform to BLMs Visual Resource Management BMPs.</p>
<p>Proposed management actions and projects will be evaluated for consistency with VRM classification objectives. Management actions and projects that would noticeably change the characteristic of the more sensitive landscape would either be modified to blend in with that landscape, denied, or moved to another more suitable location (1997 ROD/RMP, p. 2-39).</p>	<p>Yes</p>	<p>The current decision is appropriate to meet visual resources goals and objectives.</p>	<p>Mitigation specifically intended to minimize impacts to VRM classification objectives may need to be developed in areas with oil and gas exploration and development. Development in areas considered as having unique backcountry landscape should be avoided.</p> <p>Oil and gas development should conform to BLMs Visual Resource Management BMPs.</p>

Table 4-27
Adequacy of Current Management Direction and Options for Change for Visual Resources

Decision	Is Decision Adequate?	Remarks	Options for Change
Stipulations or other management actions will be developed through environmental analysis and placed on approvals to mitigate the visual resource (1997 ROD/RMP, p. 2-39)	Yes	The current decision is appropriate to meet visual resources goals and objectives.	Mitigation specifically intended to minimize impacts to VRM classification objectives may need to be developed in areas with oil and gas exploration and development. Oil and gas development should conform to BLMs Visual Resource Management BMPs.
The areas of primary concern and focus will be the areas having sensitive landscapes such as: 1. all VRM Class I and II areas; 2. Canyon Pintado NHD; and 2. corridors along highways 13, 40, 64, and 139 (1997 ROD/RMP, p. 2-39).	Yes	The current decision is appropriate to meet visual resources goals and objectives.	Considering activities associated with oil and gas exploration and development would likely fall into one of these areas, consider additional mitigation may need to be implemented during the operation of BLM facilities. Oil and gas development should conform to BLMs Visual Resource Management BMPs.

4.1.14 Wilderness Characteristics

There are no objectives in the 1997 ROD/RMP for wilderness characteristics, however wilderness is discussed on page 2-37 of the 1997 ROD/RMP.

Table 4-28
Adequacy of Current Management Direction and Options for Change for Wilderness Characteristics

Decision	Is Decision Adequate?	Remarks	Options for Change
No previous specific decisions exist for wilderness characteristics.	No	Review public proposals for areas that may contain wilderness characteristics.	Evaluate areas possessing wilderness characteristics and consider limiting oil and gas activities in areas demonstrating wilderness character. Identify allowable uses and surface restrictions to avoid potential adverse effects.

4.2 RESOURCE USES

4.2.1 Forestry, Woodland and Native Plant Products

In the 1997 ROD/RMP, the Forestry section of Chapter 2 contains management decisions for Timberlands and Woodlands.

4.2.1.1 Timberlands

Objective: Determine the sustainable annual allowable timberland harvest level on suitable commercial and non-commercial timberlands. Manage timberlands to maintain productivity, extent, forest structure, and enhancement of other resources. Provide special management consideration for special or unique forest/woodland areas.

**Table 4-29
Adequacy of Current Management Direction and Options for Change for Timberlands**

Decision	Is Decision Adequate?	Remarks	Options for Change
Douglas-fir, lodgepole and spruce/fir stands will not have a commercial timber harvest program developed. If demand or other resource objectives warrant, a commercial harvest program may be developed in which harvest will be limited to four acres per year.	No	The decision does not identify characteristics to describe healthy forest conditions.	Douglas-fir, lodgepole and spruce/fir stands would be inventoried to determine composition, volumes, disease, age and structure in areas with oil and gas development.
A ten cord per year, personal use limit will be established in dead and down spruce and Douglas-fir within the Piceance, Douglas/Cathedral, and Danforth/Jensen GRAs.	No	Areas where personal use harvest is allowed in the implementation level decision may need to be modified.	During leasing and activity level planning for oil and gas exploration and development consider changes to the personal use limit. No change is necessary to this decision.

**Table 4-29
Adequacy of Current Management Direction and Options for Change for Timberlands**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>No allowable harvest limit will be established for aspen. A ten cord per year personal use limit will be established for aspen firewood in the Danforth/Jensen, Piceance and Douglas/Cathedral GRAs.</p> <p>A harvest limit of 50 saplings and 200 seedlings per year will be established for aspen. Permits will be limited to the Danforth Hills/Jensen areas.</p>	<p>No</p>	<p>Areas where personal use harvest is allowed in the implementation level decision may need to be modified.</p> <p>The harvest limits allowed in the implementation level decision may need to be modified in areas with oil and gas development.</p>	<p>During leasing and activity level planning for oil and gas exploration and development consider changes to the personal use limit. No change is necessary to this decision.</p> <p>During leasing and activity level planning for oil and gas exploration and development consider changes to the harvest limit. No change is necessary to this decision.</p>
<p>Older forest stands will be managed to preserve existing old growth. Sales will be precluded in sensitive areas having fragile soils and soils with high slumping potential, wilderness study areas, and habitat for candidate and listed T/E plant species. Regeneration of cut areas will occur by natural means. If planting becomes necessary, only local species and genotypes will be used. Fragmentation will be minimized by aggregating cutting units which reflect the natural which reflect the natural age distribution of the area. An attempt will be made to mimic natural edges and gaps during tract design and layout.</p>	<p>Yes</p>	<p>The decision is consistent with IM 2005-110 Meeting Healthy Forests Restoration Act Old-Growth Management and National Historic Preservation Act Requirements and the decision supports the timberland objectives.</p>	<p>Additional COAs or stipulations may need to be developed for areas with oil and gas exploration and development to reduce fragmentation or mimic natural edges and gaps.</p>

4.2.1.2 Woodlands

Objective: Manage woodlands to maintain productivity, extent, forest structure and enhancement of other resources.

Determine annual allowable woodland harvest levels on suitable commercial and non-commercial woodlands.

**Table 4-30
Adequacy of Current Management Direction and Options for Change for Woodlands**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Approximately 27,600 acres of suitable woodland will be available for commercial harvest within the Piceance and Douglas/Cathedral Geographic Reference Areas (GRA). Woodlands will not be available for commercial harvest in other GRAs.</p>	<p>No</p>	<p>This decision went further and allowed 25 acres in the Piceance basin and 20 acres in the Douglas Cathedral to be harvested by clearcutting. This decision also allowed 75 and 61 acres to be removed by selective cutting in the Piceance and Douglas Cathedral GRAs respectively. We are currently exceeding the limit for clearcutting resulting from oil and gas development.</p>	<p>A voidance of old growth stands is expected to decrease the acres removed. To date for FY 2007 over 100 acres of woodland have been removed in the Piceance basin.</p>
<p>Commercial permits will be issued without limit for pinyon and juniper Christmas trees and transplants within the Douglas/Cathedral, Piceance, Crooked Wash/Deep Channel, Wolf Ridge/Red Wash and Danforth/Jensen GRAs. No harvest will be permitted within the White River and Blue Mountain GRAs.</p>	<p>No</p>	<p>Currently have a moratorium on transplant harvest because of ground disturbance resulting from digging.</p>	
<p>Juniper posts and poles will have the following annual commercial and personal use harvest limits by GRA: Douglas/Cathedral GRA – 1,500 Piceance GRA – 1,500 Crooked Wash/Deep Channel – 500 Wolf Ridge/Red Wash – 200 Post and poles will not be commercially harvested in other GRAs.</p>	<p>Yes</p>	<p>Over the past several years commercial demand for posts and poles have decreased. Changing these limits will have no impact on the resources.</p>	<p>No change to this decision is necessary.</p>

4.2.2 Livestock Grazing

Objective: Maintain or enhance a healthy rangeland vegetative composition and species diversity, capable of supplying forage at a sustained yield to meet the demand for livestock grazing.

**Table 4-31
Adequacy of Current Management Direction and Options for Change for Livestock Grazing**

Decision	Is Decision Adequate?	Remarks	Options for Change
Managing livestock grazing with minor exceptions as described in the 1981 Rangeland Program Summary (RPS). The five major actions: Allocation of forage among predominant grazing animals and other uses. Initiation of intensive grazing management. Continuation of exiting[sic] intensive grazing management practices. Identification of range improvements to enhance rangeland productivity and management.	Yes	The decision does not address what lands would be open or not available for livestock grazing. The RPS identifies the allotments.	Consider in areas with oil and gas development additional COAs, stipulations or making areas unavailable for livestock grazing to protect other resource values. May need new decision looking at mitigation or additional COAs. Look at range of alternatives where with development would have additional AUMs or other stipulations (i.e., stipulations on vehicle traffic). Include timing limitation for development within livestock migration corridors.

4.2.3 Minerals

The minerals section includes management decisions for oil and gas, oil shale, sodium, coal, mineral materials, and locatable minerals

4.2.3.1 Oil and Gas

Objective: Make federal oil and gas resource available for leasing and development in a manner that provides reasonable protection for other resource values.

**Table 4-32
Adequacy of Current Management Direction and Options for Change for Oil and Gas**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>The three categories of land that affect the availability of BLM administered oil and gas estate are: Non-discretionary no lease areas (83,720 acres). The non-discretionary lands include the six Wilderness Study Area and the National Park Service's Harper's Corner Road withdrawal (see map 2-2) (1997 ROD/RMP, Page 2-5). Areas available for leasing with special stipulations (1,552,958 acres). Appendix A contains a list of special stipulations that apply to this category of land. The stipulations include 143,083 acres of no surface occupancy (see map 2-3), 912,455 acres of timing limitations (see map 2-4), and 725,339 acres of controlled surface use (see map 2-5). > Overlap commonly occurs between the acreages of these three types of stipulations; and Areas available for leasing utilizing standard lease terms (168,486 acres). The standard lease terms and conditions are included in the lease form and give the Area Manager the authority to modify operations at the time they are proposed.</p> <p>The appropriate COAs contained in Appendix B, can be used to mitigate site specific impacts resulting from Applications for Permit to Drill and surface disturbance associated with Sundry Notices.</p>	<p>Yes</p>		<p>Revise decision to consider timing limitations. Incorporate soil, water, fisheries, threatened and endangered plant populations, and forestry concerns.</p>
	<p>Yes</p>		<p>Decision is adequate, but should consider modifying COAs, etc. Do not develop a range of alternatives.</p>

4.2.3.2 Oil Shale

Objective: Provide for a prudent and planned future leasing and development program for the oil shale resource.

4.2.3.3 Sodium

Objective: Facilitate the orderly and environmentally sound development of sodium resources occurring on public lands.

**Table 4-33
Adequacy of Current Management Direction and Options for Change for Sodium**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>The decisions developed for sodium minerals in the Piceance Basin Resource Management Plan (PBRMP) are carried forward into this document with the following exceptions: The Piceance Dome area (42,420 acres) will not be available for leasing; and The multinerual zone (70,820 acres) will be reserved for multinerual leasing.</p>	<p>Yes</p>		<p>Consider developing additional COAs to oil and gas drilling that protect existing and future sodium operations on existing leases.</p>
<p>A summary of the PBRMP decisions are as follows: Approximately 106,760 acres of sodium resource will be available for leasing; Approximately 62,760 acres underlain by sodium minerals will be subject to Timing Limitation Stipulations, 29,122 acres will have Controlled Surface Use, and 5,596 acres will have No Surface Occupancy Stipulations. Acreage overlap occurs between the stipulations; Lease offerings will be scheduled based on demand and progress in developing the 16,620 acres currently under lease;</p>	<p>Yes</p>	<p>This decision will be carried forward as part of continuing management.</p>	<p>No changes are necessary to this decision.</p>

Table 4-33
Adequacy of Current Management Direction and Options for Change for Sodium

Decision	Is Decision Adequate?	Remarks	Options for Change
Land within the multimineral zone will be available for noncommercial research tracts that test technology for multimineral recovery. Research tracts could be redelineated into commercial lease tracts upon the successful demonstration of multimineral recovery			

4.2.3.4 Coal

Objective: Ensure that federal coal resources identified as acceptable for further consideration for coal leasing, are available for exploration, leasing and development.

Table 4-34
Adequacy of Current Management Direction and Options for Change for Coal

Decision	Is Decision Adequate?	Remarks	Options for Change
Decisions proposed in this document will affect an additional 600 acres that will be unavailable for leasing based on multiple use resource conflicts. In addition, 10,060 acres have been leased since the 1981 Amendment was released to the public. This leaves 150,570 acres that are carried forward for coal leasing consideration	Yes	Need to update acreage of acres that are unavailable for leasing or have been leased since the 1997 ROD/RMP was signed.	

4.2.3.5 Mineral Materials

Objective: Facilitate the orderly and environmentally sound development of mineral material resources.

**Table 4-35
Adequacy of Current Management Direction and Options for Change for Mineral Materials**

Decision	Is Decision Adequate?	Remarks	Options for Change
Disposal actions are confined to applications received from individuals, companies, other federal agencies or state and local governments.	Yes	This decision is a restatement of BLM policy.	No change to the decision is necessary.

4.2.3.6 Locatable Minerals

Objective: Ensure that lands containing locatable minerals are available for location under the Mining Law of 1872.

**Table 4-36
Adequacy of Current Management Direction and Options for Change for Locatable Minerals**

Decision	Is Decision Adequate?	Remarks	Options for Change
BLM lands not withdrawn or segregated from mineral entry under the Mining Law of 1872 are open to mining claim location.	Yes	This decision will be carried forward as part of continuing management.	No changes necessary to this decision.

4.2.4 Recreation

Objectives: Provide a broad spectrum and diversity of recreation opportunities to meet expected demand by: 1) providing services to the visiting public; 2) maintaining high quality facilities to meet public needs and demand; and 3) improving public understanding and support of BLM programs through communication and partnerships.

**Table 4-37
Adequacy of Current Management Direction and Options for Change for Recreation Management**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>The entire Resource Area will be managed as the White River Extensive Recreation Management Areas (ERMA). No Special Recreation Management Areas (SRMA) will be identified.</p>	<p>No</p>	<p>This decision supports the recreation objectives, however the decision conflicts with oil and gas development.</p>	<p>Develop range of alternatives to help meet ERMA objectives and oil and gas development (i.e., consider phased development – total surface disturbance and density). Consider establishing SRMAs for additional protection in areas with oil and gas development.</p>
<p>The Blue Mountain Geographic Reference Area (GRA) and the White River ACEC will be managed to provide specific recreation activity opportunities and physical, social, and managerial setting for targeted recreation experiences (1997 ROD/RMP, p. 2-40).</p>	<p>Yes</p>	<p>This decision supports the recreation objectives.</p>	<p>If oil and gas development and exploration opportunities are available in the Blue Mountain GRA and White River ACEC, recreation opportunities in these areas could be reduced. Not applicable currently. Will not develop range of alternatives; therefore, no change necessary.</p>
<p>The White River ERMA will be managed custodially to provide an unstructured recreational opportunity. Certain management actions and objectives will be applied to the ERMA. A diversity of outdoor recreation opportunities and activities, with resulting experiences and benefits will be maintained and protected. The ERMA delineation became effective upon signature of the 1997 ROD/RMP/ROD. Specific management of the ERMA will be included in individual project plans or in integrated activity plans written following publication of the approved RMP. An environmental assessment will be prepared for each project plan or integrated activity plan (1997 ROD/RMP, p. 2-40).</p>	<p>No</p>	<p>This decision supports the recreation objectives.</p>	<p>Evaluate areas possessing recreational opportunities and consider limiting oil and gas activities in areas reserved for recreational uses. Not applicable currently. Leave this decision as written. Same comment for remaining decisions.</p>

**Table 4-37
Adequacy of Current Management Direction and Options for Change for Recreation Management**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Map 2-21 in the 1997 ROD/RMP shows recreation opportunity spectrum (ROS) management classes that will be maintained in the Blue Mountain GRA and White River ACEC.</p> <p>Targeted activities, settings, experiences and major management actions for the Blue Mountain and White River Areas are listed below.</p> <p>Blue Mountain GRA (North) Targeted Activities: Trophy big game and upland bird hunting; mountain biking; scenic viewing; horseback riding; pleasure driving; and wildlife viewing. Setting to be Maintained: 1) Physical: Semi-primitive non-motorized (SPNM), semi-primitive motorized (SPM), roaded natural (RN), rural (R); 2) Social: SPNM, SPM, RN; and 3) Managerial: SPNM, SPM, RN.</p> <p>Benefits/Experiences: Manage to provide experiences and benefits related to: 1) <u>individual</u> – cultural / historical / rural lifestyle learning, quality of life / satisfaction, and challenge; 2) <u>socio-cultural</u> – environmental sensitivity; 3) <u>economic</u> – local and regional economic growth/stability; and 4) <u>environmental</u> – enhanced environmental ethic.</p> <p>Major Management Actions: Acquire access and key inholdings; manage as VRM Class II; encourage private sector development of a 30-50 unit tent campground somewhere along Harper’s Corner Road or develop camping facilities in</p>	<p>Yes</p>	<p>This decision supports the recreation objectives.</p> <p>The decision runs counter to current BLM L and Use Planning (LUP) Handbook (H-1601-1). Cannot manage settings without having an SRMA.</p>	<p>Exploration and development to oil and gas resources in the Blue Mountain GRA and White River ACEC could be restricted Not applicable currently. Leave this decision as written.</p>
<p>This decision supports the recreation objectives.</p> <p>The decision runs counter to current LUP Handbook. Cannot manage settings without having an SRMA.</p>	<p>Yes</p>	<p>This decision supports the recreation objectives.</p> <p>The decision runs counter to current LUP Handbook. Cannot manage settings without having an SRMA.</p>	<p>Exploration and development to oil and gas resources in the Blue Mountain GRA could be restricted.</p> <p>Consider removing these decisions or develop these areas into SRMAs and manage for setting character.</p>

**Table 4-37
Adequacy of Current Management Direction and Options for Change for Recreation Management**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>partnership with DNM, accommodate RV camping in town of Dinosaur; identify and develop mountain bike routes; pursue a scenic byway partnership.</p> <p>Blue Mountain GRA (South)</p> <p>Targeted Activities: Wilderness hiking and backpacking; trophy big game and upland bird hunting; mountain biking; scenic viewing; horseback riding; pleasure driving; and wildlife viewing.</p> <p>Settings to be maintained: 1) Physical – SPNM, SPM, RN, R; 2) Social – P, SPNM, SPM, RN, R; 3) <u>Managerial</u> – P, SPNM, SPM RN</p> <p>Benefits/Experiences: Manage to provide experiences and benefits related to 1) <u>individual</u> – tranquility, solitude, nature and cultural learning, physical health and maintenance, sense of adventure, aesthetic appreciation, and challenge; 2) <u>socio-cultural</u> – environmental sensitivity; 3) <u>economic</u> – local economic growth / stability; and 4) <u>environmental</u> – enhanced environmental ethic.</p> <p>Major Management Actions: Acquire WSA access and key inholdings; manage as VRM Class I and II; encourage private sector development of 30-50 untie tent campground somewhere along Harpers Corner Road or develop camp facilities in partnership with DNM; accommodate RV camping in town of Dinosaur; allow low impact recreational camping from June 15 through August 15 in the</p>			

**Table 4-37
Adequacy of Current Management Direction and Options for Change for Recreation Management**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Moosehead Mountain road closure area; designate/develop mountain bike routes connecting to Yampa Valley Trail in DNM, Harper's Corner Road to Ton of Dinosaur, and Moosehead Mountain to Skull Creek Rim (1997 ROD/RMP, p. 2-41).</p>			
<p>White River ACEC (Meeker to Kenny Reservoir) Targeted Activities: River floatboating (open canoeing), fishing, and camping. Settings to be Maintained: 1) <u>Physical</u> - RN, R; 2) <u>Social</u> - RN; 3) <u>Managerial</u> - RN Benefits/Experiences: Manage to provide experiences and benefits related to: 1) <u>Individual</u> - cultural/historical/rural lifestyle, quality of life/satisfaction, family orientation; 2) <u>Socio-cultural</u> - environmental sensitivity; 3) <u>Economic</u> - local and regional economic growth/ stability, and 4) <u>Environmental</u> - enhanced environmental ethic. Major Management Actions: Provide river access; retain BLM lands; establish launch sites/parking and interpretive facilities; allow camping only in designated sites (sites to be determined when developing integrated activity plans); provide user ethics and information; monitor use; VRM Class II.</p>	<p>Yes</p>	<p>This decision supports the recreation objectives. The decision runs counter to current LUP Handbook. Cannot manage settings without having an SRMA.</p>	<p>Exploration and development to oil and gas resources in the White River ACEC could be restricted. Consider removing this section of the RMP or develop these areas into SRMAs and manage for setting character.</p>
<p>White River ACEC (Kenny Reservoir to Shavetail Bridge) Targeted Activities: Open canoeing, cold- and warm-water fishing, and camping.</p>			

**Table 4-37
Adequacy of Current Management Direction and Options for Change for Recreation Management**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Settings to be Maintained: 1) Physical - R, MU; 2) Social - RN; and 3) Managerial - RN</p> <p>Benefits/Experiences: Manage to provide experiences and benefits related to: 1) individual-cultural/historical/rural lifestyle, quality of life/satisfaction, family orientation; 2) socio-cultural-environmental sensitivity; 3) economic - local and regional economic growth/stability, and 4) environmental – enhanced environmental ethic.</p> <p>Major Management Actions: Provide river access; retain BLM lands; establish launch sites/parking and interpretive facilities; allow camping only in designated sites (sites to be determined when developing RAMPS or integrated activity plans); develop watchable wildlife sites and trails at Kenny Reservoir in partnership with others; develop rock art interpretive site at reservoir; develop boat launch/parking above Shavetail Bridge; monitor river use; provide user ethics and information; VRM Class II.</p>			

**Table 4-37
Adequacy of Current Management Direction and Options for Change for Recreation Management**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>White River ACEC (Shavetail to Utah Border) Targeted Activities: River floatboating, open canoeing, warm and cold-water fishing, and camping. Settings to be Maintained: 1) Physical - SPM; 2) Social - SPNM; and 3) Managerial - SPNM. Benefits/Experiences: manage to provide experiences/benefits related to: 1) <u>Individual</u> - independence, tranquility, solitude, scenery; 2) <u>Socio-cultural</u> – environmental awareness/sensitivity; 3) <u>Economic</u>- local and regional economic growth/stability; and 4) <u>Environmental</u> – enhanced environmental ethic. Major Management Actions: acquire shoreline tracts; manage for VRM Class II; retain existing BLM public lands; monitor river use; provide user ethics and information; encourage private sector development of canoe livery and shuttle service; camping only in designated sites (sites to be designated when developing integrated activity plans); coordinate management with Utah BLM (1997 ROD/RMP, p. 2-41 and 2-42).</p>	<p>No</p>	<p>Areas allocated for recreation opportunities should be specified.</p>	<p>The area available for recreational opportunities may be reduced with land occupied by oil and gas development and exploration activities.</p>
<p>Securing public access to public lands will be a priority where demand, recreational values, and sufficient size warrant legal and/or physical access. This access would be acquired through easement, agreement, exchange or other means (1997 ROD/RMP, p. 2-43).</p>			

**Table 4-37
Adequacy of Current Management Direction and Options for Change for Recreation Management**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Lands may be identified for possible acquisition where: 1) there is high demand for highly valued recreation opportunities, 2) key areas are needed to block public lands for management purposes, 3) to mitigate conflicts, 4) recreation development may occur such as trailheads, boat launch sites, camp areas, interpretive sites, and 5) the area of interest contains willing sellers (1997 ROD/RMP, p. 2-43). Facilities will be provided and maintained to accommodate visitor health and safety and allow use of public lands resources. Parking areas, trailheads, sanitary facilities, camp areas, kiosks and other limited facilities to support trails, interpretive sites, and watchable wildlife sites will be developed in partnerships with the private sector (1997 ROD/RMP, p. 2-43).</p>	<p>No</p>	<p>Areas allocated for acquisition should be specified.</p>	<p>The area available for land acquisition associated with recreational opportunities may be reduced with land occupied by oil and gas development and exploration activities.</p>
<p>Special recreation permits (SRPs) will be issued to qualified commercial guides and outfitters based on need and demand for services. Use limits or allocations will be made based on services provided, prior use history, responsiveness, and proven responsibility of applicants. Allocations may also be used to resolve conflicts, protect resources, or reduce impacts to resources, clients and other public land users. Commercial operations would be encouraged to diversify the services and opportunities offered on the public lands. Permits would be issued for competitive events and other services as required (1997 ROD/RMP, p. 2-43).</p>	<p>No</p>	<p>Locations of recreational facilities should be specified.</p>	<p>The area available for recreational facilities may be reduced with land occupied by oil and gas development and exploration activities.</p>
<p>Special recreation permits (SRPs) will be issued to qualified commercial guides and outfitters based on need and demand for services. Use limits or allocations will be made based on services provided, prior use history, responsiveness, and proven responsibility of applicants. Allocations may also be used to resolve conflicts, protect resources, or reduce impacts to resources, clients and other public land users. Commercial operations would be encouraged to diversify the services and opportunities offered on the public lands. Permits would be issued for competitive events and other services as required (1997 ROD/RMP, p. 2-43).</p>	<p>Yes</p>	<p>This decision supports the recreation objectives.</p>	<p>No change is necessary.</p>

**Table 4-37
Adequacy of Current Management Direction and Options for Change for Recreation Management**

Decision	Is Decision Adequate?	Remarks	Options for Change
Monitoring of resources and visitor use will be conducted to ensure protection of sensitive resources and continued availability of recreation opportunities and experiences (1997 ROD/RMP, p. 2-43).	Yes	This decision supports the recreation objectives.	No change is necessary.
Picnicking / Camping sites will be developed at Divide Creek Reservoir and Peterson Draw Reservoir (1997 ROD/RMP, p. 2-43).	Yes	This decision supports the recreation objectives.	Oil and gas development and exploration activities could be restricted at Divide Creek Reservoir and Peterson Draw Reservoir.
A cultural resource interpretive program will be developed for sites in the Canyon Pintado, Duck Creek and Colorow Wickiup Areas, Moosehead Mountain ACEC, Dragon Trail, and Dripping Rock Cave areas, among others. This program will be developed in conjunction with the cultural resource activity (1997 ROD/RMP, p. 2-43 and 2-44).	Yes	This decision supports the recreation objectives.	Oil and gas development and exploration activities could be restricted at the Canyon Pintado, Duck Creek and Colorow Wickiup Areas, Moosehead Mountain ACEC, Dragon Trail, Dripping Rock Cave, and other areas identified as having cultural resources.
Develop watchable wildlife and other interpretive sites in partnership with other entities and as support and demand dictate. Develop motorized and non-motorized trails (e.g. mountain-bike, horseback, ATV, 4-wheel drive, snowmobile, etc.) as demand/needs dictate. Trails may include but are not limited to: Rangely Loop, Dinosaur, Ute, Dominguez-Escalante, Scenery Gulch, Cathedral Bluffs, and China Wall/ Lion Canyon/ Lobo Mountain Trails. Develop links to other trails: Yampa Valley Trail, Kokopelli's Trail, Uinta Railroad into Utah, etc. (1997 ROD/RMP, p. 2-44).	Yes	This decision supports the recreation objectives.	Oil and gas development and exploration activities could be restricted in these areas.

Table 4-37
Adequacy of Current Management Direction and Options for Change for Recreation Management

Decision	Is Decision Adequate?	Remarks	Options for Change
To develop a non-motorized quality hunting area, no motorized vehicles will be allowed in Cow Creek, Timber Gulch and Hay Gulch areas from August 15 to November 30. Vehicle use may be permitted during this time for permitted purposes (1997 ROD/RMP, p. 2-44).	No	This decision supports the recreation objectives. Current oil and gas activities and management preclude the non-motorized hunting use areas. Areas cannot be managed as non-motorized due to current leasing policy and increased oil and gas activity in these areas.	If oil and gas development and exploration areas are identified in Cow Creek, Timber Gulch and Hay Gulch areas, hunting accessibility may be reduced in these locations. Alternately, consider removing non-motorized hunting in these areas unless BLM intends to stop leasing and current level of activity.

4.2.5 Renewable Energy

This resource was not addressed in the 1997 ROD/RMP.

Table 4-38
Adequacy of Current Management Direction and Options for Change for Renewable Energy

Decision	Is Decision Adequate?	Remarks	Options for Change
No previous specific decisions exist for renewable energy.	No	Review public proposals for areas that may contain wilderness characteristics.	Develop a comprehensive list of specific restrictions in areas with oil and gas development that would protect these resources during the various stages of wind and solar energy site testing and development.

4.2.6 Transportation and Access

4.2.6.1 Motorized Vehicle Travel

Objective: Manage motorized vehicle travel on public lands to provide for public need and demand, protect natural resources, provide for the safety of public land users, and to minimize conflicts among various users of public lands.

**Table 4-39
Adequacy of Current Management Direction and Options for Change for Motorized Vehicle Travel**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Until a Travel Management Plan is completed, motorized vehicles will be limited to existing roads, ways and trails on most of the public lands in the Resource Area from October 1 through April 30 each year (See Map 2-22 of the 1997 ROD/RMP) (1997 ROD/RMP, p. 2-44).</p>	<p>No</p>	<p>This decision would not apply to activities associated with oil and gas development and exploration.</p>	<p>No change is necessary. Identify existing roads and/or designated routes throughout the Field Office.</p>
<p>Motorized vehicle travel will be limited to existing roads, ways and trails all year in identified fragile soil areas, the blackfooted ferret reintroduction areas, the Texas-Missouri-Evacuation Creek cultural resource area, and in areas with potential habitat for Threatened and Endangered or sensitive plant species. These overlapping areas cover approximately 326,985 acres (1997 ROD/RMP, p. 2-44).</p>	<p>No</p>	<p>This decision adequately supports the transportation and access objectives.</p>	<p>No change is necessary. May need to update acres that are managed as limited to existing routes in fragile soil areas, black-footed ferret reintroduction areas, the Texas-Missouri-Evacuation Creek cultural resource area, and in areas with potential habitat for Threatened and Endangered or sensitive plant species.</p>
<p>Motorized vehicle use will be limited to designated roads and trails in: ACECs, in order to protect sensitive resources (See Maps 2-23A through 2-23F); the Indian Valley / Deep Channel area, to comply with a court ruling (See Map 2-24); and the Canyon Pintado National Historic District, in order to protect fragile cultural resources (See Map 2-25) (1997 ROD/RMP, p. 2-44).</p>	<p>Yes</p>	<p>This decision adequately supports the transportation and access objectives.</p>	<p>No change is necessary.</p>

**Table 4-39
Adequacy of Current Management Direction and Options for Change for Motorized Vehicle Travel**

Decision	Is Decision Adequate?	Remarks	Options for Change
All six Wilderness Study Areas (WSAs) are designated as closed until time that congress either designates them as wilderness or releases them for multiple uses (1997 ROD/RMP, p. 2-44 and 2-45).	No/ Yes	Existing decision is adequate, however, if WSAs are released from study it may be prudent to look at future protections if that is deemed important. This decision will need to be updated based on current legislation. The current standing of these WSAs will need to be acknowledged.	If released from Wilderness study, exploration and development to oil and gas resources in former WSAs could be restricted to ensure the protection of resources and resource uses these areas.
Public Lands in the Moosehead Mountain Road Closure Area (6,909 acres) and Oak Ridge State Wildlife Area (2,918 acres) will be designated as closed to motorized vehicle use to prevent damage to watershed resources and wildlife habitat (1997 ROD/RMP, p. 2-45).	Yes	This decision adequately supports the transportation and access objectives.	Exploration and development of oil and gas resources in the Moosehead Mountain Road Closure Area and Oak Ridge State Wildlife Area could be restricted.
The above road designations will remain in effect until a site specific Travel Management Plan can be completed (1997 ROD/RMP, p. 2-45).	No	The status of the Travel Management Plan will need to be determined.	If available, evaluate road designations based on the Travel Management Plan to determine areas that would be restricted and accessible based on ideal oil and gas development and exploration locations. A new Travel Management Plan schedule and procedure needs to be developed per LUP Handbook.
WSAs designated as wilderness will remain closed to motorized vehicle use to prevent damage to resources and wilderness values within these areas and to comply with the Wilderness Act. Vehicle use in WSAs released from wilderness consideration by Congress would be limited to designated roads and trails (1997 ROD/RMP, p. 2-45).	Yes	This decision adequately supports the transportation and access objectives.	Oil and gas development and exploration could be restricted in WSAs.

**Table 4-39
Adequacy of Current Management Direction and Options for Change for Motorized Vehicle Travel**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>A Travel Management Plan will be completed using a public process that will help determine the following:</p> <ul style="list-style-type: none"> 1) if and where roads and trails will be closed; 2) identify public needs such as construction of motorized or nonmotorized trails; and 3) determine the need for open Areas (1997 ROD/RMP, p. 2-45). 	<p>No</p>	<p>The status of the Travel Management Plan will need to be determined.</p>	<p>If available, evaluate road designations based on the Travel Management Plan to determine areas that would be restricted and accessible based on ideal oil and gas development and exploration locations.</p> <p>Develop new criteria based on LUP Handbook guidance.</p>
<p>As proposals for construction of new roads or trails are received, NEPA documentation will analyze impacts and determine appropriate designations and the potential for replacement of other existing roads. Criteria will be developed as part of the travel management planning process to aid in the determination for changing a particular area's road and trail designations, or adding/ closing roads and trails. Any road closures will be announced in the Federal Register but will not require an RMP amendment (1997 ROD/RMP, p. 2-46).</p>	<p>Yes</p>	<p>This decision adequately supports the transportation and access objectives.</p>	<p>Construction of new roads associated with oil and gas production should be coordinated with local agencies to determine appropriate locations of new roads and identify roadways that could be improved where beneficial to oil and gas production.</p>

4.2.6.2 Access Management

Objective: Enhance access to public lands and resources.

This section addresses resource management decisions originally proposed in the 1997 ROD/RMP under Motorized Vehicle Travel Management and Access Management resources.

Table 4-40
Adequacy of Current Management Direction and Options for Change for Access Management

Decision	Is Decision Adequate?	Remarks	Options for Change
Public and/or administrative access across private land will be identified for acquisition for areas having high public resource values with limited or no public or administrative access (1997 ROD/RMP, p. 2-53)	Yes	This decision adequately supports the transportation and access objectives	The area available for acquisition may be reduced with land occupied by oil and gas development and exploration activities.
Administrative and public access will be obtained through acquisition of easements, acquisition of land through exchanges, road construction or renovation, or by other appropriate means (1997 ROD/RMP, p. 2-53).	Yes	This decision adequately supports the transportation and access objectives.	No change is necessary.
Lands identified for public access enhancement include: 1) large blocks of inaccessible BLM lands or lands with currently limited / restricted public access, 2) smaller blocks of high demand or high interest BLM lands, and 3) lands that will tie major open routes together. Map 2-27 shows some of the broad areas where: a) public access needs to be enhanced; b) administrative access is needed; or c) both public and administrative access is needed (1997 ROD/RMP, p. 2-53).	No	Specific areas identified for public access enhancement need to be identified.	This decision will need to be coordinated with proposed oil and gas resource activities. This decision could potentially provide an opportunity to cooperatively enhance public access if these areas are located in the vicinity of oil and gas development and exploration areas.
The type and degree of access acquired will be consistent with the management direction for, or emphasis of, the area to be accessed. These areas are not all inclusive however, and access activities may take place throughout the Resource Area, on a case by case basis, as opportunities arise (1997 ROD/RMP, p. 2-53).	Yes	This decision adequately supports the transportation and access objectives.	Coordination with the local regulatory authority is recommended to ensure transportation associated with the operation of oil and gas facilities is permitted.

Table 4-40
Adequacy of Current Management Direction and Options for Change for Access Management

Decision	Is Decision Adequate?	Remarks	Options for Change
Priorities for acquiring access will be identified for all areas needing access, generally through the transportation planning and integrated activity plan process. Plans will identify specific tracts of land or roads needed for public or administrative access. All access plans will include necessary NEPA documentation (1997 ROD/RMP, p. 2-54).	Yes	This decision adequately supports the transportation and access objectives.	If specific tracts have already been identified for access acquisition, this provides a potential opportunity for BLM to use new access routes for proposed oil and gas areas.

4.2.7 Lands and Realty

4.2.7.1 Land Use Authorizations

Objective: To make public lands available for the siting of public and private facilities through the issuance of applicable land use authorizations, in a manner that provides for reasonable protection of other resource values.

Table 4-41
Adequacy of Current Management Direction and Options for Change for Land Use Authorizations

Decision	Is Decision Adequate?	Remarks	Options for Change
Classify public lands as open, avoidance, or exclusion for the permitting of land use authorizations. Land use authorizations will be denied in exclusion areas, with the exception of short-term land use permits involving no development, and projects that are consistent with management objectives for the area.	Yes		The areas classified in each of these categories could change based on other resource or resource use decisions. Acreage for exclusion areas may change.

**Table 4-41
Adequacy of Current Management Direction and Options for Change for Land Use Authorizations**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Designate major right-of-way corridors on public lands that will meet public, industry, and environmental needs. Will be relegated to designated corridor on public lands (potentially working on programmatic EIS for this).</p>	<p>No</p>	<p>The decision does not address terms or conditions that may be necessary to minimize environmental impacts or limitations on other uses necessary to maintain the corridor and right-of-way values.</p>	<p>Consider the development of additional decisions. Implement corridor COAs or stipulations that would maintain corridor and right-of-way values in areas with oil and gas development. BLM will consider developing additional stipulations or COAs to ROW manual</p>
<p>Communication site rights-of-ways will be limited to currently occupied sites. An exception may be granted for non-commercial, private mobile, or microwave facilities by pipeline/power companies or land management entities, in support of their primary business, where no existing site can be shown to meet the applicant's needs. The site at Moosehead Mountain will not be available for additional authorizations.</p>	<p>Yes -Policy</p>		<p>No change to this decision is necessary.</p>
<p>... areas total 205,740 acres will be classified as avoidance areas for the permitting of land use authorizations.</p>		<p>Implementation</p>	<p>The conflict between ACEC and Lands and Realty could be addressed for oil and gas leasing through implementation of additional COAs.</p>
<p>The remainder of the Resource Area (approximately 1,142,740 acres) will be considered open for land use authorizations.</p>			<p>BLM should consider implementation of additional COAs or stipulations.</p>

4.2.7.2 Land Tenure Adjustments

Objective: To provide for adjustments in land ownership to acquire important resource/values, meet local needs, resolve unauthorized uses, and improve efficiency in public and private land management.

**Table 4-42
Adequacy of Current Management Direction and Options for Change for Land Tenure Adjustments**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Approximately 11,325 acres of public land meet the category I sale criteria under Section 203 of the Federal Land Policy and Management Act (FLMPA). Category I lands are suitable for disposal by any means, but not limited to sale, exchange, or jurisdictional transfer. These lands are listed by legal description in Table 2-15A through 2-15D, Appendix D of the 1997 ROD/RMP (1997 ROD/RMP, p. 2-52).</p>	<p>No</p>	<p>The decision does not contain criteria for lands that are eligible for disposal. This decision will be carried forward as a part of continuing management.</p>	<p>Identify lands suitable for disposal or areas to be considered for disposal, particularly in areas with oil and gas development. The plan should identify the criteria for disposal.</p>
<p>Approximately 1,282,195 acres of public lands not specifically identified for disposal or retention are designated Category II lands.</p>	<p>Yes</p>	<p>This decision will be carried forward as a part of continuing management.</p>	
<p>Approximately 162,380 acres of public lands are designated Category III lands, not suitable for disposal of any kind. Category III lands include wilderness study areas (WSAs) and areas of critical environmental concern (ACECs). Category 3 lands are listed in Table 2-16, Appendix D of the 1997 ROD/RMP (1997 ROD/RMP, p. 2-52).</p>	<p>Yes</p>	<p>This decision will be carried forward as a part of continuing management.</p>	

4.2.7.3 Withdrawals

Objective: Eliminate unnecessary segregations of public lands.

**Table 4-43
Adequacy of Current Management Direction and Options for Change for Withdrawals**

Decision	Is Decision Adequate?	Remarks	Options for Change
Recommendations will be made for the revocation of all BLM public land withdrawals which are no longer needed (1997 ROD/RMP, p. 2-54).	Yes	The decision does not address how these areas would be managed for oil and gas resources. Consider carrying forward into alternatives.	Develop management decisions for the management of oil and gas leasing decisions. Consider if additional COAs or stipulations would be required in these areas.
Recommendations will be made to continue (as is or modify) withdrawals which are still needed for the purposes for which the original withdrawal was made (1997 ROD/RMP, p. 2-54).	Yes	Consider carrying forward into alternatives.	No change necessary.

4.2.7.4 Water Power and Reservoir Management

Objective: Protect and manage eligible waterpower/reservoir sites on public lands.

**Table 4-44
Adequacy of Current Management Direction and Options for Change for Water Power and Reservoir Management**

Decision	Is Decision Adequate?	Remarks	Options for Change
All public lands withdrawn as waterpower and reservoir resource sites will be managed as sites suitable for restricted management (1997 ROD/RMP, p. 2-54).	No	The decision does not address the terms or conditions in areas where these facilities may be developed.	Revise or develop decisions for how in areas with oil and gas development that are not withdrawn from waterpower or reservoir sites would be managed to protect the value of the site.

4.3 SPECIAL DESIGNATIONS

National Recreation Areas and National Trails are not addressed in the 1997 ROD/RMP and are not present in the WRFO. Back country byways are currently not addressed in the 1997 ROD/RMP. The Wilderness section of the 1997 ROD/RMP addresses management and implementation decisions for Wilderness Study Area. The WRFO does not have designated Wilderness within the decision area.

4.3.1 Wilderness Study Areas

Objective: Manage wilderness study areas (WSA) to avoid impairment of suitability characteristics until designated as wilderness or released for other uses. Manage designated wilderness areas to preserve ecosystems and wilderness qualities in perpetuity.

**Table 4-45
Adequacy of Current Management Direction and Options for Change for Wilderness Study Areas**

Decision	Is Decision Adequate?	Remarks	Options for Change
Six Wilderness Study Areas (Bull Canyon, Willow Creek, Skull Creek, Oil Spring Mountain, Windy Gulch and Black Mountain) and the proposed additions to the WSAs (81,190 acres) will be managed under the Interim Management Policy For Land Under Wilderness Review (See Map 2-18 of the 1997 ROD/RMP). Except for certain valid existing rights, activities will not be allowed to occur in WSAs that will impair wilderness values or the area's suitability for preservation as wilderness (1997 ROD/RMP, p. 2-37).	Yes	Management decision is consistent with IMP.	No change necessary.
The boundaries of Bull Canyon, Willow Creek and Skull Creek WSA will be modified as shown in the Craig District Wilderness Study Report (BLM 1991). These three areas were recommended to the Congress to be carried forward as wilderness (1997 ROD/RMP, p. 2-37).		Consider how this decision is handled by BLM Field Offices in Colorado.	

Table 4-45
Adequacy of Current Management Direction and Options for Change for Wilderness Study Areas

Decision	Is Decision Adequate?	Remarks	Options for Change
The recommendation to the Congress for Black Mountain, Oil Spring Mountain, and Windy Gulch WSAs was that the areas not be carried forward as Wilderness (1997 ROD/RMP, p. 2-37).	No	This decision does not address the management of these areas if released by Congress for oil and gas resources.	Consider how these areas would be managed for oil and gas resources if released by Congress.
Motorized vehicle travel, in areas released to multiple use by Congress, will be limited to designated roads and trails. Other land management practices may be allowed, including prescribed fire and wildlife habitat enhancement projects. The landscape will be managed as VRM Class II (1997 ROD/RMP, p. 2-38).	No	This implementation decision does not address the management of these areas if released by Congress for oil and gas resources.	Consider how these areas would be managed for oil and gas resources if released by Congress.
If Congress releases the Black Mountain/Windy Gulch areas from further wilderness review, they will again become available for multiple use management (1997 ROD/RMP, p. 2-38).	No	This implementation decision does not address the management of these areas if released by Congress for oil and gas resources.	Consider how these areas would be managed for oil and gas resources if released by Congress.
Oil Spring Mountain, Bull Canyon, Willow Creek and Skull Creek areas will be designated as ACECs if Congress releases these areas to multiple use management (1997 ROD/RMP, p. 2-38).	No	This implementation decision does not address the management of these areas if released by Congress for oil and gas resources.	Consider how these areas would be managed for oil and gas resources if released by Congress.
Dinosaur Diamond	No	This implementation decision does not address the management of these areas if released by Congress for oil and gas resources.	Consider how these areas would be managed for oil and gas resources if released by Congress.

4.3.2 Wild and Scenic Rivers

Objective: Determine the eligibility and suitability of river and stream segments for Wild and Scenic River (WSR) designation under the Wild and Scenic Rivers Act.

Table 4-46
Adequacy of Current Management Direction and Options for Change for Wild and Scenic Rivers

Decision	Is Decision Adequate?	Remarks	Options for Change
None of the eight eligible river and stream segments were recommended as suitable for wild and scenic river designation (1997 ROD/RMP, p. 2-38).	Yes	Inventory for outstanding remarkable values is completed.	No change necessary.

4.3.3 Areas of Critical Environmental Concern

Objective: Designate and protect areas that contain important historic, cultural, scenic and natural values as Areas of Critical Environmental Concern.

Table 4-47
Adequacy of Current Management Direction and Options for Change for Areas of Critical Environmental Concern

Decision	Is Decision Adequate?	Remarks	Options for Change
Maintain environmental quality to prevent undue degradation to the values that make the site or locale unique (1997 ROD/RMP, p. 2-39).	Yes	Decision is adequate when evaluating the threat of irreparable harm to special values within an ACEC.	Review existing COAs and stipulations. Consider revision to existing or develop new COAs and stipulations.
Allow for multiple uses of ACECs within the context of maintaining special values in the ACECs (1997 ROD/RMP, p. 2-9).	Yes	Decision is adequate when considering special values within an ACEC to facilitate other public uses.	Review existing COAs and stipulations. Consider revision to existing or develop new COAs and stipulations.

**Table 4-47
Adequacy of Current Management Direction and Options for Change for Areas of Critical Environmental Concern**

Decision	Is Decision Adequate?	Remarks	Options for Change
<p>Manage ACECs in cooperation with interested agencies, landowners, and other parties to prevent degradation of the special values (1997 ROD/RMP, p. 2-39).</p>	<p>Yes</p>	<p>Decision is adequate when evaluating the threat of irreparable harm to special values within an ACEC.</p>	<p>Review existing COAs and stipulations. Consider revision to existing or develop new COAs and stipulations.</p>
<p>Surface stipulations will be applied to each ACEC (see Appendix A) to protect the resource(s) of concern for which the ACEC was designated. The stipulations will be either controlled surface use, no surface occupancy, or combinations of both (1997 ROD/RMP, p. 2-39 and 2-40).</p>	<p>Yes</p>	<p>Decision is adequate when evaluating the threat of irreparable harm to special values within an ACEC.</p>	<p>Review existing COAs and stipulations. Consider revision to existing or develop new COAs and stipulations.</p>
<p>Reclamation of surface disturbance resulting from authorized activities within ACECs and RVAs shall use only locally gathered or genetic stock from locally gather, native species. In those cases where locally gathered native species are not available, the impact of using non-local native species on the genetic integrity of the ACECs and RVAs must be analyzed and mitigated through a site specific environmental analysis (1997 ROD/RMP, page 2-40).</p>	<p>No</p>	<p>Decision is adequate when considering special values within an ACEC to facilitate other public uses.</p>	<p>Review existing COAs and stipulations. Consider revision to existing or develop new COAs and leasing stipulations to protect vegetation in ACECs and RVAs.</p>

CHAPTER 5

CONSISTENCY / COORDINATION WITH OTHER PLANS

CHAPTER 5 CONSISTENCY/COORDINATION WITH OTHER PLANS

According to the Bureau of Land Management (BLM) Resource Management Plan (RMP) guidance found in 43 Code of Federal Regulations (CFR) 1610, BLM RMPs and amendments must be consistent, to the extent practical, with officially approved or adopted resource-related plans of state and local governments, other federal agencies, and tribal governments so long as the guidance and RMPs are also consistent. BLM RMPs must also be consistent with the purposes, policies, and programs of Federal Land Policy and Management Act (FLPMA) and other federal laws and regulations applicable to public lands, including federal and state pollution control laws (see 43 CFR 1610.3-2 [a]). If these other entities do not have officially approved or adopted resource-related plans, then BLM RMPs must, to the extent practical, be consistent with their officially approved and adopted resource-related policies and programs. This consistency will be accomplished so long as BLM RMPs incorporate the policies, programs, and provisions of public land laws and regulations and federal and state pollution control laws (see 43 CFR 1610.3-2 [b]).

Before BLM approves proposed RMP decisions, the Governor has 60 days to identify inconsistencies between the proposed plan and state plans and programs and to provide written comments to the BLM State Director. The BLM and the state may mutually agree on a shorter review period satisfactory to both. If the Governor does not respond within this period, it is assumed that the proposed RMP decisions are consistent. If the Governor recommends changes to the proposed plan or amendment that were not raised during the public participation process, the State Director shall provide the public with an opportunity to comment on the recommendations (see 43 CFR 1610.3-2 [e]). This public comment opportunity will be offered for 30 days and may coincide with the 30-day comment period for the Notice of Significant Change. If the State Director does not accept the Governor's recommendations, the Governor has 30 days to appeal in writing to the BLM Director (see 43 CFR 1610.3-2[e]). County and town, state agency, and other federal agency plans for neighboring areas or cross-jurisdictional purposes are further discussed in the following sections. The plans discussed in the following sections should be consulted as applicable during the development of this RMP Amendment (RMPA) for oil and gas.

5.1 LOCAL PLANS

The White River Field Office (WRFO) planning area boundaries encompass all of Rio Blanco County and portions of Moffat and Garfield counties. The majority of contiguous BLM-administered surface and mineral estate is within Rio Blanco County and scattered BLM-

administered surface and mineral estate is found within southern Moffat County and northern Garfield County. The communities of Rangely, Meeker, and Dinosaur are located within the planning area. Relevant local planning documents within the planning area are discussed in Tables 5-1 and 5-2 below.

**Table 5-1
City Agency Plans**

Document Name:	Town of Meeker Comprehensive Plan
Date:	Updated September 2005
Purpose:	The Comprehensive Plan is an advisory document that provides guidance for decisions affecting growth and annexation, the use and development of land, preservation of open space, and the expansion of public facilities and services.
Common, Dependent, and Interdependent Resources:	Broad issue areas, or planning objectives, outlined in the Plan include: fiscal issues, community economics, future land use, parks, and transportation.
Planning Implications:	The policy recommendations contained in the Plan should be considered for any oil and gas management actions that occur near the area.
Document Name:	Town of Rangely Comprehensive Plan 2004 to 2024: “Rangely: Building on Diverse Opportunities from Scenic Settings and Resource Wealth”
Date:	July 20, 2004
Purpose:	This Comprehensive Plan is intended to outline activities for the betterment, health, and longevity of the Town of Rangely over the next twenty years.
Common, Dependent, and Interdependent Resources:	Strategies and policies established in the Plan are related to five general themes: A Place to Call Home; Coming Together; Preserving and Building on the Qualities of Place, Diversity in Long-term Options; and Relationship to the Rest of the World. Theme 3, Preserving and Building on the Qualities of Place, includes a policy that recommends that the Town work with BLM to facilitate the development of recreational facilities on lands in the area around Rangely. In addition, it is suggested that features be developed so they enhance and do not detract from existing features and preserve the unique environmental, economic, and historic aspects of the area. Theme 5, Access to the Industry, includes a strategy to enhance transportation patterns in the County and City to improve access to developable gas fields on the Roan Plateau and Piceance Basin.
Planning Implications:	The strategies contained in the Plan should be considered for any oil and gas management actions that occur near the area.

**Table 5-2
County Agency Plans**

Document Name:	Rio Blanco County Land Use Resolution: County Zoning, Subdivision Rules, Approval Processes, and Standards
Date:	Adopted November 13, 2002; Revision B – December 9, 2002
Purpose:	The regulations are designed and enacted for the purpose of promoting the health, safety, morals, convenience, order, prosperity, or welfare of the present and future inhabitants of the County, including, but not limited to: classification of land uses and distribution of land development and utilization; and fostering the County’s agricultural and other industries.
Common, Dependent, and Interdependent Resources:	Lands that are held privately for oil and mineral extraction as well as lands administered by the BLM are classified as Multiple Use District. These lands are used for diverse purposes that include grazing, gas and oil production, logging, hunting, and other diversified purposes. Operations such as oil and gas fields are unique and not discrete enough types of operations to manage with individual Special Use Permits and, therefore, require a Special Use Permit Operators License to operate in the County. The operator may carry on activities anywhere in the County upon receipt of a license and comply with all applicable sections of the Land Use Resolution.
Planning Implications:	The regulations established in the Land Use Resolution should be considered for any oil and gas management actions that could occur in the area.
Document Name:	Garfield County Comprehensive Plan
Date:	Comprehensive Plan comprised of individual study area plans: Study Areas 1, 2, and 3 (November 2000) and Study Areas Four and Five (Public Review Draft March 2002)
Purpose:	Individual Study Area Plans are adopted by the Garfield County Planning Commission and folded into the overall Garfield County Comprehensive Plan (referred to as the Plan) to provide a general statement of direction for land use planning in unincorporated Garfield County. The Plan provides a foundation for decisions and policies that guide and direct the physical, social, economic, and spatial development for the unincorporated portions of the County.
Common, Dependent, and Interdependent Resources:	The plan acknowledges the increase in exploration and continued development in the county. Positive and negative impacts to the County as a result of oil and gas development include: significant revenue generated from natural gas production; construction activity and ongoing noise impacts, impacts on County road transportation network; reclamation on structures, pipelines and well sites; and impacts to the multitude of sensitive ecosystems, including riparian and wetland resources, wildlife habitat, and important visual corridors. Considering these issues, existing policies towards the environment are based on the goal of encouraging a land use pattern which considers the environmental sensitivity of the land, does not overburden the physical capacity of the land, and is in the best interest of County Residents.
Planning Implications:	The direction established in the Plan should be considered for any oil and gas management actions that could occur in the area.

**Table 5-2
County Agency Plans**

Document Name:	Moffat County/City of Craig Master Plan
Date:	Dated April 2003; Adopted June 3, 2003
Purpose:	To jointly guide the coordinated and harmonious development of unincorporated Moffat County, the City of Craig and the Town of Dinosaur while promoting the custom and culture of residents and land users. This 2003 Plan is a broad public policy tool for guiding decisions concerning land use and future growth. The 2003 Plan builds on and succeeds previous master planning efforts, primarily the <i>Moffat County Master Plan</i> completed in 1982 and revised in 1992, and the <i>Moffat County Land Use Plan: Chapter One</i> adopted in 2001.
Common, Dependent, and Interdependent Resources:	<p>The nature and intent of Moffat County land use policy concerning the use of public land and public resources in Moffat County is to protect the custom and culture of County citizens and the resource itself, per the recommendations of the <i>Moffat County Land Use Plan</i>. The Public Land Area encompasses approximately 60 percent of Moffat County and provides direction for federal and state land management efforts in Moffat County. The directions, policies, and actions of the Public Land Area are intended to support and enhance, rather than substitute, Moffat County’s position statements and action steps found within the adopted <i>Moffat County Land Use Plan</i>. Direction and Policy established in the 2003 Plan relevant to oil and gas development and production includes:</p> <p>Public Land Area Directions and Policies:</p> <ul style="list-style-type: none"> • Direction: To support prioritizing, or considering primary uses, in multiple land use designated areas, based on sound science, community input, and economic impact. • Policy 9: Moffat County shall support multiple land use concepts on federal and state lands based on sound science, community input, and economic impact. • Policy 10: Moffat County shall support or oppose a range of land uses on a given tract of public land, including limited uses based on a case-by-case investigation. <p>Rural Character Area Direction and Policies:</p> <ul style="list-style-type: none"> • Direction: To encourage coal, oil and gas exploration and extraction in an environmentally responsible manner. • Policy 32: All development proposals which are located on or adjacent to areas of previous mining activities shall include a thorough analysis of existing conditions as they may affect the proposed development. • Policy:33: The design of pipelines shall consider the following factors: input from public; use of public versus private lands; relationship to populated areas; effect on the use of agricultural and recreational land uses; potential for establishing corridors for the placement of two or more lines; location along County Road, State Highway, or Railroad ROWs, and; coordination with adjoining county or state agencies. • Policy 34: Moffat County shall encourage future coal, oil and gas exploration, and extraction in an environmentally responsible manner (taking into consideration land, air, and water quality), and utilizing public involvement.
Planning Implications:	The Direction and Policy outlined in the 2003 Moffat County/City of Craig Master Plan should be considered for any oil and gas management actions that could occur in the area.
Document Name:	Moffat County Land Use Plan: Chapter One
Date:	Adopted September 2001
Purpose:	Due to Moffat County’s dependence on public lands and accompanying resources, the land use plan is intended to provide direction for federal and state land management efforts in Moffat County.

**Table 5-2
County Agency Plans**

<p>Common, Dependent, and Interdependent Resources:</p>	<p>The mission of Chapter One of the Moffat County Land Use Plan is to promote the custom and culture of Moffat County’s residents and land users by identifying Moffat County’s position and recommended action steps to support Moffat County’s position on public land on matters including multiple uses, which includes industry (e.g., natural gas extraction) and minerals and industry.</p> <p>Moffat County’s position on multiple uses is: Moffat County will support multiple use concepts on federal and state lands in Moffat County. Furthermore, the County recommends federal and state agencies evaluate opportunities for commercial use of public lands for purposes of benefiting the custom and culture of Moffat County as well as the economic base of the County.</p> <p>Moffat County’s position on minerals and industry is: Moffat County encourages future coal, oil and gas exploration, and extraction in an environmentally responsible manner (taking into consideration land, air, and water quality) and utilizing public involvement.</p>
<p>Planning Implications:</p>	<p>The recommended action steps and positions outlined in the 2001 Moffat County Land Use Plan should be considered for any oil and gas management actions that could occur in the area.</p>

5.2 STATE AGENCY PLANS

Several state agencies have interests or jurisdiction within the WRFO planning area. These agencies include the Colorado Division of Wildlife (including 11 state wildlife areas [SWAs], identified in Section 2.3.4 Lands and Realty) and the Colorado State Land Board. A description of the state agency plans or missions relevant to this RMPA are provided in Table 5-3.

**Table 5-3
State Agency Plans**

<p>Document Name:</p>	<p>Colorado Division of Wildlife Strategic Plan</p>
<p>Date:</p>	<p>January 11, 2002</p>
<p>Purpose:</p>	<p>It is the policy of the state of Colorado that the wildlife and their environment are to be protected, preserved, enhanced, and managed for the use, benefit, and enjoyment of the people of this state and its visitors. It is further declared to be the policy of this state that there shall be provided a comprehensive program designed to offer the greatest possible variety of wildlife-related recreational opportunity to the people of this state and its visitors and that, to carry out such program and policy, there shall be a continuous operation of planning, acquisition, and development of wildlife habitats and facilities for wildlife-related opportunities [C.R.S. 33-1-101 (1)]. The mission of the Colorado Division of Wildlife is to perpetuate the wildlife resources of the state and provide people the opportunity to enjoy them.</p> <p>The Colorado Division of Wildlife’s (CDOW’s) Strategic Plan defines values and expectations, consistent with the Division’s mission, that form a roadmap for wildlife management in the coming years. In addition, the Strategic Plan provides a foundation for policy analysis and priority setting for current wildlife management issues and for unforeseen issues that will inevitably arise over the five year period covered by the Strategic Plan.</p>

**Table 5-3
State Agency Plans**

Document Name:	Colorado Division of Wildlife Strategic Plan
Common, Dependent, and Interdependent Resources:	<p>The Plan identifies 10 items of high priority:</p> <ul style="list-style-type: none"> • Research, identify, detect, contain and eliminate, when possible, diseases in free-ranging and captive wildlife that could negatively impact wildlife populations. • Manage mule deer populations to meet DAU (data analysis unit, a geographic area where a particular herd resides) objectives. • Protect, enhance and acquire high-priority deer and elk habitat (i.e., migration corridors, transition range and winter range). CDOW will also strive to maintain, create and manage habitat to support the broadest sustainable wildlife populations. • Increase hunter satisfaction by providing responsive customer service. • Provide the number of fish needed to meet recreation objectives through natural and captive productivity. • Protect coldwater habitats and fish from the whirling disease parasite. • Expand wildlife conservation partnerships with private landowners. • Preserve, protect and enhance wildlife species at risk of becoming threatened or endangered. • Prioritize, develop and implement recovery plans for species listed as threatened or endangered. • Increase the number of Colorado students who learn about wildlife management and issues and how human actions affect wildlife and habitat.
Planning Implications:	BLM should work with CDOW to evaluate and coordinate oil and gas management actions that may conflict with the priority items listed above.
Agency Name:	Colorado State Land Board
Mission:	The mission of the State Land Board is to manage the assets entrusted to its care for its beneficiaries by producing a reasonable and consistent income with long-term protection of economic values, while providing responsible environmental stewardship to ensure the conservation of natural resources. The agricultural section leases grazing, cropland, recreational and other surface rights to both public and private entities. The mineral section manages the exploration and development of coal, oil and gas, and other minerals, and oversees and evaluates nonrenewable resources, manages all mineral leases, administers quarterly oil and gas lease sales, processes mineral royalty revenue and ensures the State is compensated for its resources. The real estate section leases primarily commercial land to public and private entities.
Common, Dependent, and Interdependent Resources:	State-owned lands are interspersed throughout the planning area that are used for agriculture and minerals.
Planning Implications:	BLM should work with the State Land Board to evaluate and coordinate oil and gas management actions that may conflict with the mission.

5.3 FEDERAL AGENCY PLANS

A variety of federal lands are located near or within the planning area boundaries, including:

- A portion of Dinosaur National Monument, managed by the National Park Service
- White River National Forest, managed by the USFS

A description of federal agency plans relevant to this RMPA are provided in Table 5-4.

**Table 5-4
Federal Agency Plans**

Document Name:	Dinosaur National Monument General Management Plan (National Park Service)
Date:	1986
Purpose:	<p>The purpose of this final plan is to guide management of Dinosaur National Monument over the next 15 years so its resources will be managed as a total environment, perpetuating the natural, historic, and prehistoric features for which the area was established.</p> <p>The primary goals of the Monument are to: protect and preserve the natural and cultural environments; permit biological, geological, and other natural processes to continue with a minimum of human disturbance; and provide opportunities for enjoyable visitor experiences as well as an understanding of the significance of Monument resources.</p>
Common, Dependent, and Interdependent Resources:	<p>The land protection plan for Dinosaur National Monument describes the recommended strategies for non-federal lands within the boundary as well as certain non-federal and federal lands adjacent to the boundary. One of the objectives of the plan identified is to cooperate with landowners, other federal agencies, state and local governments, and the private sector to manage lands for public use or to protect them for resource conservation. Land protection issues from external conditions outside the Monument that could affect natural and visual resources within the boundary include:</p> <ul style="list-style-type: none"> • Pollution or flow disruptions of tributary streams originating outside the Monument that impact upon the Green and Yampa Rivers in the monument (stock pond/reservoir impoundments, cattle excrement, silting and sedimentation, pesticides and herbicides, fertilizers, etc.). • Mining activity near the Monument (such as existing phosphate and coal mining) and related noise, dust, air, and water quality, and visual impacts. • Oil and gas exploration and extraction adjacent to the Monument boundary, resulting in noise, visual impacts, ground disturbance, water pollution, etc. • Surface disturbance and dust from sand and gravel operations as seen from the Quarry and Split Mountain areas (Green River peninsula). • Cattle trespassing on lands inside the Monument from lands outside the Monument. Pesticides (herbicide and insecticide) used on adjacent federal, state, and private lands.
Planning Implications:	The land protection plan and issues from external conditions should be considered for any oil and gas management actions that could affect resources or resource uses near the Monument.

**Table 5-4
Federal Agency Plans**

Document Name:	White River National Forest (U.S. Forest Service) Land and Resource Management Plan; Final Environmental Impact Statement (FEIS) and Record of Decision
Date:	2002 Revision
Purpose:	The 2002 Forest Plan and the FEIS/ROD are intended to be considered concurrently. Together, these two documents provide strategic, forest-wide direction for the next 10 to 15 years. A forest plan provides guidance for all resource management activities on a national forest.
Common, Dependent, and Interdependent Resources:	Forest-wide direction combines regional goals (which apply to all national forests in the Rocky Mountain Region of the Forest Service) with goals, objectives, standards, and guidelines that are specific to the White River National Forest. The Plan establishes Forest goals and objectives for desired resource conditions, which focus on ecosystem health, multiple benefits to people, scientific and technical assistance, effective public service, public collaboration, and American Indian rights and interests. Standards and guidelines are set that apply to physical resources, biological resources, disturbance processes, social resources, and administrative issues.
Planning Implications:	Goals and objectives in the plan should be considered for any oil and gas management actions that could occur near White River Forest managed lands.

5.4 NEIGHBORING AGENCY CONSULTATION AND COORDINATION

5.4.1 Neighboring Bureau of Land Management Field Offices

The WRFO planning area surface estate boundaries are shared with other BLM field offices in Colorado and Utah. Many resources are common, dependent, or interdependent, which may have planning implications on oil and gas management in the WRFO. A list of adjacent BLM Field Office plans is provided in Table 5-5.

**Table 5-5
Neighboring BLM Field Office Plans**

State	BLM Field Office	Plan Name	Date/Status
Colorado	Little Snake Field Office	Draft RMP Revision / EIS	Scheduled for public release Winter 2007
	Glenwood Springs Field Office	Oil & Gas Leasing & Development Proposed RMP / Final Supplemental EIS	January 1999
		Oil & Gas Leasing & Development ROD and RMP Amendment	March 1999
		Roan Plateau Planning Area Proposed RMP Amendment/Final EIS	Released for public review in September 2006
	Grand Junction Field Office	Final RMP / EIS	November 1985
RMP / ROD		January 1987	
Utah	Vernal Field Office	Vernal Draft RMP / EIS	Released for public review in January 2005

5.4.2 Neighboring Agencies

The WRFO will be collaborating with other federal, state, and local agencies and governmental entities throughout the RMPA process. Several agencies have been invited to be cooperating agencies on the project including: U.S. Fish and Wildlife Service, Western Colorado Field Office; U.S. Department of Agriculture, Natural Resources Conservation Service; U.S. Geological Survey, Colorado Water Science Center; U.S. Forest Service, White River National Forest; National Park Service, Dinosaur National Monument; U.S. Army Corps of Engineers, Sacramento District; the Governor of the State of Colorado; Colorado Department of Transportation, Region 3; Colorado Department of Public Health and Environment; Colorado Department of Natural Resources; Moffat, Garfield, and Rio Blanco counties; and the communities of Meeker, Rangely, Craig, Dinosaur, and Rifle. In addition, an initial cooperating agency meeting was held in Meeker, Colorado, on February 8, 2007. As of February 2007, the following agencies have requested cooperating agency status: U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, Colorado Department of Health and Environment/Air Pollution Control Division, Colorado Department of Wildlife, Moffat County, Rio Blanco County, Garfield County, Town of Meeker, and Town of Rangely. Other federal, state, and local agencies have communicated with the BLM, and may request cooperating agency status in the future. Agencies that have accepted cooperating agency status have done so under agency-specific memorandums of understanding (MOUs). Additional opportunities for coordination with other agencies will be sought throughout the RMPA and EIS development process. Project phases where state and local governments, other federal agencies, and tribal governments involvement could prove to be most critical to ensure consistency include scoping, alternatives development, impacts analysis, and public and agency comment periods.

Communities adjacent to the WRFO planning area have prepared planning documents to guide development opportunities and/or direct the type, location, and quality of growth. A list of these plans is presented in Table 5-6.

**Table 5-6
Neighboring Agency Plans**

Location	Plan Name	Date
City of Rifle	Defining Rifle's Economic Future Revitalization Opportunity Assessment	January 10, 2005
Glenwood Springs	Comprehensive Plan, A Framework for Decision-Making	Adopted February 19, 1998
Glenwood Springs	Land Use Plan, an Element of the Comprehensive Plan	Adopted April 4, 1996; Revised February 19, 1998

CHAPTER 6

SPECIFIC MANDATES AND AUTHORITY

CHAPTER 6 SPECIFIC MANDATES AND AUTHORITY

The foundations of public land management are located in the mandates and authorities provided in laws, regulations, and executive orders. These statements of federal policy direct BLM concerning management of public lands and resources. The U.S. Congress has acknowledged that the appropriate use of these resources requires proper planning. BLM's planning process (as described in 43 CFR 1600) is authorized and mandated through two important laws.

Federal Land Policy and Management Act of 1976 states that BLM "shall, with public involvement...develop, maintain, and when appropriate, revise land use plans" (43 U.S.C. 35 Section 1712 (a)). In addition to federal direction for planning, FLPMA declares the policy of the United States concerning the management of federally owned land administered by BLM. Key to this management policy is the direction that BLM "shall manage the public lands under principles of multiple use and sustained yield, in accordance with the [developed] land use plans" (43 U.S.C. 35 Section 1732 (a)). The commitment to multiple-use will not mean that all land will be open for all uses. Some uses may be excluded on some land to protect specific resource values or uses, as directed by FLPMA (43 U.S.C. 35 Sections 1712 (c) (3)). Any such exclusion, however, will be based on laws or regulations or be determined through a planning process subject to public involvement. In writing and revising LUPs, FLPMA also directs BLM to coordinate land use activities with the planning and management of other federal departments and agencies, state and local governments, and Indian tribes. This coordination, however, is limited "to the extent [the planning and management of other organizations remains] consistent with the laws governing the administration of the public lands" (43 U.S.C. 35 Section 1712 (c) (9)).

In the **National Environmental Policy Act of 1969**, the Congress directs "all agencies of the Federal Government...[to]...utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision making which may have an impact on man's environment" (42 U.S.C. 55 Section 4332 (2A)). Because the development of a new RMP may cause impacts to the environment, NEPA regulations require the analysis and disclosure of potential environmental impacts in the form of an EIS. The EIS will examine a range of alternatives, including a No Action Alternative, to resolve the issues in question. Alternatives should represent complete, but alternate means of satisfying the identified purpose and need of the EIS and of resolving the issues. The White River RMPPA is being prepared using the best available information.

In addition to these acts, management of public land and resources is authorized and directed through several resource and resource use specific laws, regulations, and executive orders. The

direction from these sources is refined and made department- and bureau-specific through agency documents such as Instruction Memoranda (IM), Information Bulletins (IB), and manuals and handbooks. Following are some of the documents that direct the management of public land and resources.

6.1 LAWS, REGULATIONS, AND ORDERS

- Act of May 24, 1928 (airport leases)
- Airport and Airways Improvement Act, (49 U.S.C. 47125 et seq.)
- American Indian Religious Freedom Act of 1978 (42 U.S.C. 1996)
- Antiquities Act of 1906 (16 U.S.C. 431–433)
- Appropriations Act of 1952, McCarran Amendment
- Archeological Resources Protection Act of 1979, as amended (16 U.S.C. 470)
- Classification and Multiple Use Act of September 1964, in accordance with 43 CFR 2400
- Clean Air Act, as amended (42 U.S.C. 7418)
- Color of Title Act, as amended (43 U.S.C. 1608 et seq.)
- Colorado River Basin Salinity Control Act of 1974
- Combined Hydrocarbon Leasing Act of 1981
- Desert Land Entry Act, as amended (43 U.S.C. 321 et seq.)
- Economy Act of 1932, as amended
- Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.)
- Federal Cave Resources Protection Act of 1988 (16 U.S.C. 4301 et seq.)
- Federal Coal Leasing Amendments Act of 1976 (30 U.S.C. 201)
- Federal Water Pollution Control Act [commonly referred to as the Clean Water Act], as amended (33 U.S.C. 1251–1387)
- Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.)

- General Mining Law of 1872, as amended (30 U.S.C. 21 et seq.)
- Healthy Forests Restoration Act of 2003
- Historic Sites Act of 1935 (16 U.S.C. 461)
- Homestead Act of 1862 (Although repealed in 1976, the effects of this act are visible and impact some management decisions.)
- Migratory Bird Conservation Act of 1979 (16 U.S.C. 715)
- Mineral Leasing Act of 1920, as amended (30 U.S.C. 181 et seq.)
- Mining and Mineral Policy Act of 1970 (30 U.S.C. 21a)
- National Historic Preservation Act, as amended (16 U.S.C. 470)
- Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001)
- Onshore Oil and Gas Leasing Reform Act of 1987 (30 U.S.C. 181 et seq.)
- Public Rangelands Improvement Act of 1978 (43 U.S.C. 1901)
- Recreation and Public Purposes Act of 1926, as amended (43 U.S.C. 869 et seq.)
- Reservoir Salvage Act of 1960 (16 U.S.C. 469)
- Safe Drinking Water Act of 1974 (42 U.S.C. 201)
- Sikes Act (16 U.S.C. 670 et seq.)
- Soil Conservation and Domestic Allotment Act of 1935, as amended
- Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1201 et seq.)
- Taylor Grazing Act of 1934 (43 U.S.C. 315)
- Water Resources Development Act of 1974
- Water Resources Planning Act of 1965, as amended
- Water Resources Research Act of 1954, as amended

- Watershed Protection and Flood Control Act of 1954
- Wild and Scenic Rivers Act, as amended (16 U.S.C. 1271 et seq.)
- Wild Free-Roaming Horses and Burros Act (16 U.S.C. 30)
- Wilderness Act, as amended (16 U.S.C. 1131 et seq.)
- Executive Orders 10046, 10175, 10234, 10322, 10787, and 10890 (Authorize the transfer of certain lands from the Department of Agriculture to the Department of the Interior for use, administration, or exchange under the Taylor Grazing Act of 1934)
- Executive Order 11288 (water quality management and pollution abatement plans)
- Executive Order 11507 (protect and enhance the quality of air and water resources)
- Executive Order 11514 as amended by Executive Order 11991 (Protecting and enhancing the quality of the nation's environment to sustain and enrich human life)
- Executive Order 11593 (Protection and Enhancement of the Cultural Environment)
- Executive Order 11644 (Use of Off-Road Vehicles [ORV] 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 11752 (Protect and enhance the quality of air, water, and land resources through compliance with applicable federal, state, interstate, and local pollution standards)
- Executive Order 11987 (Exotic Flora and Fauna)
- Executive Order 11988 as amended by Executive Order 12148 (Floodplain Management)
- Executive Order 11989 (ORVs on Public Lands)
- Executive Order 11990 (Protection of Wetlands)
- Executive Order 12088 (Federal Compliance with Pollution Control Standards)
- Executive Order 12322 requires that any report, proposal, or plan relating to a Federal or Federally assisted water and related land resources project or program must be submitted

to the Director, Office of Management and Budget (OMB), before submission to the Congress

- Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations)
- Executive Order 13007 (Indian Sacred Sites)
- Executive Order 13084 (Consultation and Coordination with Indian Tribal Governments)
- Executive Order 13112 (Invasive Species)
- Executive Order 13186 (Migratory Birds)
- President's Letter of May 26, 1974 (Creates the Interagency Committee on Water Resources and establishes interagency participation in river basin planning)
- Secretarial Order 3175 (incorporated into the Departmental Manual at 512 DM 2)
- Secretarial Order 3206 (American Indian Tribal Rights, Federal–Tribal Trust Responsibilities, and the Endangered Species Act)
- Regional Haze Regulation (Federal Register/Vol. 64, No. 126; 35714 July 1, 1999)
- 43 CFR Chapter 2 Parts 1000 – 9999 (Federal Regulations for the BLM)
- 36 CFR, 62 (Addresses procedures to identify, designate, and recognize National Natural Landmarks)
- The U.S. Water Resource Council published Floodplain Guidelines on February 10, 1978, after being directed to establish guidelines for floodplain management and preservation
- The Unified Federal Policy for a Watershed Approach to Federal Land and Resource Management (*Federal Register*, October 18, 2000)
- National Ambient Air Quality Standards (40 CFR Parts 50.4–50.12)
- New Source Review (40 CFR Part 51.307)
- Regional Haze Rule (40 CFR 51)

- “Treatment as a State” Regulation (40 CFR Part 71)
- National Emission Standards for Hazardous Air Pollutants (40 CFR Part 61)

6.2 INSTRUCTION MEMORANDA, 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 2000-179 (Funding of Water-Related Restoration and Cleanup Projects on Private and Other Non-BLM Lands)
- IM 2002-174 (Oil and Gas Leasing Stipulations)
- IM 2003-035 (Implementing the President’s Healthy Forests Initiative)
- IM 2003-137 (Integration of the Energy Policy and Conservation Act [EPCA] Inventory Results into Land Use Planning and Energy Use Authorizations)
- IM 2003-158 (Memorandum of Understanding (MOU) between Bureau of Land Management and the Animal and Plant Health Inspection Service (APHIS) Addressing the Management of Grasshoppers and Mormon Crickets)
- IM 2003-169 (Use of the Economic Profile System in Planning and Collaboration)
- IM 2003-182 (Geocaching Activities on BLM Public Lands)
- IM 2003-195 (Rescission of National Level Policy Guidance on Wilderness Review and Land Use Planning)
- IM 2003-197 (Right-of-Way management, Interstate Natural Gas Pipeline)
- IM 2003-226 (Fire Program Analysis System—Development of Fire Management Objectives)

- IM 2003-233 (Integration of the EPCA Inventory Results into the Land Use Planning Process)
- IM 2003-234 (Integration of the Energy Policy and Conservation Act (EPCA) Inventory Results into Oil and Gas Exploration and Development Use Authorizations)
- IM 2003-238 (Guidance for Data Management in Land Use Planning)
- IM 2003-274 (BLM Implementation of the Settlement of Utah v. Norton Regarding Wilderness Study)
- IM 2003-275 (Consideration of Wilderness Characteristics in Land Use Planning [Excluding Alaska])
- IM 2004-005 (Clarification of OHV Designations and Travel Management in the BLM Land Use Planning Process)
- IM 2004-007 (Land Use Plan and Implementation Plan Guidance for Wildland Fire Management)
- IM 2005-003 (Cultural Resources and Tribal Consultation for Fluid Minerals Leasing)
- IM 2005-006 (Solar Energy Development Policy)
- IM 2005-008 (Black-tailed, White-tailed, and Gunnison Prairie Dog Conservation Update)
- IM 2005-024 (National Sage-Grouse Habitat Conservation Strategy)
- 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)
- IB 2004-005 (Extension of FY 2002 Instruction Memoranda)
- BLM-M-1601 (Land Use Planning)
- BLM-M-1613 (Areas of Critical Environmental Concern)

- BLM-M-4180 (Rangeland Health Standards)
- BLM-M-4700 (Wild Horse and Burro Management)
- BLM-M-6740 (Establishes policy and procedures for the identification, protection, maintenance, and management of fresh, brackish, and saline waters and wetland areas)
- BLM-M-6800 (Special Status Species Management)
- BLM-M- 7100 (Defines the policy of BLM's Soil Resource Management Program.)
- BLM-M-7120 (Provides guidelines for maintaining Bureau watershed improvements constructed on public lands)
- BLM-M-7150 (Provides guidance in the conduct and maintenance of water utilization and development, water quality, water yield and timing, and water rights)
- BLM-M-7160 (Provides general guidance for preventing water and wind erosion)
- BLM-M-7180 (Relates the restoration of disturbed areas directly to policy on erosion control, protection, maintenance of environmental quality, rehabilitation of mined lands (BLM 3509 and 3605), and prevention of erosion in road construction, etc.)
- BLM-M-7210 (Provides the basic framework for soil and watershed activities)
- BLM-M-7221 (Describes the policies, responsibilities, and procedures used to incorporate floodplain management into BLM activities)
- BLM-M-7240 (Describes BLM policy to protect, maintain, restore, and enhance the quality of water on public lands so that its utility for other dependent ecosystems will be maintained equal to or above legal water quality criteria)
- BLM-M-7250 (Establishes policy and guidance to acquire, perfect, and protect water rights necessary for multiple use management)
- BLM-M-7315-7317 (Provides procedures for inventory and analysis of ground and surface water inventories and of erosion and sediment reduction)
- BLM-M-7322 (Provides procedures for analyzing watershed problems and developing plans for improving watershed conditions)
- BLM-M-7410 (Provides criteria, standards, and techniques for land treatment)

- BLM-M-8100 (Cultural Resource Management)
- BLM-M-8110 (Identifying Cultural Resources)
- BLM-M-8120 (Protecting Cultural Resources)
- BLM-M-8130 (Utilizing Cultural Resources for Public Benefit)
- BLM-M-8160 (Native American Coordination and Consultation)
- BLM-M-8270 (Paleontological Resource Management)
- BLM-M-8340 (OHV Management)
- BLM-M-8531 (Wild and Scenic Rivers)
- BLM-M-9210 (Fire Management Policy)
- BLM-H-1601 (Land Use Planning)
- BLM-H-1742 (Emergency Fire Rehabilitation)
- BLM-H-1790 (NEPA Handbook)
- BLM-H-2200 (Land Exchanges)
- BLM-H-4750 (Wild Horse and Burro Management)
- BLM-H-6310-1 (Wilderness Inventory and Study Procedures)
- BLM-H-4180-1 (Rangeland Health Standards)
- BLM-H-8160-1 (General Procedural Guidance for Native American Consultation)
- BLM-H-8270-1 (Paleontological Resource Management)
- BLM-H-8410-1 (Visual Resource Inventory)
- BLM-H-8550-1 (Interim Management Policy and Guidelines for Lands Under Wilderness Review [1995])
- BLM-H-9214-1 (Prescribed Fire Management)

- Bureau of Land Management, Riparian Area Management Policy, January 1987
- 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 365: Hydrology and USLE: application to rangelands
- Technical Notes 369: Considerations in rangeland watershed monitoring
- Technical Notes 371: Determining hydrologic properties of soil
- Technical Notes 372: Stream discharge measurement using a modified technique
- Technical Notes 373: Diffuse-source salinity: mancos shale terrain
- Technical Notes 405: A framework for analyzing the hydrologic conditions of watersheds

6.3 APPLICABLE STATE LAWS AND REGULATIONS

- CO 2004-014 (Updated Environmental Assessment (EA), Categorical Exclusion (CE), and Documentation of Land Use Plan Conformance and National Environmental Policy Act (NEPA) Adequacy (DNA) Templates, Updated List of Critical Elements of the Human Bureau of Land Management (BLM) NEPA Handbook (H-1790-1) and EA-Level Guidance
- CO 2004-035 (Compliance with Critical Sections of 43 CFR 3715 and 43 CFR 3809 Regulations)
- CO 2004-040 (Prescribed Burn Plan Format)
- CO 2004-044 (Wildland Fire Use Policy)
- CO 2004-047 (Memorandum of Understanding for Fire and Fuels Management Activities in Colorado)
- Colorado Revised Statutes (CRS) Section 37, Water and Irrigation (CRS 37-1-101 through CRS 37-98-104)

6.4 MEMORANDA AND AGREEMENTS

- Master MOU with U.S. Fish and Wildlife Service (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, U.S. Department of the Interior, U.S. Geological Survey (USGS), and the Advisory Council on Historic Preservation
- Interagency MOU between the Department of the Interior-BLM and the Department of Agriculture in 1995 (60F26045-48, 5/16/95)
- MOU between the BLM State Director of Colorado and BLM State Director of Utah on public land management lying in Colorado, west of the Green River.
- MOU with Moffat County concerning weed management dated 1994.

6.5 PLANNING DOCUMENTS APPLICABLE TO THE WRFO

The following documents are applicable to land use planning efforts within the White River RMPPA.

6.5.1 BLM Land Use Plans

- Little Snake Resource Management Plan Record of Decision (1991)

6.5.2 Activity Plans

- Sand Wash Basin Herd Management Area Plan (1982)

6.5.3 Recreation Management Plans

- Little Yampa Canyon Recreation Area Management Plan (1996)
- Draft Recreation Assessment for Sand Wash Basin (2004)

6.5.4 Habitat Plans

- A Cooperative Management Plan for Black-Footed Ferrets, Little Snake Management Area, Colorado (1995)

6.5.5 Endangered Species Recovery Plans

- Dudley Bluffs Bladderpod and Dudley Bluffs Twinpod Recovery Plan (1993)
- Bonytail Chub Recovery Plan (1990)
- Colorado Squawfish Recovery Plan (1991)
- Humpback Chub Recovery Plan (1990)
- Razorback Sucker Recovery Plan (1998)
- Mexican Spotted Owl Recovery Plan (1995)
- Final Recovery Plan, Southwestern Willow Flycatcher (2002)
- Black-Footed Ferret Recovery Plan (1978)
- Gray Wolf Recovery Plan (1987)

6.5.6 Existing Environmental Assessments and Impact Statements

- Environmental Assessment and Gather Plan for the Gather and Selective Removal of Wild Horses from the Sand Wash Wild Horse Herd Management Area (2001)
- Little Snake Field Office and Brown's Park National Wildlife Refuge Fire Management Plan Environmental Assessment (2000)
- Vermillion Oil and Gas Environmental Assessment

6.5.7 Other Policy and Guiding Direction

- Northwest Colorado Fire Program Area Fire Management Plan (2004)
- Routt County Master Plan (2003)
- Moffat County Land Use Plan (2001)
- Sarvis Creek Area Plan (1996)
- South Steamboat Area Land Use Plan (1990)
- Stagecoach Community Plan (1999)

CHAPTER 7

SUMMARY OF SCOPING REPORT

CHAPTER 7 SUMMARY OF SCOPING REPORT

7.1 PUBLIC SCOPING NOTIFICATION

The White River Field Office (WRFO) Oil and Gas Resource Management Plan Amendment (RMPA)/Environmental Impact Statement (EIS) public scoping process began with the publication in the *Federal Register* of the Bureau of Land Management's (BLM's) Notice of Intent (NOI) to amend the 1997 *White River Record of Decision (ROD) and Approved Resource Management Plan (RMP)* (referred to as the 1997 White River ROD/RMP), prepare an RMPA/EIS, and conduct public scoping meetings. The Notice of Intent (NOI) to initiate planning for the WRFO was published on June 14, 2006 (Vol. 71, No. 114, Page 34388, [CO-110]).

In addition, BLM prepared news releases to introduce the project, announce the scoping period, and publicize the scoping meetings and their respective locations. The news releases were posted on the Colorado BLM web site and the WRFO web site. An announcement regarding the public scoping process and the scoping meetings was issued in August 2006, to the following local and regional newspapers: *Rio Blanco Herald Times*, *Rifle Citizen Telegram*, *Grand Junction Free Press*, *Glenwood Post-Independent*, *Grand Junction Daily Sentinel*, *Craig Daily Press*, and *Vernal Express*.

7.2 PUBLIC SCOPING MEETINGS

BLM hosted three public meetings in September 2006 in Meeker, Rangely, and Rifle, Colorado to provide planning and National Environmental Policy Act (NEPA) information to the public and agencies and allow them to identify issues and concerns to BLM. Public scoping and the scoping meetings were advertised on the BLM web site and through the local media. A total of 114 people attended, including BLM personnel.

7.3 PUBLIC SCOPING COMMENTS

Agencies and the general public submitted oral and handwritten comments to BLM staff during the public scoping meetings and during the scoping period. During public scoping, BLM received a total of 69 unique comments: 54 letters from individuals; 2 letters from affected federal and state agencies; 1 letter from a local community; 6 letters from interested businesses; 4 letters from organizations and special interest groups; 1 e-mail from a local county; and 1 e-mail message from an interested individual. Where form letters were received, a representative letter was analyzed. The submittals received were organized and reviewed, and

1 e-mail message from an interested individual. Where form letters were received, a representative letter was analyzed. The submittals received were organized and reviewed, and the comments were analyzed to identify the preliminary issues to be addressed during the preparation of the WRFO Oil and Gas RMPA/ EIS. The issues summarized below will be used to help guide the development of the RMPA/EIS.

7.3.1 Planning and NEPA Process

The public expressed concern regarding the scope of the decision that will be presented through this amendment as well as the range and scope of alternatives to be developed. In addition, the planning process is not well understood. The role of agencies and other interested parties and the input by affected entities was a concern voiced by those submitting comments. Finally, a focus on the level, adequacy, and comprehensiveness of impact analysis on all resources was stated.

7.3.2 Oil and Gas Development

Included in this category were comments regarding oil and gas development technologies, production technologies, and impacts of oil and gas development on other resources. The primary concern voiced was the need for a carefully planned development of an increased number of wells and implementation of appropriate best management practices (BMPs). The planning process should consider all positive and negative direct, indirect, and cumulative impacts of oil and gas development on the natural and human environment.

7.3.3 Air and Water Quality and Resources

Comments were received regarding degradation of air quality from increased resource production as well as the air quality effects on currently permitted uses. In addition, the need for adequate baseline air quality data and air quality modeling was expressed. The focus on detailed evaluation of direct, indirect, and cumulative impacts on air and water quality was a concern. Comments regarding the implementation and use of BMPs were also received.

7.3.4 Biological Resources

Comments were received regarding vegetation, noxious weeds, riparian areas, and fish, wildlife, and special status species. The comments focused on protection of biological resources, detailed analysis of direct, indirect, and cumulative impacts, and development of appropriate BMPs. In addition, the availability and quality of adequate data was a concern.

7.3.5 Wild Horse Management and Rangeland Management

The primary concern for wild horse management was in regards to the protection of wild horse populations. Comments regarding rangeland management focused on the impact to vegetation for livestock and wildlife.

7.3.6 Fire Management

Comments received for fire management were in regards to the implementation of appropriate BMPs.

7.3.7 Special Designations

Comments under this category included Wilderness Study Areas (WSAs), wilderness characteristics, and Areas of Critical Environmental Concern (ACECs). Comments focused on protecting these designated areas as well as appropriate designations of areas.

7.3.8 Cultural, Historic, and Paleontological Resources, and American Indian Concerns

The protection of resources was of primary importance in addition to the development of appropriate BMPs. Coordination with impacted communities was also a concern.

7.3.9 Recreation Management and Social and Economic Values

Primary concerns included evaluation of impacts to and implementation of appropriate BMPs for the recreation industry (e.g., hunting, tourism, and primitive recreation uses). Many of concerns expressed regarding recreation management were also relevant to the social and economic conditions within the WRFO.

7.3.10 Lands, Utility Corridors, Rights-of-Way, Withdrawals, and Roads and Travel Management

Comments were received regarding the existing management of lands within the WRFO and impacts of increased oil and gas development on lands and the existing transportation network. Many comments focused on the implementation of appropriate BMPs for direct impacts to lands, the transportation network, and utility and right-of-way (ROW) corridors. The availability of adequate data for a comprehensive analysis was also a concern.

7.3.11 Visual Resource Management

The preservation of the visual resources of the WRFO was of primary concern as well as the implementation of appropriate BMPs.

7.4 COLLABORATIVE PLANNING

Agency coordination is important in a successful collaborative process for several reasons. First, early involvement with other federal agencies and tribal, state, and local governments establishes solid working relationships with each agency. Next, it builds trust and credibility among agencies that then can be transferred to the public. Finally, it helps ensure that the land use decisions developed by BLM are supported by, and conform to, other jurisdictions in any given area to the maximum extent possible.

Cooperating agency status provides a formal framework for governmental units—local, state, tribal, or federal—to engage in active collaboration with a lead federal agency to implement the requirements of NEPA. In principle, a cooperating agency shares the responsibility with the lead agency for organizing the planning process.

BLM contacted federal, state, county, and local agencies in September and November 2006 to initiate coordination, consultation, and collaborative efforts that will continue throughout the RMPA/EIS process. As of February 2007, the following agencies have requested cooperating agency status: U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, Colorado Department of Health and Environment/Air Pollution Control Division, Colorado Department of Wildlife, Moffat County, Rio Blanco County, Garfield County, Town of Meeker, and Town of Rangely. Other federal, state, and local agencies have communicated with the BLM, and may request cooperating agency status in the future.

7.5 TRIBAL CONSULTATION

BLM initiated discussions with American Indian tribes to provide planning and process information and determine concerns and issues as well as to extend the offer for cooperating agency status. Informal and formal efforts to implement mandatory consultation with Tribal Historic Preservation Offices also have been initiated. BLM will continue to conduct government-to-government communications with the American Indian tribes throughout the process. The following American Indian tribes were contacted in November 2006: Northern Ute Tribe; Shoshone Tribe (Eastern Band); Southern Ute Indian Tribe; and Ute Mountain Ute Tribe.

CHAPTER 8

LIST OF PREPARERS

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Table 8-1
List of Preparers

Name	Discipline / Background	Qualifications and Experience	AMS Area of Participation
Bureau of Land Management (BLM) White River Field Office (WRFO)			
Penny Brown	Realty Manager	A.A.S. 30 years	Lands and Realty
Paul Daggett	Mining Engineer	B.S. 16 years	Geology and Minerals
Chris Ham	Outdoor Recreation Planner	B.S. 10 years	Recreation; Transportation and Access; Wilderness, Visual
Marvin Hendricks	Petroleum Engineer	B.S. 10 years	RFD Scenario; Oil and Gas
Carol Hollowed	Planning and Environmental Coordination	B.S. 28 years	Project Manager
Ed Hollowed	Wildlife Biologist	B.S. 30 years	Wildlife; Threatened, Endangered, Sensitive Animal Species; Migratory birds; Gunnison Sage Grouse; ACEC
Ken Holsinger	Botanist	B.S. 7 years	Fuels/Fire Management; Threatened, Endangered, Sensitive Plant Species; Forestry; ACEC
Tom Johnson	Hydrogeologist	B.A. M.S., 20 years	Air; Hazardous Materials
Melissa Kindall	Wild Horse Specialist	A.A.S. 16 years	Wild Horses
Bob Lange	Hydrologist	B.S. 10 years	Soil Resources; Hydrology; Surface and Groundwater
Pam Leschak	Petroleum Geologist	B.S. M.S., 20 years	RFD; Geology
Mike Selle	Archaeologist	B.A. 27 years	Cultural Resources; Paleontological Resources; Tribal Interests; ACEC
Mary Taylor	Rangeland Manager	B.S. 4 years	Range; Riparian; Vegetation; Weeds
Kent Walter	Environmental Coordinator	B.S. 25 years	Field Office Manager
BLM Colorado State Office			
Brian St. George	Planning and Environmental Coordinator	B.S. M.S. 7 years	NEPA Coordination/Land Use Planning
Chuck Romaniello	Socioeconomic Analysis	M.S. 30 years	Socioeconomics
URS Team			
Jeff Bader	Petroleum Geology, Hydrogeology	B.A., M.S. 26 years	Geology
Rachel Badger	Environmental Planning, NEPA Compliance	B.A. 14 years	Project Coordinator; Public Safety; Wild Horses
Susan Bassett	Chemical Engineering, Environmental Compliance/Air Quality	B.S. 16 years	Air Quality

**Table 8-1
List of Preparers**

Name	Discipline / Background	Qualifications and Experience	AMS Area of Participation
George Blankenship (Consultant)	Socioeconomics	MURP Masters of Urban and Regional Planning	Social Conditions
Rich Chamberlain	Geography	M.S. 10 years; Certified GIS Professional (GISP)	Geographic Information Systems (GIS) Analyst
Jeff Dawson	Ecology, Botany	M.S. 30 years	Fish and Wildlife; Special Status Species; Habitat
Jeanne DeFauw	Graphic Design	BFA 7 years	Graphics
Lynne Dissette	Drafting, CAD, GIS, and Database Management	BSB/IS 27 years	GIS Analyst
Juston Fariello	Archaeology and Cultural Resource Management	B.A. 8 years	Cultural Resources
Connie Farmer	Environmental Science; Cultural and Natural Resource Management; NEPA Compliance	M.En. 30 years	Project Management
Dave Hilliard	Civil Engineering	B.S. 20 years; Professional Engineer Colorado	Transportation and Access
David Jones	Natural Resources	B.A. 16 years	Project Manager, Special Designations
Kavi Koleini	Biology	Rangeland Ecology Wildland Firefighter (Type II)	Fire Management; Livestock Grazing; Visual Resources
Mark Levorsen	Hydrogeology	M.S. 19 years	Water Resources
Lloyd Levy (Consultant)	Socioeconomics	M.B.A. 20 years	Socioeconomics
Sarah McCall Jensen	Natural Resource Management; Environmental Planning	M.S. 3 years	Lands and Realty
David Mohrbacher	Petroleum and Environmental Engineering	M.S. 28 years	Geology; Energy and Minerals
Steve Moore (Consultant)	Socioeconomics	M.S. Agricultural Economics	Economic Conditions
Bob Mutaw	Anthropology	Ph.D 27 years	Cultural Resources; Paleontological Resources; Tribal Interests
Amanda O'Connor	Natural Resource Management/NEPA	M.S. 10 years	Management Opportunities Analysis; Technical Review
David Palmer	Geology	M.A. 28 years	Soil Resources; Energy and Minerals
Jennifer Pyne	Environmental, Land Use and Community Planning; NEPA Compliance	M.E.P. (Masters of Environmental Planning) 10 years	Recreation Resources

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List of Preparers

Name	Discipline / Background	Qualifications and Experience	AMS Area of Participation
Ryan Rausch	Natural Resource Management; Environmental Policy and Planning	M.S. 3 years	Recreation Resources
Leslie Watson	Zoology	B.S. 15 years	Vegetation; Wetlands; Riparian; Wilderness Characteristics; Forestry; Wild Horses
Sara White	Environmental Science, Geology, and Environmental Geomorphology	M.S. 20 years	Public Scoping
Aaron Worstell	Chemical and Environmental Engineering, Air Quality	B.S. 14 years	Air Quality

GLOSSARY

GLOSSARY

Actual Use. The amount of animal unit months 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.

Allotment Management Plan (AMP). A concisely written program of livestock grazing management, including supportive measures, if required, designed to attain specific management goals in a grazing allotment. An AMP 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. An AMP establishes seasons of use, the number of livestock to be permitted, the range improvements needed, and the grazing system.

Alluvium. Unconsolidated material deposited by running water, including gravel, sand, silt, clay, and various mixtures of these.

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 (AU). Defines forage consumption on the basis of one standard mature 1,000-pound cow, either dry or with calf up to 6 months old; all other classes and kinds of animals can be related to this standard, e.g. a bull equals 1.25 AU, a yearling steer equals 0.6 AU.

Animal Unit Day (AUD). One animal unit is defined as a 1,000 lb. (450 kg) beef cow with or without a nursing calf with a daily requirement of 26 lb. (11.8 kg) of dry matter forage (Ruyle and Ogden 1993). Therefore, one AUM is equal to 780 lb. (355 kg) of dry matter forage (30 days x daily forage requirement). Local AUM values may be modified and these values should be used only as a guide.

Animal Unit Month (AUM). The amount (780 pounds) of air-dry forage calculated to meet one animal unit's requirement for one animal unit for 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).

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 dusts or smokes.

AUM (Animal Unit Month). The amount of forage needed by an "animal unit" (AU) grazing for one month. The animal unit in turn is defined as one mature 1,000-pound cow and her suckling calf.

Back Country Byways. Vehicle routes that traverse scenic corridors utilizing secondary or back country road systems. National back country byways are designated by the type of road and vehicle needed to travel the byway.

Big Game. Indigenous ungulate wildlife species that are hunted, such as elk, deer, bison, bighorn sheep, and pronghorn antelope.

Candidate species. Taxa for which the FWS has sufficient information on their status and threats to support proposing 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 (from M6840, Special Status Species Manual) (from M6840, Special Status Species Manual).

Casual Use. Means activities that involve practices which do not ordinarily cause any appreciable disturbance or damage to the public lands, resources or improvements and, therefore, do not require a right-of-way grant or temporary use permit (43 CFR 2800). Also means any short term non-commercial activity which does not cause appreciable damage or disturbance to the public lands, their resources or improvements, and which is not prohibited by closure of the

lands to such activities(43 CFR 2920). Casual use generally includes the collecting of geochemical, rock, soil, or mineral specimens using hand tools, hand panning, and non-motorized 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.

Channery (adj.); **Channers** (noun) - A flat rock fragment that is 2-150 mm long.

Clean Air Act (CAA) of 1963 and Amendments. Federal legislation governing air pollution control.

Closed. Generally denotes that an area is not available for a particular use or uses; refer to specific definitions found in law, regulations, or policy guidance for application to individual programs. For example, 43 CFR 8340.0-5 sets forth the specific meaning of “closed” as it relates to off-highway vehicle use, and 43 CFR 8364 defines “closed” as it relates to closure and restriction orders (from H-1601-1, BLM Land Use Planning Handbook).

Colluvium. Unconsolidated, unsorted earth material being transported or deposited on sideslopes and/or at the base of slopes by mass movement (e.g. direct gravitational action) and by local, unconcentrated runoff.

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.

Council on Environmental Quality (CEQ). An advisory council to the President of the United States 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.”

Cultural Modification. Any human-caused change in the landform, water form, vegetation, or the addition of a structure which creates a visual contrast in the basic elements (form, line, color, texture) of the natural character of a landscape.

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 agencies) 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).

Disposal. Transfer of public land out of federal ownership to another party through sale, exchange, Recreation and Public Purposes Act, 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 Wild and Scenic Rivers System through the determination (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 which is in danger of extinction throughout all or a significant portion of its range (from M6840, Special Status Species Manual).

Environmental Impact Statement (EIS). A detailed statement prepared by the responsible official in which a major Federal action which significantly affects the quality of the human environment is described, alternatives to the proposed action provided, and effects analyzed (from BLM National Management Strategy for OHV Use on Public Lands).

Extensive Recreation Management Area (ERMA). Areas in which significant recreation opportunities and problems are limited and explicit recreation management is not required. Minimal management actions related to the Bureau’s stewardship responsibilities are adequate in these areas.

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 the majority of the BLM's legislated authority, direction policy and basic management guidance (from BLM National Management Strategy for OHV Use on Public Lands).

Fire Frequency. A general term referring to the recurrence of fire in a given area over time. It is sometimes stated as number of fires per unit time in a designated area. It is also used to refer to the probability of an element burning per unit time.

Fire Intensity. The rate of heat release along a unit length of fireline, measured in kW m^{-1}

Fire Regime. The combination of fire frequency, predictability, intensity, seasonality, and extent characteristic of fire in an ecosystem.

Fire Regime Condition Class (FRCC). Fire Regime Condition Classes are a qualitative 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 exclusion, timber harvesting, livestock grazing, introduction and establishment of exotic plant species, introduced insects and disease, or other management activities.

Fire Severity. The effect of fire on plants. For trees, severity is often measured as a percentage of basal area removed.

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.

Forage. Browse and herbage that are available for food for grazing animals or be harvested for feeding.

Functioning at Risk. (1) Condition in which vegetation and soil are susceptible to losing their ability to sustain naturally functioning biotic communities. Human activities, past or present, may increase the risks. Rangeland Reform Final Environmental Impact Statement (FEIS) at 26. (2) Uplands or riparian-wetland areas that are properly functioning, but a soil, water, or vegetation attribute makes them susceptible to degradation and lessens their ability to sustain natural biotic communities. Uplands are particularly at risk if their soils are susceptible to degradation. Human activities, past or present, may increase the risks (Rangeland Reform Draft

Environmental Impact Statement (DEIS) Glossary). SEE ALSO Properly Functioning Condition and Nonfunctioning Condition (from H-4180-1, BLM Rangeland Health Standards Manual).

Grazing Allotment. A grazing arrangement comprised of numerous subdivisions (pastures) with a central component for livestock management and movement.

Grazing Preference. The total number of AUMs on public land apportioned and attached to base property owned or controlled by a lessee.

Habitat. An environment which 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 (HMA). 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.

Historic Fire Regime (HFR). A classification of the effects of ecosystem disturbance caused by fire over time and space. Generally encompasses the period between 1500 to late 1800, before extensive settlement by European-Americans in many parts of North America, before intense conversion of wildlands for agricultural and other purposes, and before fire suppression effectively reduced fire frequency in many areas. Sometimes referred to as “presettlement” fire regimes.

Intermittent Stream. An intermittent stream is a flowing system under normal weather conditions. 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 (pollution, thermal modifications, etc.), biology is 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 mm, 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. Fall or late summer grazing.

Land Classification. When, under criteria of 43 CFR 2400, a tract of land has potential for either 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 which will best promote the public interest.

Land Tenure adjustments. Ownership or jurisdictional changes are referred as “Land Tenure Adjustments.” To improve the manageability of the BLM lands and improve their usefulness to the public, 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, 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 MFPs. (from H-1601-1, BLM Land Use Planning Handbook).

Lease. Section 302 of the Federal Land Policy and Management Act of 1976 (FLPMA) provides the BLM's authority to issue leases for the use, occupancy, and development of the 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, harvesting of native or introduced species, 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 non-irrigation facilities. The regulations establishing procedures for the processing of these leases and permits are found in 43 Code of Federal Regulations (CFR) 2920.

Leasable Minerals. A legal term that, for federal lands or a federally retained mineral interest in lands in the United States, defines a mineral or mineral commodity acquired through the Mineral Leasing Act of 1920, as amended, the Geothermal Steam Act of 1970, as amended, or the Acquired Lands Act of 1947, as amended. Acquisition of leasable minerals is by application for a government lease and permits to mine or explore after lease issuance.

Lek. An assembly area where birds, especially sage grouse, carry on display and courtship behavior.

Limited. Designated areas and trails where the use of off-road vehicles is subject to restrictions, such as limiting the number or types of vehicles allowed, dates and times of use (seasonal restrictions), limiting use to existing roads and trails, or limiting use to designated roads and trails. Under the designated roads and trails designation, use would be allowed only on roads and trails that are signed for use. Combinations of restrictions are possible, such as limiting use to certain types of vehicles during certain times of the year (from BLM National Management Strategy for OHV Use on Public Lands).

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 U.S. Department of Agriculture to the U.S. Department of the Interior. They are now administered by the Bureau of Land Management.

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 for man’s use, 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.

Multiple Use. The management of the public lands and their various resource values so that they are utilized 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, but not limited to, 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) (from M6840, 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.

Nonfunctioning Condition. (1) Condition in which vegetation and ground cover are not maintaining soil conditions that can sustain natural biotic communities. FEIS at 25.
(2) Riparian-wetland areas are considered to be in nonfunctioning condition when they don't provide adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows and thus are not reducing erosion, improving water quality, or other

normal characteristics of riparian areas. The absence of a floodplain may be an indicator of nonfunctioning condition (DEIS Glossary). SEE ALSO Properly Functioning Condition and Functioning at Risk (from H-4180-1, BLM Rangeland Health Standards Manual).

Off-Highway Vehicle (OHV). Any motorized vehicle capable of, or designed 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. (from H-1601-1, BLM Land Use Planning Handbook).

Open. Designated areas and trails where off-road vehicles may be operated, subject to operating regulations and vehicle standards set forth in BLM Manuals 8341 and 8343; or an area where all types of vehicle use is permitted at all times, subject to the standards in BLM Manuals 8341 and 8343 (from BLM National Management Strategy for OHV Use on Public Lands).

Outstandingly Remarkable Values. Values among those listed in Section 1(b) of the Act: “scenic, recreational, geological, fish and wildlife, historical, cultural, or other similar values....” Other similar values which may be considered include ecological, biological or botanical, paleontological, hydrological, scientific or research values (from M-8351, BLM WSR Policy and Program).

Ozone. A faint blue gas produced in the atmosphere from chemical reactions of such sources as burning coal, gasoline and other fuels, and chemicals found in products including solvents, paints, hairsprays, etc.

Perennial Stream. Perennial streams carry flowing water continuously throughout the year, regardless of weather conditions. It exhibits well-defined geomorphological characteristics and in the absence of pollution, thermal modifications, or other man-made disturbances has the ability to support aquatic life. During hydrological drought conditions, the flow may be impaired.

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 is expressed in Animal Unit Months (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. Non-motorized, non-mechanized (except as provided by law), and undeveloped types of recreational activities. Bicycles are considered mechanical transport (from H-6310-1, Wilderness Inventory and Study Procedures).

Properly Functioning Condition. (1) An element of the Fundamental of Rangeland Health for watersheds, and therefore a required element of State or regional standard and guidelines under 43 CFR § 4180.2(b). (2) Condition in which vegetation and ground cover maintain soil conditions that can sustain natural biotic communities. For riparian areas, the process of determining function is described in the BLM Technical Reference TR 1737-9. FEIS at 26, 72. (3) Riparian-wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high waterflows, thereby reducing erosion and improving water quality; filter sediment, capture bedload, 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. The functioning condition of riparian-wetland areas is influenced by geomorphic features, soil, water, and vegetation (DEIS Glossary). (4) Uplands function properly when the existing vegetation and ground cover maintain soil conditions capable of sustaining natural biotic communities. The functioning condition of uplands is influenced by geomorphic features, soil, water, and vegetation (DEIS Glossary). SEE ALSO Nonfunctioning Condition and Functioning at Risk (from H-4180-1, BLM Rangeland Health Standards Manual).

Public Land. Land or interest in land owned by the United States and administered by the Secretary of the Interior through the BLM without regard to how the United States 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 (RFD) 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). Recreation and Public Purposes Act provided 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 non-profit 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 Opportunity Spectrum (ROS). A continuum used to characterize recreation opportunities in terms of setting, activity and experience opportunities. The spectrum covers a range of recreation opportunities from primitive to urban. With respect to river management planning, ROS represents one possible method for delineating management units or zones. See BLM Manual Section 8320 for more detailed discussion (from M-8351, BLM WSR Policy and Program).

Residuum. (residual soil material) Unconsolidated, weathered, or partly weathered mineral material that accumulates by disintegration of bedrock in place.

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.

Right-of-Way (ROW). Means the 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 rights-of-way over, upon, 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.

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.

Salable Minerals. A legal term that, for federal lands, defines mineral commodities sold by sales contract from the federal government. The applicable statute is the Mineral Materials Sale Act of 1947, as amended. Salable minerals are generally common varieties of construction

materials and aggregates, such as, sand, gravel, cinders, roadbed, and ballast material. Common variety minerals do not have a distinct, special value beyond normal use. On federal lands such minerals are considered salable and are disposed of by sales or by special permits to local governments.

Scenic Byways. Highway routes, which have roadsides or corridors of special aesthetic, cultural, or historic 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.

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 (i.e., activity, experience, and benefit opportunities). The BLM recognizes three distinct types of SRMAs: community-based; intensive; and undeveloped big open. (from H-1601-1, BLM Land Use Planning Handbook).

Split Season. Removing livestock from the allotment and returning them later in the year within the permitted time.

State Implementation Plan (SIP). 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 which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range (from M6840, Special Status Species Manual).

Total Maximum Daily Load (TMDL). 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 and/or cultural group such as an Indian tribe or local community. A traditional cultural property may qualify for the National Register if it meets the criteria and criteria exceptions at 36 CFR 60.4. See National Register Bulletin 38.

Valid Existing Rights. Any lease established (and valid) prior to a new authorization, change in land designation, or in regulation.

Visibility (Air Quality). A measurement of the ability to see and identify objects at different distances.

Visitor Day. Twelve visitor hours which 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 (VRM) Classes. 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 based on scenic quality, sensitivity level, and distance zones. Each class has an objective which 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 (VOCs). Volatile organic chemicals that produce vapors readily; at room temperature and normal atmospheric pressure. Volatile organic chemicals include gasoline, industrial chemicals such as benzene, solvents such as toluene and xylene, and tetrachloroethylene (perchloroethylene, the principal dry cleaning solvent).

Wild, Scenic, and/or Recreational (WSR). The term used in this Manual Section for what is traditionally shortened to “Wild and Scenic” rivers. Designated river segments are classified,

i.e., wild, scenic, and/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 waters 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.

Wild and Scenic Study River. Rivers identified in Section 5 of the Wild and Scenic Rivers Act for study as potential additions to the National Wild and Scenic Rivers System. The rivers shall 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 non-motorized, non-mechanical means, and where no or minimal developed recreation facilities are encountered.

Wilderness Study Area (WSA). 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).

Wildland Fire Use (WFU). The management of naturally ignited wildland fires to accomplish specific pre-stated resource management objectives in predefined geographic areas.

Wildland Urban Interface (WUI). The area where developed and undeveloped lands meet.

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