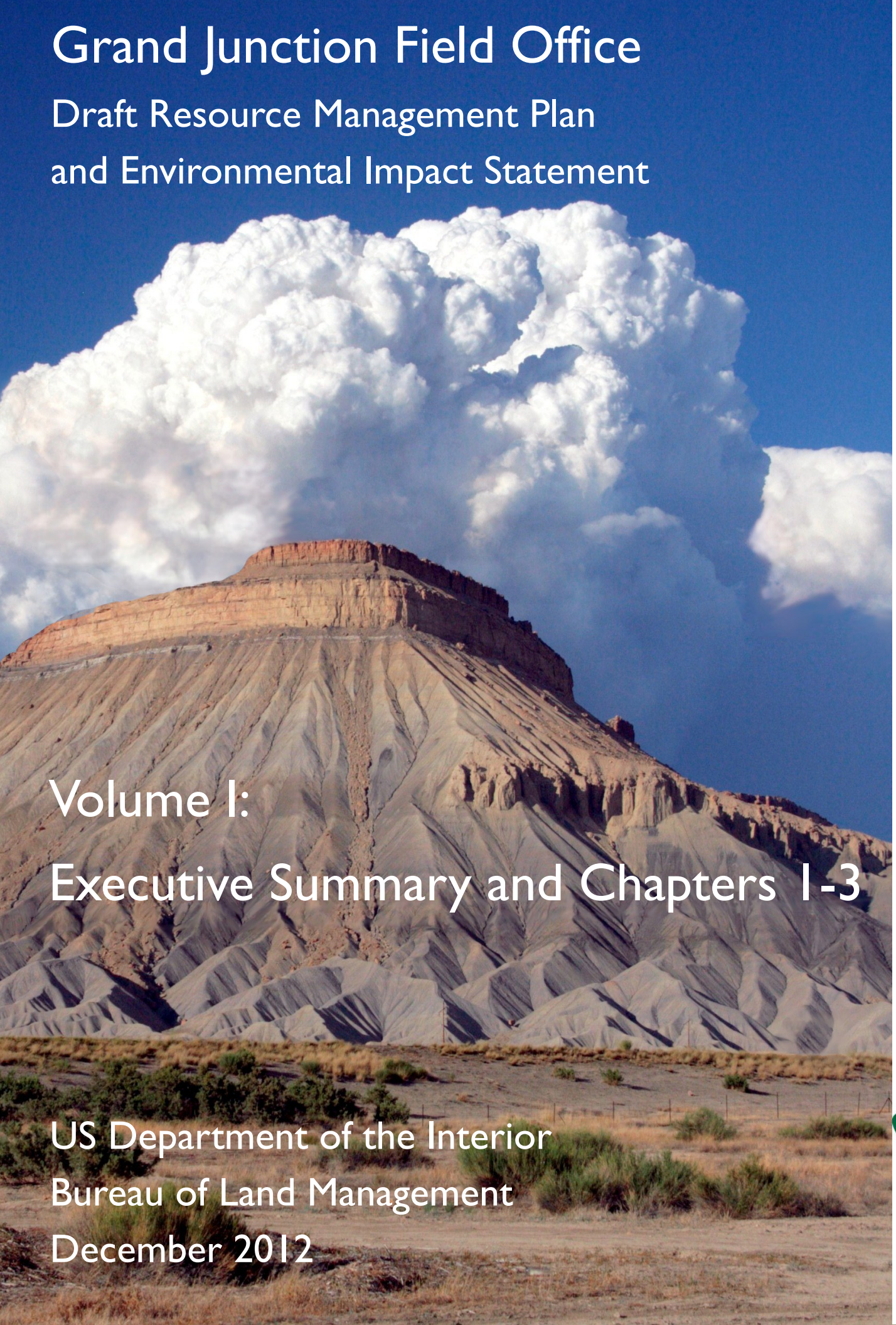
Grand Junction Field Office

Draft Resource Management Plan and Environmental Impact Statement



Volume I:

Executive Summary and Chapters 1-3

US Department of the Interior

Bureau of Land Management

December 2012

BLM

BLM Mission

To sustain the health, diversity, and productivity of America's public lands for the use and enjoyment of present and future generations.

BLM/CO/PL-12/004

Cover photo by Terry Bridgman, Range Technician, Grand Junction Field Office

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
Colorado State Office
2850 Youngfield Street
Lakewood, Colorado 80215-7076

In Reply Refer To:
1610 (CON030)

DEC 07 2012

Dear Reader:

Enclosed for your review and comment is the Draft Resource Management Plan/Draft Environmental Impact Statement (Draft RMP/EIS) for the Colorado Bureau of Land Management (BLM) Grand Junction Field Office (GJFO). The BLM prepared this document in consultation with cooperating agencies, and in accordance with the National Environmental Policy Act of 1969, as amended, the Federal Land Policy and Management Act of 1976, as amended, implementing regulations, the BLM's Land Use Planning Handbook (H-1601-1), and other applicable laws and policies.

The planning area consists of about 2.2 million acres of land which includes about 1.2 million acres of public lands and resources managed by the GJFO. The majority of the planning area is included within Mesa and Garfield counties, with small portions falling within Montrose and Rio Blanco counties. When approved, this RMP will replace the 1987 Grand Junction RMP and will guide the management of public lands administered by the GJFO into the future. The GJFO Draft RMP/EIS and supporting information is available on the project web site at: http://www.blm.gov/co/st/en/fo/gjfo/rmp.html.

The BLM encourages the public to provide information and comments pertaining to the analysis presented in the Draft RMP/EIS. We are particularly interested in feedback concerning the adequacy and accuracy of the proposed alternatives, the analysis of their respective management decisions, and any new information that would help the BLM as it develops the plan. In developing the Proposed RMP/Final EIS, which is the next phase of the planning process, the decision maker may select various management decisions from each of the alternatives analyzed in the Draft RMP/EIS for the purpose of creating a management strategy that best meets the needs of the resources and values in this area under the BLM multiple use and sustained yield mandate. As a member of the public, your timely comments on the GJFO Draft RMP/EIS will help formulate the Proposed RMP/Final EIS. Comments will be accepted for ninety (90) calendar days following the Environmental Protection Agency's publication of its Notice of Availability in the *Federal Register*. The BLM can best utilize your comments and resource information submissions if received within the review period.

Comments may be submitted electronically at: gjfo_rmp@blm.gov. Comments may also be submitted by mail to:

RMP Comments
Bureau of Land Management
Grand Junction Field Office
2815 H Road
Grand Junction, CO 81506

To facilitate analysis of comments and information submitted, we strongly encourage you to submit comments in an electronic format.

Your review and comments on the content of this document are critical to the success of this planning effort. If you wish to submit comments on the Draft RMP/EIS, we request that you make your comments as specific as possible. Comments will be more helpful if they include suggested changes, sources, or methodologies, and reference to a section or page number. Comments containing only opinion or preferences will be considered and included as part of the decision making process, although they will not receive a formal response from the BLM.

Before including your address, phone number, email address, or other personal identifying information in your comment, be advised that your entire comment - including your personal identifying information - may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Public meetings to provide an overview of the document, respond to questions, and take public comments will be announced by local media, website, and/or public mailings at least 15 days in advance. Public meetings will be held at a time and date to be determined.

Copies of the Draft RMP/EIS have been sent to affected Federal, state and local government agencies, and tribal governments Copies are also available for public inspection at the following BLM locations:

Bureau of Land Management
Colorado State Office
2850 Youngfield Street
Lakewood, CO 80215

Bureau of Land Management
Grand Junction Field Office
2815 H Road
Grand Junction, CO 81506

Thank you for your continued interest in the GJFO RMP. We appreciate the information and suggestions you contribute to the planning process. For additional information or clarification regarding this document or the planning process, please contact Collin Ewing, Planning and Environmental Coordinator at (970) 244-3027.

Sincerely,

Helen M. Hankins

Helen M. Hankins
State Director

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Draft Resource Management Plan and Draft Environmental Impact Statement for the Grand Junction Field Office, Colorado

BLM/CO/PL-12/004

1. Responsible Agency: United States Department of the Interior
   Bureau of Land Management

2. Type of Action: Administrative (X) Legislative ( )

3. Document Status: Draft (X) Final ( )

4. Abstract: This Draft Resource Management Plan and Environmental Impact Statement describes and analyzes four alternatives for managing 1.2 million acres of federal lands and resources in western Colorado administered by the Bureau of Land Management. The Grand Junction Field Office spans portions of Mesa, Garfield, Montrose, and Rio Blanco Counties. The plan alternatives are Alternative A (the "no action" alternative or continuation of the 1987 Resource Management Plan), Alternative B (the "balanced" and agency preferred alternative), Alternative C (conservation emphasis), and Alternative D (resource use emphasis). Planning issues addressed include categories such as travel management, energy development, recreation management, lands and realty/community growth and expansion, wildlife and fish, and special designations. The draft alternatives also address designation of Areas of Critical Environmental Concern and Wild and Scenic River suitability findings.

5. Review Period: The review period on the Grand Junction Field Office Draft Resource Management Plan and Draft Environmental Impact Statement is 90 calendar days. The review period began when the Environmental Protection Agency published a Notice of Availability in the Federal Register.

6. For further information contact:

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ACRONYMS AND ABBREVIATIONS

	Full Phrase
ACEC	Area of Critical Environmental Concern
AML	Appropriate Management Level
AMP	Allotment Management Plan
ATV	all-terrain vehicle
AUM	animal unit-month
BEA	United States Department of Commerce, Bureau of Economic Analysis
BLM	United States Department of the Interior, Bureau of Land Management
BMP	best management practices
Bbbl/sqmi	billion barrels of oil per square mile
CEQ	Council on Environmental Quality
CCR	Colorado Code of Regulations
CDPHE	Colorado Department of Public Health and Environment
CFR	Code of Federal Regulations
CIAA	Cumulative Impact Analysis Area
CMA	Cooperative Management Agreement
CNAP	Colorado Natural Areas Program
CNHP	Colorado Natural Heritage Program
COA	condition of approval
CPW	Colorado Parks and Wildlife
CSU	controlled surface use
CTTM	Comprehensive Trails and Travel Management
EA	environmental assessment
EDRR	Early Detection and Rapid Response
EIS	environmental impact statement
ESA	US Endangered Species Act of 1973
ERMA	extensive recreation management area
ESR	emergency stabilization and rehabilitation
FAR	functioning at risk
FAR-DOWN	functioning at risk downward trend
FAR-NA	functioning at risk no apparent trend
FAR-UP	functioning at risk upward trend
FLPMA	Federal Land Policy and Management Act of 1976
FLRMP	Forest Land and Resource Management Plan
FRCC	fire regime condition class
GIS	Geographic Information System
GJFO	Grand Junction Field Office
IMPLAN	Impact Analysis for Planning
IRMA	Intensive Recreation Management Area
K	soil eroidibilty potential factor
KPLA	Known Potash Leasing Area

LBCWHR	Little Book Cliffs Wild Horse Range
LED	Local Employment Dynamics
LN	Lease Notice
LPM	Land Parcel Model
Ma	million years before present
MOU	Memorandum of Understanding
NAICS	North American Industrial Classification System
NEPA	National Environmental Policy Act of 1969
NCA	National Conservation Area
NF	not functioning
NFRP	Normal Year Stabilization and Rehabilitation Plan
NOI	Notice of Intent
NPS	United States Department of the Interior, National Park Service
NHPA	National Historic Preservation Act
NRCS	Natural Resources Conservation Service
NREL	National Renewable Energy Laboratory
NRHP	National Register of Historic Places
NSO	no surface occupancy
NWSRS	National Wild and Scenic Rivers System
OHV	off-highway vehicle
ONA	Outstanding Natural Area
ORV	outstandingly remarkable value
PFC	proper functioning condition
PFYC	Potential Fossil Yield Classification
PGH	preliminary general habitat
PPH	preliminary priority habitat
PPR	Parachute-Piceance-Roan
RAC	Resource Advisory Council
RMIS	Recreation Management Information System
RMZ	Recreation Management Zone
RMP	resource management plan
RNA	Research Natural Area
ROD	record of decision
ROS	recreation opportunity spectrum
ROW	right-of-way
RS	Revised Statute
RSC	recreation setting characteristic
SHPO	State Historic Preservation Officer
SIC	Standard Industrial Classification
SOP	Standard Operating Procedures
SMA	Special Management Area
SRMA	Special Recreation Management Area

	Full Phrase
SRP	Special Recreation Permit
TL	timing limitation
TMDL	Total Maximum Daily Load
US	United States
US BOR	United States Department of the Interior, Bureau of Reclamation
US DOE	United States Department of Energy
US DOI	United States Department of the Interior
US EPA	United States Environmental Protection Agency
US Forest Service	United States Department of Agriculture, Forest Service
USC	United States Code
USDA	United States Department of Agriculture
USGS	United States Geological Survey
USFWS	United States Department of the Interior, Fish and Wildlife Service
VRI	visual resource inventory
VRM	visual resource management
WSA	Wilderness Study Area
WSR	Wild and Scenic River
WUI	Wildland-Urban Interface

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Executive Summary

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EXECUTIVE SUMMARY

ES.1 INTRODUCTION

The United States (US) Department of the Interior (DOI), Bureau of Land Management (BLM) has prepared this draft resource management plan (RMP) revision and environmental impact statement (EIS) for the BLM Grand Junction Field Office (GJFO) in accordance with the National Environmental Policy Act of 1969 (NEPA); Council on Environmental Quality regulations for implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508); BLM NEPA regulations (43 CFR Part 46); Federal Land Policy and Management Act (FLPMA) of 1976 (43 US Code [USC] 1701 et seq.); requirements of the BLM's NEPA Handbook, H-1790-1 (BLM 2008a); and BLM's Land Use Planning Handbook, H-1601-1 (BLM 2005a).

The approved RMP will replace the 1987 Grand Junction RMP (BLM 1987), as amended, and will guide management of public lands administered by GJFO into the future. Information about the RMP/EIS process can be obtained on the project Web site at http://www.blm.gov/co/st/en/fo/gjfo/rmp.html.

The GJFO planning area is composed of BLM; US Department of Agriculture, Forest Service (US Forest Service); US Fish and Wildlife Service; US Bureau of Reclamation; and State of Colorado lands (**Table ES-1**, Land Status within the GJFO Planning Area) in Garfield, Mesa, Montrose, and Rio Blanco Counties in western Colorado. There are nearly 1.1 million acres of BLM-administered public lands and 1.2 million acres of federal mineral estate in the planning area. The McInnis Canyons and Dominguez-Escalante National Conservation Areas (NCAs), while managed by the BLM and within the GJFO boundary, are or will be managed under separate RMPs. As such, these NCAs are not within the GJFO RMP decision area and are not part of this planning effort, with the exception of the portion of the Colorado River surrounded by the McInnis Canyons NCA that is being studied under the Wild and Scenic

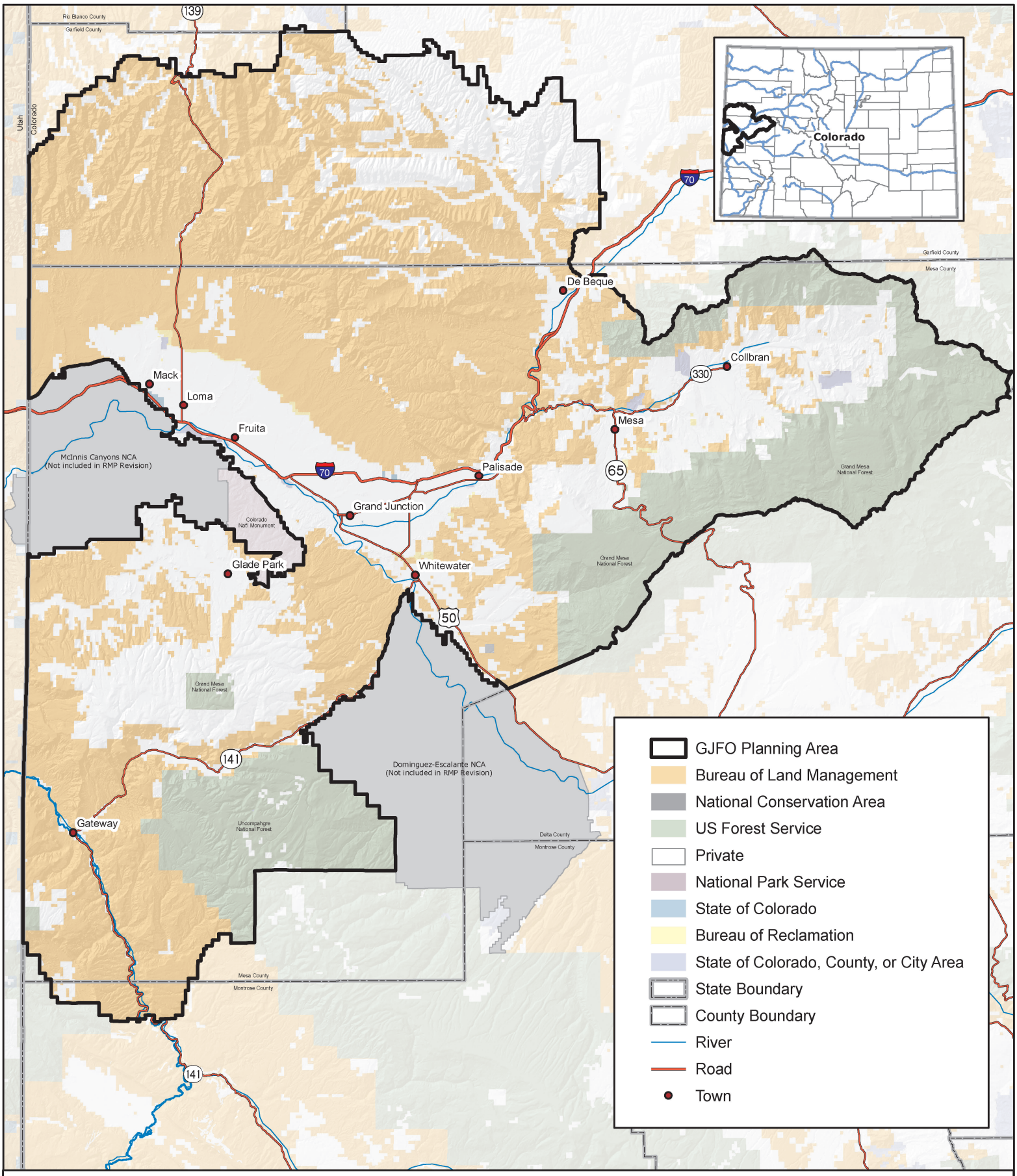
Table ES-1
Land Status within the GJFO Planning Area

Land Status	Acres	Percentage of Planning Area
BLM	1,061,400	50
US Bureau of Reclamation	7,900	less than 1
Local (State, County, and City)	3,400	less than 1
Private	714,100	30
State Wildlife Areas and State Recreation Areas (Colorado Parks and Wildlife [CPW])	1,400	less than 1
US Forest Service	380,000	20
Other	370	less than 1
Total	**2,168,600**	**100**

Note: BLM land includes approximately 3,100 acres of US Bureau of Reclamation withdrawn lands administered by the BLM.
Source: BLM 2010a

Rivers Suitability Report (**Appendix C**). A map of the planning area is provided as **Figure ES-1**, Project Planning Area.

The decision area for the RMP revision—those lands on which the RMP will make decisions—is composed only of GJFO BLM lands within the larger planning area, which comprise nearly 50 percent of the planning area (**Table ES-1**, Acres of Land Status within the GJFO Planning Area). Management direction and actions outlined in the RMP apply only to these BLM lands in the planning area and to federal mineral estate under BLM jurisdiction that may lie beneath other surface ownership. Federal mineral estate under BLM jurisdiction is composed of mineral estate underlying BLM lands, privately owned lands, and state-owned lands (**Table ES-2**, Mineral Status within the GJFO Planning Area by County). As such, federal mineral estate acres are greater than BLM surface acres. No specific measures have been developed for private, state, or other federal lands, but given that these lands are interspersed with BLM lands, they could be influenced or be indirectly affected by BLM management actions. BLM management authority on lands with a split estate (e.g., private surface but federal minerals) is limited to activities (both surface and subsurface) related to exploration and development of the minerals. The BLM adopts the leasing requirements determined by other surface-managing agencies when leasing the mineral estate under those lands. Lands administered by the Forest Service would have leasing decisions made in the appropriate Forest Service Land and Resource Management Plan/EIS. In its plans, the Forest Service analyzes impacts from oil and gas leasing and development on National Forest System Lands and describes where the Forest Service will or will not consent to leasing.



Source: BLM 2010a

Project Planning Area

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This project way developed through digital means and may be updated without notice. Map produced by Grand Junction Field Office, Bureau of Land Management, Grand Junction, CO.

0 2.5 5 10 15 20
Miles

Figure ES-1

Table ES-2
Mineral Status within the GJFO Planning Area by County

Land Status (acres)	Garfield County	Mesa County	Montrose County	Rio Blanco County	Total
BLM/Federal Minerals	322,600	721,700	17,100	0	1,061,400
BLM/Private Minerals	200	1,800	0	0	2,000
Private Surface/Federal Minerals	33,300	132,700	200	400	166,600
State Surface/Federal Minerals	0	1,200	0	0	1,200
Local Surface/Federal Minerals	0	2,100	0	0	2,100

Source: BLM 2010a

ES.2 PURPOSE OF AND NEED FOR THE RESOURCE MANAGEMENT PLAN

The purpose of this RMP revision is to ensure that public lands are managed in accordance with the intent of Congress, as stated in the FLPMA, under the principles of multiple use and sustained yield. This will be accomplished by establishing desired goals, objectives, allowable uses, and management actions needed to achieve the desired conditions for resources and resource uses. The RMP incorporates new data, addresses land use issues and conflicts, specifies where and under what circumstances particular activities would be allowed on BLM lands, and incorporates the mandate of multiple uses in accordance with the FLPMA. The RMP does not describe how particular programs or projects would be implemented or prioritized; rather, those decisions are deferred to more detailed implementation-level planning.

The FLPMA requires that the BLM "develop, maintain, and, when appropriate, revise land use plans" (43 USC 1712 [a]). The public lands within the GJFO planning area are currently managed in accordance with the decisions in the 1987 Grand Junction RMP (BLM 1987). The BLM has completed approximately 50 maintenance actions and 12 RMP amendments since the 1987 Record of Decision was signed. There is a need to revise the GJFO RMP due to new issues that have arisen since the original plan was prepared. Major issues contributing to the RMP revision include the following:

- Management of public land to support numerous wildlife species and their habitats.
- Management of public lands containing wilderness character and oil and gas potential, including areas not designated as Wilderness Study Areas.
- Management of energy and mineral resources, including identifying areas and conditions in which mineral development can occur.
- Management of increased visitation by way of off-highway vehicle use and nonmotorized uses (e.g., mountain biking and hiking) that

have led to increased concerns regarding resource protection and conflicting uses.

- Completion of Wild and Scenic River eligibility and suitability studies on river segments within the GJFO planning area.
- Consideration of opportunities for land tenure adjustment to improve public lands manageability.
- Expansion of communities and the urban interface.
- Consideration of right-of-way (ROW) exclusion areas and corridors.
- The needs of local government and citizens to be heard on an array of issues regarding both traditional and emerging uses of public land and their potential social and economic effects on local communities and values.

In addition, new resource assessments and scientific information is available to help the GJFO in revising previous decisions. Specifically, there may be a need to evaluate management prescriptions and resource allocations to address the increase in uses and demands on BLM lands (such as natural gas development and recreation), as well as the interest in protecting natural and cultural resources. There is also the need to review the RMP to allow for updated BLM management direction, guidance, and policy. Land use plan decisions may be changed only through the amendment or revision process.

ES.3 SCOPING

The formal public scoping process for the GJFO RMP/EIS began on October 15, 2008, with the publication of the Notice of Intent in the Federal Register (Vol. 73, No. 200, page 61164). The BLM issued a news release to local news organizations on November 6, 2008, announcing the scoping period for the GJFO RMP/EIS process and providing information on the scoping open houses. A newsletter was prepared and mailed to members of the public, agencies, and organizations on November 11, 2008. The BLM compiled the mailing list, which included over 680 individuals, agencies, and organizations that have participated in past BLM projects, those requesting to be on the mailing list, or those who may have an interest. The newsletter served to inform the recipients of the scoping process and the scheduled open house scoping meetings and gave them various alternative methods to submit written comments.

The BLM hosted three scoping open houses to provide the public with opportunities to become involved, to learn about the project and the planning process, to meet the GJFO RMP team members, and to offer comments. Open houses were held in Grand Junction, Colorado on December 2, 2008; in Moab, Utah on December 3, 2008; and in Collbran, Colorado on December 4, 2008. The BLM provided the local media with press releases announcing the time,

location, and purpose of these meetings. In total, 114 people attended these open houses.

The scoping period for receipt of public comments ended January 9, 2009. The BLM received 149 unique written submissions containing 953 separate comments during the public scoping period. Detailed information about the comments received and about the public outreach process can be found in the Grand Junction Field Office RMP Revision Scoping Summary Report, finalized in April 2009 (BLM 2009a). A summary of the issues identified during public scoping and outreach is included in **Section ES.4**, Issues, below.

ES.4 ISSUES

Issue identification is the first step of the nine-step BLM planning process (see **Section 1.6.2**). A planning issue is a major controversy or dispute regarding management of resources or uses on BLM lands that can be addressed in a variety of ways, which is within the BLM's authority to resolve.

The issue-identification process began with the creation of a preparation plan for the GJFO RMP/EIS in January 2008. This plan, used by the GJFO's interdisciplinary team of resource experts to begin the planning process, highlighted anticipated planning issues, management concerns, and preliminary planning criteria developed internally by the BLM interdisciplinary team. Based on the lands and resources managed in the planning area, preliminary issues fell into 20 planning issue categories in the pre-scoping analysis. The comments received during the public scoping process were analyzed, and the pre-scoping planning issues were reorganized into 17 planning issue categories. Based on the issues and concerns heard during public scoping, a planning issue statement was developed for each planning issue category. The 17 planning issue categories and statements are presented in **Table ES-3**, Planning Issue Categories and Statements. The BLM used the planning issues and statements to help guide the development of a reasonable range of alternative management strategies for the RMP.

Table ES-3
Planning Issue Categories and Statements

Issue	Planning Issue Category	Planning Issue Statement
1.	Travel Management	How will motorized, nonmotorized, and mechanized travel be managed to provide commodity, amenity, and recreation opportunities, reduce user conflicts, enforce route designations and closures, reduce fragmentation and habitat degradation, and protect natural and cultural resources?
2.	Energy Development	Which areas should be open to oil and gas leasing, coal mining, and uranium development, and what restrictions should be employed to protect natural and cultural resources and minimize user conflicts?

Table ES-3
Planning Issue Categories and Statements

Issue	Planning Issue Category	Planning Issue Statement
3.	Recreation Management	How will recreation be managed to provide for a variety of recreational activities, while protecting natural and cultural resources, minimizing user conflicts, and providing socioeconomic benefits to local communities?
4.	Lands and Realty / Community Growth and Expansion	What opportunities exist to make adjustments to public land ownership that would increase the benefit to the public, local communities, and natural resources, while working towards BLM management goals? Should the BLM designate areas to accommodate major ROW corridors across the GJFO planning area, and are there areas that should be avoided or excluded from ROWs?
5.	Wildlife and Fish	How will land uses be managed to maintain and improve terrestrial and aquatic habitats? How will the BLM manage the public lands to provide for the needs of fish and wildlife species?
6.	Special Designation Areas	Where and what types of special designations exist or should be enacted to protect and enhance unique resources and educational and research opportunities, and how will the BLM manage them to maximize recreational opportunities and socioeconomic benefits?
7.	Lands With Wilderness Characteristics	How will the BLM protect and manage lands with wilderness characteristics?
8.	Water, Soil, and Riparian Areas	What measures will be implemented to protect water resources and source water protection areas from the effects of other uses while rehabilitating areas with soils degradation?
9.	Special Status Species Management	How will the BLM manage the public lands to provide for the needs of sensitive fish, wildlife, and plant species?
10.	Vegetation Management	What measures should be implemented to protect native vegetation and riparian areas, prevent the spread of noxious weeds, and manage wildland fires?
11.	Air Quality	What measures and monitoring should the BLM implement to maintain air quality standards?
12.	Grazing	How will the BLM manage livestock grazing on public lands, while protecting, managing, and restoring the land?
13.	Cultural, Heritage, and Paleontological Resources and Native American Religious Concerns	How can the BLM protect and conserve cultural and paleontological resources while allowing for other land and resource uses, and where should BLM manage heritage resources and areas?

Table ES-3
Planning Issue Categories and Statements

Issue	Planning Issue Category	Planning Issue Statement
14.	Social and Economic Considerations	How can the BLM promote or maintain activities that provide social and economic benefits to local communities?
15.	Public Health and Safety	What measures should be undertaken to promote a healthy environment for local communities?
16.	Noise	What measures should the BLM implement to preserve the natural soundscape in the planning area?
17.	Drought Management / Climate Change	How will the BLM incorporate the analysis of the impacts of a changing climate on natural resources in the planning area?

ES.5 PLANNING CRITERIA

Planning criteria are the standards, rules, and guidelines that help guide data collection and alternative formulation and selection in the RMP-development process. In conjunction with the planning issues, planning criteria ensure that the planning process is focused. The criteria also help guide the final plan selection and provide a basis for judging the responsiveness of the planning options.

The BLM developed preliminary planning criteria before public scoping meetings to set the side boards for focused planning of the GJFO RMP revision and to guide decision making by topic. The BLM introduced these criteria to the public for review in December 2008 at all scoping meetings and encouraged the public to comment on and suggest additions to these criteria through written correspondence and at the GJFO RMP revision website. There are 31 planning criteria (see **Section 1.7**, Legislative Constraints and Planning Criteria).

ES.6 MANAGEMENT ALTERNATIVES

The basic goal of developing alternatives is to prepare different combinations of resource uses and protections to address the identified major planning issues, enhance or expand resources or resource uses, and resolve conflicts among resources and resource uses. Alternatives must meet the purpose and need; be reasonable; provide a mix of resource protection, management use, and development; be responsive to the issues; meet the established planning criteria; and meet federal laws, regulations, policies, and standards, including the multiple use mandates of the FLPMA.

Following the close of the public scoping period in January 2009, the BLM began developing alternatives by assembling an interdisciplinary team of BLM resource specialists in the GJFO. The BLM's Northwest Colorado Resource Advisory Council chartered a subgroup in August 2008, whereby they appointed 11 members of the public to provide advice on developing a reasonable range of alternatives that adequately reflect public concern. The BLM coordinated with

cooperating agencies and the Northwest Resource Advisory Council subgroup beginning in August 2008 and continuing throughout the planning process. Between June 2009 and February 2010, the BLM interdisciplinary team developed management goals and objectives and management actions to meet those goals and objectives. Four management alternatives were developed to fulfill the purpose and need, to meet the multiple use mandates of the FLPMA, and to address the 17 planning issues. Chapter 2 describes the four alternatives: the No Action Alternative (Alternative A) and three action alternatives, Alternatives B, C, and D. The following sections provide some key components of the alternatives. The alternatives offer a range of management options that address the issues identified in the scoping process and other outreach activities, including, but not limited to: input from Cooperating Agencies, the Northwest Resource Advisory Council subgroup, visitor studies, focus groups, informal interviews, and reports, such as the Wild and Scenic River eligibility study (BLM 2009c) and Wild and Scenic River suitability study, ACECs evaluation (BLM 2010b), and Visual Resource Inventory study (Otak 2009).

Each alternative stands alone as a potential RMP and provides direction for resource programs based on the development of specific goals, objectives, and management actions. Described in each alternative is specific direction influencing land management with an emphasis on different combinations of resource uses and protections, allowable uses, and restoration measures to address issues and to resolve user conflicts. Resource program goals are met in varying degrees across alternatives. Resources or resource uses not tied to planning issues or mandated by laws and regulations often contain few or no differences in management between alternatives. Alternatives may also result in different long-term conditions.

The alternatives differ from one another in the relative emphasis given to particular resources or resource uses. Each alternative has been designed to respond to the planning issues differently, providing a range of possible management approaches that the BLM could implement. Distinctions between alternatives are expressed in the RMP by varying specific objectives, allowable uses, management actions, and implementation actions, such as travel route designations. Although each alternative stands alone as a potential RMP, the final Proposed Plan/Final EIS may include elements from multiple alternatives analyzed in this draft.

Summaries of the alternatives are presented below. A complete description of all decisions proposed for each alternative is included in Chapter 2. **Table ES-4**, Comparative Summary of Alternatives, highlights the meaningful differences among alternatives relative to what they establish and where they occur.

ES.6.1 Alternative A

The "No Action" alternative, Alternative A, is the continuation of present management direction and current prevailing conditions based on existing

planning decisions and amendments. This alternative meets the requirements of the NEPA (40 CFR Part 1502.14) that a no-action alternative be considered. "No action" means that current management practices, based on the existing GJFO RMP (BLM 1987), RMP amendments, and activity- or implementation-level plans, would continue. Goals and objectives for BLM land resources and resource uses would be based on the existing GJFO RMP, RMP amendments, and activity- or implementation-level plans. The emphasis would be on maintaining the existing land management direction for physical, biological, cultural, and historic resource values along with recreational, social, and economic land uses.

Direction contained in laws, regulations, and BLM policies superseding provisions of the existing RMP and amendments would be implemented.

The appropriate development scenarios for allowable uses (such as mineral leasing, locatable mineral development, recreation, timber harvest, utility corridors, and livestock grazing) would stay the same. There would be no change in goals, objectives, allowable uses, or management actions that are allowed, restricted, or prohibited on BLM lands and mineral estate. The BLM would not establish additional criteria or change present criteria to guide the identification of site-specific use levels for implementation activities.

ES.6.2 Alternative B (Preferred)

Alternative B seeks to balance resources among competing human interests, land uses, and the conservation of natural and cultural resource values, while sustaining the ecological integrity of certain key habitats for plant, wildlife, and fish species. It incorporates a balanced level of protection, restoration, enhancement, and use of resources and services to meet ongoing programs and land uses. Goals and objectives focus on environmental, economic, and social outcomes achieved by strategically addressing demands across the landscape.

ES.6.3 Alternative C

Alternative C emphasizes non-consumptive use and management of resources through protection, restoration, and enhancement, while also providing for multiple uses, including livestock grazing and mineral development. This alternative would establish the greatest number of special designation areas, with specific measures to protect or enhance resource values within these areas. Goals and objectives focus on environmental and social outcomes achieved by sustaining relatively unmodified physical landscapes and natural and cultural resource values for current and future generations.

Management direction would generally be ecologically based; existing uses would be recognized but would likely be limited to ensure the protection of natural and cultural values, including intangible Native American landscape values encompassing plant communities, wildlife, viewsheds, air, and water. The appropriate development scenarios for allowable uses, such as mineral leasing,

locatable mineral development, recreation, and livestock grazing, are contingent on meeting the essential conditions of natural and heritage resources.

ES.6.4 Alternative D

This alternative emphasizes active management for natural resources, commodity production, and public use opportunities. Resource uses, such as recreation, livestock grazing, mineral leasing and development, would be emphasized. Management direction would recognize and give precedence to existing uses and accommodate new uses to the greatest extent possible while maintaining resource conditions. The appropriate development scenarios for allowable uses would emphasize social and economic outcomes while protecting land health.

Table ES-4
Comparative Summary of Alternatives

Resource or Resource Use	Alt A (acres)	Alt B (acres)	Alt C (acres)	Alt D (acres)	Notes
Wildlife Emphasis Areas		***Figure 2-1***	***Figure 2-2***	***Figure 2-3***	
Beehive		4,700	4,700		
Blue Mesa		9,300	9,300		
Bull Hill		4,800	4,800		
Casto			4,200		
East Salt Creek		26,100	26,100		
Glade Park		27,200			Managed as an Area of Critical Environmental Concern (ACEC) under Alternative C.
Hawxhurst			9,400		
Indian Point			11,400		
Prairie Canyon		22,200	15,300		An additional 6,900 acres managed as an ACEC under Alternative C.
Rapid Creek		28,600	28,600		
Red Mountain			5,000		
Roan and Carr Creeks		17,700		33,400	33,600 acres managed as an ACEC under Alternative C.
South Shale Ridge		3,500	3,500		
Sunnyside		14,500	11,300		An additional 3,200 acres managed as an ACEC under Alternative C.
Timber Ridge		11,900	11,900		
Total	*0*	*170,500*	*145,500*	*33,400*	
Wild Horses	***Figure 2-4***				
Little Book Cliffs Wild Horse Range	35,200				
Visual Resource Management (VRM)	***Figure 2-5***	***Figure 2-6***	***Figure 2-7***	***Figure 2-8***	
VRM Class I	27,100	98,500	100,100	96,500	
VRM Class II	132,100	314,500	556,600	194,800	

Table ES-4
Comparative Summary of Alternatives

Resource or Resource Use	Alt A (acres)	Alt B (acres)	Alt C (acres)	Alt D (acres)	Notes
VRM Class III	206,100	458,600	215,000	530,100	
VRM Class IV		189,800	189,700	240,000	
Undesignated	696,100				
Lands Managed for Wilderness Characteristics Outside Existing Wilderness Study Areas		***Figure 2-9***	***Figure 2-10***		
Bangs Canyon			20,400		
East Demaree Canyon			4,800		
East Salt Creek			17,000		
Hunter Canyon			32,200		
Kings Canyon			9,600		
Lumsden Canyon			10,100		
Maverick		17,800	20,400		
South Shale Ridge			27,500		
Spink Canyon			13,100		
Spring Canyon			8,800		
Unaweep		6,700	7,200		
West Creek (adjacent)		20	100		
Total	*0*	*24,400*	*171,200*	*0*	
Livestock Grazing[1]	***Figure 2-11***	***Figure 2-12***	***Figure 2-13***	***Figure 2-14***	
Open to livestock grazing (acres)	978,600	961,100	586,600	977,200	
Closed to livestock grazing (acres)	48,600	66,000	440,400	49,900	
Starting available Animal Unit Months (AUMs)	61,270	60,633	32,658	61,270	
Extensive Recreation Management Areas	***Figure 2-15***	***Figure 2-16***		***Figure 2-17***	
34 and C Road		550		550	
Barrel Springs		10,300		10,300	
Castle Rock		4,400			
Dolores River Canyon		151,200		16,800	
Grand Junction ERMA	703,100				
Grand Valley		5,600			
Grand Valley Ranges				800	
Gunnison River Bluffs		800			
Palisade Rims		2,700			
South Shale Ridge				21,600	
Timber Ridge				11,900	
Total	*703,100*	*175,500*	*0*	*61,900*	
Special Recreation Management Areas	***Figure 2-18***	***Figure 2-19***	***Figure 2-20***	***Figure 2-21***	
Bangs	54,700	17,300	17,300	17,300	
Castle Rock				4,400	
Dolores River Canyon		16,900			

Table ES-4
Comparative Summary of Alternatives

Resource or Resource Use	Alt A (acres)	Alt B (acres)	Alt C (acres)	Alt D (acres)	Notes
Gateway Intensive Recreation Management Area	120,700				
Grand Valley Intensive Recreation Management Area	119,600				
Grand Valley				9,700	
Gunnison River Bluffs				800	
North Fruita Desert	63,300	44,100	42,700	44,100	
Palisade Rims				2,700	
Total	*358,300*	*78,300*	*60,000*	*79,000*	
Comprehensive Travel and Transportation Management	***Figure 2-22***	***Figure 2-23***	***Figure 2-24***	***Figure 2-25***	
Open to cross-country motorized use	445,400				
Open to motorized use	12,500	5,400		10,200	
Closed to motorized use	35,300	187,900	379,500	111,300	
Limited to existing routes for motorized use	342,700				
Limited to designated routes for motorized use	225,500	868,100	681,900	939,900	
Open to mechanized travel	12,500	5,400		10,200	
Closed to mechanized travel		158,500	367,000	98,000	
Limited to designated routes for mechanized travel	6,200	897,500	694,400	953,200	
Open to horse travel		1035,500	1,023,800	1,042,400	
Closed to horse travel		1,300	1,300	1,300	
Limited to designated routes for horse travel	6,200	24,600	36,300	17,700	
Open to foot travel		1,036,800	1,023,800	1,043,700	
Closed to foot travel			1,300		
Limited to designated routes for foot travel	6,200	24,600	36,300	17,700	
Lands and Realty	***Figure 2-26***	***Figure 2-27***	***Figure 2-28***	***Figure 2-29***	
ROW exclusion areas	234,900	204,200	365,800	104,100	
ROW avoidance areas	441,400	740,900	627,000	80,500	
Acres suitable for disposal *(Figures 2-30 through 2-33)*	16,100	12,500	2,600	18,000	
Coal Leasing	***Figure 2-34***	***Figure 2-35***	***Figure 2-36***	***Figure 2-37***	
Unacceptable for coal leasing	36,700	56,000	58,200	43,800	
Acceptable for coal leasing	300,700	253,400	251,200	265,600	
Fluid Mineral Leasing (in acres of federal mineral estate[2])					
Closed to fluid mineral leasing and geophysical exploration	96,500	202,400	623,600	100,500	

Table ES-4
Comparative Summary of Alternatives

Resource or Resource Use	Alt A (acres)	Alt B (acres)	Alt C (acres)	Alt D (acres)	Notes
BLM surface/federal minerals	96,500 *(Figure 2-38)*	182,700 *(Figure 2-39)*	554,700 *(Figure 2-40)*	100,000 *(Figure 2-41)*	
Private or State surface/federal minerals		19,700	68,900	500	
Open to fluid mineral leasing and geophysical exploration	1,134,600	1,028,800	607,600	1,130,700	
BLM surface/federal minerals	964,800 *(Figure 2-38)*	878,700 *(Figure 2-39)*	506,700 *(Figure 2-40)*	961,400 *(Figure 2-41)*	
Private or state surface/federal minerals	169,800	150,100	100,900	169,300	
Stipulations for Surface-Disturbing Activities (in acres of federal mineral estate[2]; *refer to Appendix B)*					
NSO stipulation for surface-disturbing activities	*(Figure 2-42)*[3]	614,000 *(Figure 2-43)*	858,000 *(Figure 2-44)*	497,800 *(Figure 2-45)*	
BLM surface/federal minerals		551,600	781,100	446,600	
Private or state surface/federal minerals		62,400	76,900	51,200	
CSU stipulation for surface-disturbing activities	*(Figure 2-46)*[3]	656,200 *(Figure 2-47)*	664,400 *(Figure 2-48)*	471,500 *(Figure 2-49)*	
BLM surface/federal minerals		618,100	627,000	458,700	
Private or state surface/federal minerals		38,100	37,400	12,800	
TL stipulation for surface-disturbing activities	*(Figure 2-50)*[3]	517,300 *(Figure 2-51)*	507,200 *(Figure 2-52)*	487,900 *(Figure 2-53)*	
BLM surface/federal minerals		457,300	447,200	455,100	
Private or state surface/federal minerals		60,000	60,000	32,800	
Open to leasing with NSO stipulation[4]	433,000 *(Figure 2-42)*	429,100	302,900	400,900	
BLM surface/federal minerals	433,000	382,200	266,300	349,700	
Private or state surface/federal minerals		46,900	36,600	51,200	
Open to leasing with CSU stipulation[4]	74,100 *(Figure 2-46)*	563,500	326,800	445,800	
BLM surface/federal minerals	74,100	527,500	303,500	433,000	
Private or state surface/federal minerals		3,600	23,300	12,800	
Open to leasing with TL stipulation[4]	233,000 *(Figure 2-50)*	401,600	241,600	438,700	
BLM surface/federal minerals	233,000	349,400	197,600	405,900	
Private or state surface/federal minerals		52,200	44,000	32,800	

Table ES-4
Comparative Summary of Alternatives

Resource or Resource Use	Alt A (acres)	Alt B (acres)	Alt C (acres)	Alt D (acres)	Notes
Locatable, Salable, and Non-energy Leasable Minerals					
Open to locatable mineral exploration or development	1,047,100	1,047,100	1,047,100	1,047,100	
Withdrawn from mineral entry *(Figure 2-54)*	20,100	20,100	20,100	20,100	
Petition to withdraw from locatable mineral exploration or development		23,900 *(Figure 2-55)*	45,100 *(Figure 2-56)*	1,300 *(Figure 2-57)*	
Open for consideration for mineral material (salables) disposal on a case-by-case basis	787,100 *(Figure 2-58)*	781,900 *(Figure 2-59)*	609,400 *(Figure 2-60)*	906,100 *(Figure 2-61)*	
Closed to mineral material (salables) disposal	274,300 *(Figure 2-58)*	279,600 *(Figure 2-59)*	452,000 *(Figure 2-60)*	155,300 *(Figure 2-61)*	
Open for consideration of non-energy leasable mineral prospecting and development		542,500 *(Figure 2-62)*	353,800 *(Figure 2-63)*	925,400 *(Figure 2-64)*	
Closed to potash or other non-energy leasable mineral exploration or development		518,900 *(Figure 2-62)*	707,600 *(Figure 2-63)*	136,000 *(Figure 2-64)*	
ACECs	***Figure 2-65***	***Figure 2-66***	***Figure 2-67***	***Figure 2-68***	**ACEC Values**
Atwell Gulch		2,900	6,100		Cultural and paleontological resources, rare plants, scenic values, wildlife habitat
Badger Wash	1,700	2,200	2,200	2,200	Rare plants, use as a hydrologic study area
Colorado River Riparian			880		Significant cottonwood and willow communities, fisheries and scenic values
Coon Creek			110		Riparian habitat, fisheries values
Dolores River Riparian		7,400	7,400		Riparian habitat, hydrology, scenic values, paleontological resources, fisheries and wildlife values
Glade Park-Pinyon Mesa			27,200		Occupied Gunnison sage-grouse habitat
Gunnison River Riparian			460		Riparian and fisheries values
Hawxhurst Creek			860		Riparian and fisheries values
Indian Creek		1,700	1,700		Wildlife and cultural values
John Brown Canyon			1,400		Old-growth pinyon-juniper woodlands
Juanita Arch		1,600	1,600		Rare plants, geologic values
Mt. Garfield		3,500	5,700		Scenic values
Nine-Mile Hill Boulders			90		Paleontological values

Table ES-4
Comparative Summary of Alternatives

Resource or Resource Use	Alt A (acres)	Alt B (acres)	Alt C (acres)	Alt D (acres)	Notes
The Palisade	23,600	32,200	32,200	26,900	Rare plant populations, scenic values, special status wildlife
Plateau Creek			220		Fish
Prairie Canyon			6,900		Rare plants and wildlife habitat
Pyramid Rock	600	1,300	1,300	1,300	Rare plant habitat, cultural resources, paleontological resources
Reeder Mesa			470		Plant resources
Roan and Carr Creeks		15,700	33,600		Unique riparian habitats, core conservation populations of cutthroat trout
Rough Canyon	2,700	2,800	2,800	2,700	Geologic values, wildlife habitat, cultural resources, rare plants
Sinbad Valley		6,400	6,400		Rare plants, wildlife, cultural resources, geologic values, scenic values
South Shale Ridge		28,200	28,200		Rare plants, wildlife habitat, scenic values
Unaweep Seep	80	85	85	80	Great Basin silverspot butterfly habitat, rare plants, riparian habitat, hydrologic values
Total	*28,900*	*106,000*	*168,000*	*33,200*	
Wilderness Study Areas	***Figure 2-69***				
Demaree Canyon	22,700				
Little Book Cliffs	29,300				
The Palisade	26,700				
Sewemup Mesa	17,800				
Total	*96,500*				
Wild and Scenic River Segments Eligible (Alternatives A and B) or Suitable (Alternative C) for Inclusion in the National Wild and Scenic Rivers System (in miles crossing BLM land)	***Figure 2-70***	***Figure 2-71***	***Figure 2-70***		**Classification**
Blue Creek	10.07		10.07		Scenic
Carr Creek	5.06		5.06		Scenic
Colorado River Segment 1	7.32		7.32		Recreational
Colorado River Segment 2	1.31		1.31		Recreational
Colorado River Segment 3	19.14		19.14		Scenic

Table ES-4
Comparative Summary of Alternatives

Resource or Resource Use	Alt A (acres)	Alt B (acres)	Alt C (acres)	Alt D (acres)	Notes
Dolores River	18.62	11.53	18.62		Recreational
East Creek	8.96		8.96		Recreational
Gunnison River Segment 2	3.85		3.85		Recreational
North Fork Mesa Creek	2.05		2.05		Scenic
North Fork West Creek	3.31		3.31		Wild
Roan Creek	6.47		6.47		Scenic
Rough Canyon Creek	4.22		4.22		Scenic
Ute Creek	4.19		4.19		Scenic
West Creek	4.93		4.93		Recreational
Total Miles	*99.5*	*11.53*	*99.5*	*0*	

Source: BLM 2010a
Hatching indicates zero acres or miles under that alternative.
[1]Portions of some allotments are outside of the GJFO planning area, but are administered by the GJFO. The inverse is also true where portions of allotments are within the GJFO planning area but are managed by another BLM Field Office. Additionally, not all lands within the planning area are allotted.
[2]Federal mineral estate includes mineral estate underlying BLM lands, privately owned lands, and state-owned lands. As such, federal mineral estate acres are greater than BLM surface acres. Federal mineral estate totals 1.2 million acres in the planning area.
[3]Acreage for Alternative A applies only to areas open to fluid mineral leasing.
[4]Stipulations may be applied to additional acreage if new information is provided (e.g., biological or cultural surveys).

ES.7 ENVIRONMENTAL CONSEQUENCES

The purpose of the environmental consequences analysis in this RMP/EIS is to determine the potential for significant impacts of the federal action on the human environment. Council on Environmental Quality regulations for implementing NEPA states that the "human environment" is interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment (40 CFR, Part 1508.14). The "federal action" is the BLM's selection of an RMP on which future land use actions will be based for the GJFO.

Chapter 4 objectively evaluates the likely direct, indirect, and cumulative impacts on the human and natural environment in terms of environmental, social, and economic consequences that are projected to occur from implementing the alternatives. Some types of impacts for resources or resource uses could be confined to BLM lands (such as soil disturbance from recreational use), whereas some actions may have off-site/indirect impacts on resources on federal mineral estate (such as energy and minerals and requirements to protect such resources as special status species and cultural resources) or other land jurisdictions (e.g., private or state lands). Some BLM management actions might affect only certain resources and alternatives. The impact analysis identifies both enhancing and improving effects on a resource from a management action, as well as those that have the potential to diminish resource values.

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Chapter 1

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FIGURES *(see Appendix A)*

1-1 Project Planning Area

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CHAPTER 1
INTRODUCTION

1.1 INTRODUCTION

The United States (US) Department of the Interior (DOI), Bureau of Land Management (BLM) has prepared this draft resource management plan (RMP) revision and environmental impact statement (EIS). The purposes of this document are:

- To provide direction for managing public lands under the jurisdiction of the BLM Grand Junction Field Office (GJFO); and
- To analyze the environmental effects that could result from implementing the alternatives addressed in the RMP.

The affected lands are managed under the 1987 Grand Junction RMP (BLM 1987) and associated plan amendments.

The land use planning process is the key tool the BLM uses to manage resources and to designate uses on its lands, in coordination with tribal, other federal, state, and local government, land users, and interested members of the public. Generally, an RMP does not result in a wholesale change of management direction; accordingly, this RMP incorporates new information and regulatory guidance that has been adopted since the previous plan (BLM 1987) and provides management direction where it may be lacking or where it requires clarification to resolve land use issues or conflicts. Current management direction that has proven effective and requires no change has been carried forward into this RMP and will be considered throughout the analysis process.

This RMP is being prepared using BLM planning regulations and guidance issued under the authority of the Federal Land Policy and Management Act (FLPMA) of 1976 (43 US Code [USC] 1701 et seq.) and the BLM's Land Use Planning Handbook, H-1601-1 (BLM 2005a). An EIS is incorporated into this document to meet the requirements of the National Environmental Policy Act of 1969

(NEPA), Council on Environmental Quality regulations for implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508), BLM NEPA regulations (43 CFR Part 46), and requirements of the BLM's NEPA Handbook, H-1790-1 (BLM 2008a). Because this RMP/EIS contains a broad range of information, **Diagram 1-1**, Document Organization, provides an outline of the RMP/EIS and describes the information found within each section. All maps for the RMP/EIS are provided in **Appendix A**, Figures. The management alternatives are presented in **Chapter 2**, Alternatives, and are supported by the stipulations contained in **Appendix B**, Stipulations Applicable to Fluid Mineral Leasing and Other Surface-disturbing Activities.

1.2 PURPOSE OF AND NEED FOR THE RESOURCE MANAGEMENT PLAN

The purpose of this RMP revision is to ensure that public lands are managed in accordance with the intent of Congress, as stated in the FLPMA, under the principles of multiple use and sustained yield. This will be accomplished by establishing desired goals, objectives, allowable uses, and management actions needed to achieve the desired conditions for resources and resource uses. The RMP incorporates new data, addresses land use issues and conflicts, specifies where and under what circumstances particular activities would be allowed on BLM lands, and incorporates the mandate of multiple uses in accordance with the FLPMA. The RMP does not describe how particular programs or projects would be implemented or prioritized; rather, those decisions are deferred to more detailed implementation-level planning.

The FLPMA requires that the BLM "develop, maintain, and, when appropriate, revise land use plans" (43 USC 1712 [a]). The public lands within the GJFO planning area are currently managed in accordance with the decisions in the 1987 Grand Junction RMP (BLM 1987). The BLM has completed approximately 50 maintenance actions and 12 RMP amendments since the 1987 Record of Decision (ROD) was signed. There is a need to revise the GJFO RMP due to new issues that have arisen since the original plan was prepared. Major issues contributing to the RMP revision include the following (additional planning issues identified for this plan are outlined in Section 1.6.1:

- Management of public land to support numerous wildlife species and their habitats.
- Management of public lands containing both wilderness character and oil and gas potential, including areas not designated as Wilderness Study Areas (WSAs).
- Management of energy and mineral resources, including identifying areas and conditions in which mineral development can occur.
- Management of increased visitation by way of off-highway vehicle (OHV) use and nonmotorized uses (e.g., mountain biking and hiking) that have led to increased concerns regarding resource protection and conflicting uses.

Diagram 1-1
Document Organization

Volume I

Executive Summary

Provides a concise overview of the Draft RMP/EIS

Chapter 1 Introduction

Summarizes the proposed action, purpose and need, and decisions to be made in the RMP/EIS

Chapter 2 Alternatives

Describes and compares the proposed management alternatives

Chapter 3 Affected Environment

Presents the existing biological, physical and socioeconomic resources that could be affected by implementing the management alternatives.

Volume II

Chapter 4 Environmental Consequences

Evaluates the impacts of the alternatives on the human and natural environment in terms of environmental, social and economic consequences projected to occur from implementing the alternatives.

Chapter 5 Consultation and Coordination

Describes the scoping and public comment process, agencies consulted, and government-to-government consultation, and lists the preparers of the RMP/EIS.

Chapter 6 References

Lists the documents and other sources used to prepare the RMP/EIS.

Glossary

Provides definitions for important terms used in the RMP/EIS.

Index

Lists where significant issues, resource descriptions, NEPA terms, and agencies and groups discussed in the RMP/EIS are located.

Appendix A Figures

Volume III

Appendices B through Q

B	Stipulations Applicable to Fluid Mineral Leasing and Other Surface-disturbing Activities
C	Wild and Scenic River Suitability Report
D	Summary of Areas of Critical Environmental Concern Report on the Application of Relevance and Importance Criteria
E	BLM Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado
F	Wilderness Characteristics Assessment
G	Draft Air Resources Management Plan
H	Best Management Practices and Standard Operating Procedures
I	Cultural Resources Allocation to Use Categories
J	Allotments and Allotment Levels
K	Description of Recreation Resources
L	Special Recreation Permits
M	Travel Management Plan
N	Coal Screening Criteria
O	Air Emissions Inventory
P	Leasing Reform and Master Leasing Plan Analysis
Q	Proposed Route Designations Maps (*see enclosed CD-ROM*)

- Completion of Wild and Scenic River (WSR) eligibility and suitability studies on river segments within the GJFO planning area.
- Consideration of opportunities for land tenure adjustment to improve public lands manageability.
- Expansion of communities and the urban interface.
- Consideration of right-of-way (ROW) exclusion areas and corridors.
- The needs of local government and citizens to be heard on an array of issues regarding both traditional and emerging uses of public land and their potential social and economic effects on local communities and values.

In addition, new resource assessments and scientific information is available to help the GJFO in revising previous decisions. Specifically, there may be a need to evaluate management prescriptions and resource allocations to address the increase in uses and demands on BLM lands (such as natural gas development and recreation), as well as the interest in protecting natural and cultural resources. There is also the need to revise the RMP to allow for updated BLM management direction, guidance, and policy. Land use plan decisions may be changed only through the amendment or revision process.

1.3 DESCRIPTION OF THE PLANNING AREA

The GJFO planning area is composed of BLM; US Department of Agriculture (USDA), Forest Service (US Forest Service); US Bureau of Reclamation (US BOR); and State of Colorado lands (**Table 1-1**, Land Status within the GJFO Planning Area) in Garfield, Mesa, Montrose, and Rio Blanco Counties in western Colorado. There are nearly 1.1 million acres of BLM-administered public lands and 1.2 million acres of federal mineral estate in the planning area. The McInnis Canyons and Dominguez-Escalante National Conservation Areas (NCAs), while managed by the BLM and within the GJFO boundary, are or will be managed under separate RMPs. As such, these NCAs are not within the GJFO RMP decision area and are not part of this planning effort, with the exception of the portion of the Colorado River within the McInnis Canyons NCA that is being studied under the WSR Suitability Report (**Appendix C**). This is because the Colorado River is not part of the McInnis Canyons NCA (Public Law 106-353). If the segment is found suitable for inclusion in the National Wild and Scenic Rivers System, a separate activity-level plan will be prepared to provide for the management of the river as suitable. In addition, the Colorado National Monument, managed by the National Park Service (NPS), is within the GJFO boundary but is not included in the planning area or this RMP effort. A map of the planning area is provided as **Figure 1-1**, Project Planning Area, in **Appendix A**, Figures.

Table 1-1
Land Status within the GJFO Planning Area

Land Status	Acres	Percentage of Planning Area
BLM	1,061,400	50
US BOR	7,900	less than 1
Local (State, County, and City)	3,400	less than 1
Private	714,100	30
State Wildlife Areas and State Recreation Areas (Colorado Parks and Wildlife [CPW])	1,400	less than 1
US Forest Service	380,000	20
Other	370	less than 1
Total	**2,168,600**	**100**

Source: BLM 2010a

The decision area for the RMP revision—those lands on which the RMP will make decisions—is composed of GJFO BLM lands within the larger planning area only, which comprise nearly 50 percent of the planning area (**Table 1-1**, Land Status within the GJFO Planning Area). Management direction and actions outlined in the RMP apply only to these BLM lands in the planning area and to federal mineral estate under BLM jurisdiction that may lie beneath other surface ownership. Federal mineral estate under BLM jurisdiction is composed of mineral estate underlying BLM lands, privately owned lands, and state-owned lands (**Table 1-2**, Mineral Status within the GJFO Planning Area by County). As such, federal mineral estate acres are greater than BLM surface acres. No specific measures have been developed for private, state, or other federal lands, but given that these lands are interspersed with BLM lands, they could be influenced or be indirectly affected by BLM management actions. BLM management authority on lands with a split estate (e.g., private surface but federal minerals) is limited to activities (both surface and subsurface) related to exploration and development of the minerals. The BLM adopts the leasing

Table 1-2
Mineral Status within the GJFO Planning Area by County

Land Status (acres)	Garfield County	Mesa County	Montrose County	Rio Blanco County	Total
BLM/Federal Minerals	322,600	721,700	17,100	0	1,061,400
Private Surface/Federal Minerals	33,300	132,700	200	400	166,600
State Surface/Federal Minerals	0	1,200	0	0	1,200
Local Surface/Federal Minerals	0	2,100	0	0	2,100

Source: BLM 2010a

requirements determined by other surface-managing agencies when leasing the mineral estate under those lands with a split estate. Lands administered by the Forest Service would have leasing decisions made in the appropriate Forest Service Land and Resource Management Plan/EIS. In its plans, the Forest Service analyzes impacts from oil and gas leasing and development on National Forest System Lands and describes where the Forest Service will or will not consent to leasing.

1.4 PLANNING PROCESS

The process for developing, approving, maintaining, and amending or revising the RMP was initiated under the authority of Section 202(f) of FLPMA and Section 202(c) of NEPA. The process is guided by BLM planning regulations codified in 43 CFR 1600 and Council on Environmental Quality regulations codified in 40 CFR 1500 and has two tiers:

1. The land use planning tier; and
2. The implementation tier.

In the land use planning tier, the BLM develops the RMP. The RMP prescribes the allocation of and general future management direction for the resources and land uses of BLM-managed lands in the GJFO planning area. The RMP then guides the implementation tier, which includes site-specific activity or implementation planning and daily operations. Activity or implementation planning converts the resource and land use decisions of the RMP into site-specific management decisions for smaller geographic units of public lands within the GJFO planning area. Activity planning includes elements such as allotment management plans (AMPs), habitat management plans, and interdisciplinary or coordinated activity plans that issue various land and resource use authorizations. Activity planning also may include identification of specific mitigation needs and development and implementation of other similar plans and actions.

An RMP guides the management of BLM lands in a particular area or administrative unit and is usually prepared to cover the lands administered by a certain BLM field office. As part of this RMP revision, published documents will include a draft RMP/EIS, proposed RMP/final EIS, and approved RMP/Record of Decision (ROD). The approved RMP/ROD will describe the following:

- Resource conditions goals and objectives;
- Allowable resource uses and related levels of production or use to be maintained;
- Land areas to be managed for limited, restricted, or exclusive resource uses or for transfer from BLM administration;
- Program constraints and general management practices and protocols;

- General implementation schedule or sequences; and
- Intervals and standards for monitoring the RMP.

Preparation of an RMP involves interrelated steps, as illustrated in **Diagram 1-2**, BLM Planning Process, and described in **Table 1-3**, BLM Planning Steps.

1.5 SCOPING AND PLANNING

Public involvement is a vital component of both the RMP and EIS processes. Public involvement includes the public in the decision-making process and allows for full environmental disclosure. The regulatory requirements for public involvement in NEPA procedures are addressed in 40 CFR 1506.6. Section 202 of FLPMA directs the Secretary of the Interior to establish procedures for public involvement during land use planning actions on public lands. These procedures can be found in 43 CFR 1610.2 and the BLM's Land Use Planning Handbook, H-1601-1 (BLM 2005a). Public involvement for the GJFO RMP/EIS includes the following four phases:

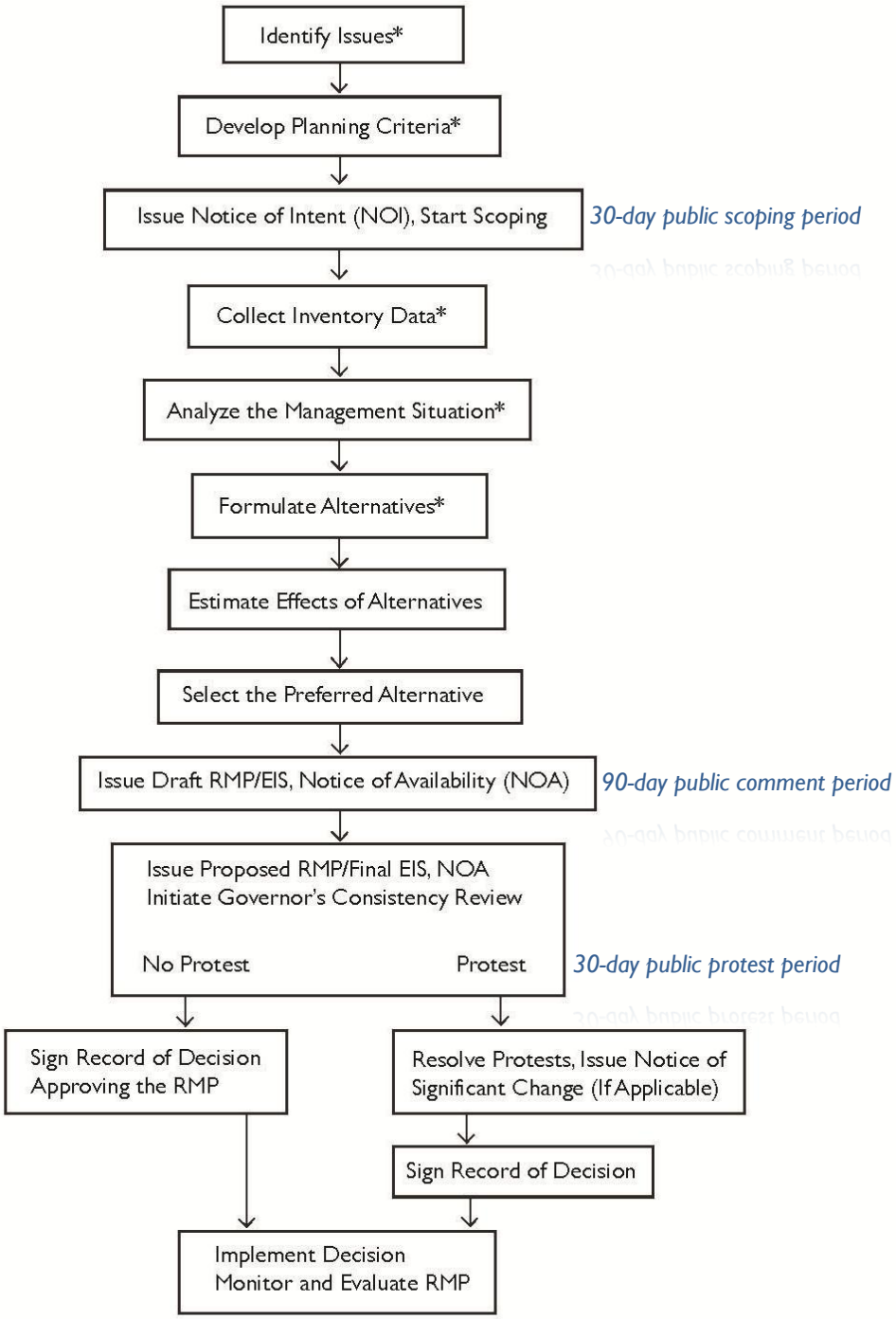
- Public scoping before NEPA analysis begins, to determine the scope of issues and alternatives to be addressed in the RMP/EIS;
- Public outreach via newsletters and news releases;
- Collaboration with federal, state, local, and tribal governments, the BLM Colorado Northwest Resource Advisory Council (RAC), and cooperating agencies; and
- Public review of and comment on the draft RMP/EIS, which analyzes likely environmental effects and identifies the BLM's preferred alternative.

The public scoping phase of the process has been completed and is described in Section 1.5.1, Public Scoping. The public outreach and collaboration phases are ongoing, while public review of the draft RMP/EIS is estimated for Fall 2012. Information about the RMP/EIS process can be obtained by the public at any time on the project Web site at http://www.blm.gov/co/st/en/fo/gjfo/rmp.html. This Web site contains background information about the project, a public involvement timeline and calendar, maps and photos of the planning area, and copies of public information documents released throughout the RMP/EIS process.

1.5.1 Public Scoping

The formal public scoping process for the GJFO RMP/EIS began on October 15, 2008, with the publication of the Notice of Intent in the Federal Register (Vol. 73, No. 200, page 61164). The Notice of Intent, also posted on the project Web site, notified the public of the BLM's intent to develop an RMP for the GJFO; it also initiated the public scoping period, which closed on January 9, 2009. Pubic scoping activities included the following:

Diagram 1-2
BLM Planning Process



*These steps may be revisited throughout the planning process and may overlap other steps.

Table 1-3
BLM Planning Steps

BLM Planning Process Step	Description	Timeframe
Step 1—Prepare to Plan	A properly prepared preparation plan provides the foundation for the entire planning process.	July to November 2008
Step 2—Analyze the Management Situation	The current management of resources in the planning area is assessed.	March to August 2009
Step 3—Issue Notice of Intent to Prepare the RMP/EIS and Start Scoping	Notify the public, Indian Tribes, other Federal agencies, and state and local governments about the BLM's intent to engage in land use planning for the GJFO.	October 2008
Step 4—Conduct Scoping	Issues and concerns are identified through a scoping process that includes the public, Indian tribes, other federal agencies, and state and local governments.	October 2008 to January 2009
Step 5—Formulate Alternatives	A range of reasonable management alternatives is developed to address issues identified during scoping.	September 2009 to October 2010
Step 6—Analyze Effects of Alternatives	The effects of each alternative are estimated.	October 2010 to April 2011
Step 7—Select a Preferred Alternative	The alternative that best resolves planning issues is identified as the preferred alternative.	April 2011
Step 8—Prepare a Draft RMP/Draft EIS	This document describes the purpose and need for the plan, the affected environment, the alternatives for managing public lands within the planning area (including the preferred alternative), the environmental impacts of those alternatives, and the consultation and coordination in which the BLM engaged in developing the plan	May 2011 to December 2012
Step 9—Publish Notice of Availability	Provide a 90-day public comment period.	January 2013 to April 2013
Step 10—Prepare a Proposed RMP/Final EIS	After comments on the draft document have been received and analyzed, it is modified as necessary.	*Estimated* Spring 2013 to Winter 2014
Step 11—Publish Notice of Availability	Provide a 30-day public comment period.	*Estimated* Winter 2014
Step 12—Provide a 60-day Governor's Consistency Review Period	Concurrent with the 30-day public comment period.	*Estimated* Winter 2014
Step 13—Prepare a Record of Decision/Approved RMP	A Record of Decision is signed to approve the RMP/EIS.	*Estimated* Summer 2014
Step 14—Implement, Monitor, and Evaluate Plan Decisions	Management measures outlined in the approved plan are implemented on the ground, and monitoring is conducted to test their effectiveness. Changes are made as necessary to achieve desired results.	Ongoing after RMP approval

- The BLM issued a news release to local news organizations on November 6, 2008, announcing the scoping period for the GJFO RMP/EIS process and providing information on the scoping open houses.
- The BLM compiled a mailing list of over 680 individuals, agencies, and organizations that have participated in past BLM projects. Attendees at the scoping open houses were added to the mailing list if they wanted to receive or continue to receive project information. In addition, all individuals or organizations who submitted scoping comments were added to the mailing list. Through this process, the mailing list was revised to include approximately 870 entries.
- The BLM mailed a newsletter on November 11, 2008, announcing the start of the scoping period for the GJFO RMP/EIS to the over 680 individuals, agencies, and organizations on the initial mailing list. The newsletter provided the dates and venues for the three scoping open houses, included a comment form for submitting scoping comments, and described the various methods for submitting comments, including dedicated email and postal addresses.
- The BLM hosted three scoping open houses to provide the public with opportunities to become involved, to learn about the project and the planning process, to meet the GJFO RMP team members, and to offer comments. Open houses were held in Grand Junction, Colorado on December 2, 2008; in Moab, Utah on December 3, 2008; and in Collbran, Colorado on December 4, 2008. In total, 114 people attended these open houses.

The BLM received 149 unique written submissions containing 953 separate comments during the public scoping period. Detailed information about the comments received and about the public outreach process can be found in the Grand Junction Field Office RMP Revision Scoping Summary Report, finalized in April 2009 (BLM 2009a), and available on the project Web site. A summary of the issues identified during public scoping and outreach is included in Section 1.6, Issues, of this RMP/EIS.

1.6 ISSUES

The GJFO enacted a multi-step issue-identification process for the RMP planning effort. The GJFO provided numerous opportunities to the public, various groups, other federal agencies, Native American tribal members, and state and local governments to participate meaningfully and substantively and to give input and comments to the BLM during the preparation of the RMP/EIS. Early in the planning process, the public was invited to identify planning issues and concerns for managing BLM lands, resources, and uses in the planning area.

1.6.1 Issue Identification

Issue identification is the first step of the nine-step BLM planning process (**Diagram 1-2**). A planning issue is a major controversy or dispute regarding management of resources or uses on BLM lands that can be addressed in a variety of ways, which is within the BLM's authority to resolve.

The issue-identification process began with the creation of a preparation plan for the GJFO RMP/EIS in January 2008. This plan, used by the interdisciplinary team to begin the planning process, highlighted anticipated planning issues, management concerns, and preliminary planning criteria developed internally by the BLM interdisciplinary team. Based on the lands and resources managed in the planning area, preliminary issues fell into 20 planning issue categories in the pre-scoping analysis. The comments received during the public scoping process were analyzed, and the pre-scoping planning issues were reorganized into 17 planning issue categories. Based on the issues and concerns heard during public scoping, a planning issue statement was developed for each planning issue category. The 17 planning issue categories and statements are presented in **Table 1-4**, Planning Issue Categories and Statements. The BLM used the planning issues and statements to help guide the development of a reasonable range of alternative management strategies for the RMP.

Table 1-4
Planning Issue Categories and Statements

Issue	Planning Issue Category	Planning Issue Statement
1.	Travel Management	How will motorized, nonmotorized, and mechanized travel be managed to provide commodity, amenity, and recreation opportunities, reduce user conflicts, enforce route designations and closures, reduce fragmentation and habitat degradation, and protect natural and cultural resources?
2.	Energy Development	Which areas should be open to oil and gas leasing, coal mining, and uranium development, and what restrictions should be employed to protect natural and cultural resources and minimize user conflicts?
3.	Recreation Management	How will recreation be managed to provide for a variety of recreational activities, while protecting natural and cultural resources, minimizing user conflicts, and providing socioeconomic benefits to local communities?
4.	Lands and Realty / Community Growth and Expansion	What opportunities exist to make adjustments to public land ownership that would increase the benefit to the public, local communities, and natural resources, while working towards BLM management goals? Should the BLM designate areas to accommodate major ROW corridors across the GJFO planning area, and are there areas that should be avoided or excluded from ROWs?

Table 1-4
Planning Issue Categories and Statements

Issue	Planning Issue Category	Planning Issue Statement
5.	Wildlife and Fish	How will land uses be managed to maintain and improve terrestrial and aquatic habitats? How will the BLM manage the public lands to provide for the needs of fish and wildlife species?
6.	Special Designation Areas	Where and what types of special designations should be enacted to protect and enhance unique resources and educational and research opportunities, and how will the BLM manage them to maximize recreational opportunities and socioeconomic benefits?
7.	Lands with Wilderness Characteristics	How will the BLM protect and manage lands with wilderness characteristics?
8.	Water, Soil, and Riparian Areas	What measures will be implemented to protect water resources and source water protection areas from the effects of other uses while rehabilitating areas with soils degradation?
9.	Special Status Species Management	How will the BLM manage the public lands to provide for the needs of sensitive fish, wildlife, and plant species?
10.	Vegetation Management	What measures should be implemented to protect native vegetation and riparian areas, prevent the spread of noxious weeds, and manage wildland fires?
11.	Air Quality	What measures and monitoring should the BLM implement to maintain air quality standards?
12.	Grazing	How will the BLM manage livestock grazing on public lands, while protecting, managing, and restoring the land?
13.	Cultural, Heritage, and Paleontological Resources and Native American Religious Concerns	How can the BLM protect and conserve cultural and paleontological resources while allowing for other land and resource uses, and where should BLM manage heritage resources and areas?
14.	Social and Economic Considerations	How can the BLM promote or maintain activities that provide social and economic benefits to local communities?
15.	Public Health and Safety	What measures should be undertaken to promote a healthy environment for local communities?
16.	Noise	What measures should the BLM implement to preserve the natural soundscape in the planning area?
17.	Drought Management / Climate Change	How will the BLM incorporate the analysis of the impacts of a changing climate on natural resources in the planning area?

1.6.2 Issues Considered but Not Further Analyzed

In addition to planning issues, public scoping comments also addressed issues that are policy or administrative actions; issues that have been or will be addressed by the GJFO outside of the RMP; and issues that are outside the scope of the RMP. The Grand Junction Field Office RMP Revision Scoping Summary Report (BLM 2009a) provides a comprehensive list of issues outside the scope of the RMP.

1.7 LEGISLATIVE CONSTRAINTS AND PLANNING CRITERIA

The FLPMA is the primary authority for the BLM to manage its lands. This law establishes provisions for land use planning, land acquisition and disposition, administration, rangeland management, ROWs, and designated management areas, and the repeal of certain laws and statutes. NEPA requires the consideration and public availability of information on the environmental impacts of major federal actions significantly affecting the quality of the human environment.

Planning criteria are the standards, rules, and guidelines that help guide data collection and alternative formulation and selection in the RMP-development process. In conjunction with the planning issues, planning criteria ensure that the planning process is focused. The criteria also help guide the final plan selection and provide a basis for judging the responsiveness of the planning options.

The BLM developed preliminary planning criteria before public scoping meetings to set the side boards for focused planning of the GJFO RMP revision and to guide decision making by topic. The BLM introduced these criteria to the public for review in December 2008 at all scoping meetings and encouraged the public to comment on and suggest additions to these criteria through written correspondence and at the GJFO RMP revision Web site, http://www.blm.gov/co/st/en/fo/gjfo/rmp.html. The planning criteria are:

1. Only public lands and mineral resources managed by BLM are covered in the RMP. No decisions will be made relative to non-BLM-administered lands.
2. The planning process will follow the 14 stages of an EIS-level planning process: 1) prepare to plan; 2) issue a notice of intent to prepare the RMP/EIS and start scoping; 3) conduct scoping; 4) analyze the management situation; 5) formulate alternatives; 6) analyze the effects of the alternatives; 7) select a preferred alternative; 8) prepare a draft RMP and draft EIS; 9) publish a notice of availability and provide a public comment period; 10) prepare a proposed RMP and final EIS; 11) publish a notice of availability, provide a protect period, and resolve protests; 12) provide a Governor's consistency review period; 13) determine need for a notice of significant change and provide a comment period if necessary; and 14) prepare a record of decision and approved RMP.

For specific information, refer to the BLM Land Use Planning Handbook, H-1601-1 (BLM 2005a).

3. For program-specific guidance of land use planning level decisions, the process will follow the Land Use Planning Manual 1601 (BLM 2000) and Handbook H-1601-1, Appendix C (BLM 2005a).
4. Broad-based public participation will be an integral part of the planning and EIS process.
5. Decisions in the RMP will strive to be compatible with the existing plans and policies of adjacent local, state, federal, and tribal agencies, as long as the decisions are consistent with the purposes, policies, and programs of federal law and regulations applicable to public lands.
6. The RMP will recognize the state's responsibility and authority to manage wildlife.
7. The RMP will recognize the Office of Surface Mining's responsibility and authority to regulate coal activities.
8. The BLM will recognize the State's responsibility for permitting related to oil and gas activities and in regulating air quality impacts.
9. The BLM will recognize the State's and counties' responsibilities for permitting related to mineral extraction activities (i.e., uranium, gold, coal, and sand and gravel), and in regulating water quality impacts.
10. The National Sage-grouse Strategy directs that impacts to sagebrush habitat and sagebrush-dependent wildlife species be analyzed and considered in BLM land use planning efforts for public lands with sagebrush habitat in the planning area.
11. The RMP will recognize valid existing rights.
12. The RMP/EIS will incorporate existing adequate management decisions brought forward from existing planning documents.
13. The planning team will work cooperatively and collaboratively with cooperating agencies and all other interested groups, agencies, and individuals.
14. The BLM and cooperating agencies will jointly develop alternatives for resolution of resource management issues and management concerns.
15. The planning process will incorporate the BLM Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado (BLM 1997a) as goal statements.

16. Areas with special environmental quality will be protected and, if necessary, designated as Areas of Critical Environmental Concern (ACECs), WSRs, or other appropriate designations.
17. Any public land surface found to meet the suitability factors to be given further consideration for inclusion in the National WSR System will be addressed in the RMP revision effort in terms of developing interim management options in the EIS alternatives.
18. The WSAs will continue to be managed under the Interim Management Policy for Lands under Wilderness Review, H-8550-1 (BLM 1995a) until Congress either designates all or portions of the WSA as wilderness or releases the lands from further wilderness consideration. It is no longer the policy of the BLM to make formal determinations regarding wilderness character, to designate additional WSAs through the RMP process, or to manage any lands other than existing WSAs in accordance with the Interim Management Policy.
19. Forest management strategies will be consistent with the Healthy Forests Restoration Act.
20. The planning process will involve American Indian tribal governments and will provide strategies for the protection of recognized traditional uses.
21. Any location-specific information pertaining to cultural or paleontological resources (map, description, or photo) is proprietary to the BLM and will not become the property of any contractors working on the EIS or attached to any document (paper or electronic), nor is this information subject to any public release or Freedom of Information Act requests (43 CFR 7.18).
22. All proposed management actions will be based upon current scientific information, research, and technology, as well as existing inventory and monitoring information.
23. The RMP will include adaptive management criteria and protocol to deal with future issues.
24. The planning process will use applicable BLM Colorado mitigation guidelines to develop management options and alternatives and to analyze their impacts. The guidelines will also be part of the planning criteria for developing the options and alternatives, as well as for determining mitigation requirements.
25. A reasonable foreseeable development scenario for fluid minerals will be developed from analysis of past activity and production, which will aid in the environmental consequences analysis.

26. Planning and management direction will be focused on the relative values of resources and not on the combination of uses that will give the greatest economic return or economic output.
27. Where practicable and timely for the planning effort, current scientific information, research, and new technologies will be considered.

Additional criteria received in public scoping comments suggested during the scoping period (October 15, 2008, to January 9, 2009) and added to the list of planning criteria include the following:

1. The BLM will address lands with wilderness characteristics as a separate and unique issue in the planning process, including in its planning criteria.
2. The BLM will incorporate key aspects of its OHV regulations, as well as ecological metrics, in planning criteria.
3. The National Sage-grouse Strategy criteria should state that impacts to sagebrush-dependent wildlife will be minimized whenever possible. Current scientific information should be used, especially regarding buffer areas around leks, nesting areas, and brood rearing areas for both sage-grouse species.

All management direction and/or actions developed as part of the BLM planning process are subject to valid existing rights and must meet the objectives of BLM's multiple-use management mandate and responsibilities (FLPMA Section 202[c] and [e]). Valid existing rights include all valid lease, permit, patent, ROWs, or other land use rights or authorizations in effect on the date of approval of this RMP. Current BLM policy does not allow BLM to consider unadjudicated Revised Statute 2477 claims as valid existing rights. The current moratorium precluding the BLM from processing Revised Statute 2477 claims is still in effect, making Revised Statute 2477 assertions a legal issue beyond the scope of this planning effort.

1.8 Resource Management Plan Amendments and Implementation-level Plans

Since the GJFO RMP (BLM 1987) was developed and approved, it has been necessary to amend it to respond to new issues and conditions. As the land use plan guidance is put into practice on the ground, implementation-level (activity-level) planning is directed by the land use plan (RMP), BLM policy, and program-specific guidance. **Table 1-5**, RMP Amendments and Implementation-level Plans, identifies approved plan amendments incorporated into the current land use plan and implementation-level plans. These amendments and plans provide a perspective of the many management considerations pertinent to the decision area.

Table 1-5
RMP Amendments and Implementation-level Plans

Amendments to 1987 RMP
Environmental Assessment (EA) for Hawxhurst Land Exchange and RMP Amendment (BLM 1993a)
Withdrawal of Public Lands from Location and Entry Under the Mining Laws, and Amendment to the Grand Junction Resource Area RMP (Walker Field Airport) (BLM 1993b)
EA for Grand Mesa Slopes Special Management Area Management Plan (BLM 1995b)
EA for Gunnison River Bluffs Plan and Powerline Road Public Access (BLM 1997b)
EA for Mineral Withdrawal for Unaweep Seep/West Creek Area (BLM 1999a)
EA for Oil Shale Withdrawal Revocation/RMP Amendment (BLM 2001)
North Fruita Desert Management Plan and Grand Junction RMP Amendment (BLM 2004a)
EA for Bangs Canyon Management Plan Implementation (BLM 2004b)
Record of Decision for Implementation of a Wind Energy Development Program and Associated Land Use Plan Amendments (BLM 2005b)
BLM Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States – Final Programmatic EIS Record of Decision (BLM 2007)
Approved RMP Amendments and Record of Decision for Oil Shale and Tar Sands Resources to Address Land Use Allocations in Colorado, Utah, and Wyoming, and Final Programmatic EIS (BLM 2008c)
Record of Decision and Resource Management Plan Amendments for Geothermal Leasing in the Western United States (BLM 2008d)
Approved Resource Management Plan Amendments/Record of Decision for Designation of Energy Corridors on Bureau of Land Management-Administered Lands in the 11 Western States (US Department of Energy [US DOE] and BLM 2009)
Implementation-Level Plans
Grand Junction Grazing Management, Proposed Domestic Livestock Grazing Program, Final EIS (BLM 1979)
Badger Wash, Pyramid Rock, and Rough Canyon Combined Activity Plan and EA (BLM 1992a)
Little Book Cliffs Wild Horse Management Plan (BLM 1992b)
Grand Mesa Slopes Special Management Area Management Plan (BLM et. al. 1993)
Gunnison River Bluffs Public Use Plan (BLM 1995c)
Bangs Canyon Management Plan (BLM 1999b)
Unaweep Seep Natural Area Management Plan and EA (BLM 1999c)
Little Book Cliffs Wild Horse Range Population Management Plan (BLM 2002)
Fire Management Plan for the Colorado National Monument and BLM Grand Junction Field Office (BLM 2008b)
EA for Integrated Weed Management (BLM 2010b)

1.9 COLLABORATION

The benefits of enhanced collaboration among agencies in preparing NEPA analyses include the following:

- Disclosing relevant information early in the analytical process;
- Applying available technical expertise and staff support;
- Avoiding duplication with other federal, state, tribal, and local procedures; and
- Establishing a mechanism for addressing intergovernmental issues.

Additional information regarding collaboration with governments, agencies, and tribal representatives is provided in **Chapter 5**, Consultation and Coordination.

1.10 RELATED LAND USE PLANS

The BLM's planning regulations require that its RMPs be consistent with officially approved or adopted land use-related plans of other federal, state, local, and tribal governments, to the extent that those plans are consistent with the purposes, policies, and programs of federal laws and regulations applicable to public lands. Plans formulated by federal, state, local, and tribal governments that relate to managing lands and resources have been reviewed and considered as the RMP/EIS has been developed. These plans are listed below.

1.10.1 Other Federal Plans

National BLM

- National Sage-grouse Planning Strategy (in progress)

Neighboring BLM Offices

- Colorado River Valley Field Office RMP revision (in progress)
- Uncompahgre Field Office RMP revision (in progress)
- Dominguez-Escalante NCA RMP (in progress)
- McInnis Canyons NCA RMP (BLM 2004e)
- Moab Field Office RMP (BLM 2008e)
- White River Field Office RMP revision (BLM 1997c)

US Fish and Wildlife Service, Colorado

- Programmatic Biological Opinion for Water Depletions Associated with BLM's Fluid Minerals Program Within the Upper Colorado River Basin in Colorado, issued December 19, 2008 (#ES/GJ-6-CO-08-F-0006)
- Programmatic Biological Opinion for Water Depletions Associated with BLM Projects (excluding Fluid Minerals Development)

Authorized by BLM in the Upper Colorado River Basin in Colorado, issued February 25, 2009 (#ES/GJ-6-CO-08-F-0010)

US Forest Service, Colorado

- Noxious and Invasive Weed Management Plan for Oil and Gas Operators (US Forest Service and BLM 2007)
- US Forest Service Roadless Inventory and Associated EIS (US Forest Service 2001)
- Proposed Forest Plan for Grand Mesa, Uncompahgre, and Gunnison National Forests (US Forest Service 2007)
- Grand Mesa, Uncompahgre and Gunnison National Forests Oil and Gas Leasing Final Environmental Impact Statement (USDA Forest Service 1993)
- White River National Forest Oil and Gas Leasing Final Environmental Impact Statement (USDA Forest Service 1993)

1.10.2 State Plans

- Colorado Greater Sage-grouse Conservation Plan (CPW 2008a)
- Colorado Division of Wildlife Strategic Plan 2010-2020 (CPW 2009a).
- Gunnison Sage-grouse Conservation Plan, Piñon Mesa, Colorado (Piñon Mesa Gunnison Sage Grouse Partnership 2000)
- Gunnison Sage-grouse Rangewide Conservation Plan (Gunnison Sage-grouse Rangewide Steering Committee 2005)
- Conservation Assessment of Greater Sage-grouse and Sagebrush Habitats (Connelly et al. 2004)
- Colorado Sagebrush: A Conservation Assessment and Strategy (Boyle and Reeder 2005)
- Colorado's Comprehensive Wildlife Conservation Strategy (CPW 2006)
- Colorado Parks and Wildlife Data Analysis Unit Plans (CPW undated)
- Parachute-Piceance-Roan Greater Sage-grouse Conservation Plan (Parachute-Piceance-Roan Greater Sage-grouse Work Group 2008)

1.10.3 Local Government Plans

- Mesa County Noxious Weed Management Plan (Mesa County 2009a)
- Mesa County Mineral and Energy Resources Master Plan (Mesa County 2011)

- Mesa Countywide Land Use Plan (Mesa County 1996)
- City of Grand Junction Comprehensive Plan (City of Grand Junction 2009)
- Fruita Community Plan (City of Fruita 2008)
- Town of Palisade Compressive Plan (Town of Palisade 2007)

1.11 IMPLEMENTATION AND MONITORING OF THE RESOURCE MANAGEMENT PLAN

Implementation of the RMP would begin when the Colorado BLM State Director signs the ROD for the RMP. Decisions in the RMP would be tied to the BLM budgeting process. An implementation schedule would be developed, providing for systematic accomplishment of decisions in the approved RMP. The BLM will prepare supplementary rules in order to provide full authority to BLM Law Enforcement to enforce management decisions made in the approved RMP pursuant to the BLM's authority under 43 CFR § 8365.1-6.

During implementation of the RMP, site-specific analysis may be required, which can vary from a simple statement of conformance with the ROD to more complex documents that analyze several alternatives. For example, an EA could be required for some large-scale implementation decisions, such as travel management decisions. An EA documents the NEPA requirements for site-specific actions.

The RMP would be monitored and periodically evaluated based on guidance in the BLM's Land Use Planning Handbook, H-1601-1 (BLM 2005a). Monitoring is the process of tracking and documenting the implementation (or the progress of implementation) of land use plan decisions. Evaluation is the process of reviewing the land use plan and the periodic plan monitoring reports to determine whether the land use plan decisions and NEPA analysis are still valid and where the plan is being implemented. As outlined in BLM's Land Use Planning Handbook, H-1601-1, the plan should be periodically evaluated (at a minimum every 5 years) as documented in an evaluation schedule. Revisions or amendments to the RMP may be necessary to accommodate changes in resource needs, policies, or regulations. Other decisions would be issued in order to fully implement the RMP.

Chapter 2

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CHAPTER 2
ALTERNATIVES

2.1 INTRODUCTION

This chapter details the proposed Alternatives A through D that are considered in the draft RMP/EIS and maps (**Appendix A**, Figures) to show where actions are applicable. The alternatives respond to identified issues and concerns, resolve problems with management, and explore opportunities for enhancing or expanding resources or resource uses. (The McInnis Canyons and Dominguez-Escalante NCAs, while within the planning area, are not included in this draft RMP/EIS.)

Under the Mineral Leasing Act of 1920, the BLM is the agency responsible for the administration of leasing and development of the federal mineral estate. In the planning area, subsurface mineral estate administered by the BLM (federal mineral estate) totals 1.2 million acres. The mineral estate acres are greater than BLM surface acres (1,061,400 acres) because the BLM manages federal mineral estate underlying some privately owned lands, state-owned lands, and National Forest System lands.

Appendix B, Stipulations Applicable to Oil and Gas Leasing and Other Surface-disturbing Activities, applies to fluid mineral leasing on BLM lands overlying federal mineral estate. Where appropriate, stipulations also apply to other surface-disturbing activities (and occupancy) associated with land use authorizations, permits, and leases issued on all BLM lands. The intent of these stipulations is to consistently mitigate impacts by applying the same stipulation to land use authorizations across the board. It is the BLM's intent to incorporate the same level of restrictions, to the extent practicable, on agency proposed projects. Stipulations also apply to federal mineral estate underlying privately owned lands or state-owned lands. Acreages in Chapter 2 and Appendix B reflect federal mineral estate overlain by BLM, private, and state-owned land.

Stipulations may be applied to land managed by other federal agencies at the leasing phase, based on coordination with the agency. Acreages for alternatives in this chapter and stipulations in Appendix B are calculated based on current information and may be adjusted in the future through RMP maintenance, as conditions warrant.

Data from geographic information systems (GIS) have been used in developing acreage calculations and for generating many of the figures in Appendix A. Calculations are dependent upon the quality and availability of data and most calculations in this RMP are rounded to the nearest one hundred acres. Given the scale of the analysis, the compatibility constraints between datasets, and lack of data for some resources, all calculations are approximate and serve for comparison and analytic purposes only. Likewise, the figures in Appendix A are provided for illustrative purposes and subject to the limitations discussed above. BLM may receive additional GIS data; therefore, acreages may be recalculated and revised at a later date.

In all instances, stipulations proposed under Alternatives B, C, and D (the action alternatives) would apply only to new fluid mineral leases. Within the GJFO planning area, approximately 389,700 acres are available for leasing but are not yet leased. New stipulations from this RMP would not apply to existing leases, but the BLM would develop Conditions of Approval (COAs) for Applications for Permit to Drill to achieve resource objectives of the RMP (see the BLM's Land Use Planning Handbook H-1601-1 at Appendix C, part H), when they are determined reasonable and consistent with valid existing rights.[1]

Three types of stipulations could be applied to fluid mineral leasing or other land use authorizations, except for those authorized under the realty program: 1) no surface occupancy (NSO) or other no surface-disturbing activities; 2) controlled surface use (CSU); and 3) timing limitation (TL). ROW authorizations are governed by avoidance and exclusion area restrictions.

> NSO/No Surface-disturbing Activities: Allows fluid mineral leasing, but surface-disturbing activities cannot be conducted on the surface of the land unless an exception, waiver, or modification is granted (**Appendix B**, Section B.2). Access to fluid mineral deposits would require directional drilling from outside the boundaries of the NSO/No Surface-disturbing Activities areas.
>
> CSU: Allows some use and occupancy of public land, while protecting identified resources or values. A CSU stipulation allows the BLM to require special operational constraints, or the surface-disturbing activity

[1]See also 43 CFR 1610.5-3(b): "…the Field Manager shall take appropriate measures, subject to valid existing rights, to make operations and activities under existing permits, contracts, cooperative agreements or other instruments for occupancy and use, conform to the approved plan or amendment within a reasonable period of time."

can be shifted more than 200 meters (656 feet) to protect the specified resource or value.

TL: Closes an area to fluid mineral exploration and development, surface-disturbing activities, and intensive human activity during identified time frames. This stipulation does not apply to operation and basic maintenance activities, including associated vehicle travel, unless otherwise specified. Construction, drilling, completions, and other operations considered to be intensive in nature are not allowed.

2.2 SUMMARY COMPARISON OF ALTERNATIVES

Combined with the figures in **Appendix A**, **Sections 2.2.1** through **2.2.4** and **Table 2-1**, Comparative Summary of Alternatives, highlight the meaningful differences among alternatives relative to what they establish and where they occur. The details of each alternative are described in **Section 2.8**, including goals, objectives, management actions, and allowable uses for each resource program. The alternatives development process is described in **Section 2.3.**

2.2.1 Alternative A (No Action Alternative)

The no action alternative, Alternative A, is the continuation of present management direction and current prevailing conditions, based on existing planning decisions and amendments. This alternative meets the requirements of NEPA (40 CFR Part 1502.14) that a no action alternative be considered. This means that current management practices, based on the existing GJFO RMP (BLM 1987) and other management decision documents, would continue. Goals and objectives for BLM land resources and resource uses would be based on the existing GJFO RMP, RMP amendments, and activity- or implementation-level plans. The emphasis would be on maintaining the existing land management direction for physical, biological, cultural, and historic resource values, along with recreational, social, and economic land uses. The BLM would implement direction contained in laws, regulations, and BLM policies superseding provisions of the existing RMP and amendments.

The appropriate development scenarios for allowable uses (such as mineral leasing, locatable mineral development, recreation, timber harvest, utility corridors, and livestock grazing) would stay the same. There would be no change in goals, objectives, allowable uses, or management actions that are allowed, restricted, or prohibited on BLM lands and mineral estate. The BLM would not establish additional criteria or change present criteria to identify site-specific levels for use.

2.2.2 Alternative B (Preferred)

Alternative B would balance resources among competing human interests, land uses, and the conservation of natural and cultural resource values, while sustaining the ecological integrity of certain key habitats for plants, wildlife, and fish. It incorporates a balanced level of protection, restoration, enhancement, and use of resources and services to meet ongoing programs and land uses.

Goals and objectives focus on environmental, economic, and social outcomes achieved by strategically addressing demands across the landscape.

2.2.3 Alternative C

Alternative C emphasizes nonconsumptive use and management of resources through protection, restoration, and enhancement, while providing for multiple uses, including livestock grazing and mineral development. This alternative would establish the greatest number of special designation areas, with specific measures to protect or enhance resource values within these areas. Goals and objectives focus on environmental and social outcomes achieved by sustaining relatively unmodified physical landscapes and natural and cultural resources for current and future generations.

Management direction would generally be ecologically based. Existing uses would be recognized but would likely be limited to ensure the protection of natural and cultural values, including intangible Native American landscape values encompassing plant communities, wildlife, viewsheds, air, and water. The appropriate development scenarios for allowable uses, such as mineral leasing, locatable mineral development, recreation, and livestock grazing, are contingent on meeting the essential conditions of natural and heritage resources.

2.2.4 Alternative D

This alternative emphasizes active management for natural resources, commodity production, and public use opportunities. Resource uses, such as recreation, livestock grazing, and mineral leasing and development, would be emphasized. Management would recognize and give precedence to existing uses and would accommodate new uses to the greatest extent possible, while maintaining resource conditions. The appropriate development scenarios for allowable uses would emphasize social and economic outcomes, while protecting land health.

Table 2-1
Comparative Summary of Alternatives

Resource or Resource Use	Alt A (acres)	Alt B (acres)	Alt C (acres)	Alt D (acres)	Notes
Wildlife Emphasis Areas		***Figure 2-1***	***Figure 2-2***	***Figure 2-3***	
Beehive		4,700	4,700		
Blue Mesa		9,300	9,300		
Bull Hill		4,800	4,800		
Casto			4,200		
East Salt Creek		26,100	26,100		
Glade Park		27,200			Managed as an Area of Critical Environmental Concern (ACEC) under Alternative C.
Hawxhurst			9,400		
Indian Point			11,400		

Table 2-1
Comparative Summary of Alternatives

Resource or Resource Use	Alt A (acres)	Alt B (acres)	Alt C (acres)	Alt D (acres)	Notes
Prairie Canyon		22,200	15,300		An additional 6,900 acres managed as an ACEC under Alternative C.
Rapid Creek		28,600	28,600		
Red Mountain			5,000		
Roan and Carr Creeks		17,700		33,400	33,600 acres managed as an ACEC under Alternative C.
South Shale Ridge		3,500	3,500		
Sunnyside		14,500	11,300		An additional 3,200 acres managed as an ACEC under Alternative C.
Timber Ridge		11,900	11,900		
Total	*0*	*170,500*	*145,500*	*33,400*	
Wild Horses	***Figure 2-4***				
Little Book Cliffs Wild Horse Range	35,200				
Visual Resource Management (VRM)	***Figure 2-5***	***Figure 2-6***	***Figure 2-7***	***Figure 2-8***	
VRM Class I	27,100	98,500	100,100	96,500	
VRM Class II	132,100	314,500	556,600	194,800	
VRM Class III	206,100	458,600	215,000	530,100	
VRM Class IV		189,800	189,700	240,000	
Undesignated	696,100				
Lands Managed for Wilderness Characteristics Outside Existing Wilderness Study Areas		***Figure 2-9***	***Figure 2-10***		
Bangs Canyon			20,400		
East Demaree Canyon			4,800		
East Salt Creek			17,000		
Hunter Canyon			32,200		
Kings Canyon			9,600		
Lumsden Canyon			10,100		
Maverick		17,800	20,400		
South Shale Ridge			27,500		
Spink Canyon			13,100		
Spring Canyon			8,800		
Unaweep		6,700	7,200		
West Creek (adjacent)		20	100		
Total	*0*	*24,400*	*171,200*	*0*	
Livestock Grazing[1]	***Figure 2-11***	***Figure 2-12***	***Figure 2-13***	***Figure 2-14***	
Open to livestock grazing (acres)	978,600	961,100	586,600	977,200	
Closed to livestock grazing (acres)	48,600	66,000	440,400	49,900	
Starting available Animal Unit Months (AUMs)	61,270	60,633	32,658	61,270	

Table 2-1
Comparative Summary of Alternatives

Resource or Resource Use	Alt A (acres)	Alt B (acres)	Alt C (acres)	Alt D (acres)	Notes
Extensive Recreation Management Areas	***Figure 2-15***	***Figure 2-16***		***Figure 2-17***	
34 and C Road		500		500	
Barrel Springs		10,300		10,300	
Castle Rock		4,400			
Dolores River Canyon		151,200		16,800	
Grand Junction ERMA	703,100				
Grand Valley		5,600			
Grand Valley Ranges				800	
Gunnison River Bluffs		800			
Palisade Rims		2,700			
South Shale Ridge				21,600	
Timber Ridge				11,900	
Total	*703,100*	*175,500*	*0*	*61,900*	
Special Recreation Management Areas	***Figure 2-18***	***Figure 2-19***	***Figure 2-20***	***Figure 2-21***	
Bangs	54,700	17,300	17,300	17,300	
Castle Rock				4,400	
Dolores River Canyon		16,900			
Gateway Intensive Recreation Management Area	120,700				
Grand Valley Intensive Recreation Management Area	119,600				
Grand Valley				9,700	
Gunnison River Bluffs				800	
North Fruita Desert	63,300	44,100	42,700	44,100	
Palisade Rims				2,700	
Total	*358,300*	*78,300*	*60,000*	*79,000*	
Comprehensive Travel and Transportation Management	***Figure 2-22***	***Figure 2-23***	***Figure 2-24***	***Figure 2-25***	
Open to cross-country motorized use	445,400				
Open to motorized use	12,500	5,400		10,200	
Closed to motorized use	35,300	187,900	379,500	111,300	
Limited to existing routes for motorized use	342,700				
Limited to designated routes for motorized use	225,500	868,100	681,900	939,900	
Open to mechanized travel	12,500	5,400		10,200	
Closed to mechanized travel		158,500	367,000	98,000	
Limited to designated routes for mechanized travel	6,200	897,500	694,400	953,200	
Open to horse travel		1035,500	1,023,800	1,042,400	
Closed to horse travel		1,300	1,300	1,300	

Table 2-1
Comparative Summary of Alternatives

Resource or Resource Use	Alt A (acres)	Alt B (acres)	Alt C (acres)	Alt D (acres)	Notes
Limited to designated routes for horse travel	6,200	24,600	36,300	17,700	
Open to foot travel		1,036,800	1,023,800	1,043,700	
Closed to foot travel			1,300		
Limited to designated routes for foot travel	6,200	24,600	36,300	17,700	
Lands and Realty	***Figure 2-26***	***Figure 2-27***	***Figure 2-28***	***Figure 2-29***	
ROW exclusion areas	234,900	204,200	365,800	104,100	
ROW avoidance areas	441,400	740,900	627,000	80,500	
Acres suitable for disposal *(Figures 2-30 through 2-33)*	16,100	12,500	2,600	18,000	
Coal Leasing	***Figure 2-34***	***Figure 2-35***	***Figure 2-36***	***Figure 2-37***	
Unacceptable for coal leasing	36,700	56,000	58,200	43,800	
Acceptable for coal leasing	300,700	253,400	251,200	265,600	
Fluid Mineral Leasing (in acres of federal mineral estate[2])					
Closed to fluid mineral leasing and geophysical exploration	96,500	202,400	623,600	100,500	
BLM surface/federal minerals	96,500 *(Figure 2-38)*	182,700 *(Figure 2-39)*	554,700 *(Figure 2-40)*	100,000 *(Figure 2-41)*	
Private or State surface/federal minerals		19,700	68,900	500	
Open to fluid mineral leasing and geophysical exploration	1,134,600	1,028,800	607,600	1,130,700	
BLM surface/federal minerals	964,800 *(Figure 2-38)*	878,700 *(Figure 2-39)*	506,700 *(Figure 2-40)*	961,400 *(Figure 2-41)*	
Private or state surface/federal minerals	169,800	150,100	100,900	169,300	
Stipulations for Surface-Disturbing Activities (in acres of federal mineral estate[2]*; refer to Appendix B)*					
NSO stipulation for surface-disturbing activities	*(Figure 2-42)*[3]	614,000 *(Figure 2-43)*	858,000 *(Figure 2-44)*	497,800 *(Figure 2-45)*	
BLM surface/federal minerals		551,600	781,100	446,600	
Private or state surface/federal minerals		62,400	76,900	51,200	
CSU stipulation for surface-disturbing activities	*(Figure 2-46)*[3]	656,200 *(Figure 2-47)*	664,400 *(Figure 2-48)*	471,500 *(Figure 2-49)*	
BLM surface/federal minerals		618,100	627,000	458,700	
Private or state surface/federal minerals		38,100	37,400	12,800	
TL stipulation for surface-disturbing activities	*(Figure 2-50)*[3]	517,300 *(Figure 2-51)*	507,200 *(Figure 2-52)*	487,900 *(Figure 2-53)*	

Table 2-1
Comparative Summary of Alternatives

Resource or Resource Use	Alt A (acres)	Alt B (acres)	Alt C (acres)	Alt D (acres)	Notes
BLM surface/federal minerals		457,300	447,200	455,100	
Private or state surface/federal minerals		60,000	60,000	32,800	
Open to leasing with NSO stipulation[4]	433,000 *(Figure 2-42)*	429,100	302,900	400,900	
BLM surface/federal minerals	433,000	382,200	266,300	349,700	
Private or state surface/federal minerals		46,900	36,600	51,200	
Open to leasing with CSU stipulation[4]	74,100 *(Figure 2-46)*	563,500	326,800	445,800	
BLM surface/federal minerals	74,100	527,500	303,500	433,000	
Private or state surface/federal minerals		3,600	23,300	12,800	
Open to leasing with TL stipulation[4]	233,000 *(Figure 2-50)*	401,600	241,600	438,700	
BLM surface/federal minerals	233,000	349,400	197,600	405,900	
Private or state surface/federal minerals		52,200	44,000	32,800	
Locatable, Salable, and Non-energy Leasable Minerals					
Open to locatable mineral exploration or development	1,047,100	1,047,100	1,047,100	1,047,100	
Withdrawn from mineral entry *(Figure 2-54)*	20,100	20,100	20,100	20,100	
Petition to withdraw from locatable mineral exploration or development		20,700 *(Figure 2-55)*	45,100 *(Figure 2-56)*	1,300 *(Figure 2-57)*	
Open for consideration for mineral material (salables) disposal on a case-by-case basis	787,100 *(Figure 2-58)*	809,000 *(Figure 2-59)*	609,400 *(Figure 2-60)*	906,100 *(Figure 2-61)*	
Closed to mineral material (salables) disposal	274,300 *(Figure 2-58)*	252,400 *(Figure 2-59)*	452,000 *(Figure 2-60)*	155,300 *(Figure 2-61)*	
Open for consideration of non-energy leasable mineral prospecting and development		567,500 *(Figure 2-62)*	298,600 *(Figure 2-63)*	925,400 *(Figure 2-64)*	
Closed to potash or other non-energy leasable mineral exploration or development		493,900 *(Figure 2-62)*	762,900 *(Figure 2-63)*	136,000 *(Figure 2-64)*	
ACECs	***Figure 2-65***	***Figure 2-66***	***Figure 2-67***	***Figure 2-68***	**ACEC Values**
Atwell Gulch		2,900	6,100		Cultural and paleontological resources, rare plants, scenic values, wildlife habitat
Badger Wash	1,700	2,200	2,200	2,200	Rare plants, use as a hydrologic study area

Table 2-1
Comparative Summary of Alternatives

Resource or Resource Use	Alt A (acres)	Alt B (acres)	Alt C (acres)	Alt D (acres)	Notes
Colorado River Riparian			880		Significant cottonwood and willow communities, fisheries and scenic values
Coon Creek			110		Riparian habitat, fisheries values
Dolores River Riparian		7,400	7,400		Riparian habitat, hydrology, scenic values, paleontological resources, fisheries and wildlife values
Glade Park-Pinyon Mesa			27,200		Occupied Gunnison sage-grouse habitat
Gunnison River Riparian			460		Riparian and fisheries values
Hawxhurst Creek			860		Riparian and fisheries values
Indian Creek		1,700	1,700		Wildlife and cultural values
John Brown Canyon			1,400		Old-growth pinyon-juniper woodlands
Juanita Arch		1,600	1,600		Rare plants, geologic values
Mt. Garfield		3,500	5,700		Scenic values
Nine-Mile Hill Boulders			90		Paleontological values
The Palisade	23,600	32,200	32,200	26,900	Rare plant populations, scenic values, special status wildlife
Plateau Creek			220		Fish
Prairie Canyon			6,900		Rare plants and wildlife habitat
Pyramid Rock	600	1,300	1,300	1,300	Rare plant habitat, cultural resources, paleontological resources
Reeder Mesa			470		Plant resources
Roan and Carr Creeks		15,700	33,600		Unique riparian habitats, core conservation populations of cutthroat trout
Rough Canyon	2,700	2,800	2,800	2,700	Geologic values, wildlife habitat, cultural resources, rare plants
Sinbad Valley		6,400	6,400		Rare plants, wildlife, cultural resources, geologic values, scenic values
South Shale Ridge		28,200	28,200		Rare plants, wildlife habitat, scenic values

Table 2-1
Comparative Summary of Alternatives

Resource or Resource Use	Alt A (acres)	Alt B (acres)	Alt C (acres)	Alt D (acres)	Notes
Unaweep Seep	80	85	85	80	Great Basin silverspot butterfly habitat, rare plants, riparian habitat, hydrologic values
Total	*28,900*	*106,000*	*168,000*	*33,200*	
Wilderness Study Areas	***Figure 2-69***				
Demaree Canyon	22,700				
Little Book Cliffs	29,300				
The Palisade	26,700				
Sewemup Mesa	17,800				
Total	*96,500*				
Wild and Scenic River Segments Eligible (Alternatives A and B) or Suitable (Alternative C) for Inclusion in the National Wild and Scenic Rivers System (in miles crossing BLM land)	***Figure 2-70***	***Figure 2-71***	***Figure 2-70***		**Classification**
Blue Creek	10.07		10.07		Scenic
Carr Creek	5.06		5.06		Scenic
Colorado River Segment 1	7.32		7.32		Recreational
Colorado River Segment 2	1.31		1.31		Recreational
Colorado River Segment 3	19.14		19.14		Scenic
Dolores River	18.62	11.53	18.62		Recreational
East Creek	8.96		8.96		Recreational
Gunnison River Segment 2	3.85		3.85		Recreational
North Fork Mesa Creek	2.05		2.05		Scenic
North Fork West Creek	3.31		3.31		Wild
Roan Creek	6.47		6.47		Scenic
Rough Canyon Creek	4.22		4.22		Scenic
Ute Creek	4.19		4.19		Scenic
West Creek	4.93		4.93		Recreational
Total Miles	*99.5*	*11.53*	*99.5*	*0*	

Source: BLM 2010a
Hatching indicates zero acres or miles under that alternative.
[1]Portions of some allotments are outside of the GJFO planning area, but are administered by the GJFO. The inverse is also true where portions of allotments are within the GJFO planning area but are managed by another BLM Field Office. Additionally, not all lands within the planning area are allotted.
[2]Federal mineral estate includes mineral estate underlying BLM lands, privately owned lands, and state-owned lands. As such, federal mineral estate acres are greater than BLM surface acres. Federal mineral estate totals 1.2 million acres in the planning area.
[3]Acreage for Alternative A applies only to areas open to fluid mineral leasing.
[4]Stipulations may be applied to additional acreage if new information is provided (e.g., biological or cultural surveys).

2.3 ALTERNATIVES DEVELOPMENT

Alternatives development is the heart of the RMP and EIS process. Land use planning regulations and NEPA require the BLM to develop a reasonable range of alternatives during the planning process. Alternatives must be within the established planning criteria (43 CFR, Section 1610). The basic goal of developing alternatives is to prepare different possible management scenarios that:

- Address the identified major planning issues;
- Explore opportunities to enhance or expand resources or resource uses;
- Resolve conflicts among resources and resource uses; and
- Meet the purpose of and need for the RMP.

Achieving this goal will help the BLM and the public understand the various ways of addressing conflicts concerning alternative uses of available resources. Also, it will provide the BLM decision maker with a reasonable range of alternatives with which to make an informed decision. The components of the alternatives and the general direction of each alternative are discussed below.

2.3.1 Developing Alternatives for the Grand Junction Field Office

The GJFO implemented the first five steps of the BLM's planning process in developing alternatives, as follows: scoping, planning criteria development, issue identification, data collection, and current management assessment (see **Section 1.3**, BLM Planning Process). The issue identification and current management assessment processes began in 2008 with an extensive review by the BLM's interdisciplinary team of current land management decisions and direction from the Grand Junction RMP (BLM 1987) and subsequent amendments (BLM 1993a, 1993b, 1995b, 1997b, 2001, 2004a, 2004b, 2005b, 2007, 2008b, 2008c, 2008d; Department of Energy and BLM 2009). From this, the BLM identified preliminary planning issues that could be addressed in a new RMP.

> ***Planning Issues*** express concerns, conflicts, and problems with the existing management of public lands. Frequently, issues are based on how land uses affect resources. Some issues are concerned with how land uses can affect other land uses, or how the protection of resources affects land uses.

As discussed in **Section 1.5**, Issue Identification, preliminary planning issues were distributed during the scoping process for public comment, along with a request for identifying additional issues. Based on scoping and public participation efforts, the GJFO identified 17 planning issue categories. Planning issues are concerns or controversies about existing and potential land and resource allowable uses, levels of resource use, production, and related management practices. Planning issues are well defined or topically

discrete and entail alternatives to choose from. As this definition suggests, there are different ways to resolve each planning issue (see **Table 2-1**, Comparative Summary of Alternatives).

2.4 ALTERNATIVES CONSIDERED FOR DETAILED ANALYSIS

Following the close of the public scoping period in January 2009, the BLM began developing alternatives by assembling an interdisciplinary team of BLM resource specialists in the GJFO. The BLM also coordinated with cooperating agencies and the Northwest Resource Advisory Council subcommittee beginning in August 2008 and continuing throughout the planning process.

Between June 2009 and February 2010, the BLM interdisciplinary team developed management goals and objectives and management actions to meet those goals and objectives. Four management alternatives were developed to fulfill the purpose and need (**Section 1.2**, Purpose and Need), to meet the multiple use mandates of the Federal Land Policy and Management Act of 1976 (FLPMA, 43 USC, 1716), and to address the 17 planning issues.

Alternatives B, C, and D, the action alternatives, offer a range of management options that resolve the issues identified in the scoping process and other outreach activities, including input from cooperating agencies and the Northwest Resource Advisory Council subcommittee. Other issues were identified through visitor studies, focus groups, informal interviews, and reports, such as the Wild and Scenic River eligibility study (BLM 2009c) and Wild and Scenic River suitability study (**Appendix C**) for all rivers in the decision area, ACECs evaluation (BLM 2010c; summarized in **Appendix D**), and Visual Resource Inventory (VRI) study (Otak 2009).

Each alternative stands alone as a potential RMP and provides direction for resource programs based on the development of specific goals, objectives, and management actions. Described under each alternative is specific direction influencing land management, with an emphasis on different combinations of resource uses, allowable uses, and restoration measures to address issues and to resolve user conflicts. Resource program goals are met in varying degrees across alternatives. Resources or resource uses not tied to planning issues or mandated by laws and regulations often contain few or no differences in management between alternatives. Alternatives may also result in different long-term conditions.

The alternatives differ from one another in the relative emphasis given to particular resources or resource uses. Each alternative has been designed to respond to the planning issues differently, providing a range of possible management approaches that the BLM could implement. Distinctions between alternatives are expressed in the RMP by varying specific objectives, allowable uses, management actions, and implementation actions, such as travel route designations. A complete description of all decisions proposed for each

alternative is in **Table 2-2**, Descriptions of Alternatives A, B, C, and D, at the end of this chapter.

2.4.1 Components of Alternatives

Decisions in RMPs guide future land management actions and subsequent site-specific implementation decisions. The RMP decisions establish goals and objectives (desired outcomes) for resources and resource uses and the allowable uses and management actions needed to achieve those goals and objectives. The goals are the same across all alternatives, but objectives may vary. This may result in different allowable uses and management actions across alternatives for many resources and resource uses.

More specifically, desired future conditions or desired outcomes are stated as goals and objectives. *Goals* are broad statements of desired outcomes, (RMP-wide and resource or resource-use specific), and generally are not quantifiable or measurable; *objectives* are more specifically desired conditions or outcomes to meet the resource or resource use goal.

Management actions and allowable uses are designed to achieve the objectives. *Management actions* include management measures that will guide future and day-to-day activities; *allowable uses* indicate which uses are allowed, restricted, or prohibited and may include stipulations. Allowable uses also identify lands where specific uses are excluded to protect resource values, or where certain lands are open or closed in response to legislative, regulatory, or policy requirements.

Implementation decisions generally constitute site-specific on-the-ground actions and are not addressed in the RMP revision, with the exception of travel management decisions.

2.4.2 Management Common to All Alternatives

Some of the allowable uses and management actions in this draft RMP/EIS are carried forward from the existing RMP (Alternative A) because there is no impending concern associated with them or they do not need to change. These decisions are common to all four alternatives because a range of alternative decisions is not necessary for every resource or resource use. Other decisions are common only to the action alternatives (Alternatives B, C, and D). Each alternative emphasizes a slightly different mix of resource protections and resource uses, but many similarities exist.

All action alternatives would involve collaboration through partnerships and communication with other agencies and interested parties to implement the RMP, including outreach and education, monitoring, and project-specific activities (e.g., trail development). In addition, all action alternatives contain the following common elements:

- Complying with state and federal laws, regulations, policies, and standards, including the multiple use mandates of the FLPMA;
- Conducting implementation actions (day-to-day management, monitoring, and administrative functions) that stem directly from regulations, policy, and law, which are considered in conformance with the RMP alternatives and are not specifically addressed in the alternatives;
- Providing for human safety and property protection from wildfire;
- Managing areas classified as limited to designated routes by designating specific routes for motorized, mechanized, and non-motorized/non-mechanized use;
- Incorporating Colorado Standards for Public Land Health (BLM 1997a) as goals;
- Managing the LBCWHR in accordance with the 1971 Wild and Free-Roaming Horses and Burros Act. The LBCWHR is part of the larger Little Book Cliffs herd area (approximately 53,000 acres), which was established under the Wild and Free-Roaming Horses and Burros Act. The boundary for the LBCWHR has been established through agreements with livestock grazing permittees so that no livestock grazing is allowed. The LBCWHR, through special designation, is one of three wild horse ranges under BLM management, with an emphasis on management for wild horses for the established area;
- Authorizing livestock grazing in a manner consistent with Colorado Standards for Public Land Health and Guidelines for Livestock Management (BLM 1997a), while supporting the local livestock industry;
- Sustaining habitat in sufficient quantities and quality for viable plant, fish, and wildlife populations;
- Including protective measures that minimize pollutants to air and water;
- Adhering to the Colorado Department of Public Health and Environment's (CDPHE) Water Quality Control Commission Regulations, as required by law, to ensure that the Clean Water Act is not violated;
- Adhering to the CDPHE's Air Quality Control Commission Regulations (CDPHE 2010), as required by law, to ensure that the Clean Air Act is not violated. Special requirements to alleviate air quality impacts are included on a case-by-case basis in use authorizations (including lease stipulations) within the BLM's authority;

- Facilitating orderly, economic, and environmentally sound energy development;
- Continuing to manage existing WSAs in compliance with the BLM's interim management policy (BLM Handbook 8550-1, Interim Management Policy for Lands under Wilderness Review [BLM 1995a]);
- Offering a diversity of recreation opportunities that foster outdoor-oriented lifestyles and add to people's quality of life;
- Conserving key scenic vistas that communities and visitors value;
- Providing some sustainable forest, biomass, and woodland products, while maintaining landscape diversity and ecosystem integrity;
- Applying COAs, best management practices (BMPs), and other site-specific mitigation (e.g., recreation guidelines) to all resource uses;
- Applying COAs, BMPs, and other site-specific mitigation to minimize erosion, encourage rapid reclamation, retain soils using stormwater mitigation practices, maintain soil stability, and support resources;
- Collaborating with adjacent landowners, federal and state agencies, tribes, communities, other agencies, and other individuals and organizations as needed to attain and monitor water quality standards and to provide source water protection; and
- Collaborating with adjacent landowners, federal and state agencies, tribes, communities, other agencies, and other individuals and organizations, as needed, to monitor and implement decisions to achieve desired resource conditions.

In addition to these common elements, **Table 2-2**, Descriptions of Alternatives A, B, C, and D, at the end of this chapter, includes allowable uses and management actions common to all four alternatives. These are shown as one common cell across a row of the table.

Plan Maintenance

The RMP revision is based on current scientific knowledge and the best available data. To be successful, the RMP must have the flexibility to adapt and respond to new information. The decisions in the RMP will be periodically reviewed to ensure management measures are meeting the intent of the RMP goals and objectives and that there is adequate guidance for implementation actions. The plan may be updated and revised, and the appropriate level of environmental review and documentation will be conducted.

2.5 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

The following alternatives were considered but eliminated from detailed study because they did not meet the purpose of and need for the RMP (**Section 1.2**)

or because they were outside of the technical, legal, or policy constraints of developing an RMP for BLM land resources and resource uses.

2.5.1 Implement Exclusive Use or Protection

Some alternatives and general management options were not considered, specifically those that proposed exclusive use or maximum development, production, or protection of one resource at the expense of other resources or resource uses. As outlined in **Section 1.2**, the purpose of this RMP is to ensure that public lands are managed in accordance with the intent of Congress, as stated in the FLPMA, under the principles of multiple use and sustained yield. This eliminates such alternatives as closing all BLM lands to grazing (discussed further in **Section 2.5.6**, below) or oil and gas leasing in the absence of other resource conflicts, or managing those lands only for fish, wildlife, and wilderness values at the exclusion of other resource considerations. Each alternative considered allows for some level of support, protection, or use of all resources in the planning area. In some instances, the alternatives analyzed in detail do include various considerations for eliminating or maximizing individual resource values or uses in specific areas where conflicts exist.

2.5.2 Designate Entire Decision Area as Either Open or Closed to Off-Highway Vehicle Use

Considered but dismissed were suggestions to designate all areas on BLM lands as entirely open for yearlong OHV use, without regard to current travel restrictions, or to entirely close areas to OHV use. A need that has been identified for this RMP (**Section 1.2**) is to address increased visitation by way of OHV use and nonmotorized uses (e.g., mountain biking and hiking), which have led to increased concerns regarding resource protection and conflicting uses. Management of BLM lands not only requires implementing restrictions to address travel concerns and recreation demands, but it also requires protecting resource values. In addition, the BLM concluded that the current level of open, closed, or limited OHV areas would be used as a baseline for comparing alternatives.

2.5.3 No Leasing Alternative

The purpose of and need for the RMP is to identify and resolve potential conflicts between competing resource uses rather than to eliminate a significant use of public lands in the GJFO. The RMP presents a range of alternatives that include proposed closure of areas to leasing based on resource conflicts.

2.5.4 No Herbicide Alternative

The BLM treats vegetation using fire, mechanical and manual methods, biological treatments, and herbicides. In an integrated vegetation management program, each management option is considered, recognizing that no one management option is a stand-alone option and that each has strengths and weaknesses. Using the strengths of each allows for a more effective and environmentally sound program. When the BLM plans vegetation management projects, all

control methods should be available for use, allowing the BLM to select the method or combination of methods that optimizes vegetation control with response to environmental concerns, effectiveness, and cost control. Prohibiting the use of pesticides under an alternative would increase the likelihood that noxious and invasive species would increase and native species would decrease, which conflicts with Standard 3 under Colorado's Standards for Public Land Health (BLM 1997a; **Appendix E**). In addition, the GJFO uses the Vegetation Treatments Using Herbicides Plan and has tiered management through an environmental assessment (EA) of the plan. Both the programmatic EIS for the Vegetation Treatments Using Herbicides Plan and the GJFO EA for tiering to this plan already analyzed a No Herbicide alternative. For these reasons, an alternative that prohibits the use of pesticides was considered but dismissed.

To effectively manage 1,061,400 acres, the BLM must have flexibility to adapt the treatment approach that is best for each situation. Wildland fire management provides the basis for proposed vegetation-treatment activities. However, treatments are also used to address a variety of BLM program needs, including weed removal, invasive or noxious species prevention, fish and wildlife habitat improvement, threatened and endangered species habitat improvement, riparian habitat restoration, reforestation for forest health restoration and habitat improvement, vegetation composition and structure modification to improve land health, and vegetation protection and enhancement in areas with cultural resources and administrative facilities (BLM 2007).

2.5.5 Designate Additional Wilderness Study Areas

Designating additional WSAs is not being considered in the alternatives because the BLM's authority for establishing WSAs ended in 1993. The BLM has an obligation under Sections 201 and 202 of FLPMA to maintain an inventory of all public lands and their resources, including wilderness characteristics, and to consider such information during land use planning. **Appendix F**, Draft Wilderness Characteristics Assessment, includes results of the BLM's inventory of these non-WSA lands for wilderness character. Values associated with solitude, primitive recreation, and naturalness are considered with all other resources and resource uses. Areas where wilderness character was not found were not analyzed (see **Appendix F**). Plan alternatives include allocations and actions that protect these lands with wilderness characteristics.

2.5.6 Close Entire Decision Area to Livestock Grazing

An alternative that proposes to make all BLM-administered lands within the planning area unavailable for livestock grazing was considered but dismissed from detailed analysis because it would not meet the purpose and need of the GJFO RMP. The FLPMA requires that public lands be managed on a "multiple use and sustained yield basis" (FLPMA Sec. 302 [a] and Sec. 102 [7]) and includes livestock grazing as a principal or major use of public lands. While multiple use does not require that all lands be used for livestock grazing, complete removal

of livestock grazing on the entire planning area would not meet the principle of multiple use and sustained yield.

In addition, NEPA requires that agencies study, develop, and describe appropriate alternatives to recommended courses of action in any proposal that involves unresolved conflicts concerning alternative uses of available resources. Since no issues or conflicts have been identified during this planning process (which requires the complete elimination of grazing within the planning area for their resolution), this alternative would be arbitrary. Where appropriate, the preclusion or adjustment of livestock use within an allotment or area was incorporated into the alternatives to address specific issues identified through the planning process. This resulted in consideration of an alternative that would significantly reduce the amount of BLM land in the planning area available for livestock grazing (Alternative C). The analysis of an alternative that precludes grazing from the entire planning area is not necessary. This is because the BLM has considerable discretion through its grazing regulations to determine and adjust stocking levels, seasons of use, and grazing management activities and to allocate forage to uses of the public lands in RMPs.

Livestock grazing is a principal use of the public lands, as it has been for many years, and it will remain an important governmental program administered by the BLM. Although the CEQ guidelines for compliance with NEPA require the analysis of a no action alternative in all EISs, for purposes of this analysis, the no action alternative is to continue the status quo, which includes livestock grazing under the current land use plan (CEQ Forty Most Asked Questions, Question 3). For these reasons, the no grazing alternative for the entire planning area was dismissed from further consideration in this EIS.

2.5.7 Greater Sage-Grouse National Technical Team Report Recommendations

The BLM published a Notice of Intent in the *Federal Register* on December 9, 2011, initiating a range-wide planning process that would analyze the National Technical Team Report recommendations in detail. The GJFO RMP alternatives do include some measures that are similar to the NTT recommendations, however many of the recommendations are not included. The BLM Northwest Colorado District Office is completing a possible Plan Amendment/EIS that considers and analyzes the NTT report recommendations in detail and addresses BLM-managed lands in the GJFO planning area. Therefore, an alternative(s) to analyze the Greater Sage-Grouse NTT Report recommendations in detail was considered but eliminated from detailed analysis in this EIS.

2.6 RATIONALE FOR THE IDENTIFICATION OF THE PREFERRED ALTERNATIVE

The draft RMP/EIS presents four different alternatives that take into consideration comments received by other governmental agencies, public organizations, the state, tribal entities, and interested individuals. Public

collaboration through the scoping process shaped issues covering recreation, wildlife, minerals, cultural resources, grazing, land tenure, ACEC designation, travel management, and other topics. As part of the RMP process, the alternatives evaluated in the draft RMP/EIS represent the range of management actions that address issues identified during scoping and that offer a distinct choice among potential management strategies.

The CEQ regulations for implementing NEPA require the lead agency preparing an EIS to identify its preferred alternative in the draft RMP/EIS. This is the alternative that, at this stage, best represents the resolution of planning issues and promotes balanced multiple use objectives. The Field Manager is required to recommend to the BLM State Office which of the range of alternatives best represents the basis on which to develop the proposed RMP. As part of the GJFO's ongoing coordination with cooperating agencies and the RAC subgroup (**Chapter 5**), the GJFO Field Manager asked for input on the range of alternatives for this draft RMP/EIS.

Alternative A, the No Action Alternative, minimally addresses relevant issues identified through public scoping and required components of the land use planning document. Thus, Alternative A was not selected as the preferred alternative because it does not adequately address issues and concerns identified by the public, required planning components, and concerns of the planning team.

Alternatives C and D address both the identified relevant issues and required components necessary in a land use planning document, with varying degrees of flexibility, protection, conservation, and establishment of allowable uses. Alternatives C and D address the public's issues and concerns through identified management direction as well as the purpose and need. However, both alternatives lack a balance between resources and resource use allocations.

Alternative B provides the most reasonable and practical approach to managing the public lands resources and resource uses, while addressing the issues and the purpose and need. Alternative B provides a balanced approach to management, with an appropriate level of flexibility to meet the overall needs of the resources and allocation of various uses. Alternative B represents a mix of management actions (proactive and prescriptive) that best resolve identified issues, while emphasizing a level of protection, restoration, enhancement, and use of resources and services to meet ongoing programs and land uses. Therefore, the Field Manager, in collaboration with the Manager of the Northwest District, recommended Alternative B to the BLM State Office as the preferred alternative.

During the public review of the draft RMP/EIS, the BLM will ask for comments on the preferred alternative, as well as the other alternatives. After consideration of these comments, the BLM will develop the Proposed RMP/Final EIS.

2.7 MANAGEMENT GUIDANCE FOR ALTERNATIVES A, B, C, AND D

Table 2-2, Descriptions of Alternatives A, B, C, and D, describes all decisions proposed for each alternative, including goals and objectives. All decisions in **Table 2-2** are land use plan-level decisions, with the exception of those in the Comprehensive Travel and Transportation Management section, which are implementation-level decisions.

Stipulation decisions (see **Appendix B**) apply to surface-disturbing activities on BLM lands overlying federal mineral estate, which totals 1.2 million acres in the planning area. Stipulations also apply to fluid mineral leasing on lands overlying federal mineral estate, which includes federal mineral estate underlying BLM lands, privately owned lands, and state-owned lands.

2.7.1 How to Read Table 2-2

The following describes how **Table 2-2** is written and formatted to show the land use plan decisions proposed for each alternative. Refer to the diagram on the next page for an example of how to read **Table 2-2**.

- In accordance with Appendix C of BLM Land Use Planning Handbook H-1601-1, land use plan decisions are broad-scale decisions that guide future land management actions and subsequent site-specific implementation decisions. Land use plan decisions fall into two categories, which establish the base structure for **Table 2-2:** desired outcomes (**goals** and **objectives**) and **allowable uses** and **actions** to achieve outcomes.
  - *Goals* are broad statements of desired outcomes that usually are not quantifiable.
  - *Objectives* identify specific desired outcomes for resources. Objectives may be quantifiable and measurable and may have established timeframes for achievement, as appropriate.
  - *Actions* identify measures or criteria to achieve desired outcomes (i.e., objectives), including actions to maintain, restore, or improve land health.
  - *Allowable uses* identify uses, or allocations, that are allowable, restricted, or prohibited on the public lands and mineral estate.
  - *Stipulations* (NSO, CSU, TL), which fall under the allowable uses category, are also applied to surface-disturbing activities to achieve desired outcomes (i.e., objectives).
- In general, only those resources and resource uses that have been identified as planning issues have notable differences between the alternatives.

- Actions that are applicable to all alternatives are shown in one cell across a row. These particular objectives and actions would be implemented regardless of which alternative is ultimately selected.
- Actions that are applicable to more than one but not all alternatives are indicated by either combining cells for the same alternatives, or by denoting those objectives or actions as "same as Alternative B," for example.

Diagram 2-1
How to Read Table 2-2

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
STIPULATION *NSO-1: (Soils in the Plateau Area)*. (Refer to Appendix B.) See also *NSO-3: Steep Slopes*.			
Action: No similar action in current RMP.	Action: Implement appropriate management techniques, guidelines or practices, as outlined in Appendix H, to limit soil loss to an amount not exceeding natural erosion rates and to not affect its long term quality, productivity or hydrological function.		
Action: No similar action in current RMP.	Action: In areas designated as open to OHVs, monitor and identify thresholds for evaluating vulnerability to erosional processes and utilize best available science to limit erosion and sedimentation/salt loading to the Colorado River.	Action: No similar action.	Action: Same as Alternative B.
Action: No similar action in current RMP.	Action: Identify those biologic soil crusts in the planning area which are key to sustaining proper function and condition of upland soil health as determined by BLM Land Health Assessments and/or onsite evaluation. Avoid and mitigate disturbance to biologic soil crusts which are determined to be key in sustaining proper function and condition of upland soil health.		Action: No similar action
Allowable Use: Analyze proposed surface disturbing projects to determine suitability of soils to support such projects.	Allowable Use: Manage fragile soils, mapped Mancos shale areas, and saline soils acres as ROW avoidance areas.		
Action: No similar action in current RMP.	Action: Protect watershed health and water quality by limiting motorized travel over fragile soils during seasonally wet periods. Allow management officials the authority to modify closure dates based on climatological variability.		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-8: *Fragile Soils (Slump Areas)*. Prohibit surface	Allowable Use: **STIPULATION** NSO-9: *Fragile Soils*. Prohibit surface occupancy and surface-	Allowable Use: No similar allowable use.

Actions that are applicable to more than one but not all alternatives are indicated by combining cells for the same alternatives.

Actions that are the same as another alternative, but not the same as all alternatives, are noted as "Same as Alternative _."

Where an action in Alternatives B and C, for example, does not apply to Alternative D, it states "no similar action."

2.7.2 Quick Links to Resource and Resource Use Management Actions

Table 2-2
Description of Alternatives A, B, C, and D

ACECs (page 2-183)	Mineral Materials (page 2-180)	Vegetation (General) (page 2-37)
Air (page 2-24)	National, State, and BLM Byways (page 2-212)	*Adaptive Drought Management* (page 2-48)
Coal (page 2-169)	National Trails (page 2-209)	*Desired Plant Communities* (page 2-39)
Comprehensive Travel and Transportation Management (page 2-142)	Non-energy Leasables (page 2-181)	*Forest/Woodlands* (page 2-44)
Cultural Resources (page 2-101)	Paleontological Resources (page 2-109)	*Riparian* (page 2-46)
Fish and Wildlife (page 2-75)	Recreation and Visitor Services (page 2-132)	*Weeds* (page 2-49)
Fluid Minerals (Oil and Gas, Geothermal, and Oil Shale Resources) (page 2-171)	Renewable Energy (page 2-156)	Visual Resources (page 2-110)
Forestry (page 2-121)	Soil Resources (page 2-34)	Water Resources (page 2-26)
Interpretation and Environmental Education (page 2-214)	Special Status Species (General) (page 2-49)	Wild and Scenic Rivers (page 2-206)
Lands and Realty (page 2-150)	*Fish* (page 2-51)	Wild Horses (page 2-98)
Livestock Grazing (page 2-124)	*Plants and Terrestrial Wildlife* (page 2-54)	Wilderness Study Areas (page 2-201)
Lands with Wilderness Characteristics Outside Existing WSAs (page 2-118)	Transportation Facilities (page 2-215)	Wildland Fire Management (page 2-116)
Locatable Minerals (page 2-178)		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Theme: CURRENT MANAGEMENT	Theme: BLENDED	Theme: CONSERVATION	Theme: RESOURCE USE
RESOURCES			
Air			
GOAL: Minimize impacts on air quality from BLM management actions in accordance with the Clean Air Act and the NEPA.			
Objective: Limit air quality degradation by ensuring authorized uses on BLM-administered lands are in compliance with applicable Colorado and National Ambient Air Quality Standards and federal, state, and local air quality laws, rules, regulations, and implementation plans.			
Action: No similar action in current RMP.	Action: Develop COAs, lease notices, and stipulations for surface-disturbing activities to prevent permitted activities from causing or contributing to violations of ambient air quality standards or causing significant adverse impacts on air quality related values.		
Action: No similar action in current RMP.	Action: Participate in, conduct, or require air modeling analyses as described in the Air Resources Management Plan (ARMP) (see **Appendix G**) as part of a comprehensive strategy to prevent permitted activities from causing or contributing to violations of ambient air quality standards or causing significant adverse impacts on air quality.		
Action: No similar action in current RMP.	Action: Work cooperatively with local, state, federal, and Tribal agencies to enhance air monitoring efforts to measure compliance with ambient air quality standards and impacts on air quality related values.		
Action: No similar action in current RMP.	Action: Manage prescribed fire in accordance with the State of Colorado Department of Public Health and Environment Smoke Management Program and Regulation Number 9 (5 CCR 1001-11). Prescribed burns would be timed during favorable meteorological conditions so as to minimize smoke impacts.		
GOAL: Manage BLM-administered lands in a manner that protects the quality of air and atmospheric values as directed under the FLPMA.			
Action: No similar objective in current RMP.	Objective: Manage air resources within the GJFO in accordance with the ARMP (Appendix G).		
Action: No similar action in current RMP.	Action: Implement the adaptive management strategy for managing air resources that includes monitoring, modeling, mitigation, and emissions reductions components as described in the ARMP (Appendix G).		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Objective: Minimize emissions, within the scope of BLM's authority, from activities that cause or contribute to air quality impairment, visibility degradation, atmospheric deposition, or climate variability.			
Action: Require drill rig engines to meet United States Environmental Protection Agency (US EPA) requirements.	Action: Require all drilling and completion engines used on public lands or used to access federal minerals to meet or exceed US EPA Tier 2 non-road diesel engine emission standards (40 CFR Part 89). Beginning in 2015, evaluate phased in use of improved engine technology that meets or exceeds Tier IV non-road diesel emission standards (40 CFR 1039). The rate of phase in would be determined in accordance with the annual review specified in the ARMP (Appendix G).	Action: Within one year of the Record of Decision, require that all drilling and completion engines used on public lands or used to access federal minerals to meet or exceed US EPA Tier IV non-road diesel engine emission standards (40 CFR Part 1039).	Action: Same as Alternative B.
Action: No similar action in current RMP.	Action: Require that oil and gas operators use reduced emission completion technology (i.e. "green" completion) as defined in COGCC Rule 805 and the New Source Performance Standards for Crude Oil and Natural Gas Production at 40 CFR Part 63 Subpart OOOO at all wells on BLM-administered lands and wells that access federal minerals. An exemption may be granted on a case-by-case basis.		
Action: Allow flaring and venting in accordance with Notice to Lessees (NTL-4A).	Action: Require flaring of natural gas during well completions that are exempted from green completion technology. Prohibit venting of natural gas except during emergency situations.		Action: Same as Alternative A
Action: No similar action in current RMP.	BLM will manage emissions of greenhouse gases from its authorized actions in accordance with state and federal regulations, executive and secretarial orders, and BLM policy.		
Action: No similar action in current RMP.	Action: Require proper road design, construction, and surfacing on BLM authorized roads to reduce particulate matter emissions.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: No similar action in current RMP.	Action: Open areas and designated routes may be closed during wind events (e.g. during National Weather Service high wind warning) to reduce fugitive dust emissions.	Action: Designated routes may be closed during wind events (e.g. during National Weather Service high wind warning) to reduce fugitive dust emissions.	Action: No similar action.
Water Resources			
GOAL: Protect, preserve, and enhance watershed functions in the capture, retention, and release of water in quantity, quality, and time to meet ecosystem and human needs.			
Objective: No similar objective.	Objective: Manage public land activities to maintain or contribute to the long term improvement of surface and ground water quality and minimize or control elevated levels of salt, sediment, and selenium contribution from federal lands to water resources in the planning area.		
Action: No similar action in current RMP.	Action: Promote the delisting of impaired water bodies (303d listed) by monitoring actions including but not limited to grazing, travel management, and other surface disturbing actions and implementing appropriate management change.		
Action: Maintain existing sediment and salinity control structures in Indian Wash and Leach Creek.	Action: Remove nonfunctional structures such as sediment basins, ponds, and associated structures and implement additional erosion control/soil stabilization measures as necessary.		
Objective: No similar objective in current RMP.	Objective: Ensure streams on BLM lands are in geomorphic balance (e.g., stream channel size, sinuosity, slope, and substrate are appropriate for its landscape setting and geology) with the water and sediment being supplied by the watershed (e.g., no accelerated erosion, deposition, or head-cutting) and ensure that land use does not impede the natural hydrograph (e.g. allows timing, magnitude and duration of peak, high and low flow events by minimizing surface disturbance, erosion, and sedimentation of streams).		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: Close the river corridors of the three major rivers (Colorado, Dolores, and Gunnison) to mineral material disposal and non-energy solid mineral leasing and development.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Allowable Use: No similar allowable use in current RMP.	Allowable Use: Classify the Colorado River corridor as unsuitable for coal leasing.		
Allowable use: No similar allowable use in current RMP.	Allowable use: **STIPULATION** NSO-1: *Major River Corridors.* Prohibit surface occupancy and surface-disturbing activities within stream channels, stream banks, and the area 0.25-mile either side of the ordinary high-water mark (bank-full stage) or within 100 meters (328 feet) of the 100-year floodplain (whichever area is greatest) of the Colorado, Gunnison, and Dolores Rivers. (Refer to Appendix B.) See Figures 2-43 (Alternative B), 2-44 (Alternative C), and 2-45 (Alternative D) in Appendix A.		
Allowable use: No similar allowable use in current RMP.	Allowable use: **STIPULATION** CSU-1: *Major River Corridors.* Apply CSU (site-specific relocation) (Exhibit Colorado [CO]-28) restrictions from 0.25- to 0.5-mile landward from identified NSO buffer (0.25-mile from ordinary high water mark or within 100 meters [328 feet] of the 100-year floodplain, whichever is greatest) on either side of the Colorado, Gunnison, and Dolores Rivers. (Refer to Appendix B.) See Figures 2-47 (Alternative B) and 2-48 (Alternative C in Appendix A.		Allowable use: No similar allowable use.
Allowable use: **STIPULATION** *CSU-7: Perennial Streams Water Quality.* Limit surface-disturbing activities within 100 feet of perennial streams to essential roads and utility crossings. (Refer to Appendix B.)	Allowable use: **STIPULATION** CSU-2: *Hydrologic Features/Riparian:* Apply CSU (site-specific relocation) restrictions within 152 meters (500 feet) from the edge of any hydrologic feature including perennial and intermittent streams, wetlands (including fens), lakes, springs, seeps, and riparian areas. (Refer to Appendix B.) See Figures 2-47 (Alternative B), 2-48 (Alternative C), and 2-49 (Alternative D) in Appendix A.		
Allowable use: No similar allowable use in current RMP.	Allowable use: Identify areas with lentic and lotic riparian characteristics as ROW avoidance area.		Allowable use: No similar allowable use.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Allowable use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-2: *Streams/Springs Possessing Lotic Riparian Characteristics.* Prohibit surface occupancy and surface-disturbing activities within a minimum distance of 100 meters (328 feet) from the edge of the ordinary high-water mark (bank-full stage). Where the riparian corridor width is greater than 100 meters (328 feet) from bank-full, prohibit surface occupancy and surface-disturbing activities within the riparian zone. (Refer to Appendix B.) See Figures 2-43 (Alternative B) and 2-44 (Alternative C) in Appendix A.		Allowable use: No similar allowable use.
Allowable use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-3: *Definable Streams.* Surface disturbing actions within a minimum distance of 30 meters (98 feet) from the edge of the ordinary high-water mark (bank-full stage) should be avoided to the greatest extent practicable and disturbances would be subject to site specific relocation at the discretion of the BLM (Refer to Appendix B.) See Figure 2-47 in Appendix A.	Allowable Use: **STIPULATION** NSO-3: *Definable Streams.* Prohibit surface occupancy and surface-disturbing activities within a minimum distance of 30 meters (98 feet) from the edge of the ordinary high-water mark (bank-full stage). (Refer to Appendix B.) See Figure 2-44 in Appendix A.	Allowable use: No similar allowable use.
Allowable use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-4: *Lentic Riparian Areas (including springs, seeps, and fens).* Prohibit surface occupancy and surface-disturbing activities within a minimum distance of 100 meters (328 feet) from the edge of the riparian zone. (Refer to Appendix B.) See Figures 2-43 (Alternative B) and 2-44 (Alternative C) in Appendix A.		Allowable use: No similar allowable use.
Action: No similar action in current RMP.	Action: Prohibit the use of subsurface explosives and vibroseis buggies within 0.25-mile of all spring sources and perennial streams. This prohibition does not apply to oil and gas well operations (e.g., well perforating).		Action: No similar action.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: No similar action in current RMP.	Action: For projects that propose to disturb riparian vegetation and channels, require professionally engineered design, construction, maintenance, and reclamation plans to mitigate to the fullest extent practicable riparian resource damage associated with the proposed action.		Action: No similar action.
Action: Manage the Badger Wash ACEC as a hydrologic study area.	Action: Manage the Badger Wash ACEC as a hydrologic study area. Refer to the ACEC Section for Badger Wash ACEC management actions.		
Objective: No similar objective in current RMP.	Objective: Provide sufficient water quantity on BLM lands for multiple use management and functioning, healthy riparian, wetland, aquatic, and upland systems.		
Action: No similar action in current RMP.	Action: Secure adequate water rights for point sources on BLM lands from the State of Colorado on springs/seeps and wells necessary to preserve, protect, and enhance ecological diversity and sustainability within planning area watersheds. Uses for which BLM would apply for water rights include, but are not limited to, livestock, wildlife, watering, wildlife habitat, wild horses, recreation, and fire suppression.		
Action: No similar action in current RMP.	Action: Acquire private stream-side and river-side parcels from willing sellers that are contained within or adjacent to public land (i.e., West, East, Roan, and Carr Creeks, and the Colorado, Gunnison, and Dolores Rivers) and display important riparian values.		
Objective: Maintain or improve existing water quality in the resource area when possible. Protect the municipal watersheds providing domestic water for the cities of Palisade and Grand Junction.	Objective: Protect municipal watersheds and source water protection areas on public land that provide drinking water to local communities.		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: No similar allowable use.	Allowable Use: Close the Palisade and Grand Junction municipal watersheds (5,200 and 1,900 acres) to livestock grazing.	Allowable Use: No similar allowable use.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Allowable Use: No similar allowable use in current RMP.	Allowable Use: Manage the high sensitivity zone of the Palisade municipal watershed as ROW exclusion area.		Allowable Use: No similar allowable use.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: Close the Palisade and Grand Junction municipal watersheds, and the Mesa/Powderhorn and Collbran source water protection areas to non-energy solid leasing and development.		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **No Leasing**: *Watersheds.* Close the Palisade and Grand Junction municipal watersheds to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-39 in Appendix A.	Allowable Use: **No Leasing**: *Watersheds and Source Water Protection Areas.* Close the Palisade and Grand Junction municipal watersheds, Collbran and Mesa/Powderhorn source water protection areas, and the Jerry Creek watershed to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-40 in Appendix A.	Allowable Use: No similar allowable use.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: No similar allowable use.	Allowable Use: **No Leasing:** *Split-estate.* Manage 7,100 acres of Private and State surface/federal fluid mineral estate in the Palisade municipal watershed as closed to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-40 in Appendix A.	Allowable Use: No similar allowable use.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: Classify the Palisade and Grand Junction municipal watersheds, Collbran and Mesa/Powderhorn source water protection areas, Jerry Creek watershed, and Cabin Reservoir as unacceptable for coal leasing.		Allowable Use: Classify the Palisade and Grand Junction municipal watersheds, as unsuitable for coal leasing.
Allowable Use: **STIPULATION** *NSO-1: No Surface Occupancy (Grand Junction Municipal Watershed)*. Prohibit surface	Allowable Use: **STIPULATION** NSO-5: *No Surface Occupancy (Palisade and Grand Junction Municipal Watersheds).*	Allowable Use: **STIPULATION** NSO-6: *No Surface Occupancy (Palisade and Grand Junction Municipal Watersheds, Collbran and*	Allowable Use: No similar allowable use.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
occupancy and other activities in the Grand Junction municipal watershed. (Refer to Appendix B.) See Figure 2-42 in Appendix A.	Prohibit surface occupancy and other surface-disturbing activities in the Palisade and Grand Junction municipal watersheds. (Refer to Appendix B.) See Figure 2-43 in Appendix A.	*Mesa/Powderhorn Source Water Protection Areas, and Jerry Creek Watershed)*. Prohibit surface occupancy and other activities in the Palisade and Grand Junction municipal watersheds, Collbran and Mesa/ Powderhorn source water protection areas, and Jerry Creek watershed. (Refer to Appendix B.) See Figure 2-44 in Appendix A.	
Allowable Use: **STIPULATION** *CSU-6: Watersheds*. Require that all lease operations avoid interference with watershed resource values. This includes Jerry Creek Reservoirs and the Palisade municipal watershed. (Refer to Appendix B.) See Figure 2-46 in Appendix A).	Allowable Use: **STIPULATION** CSU-4: *Collbran and Mesa/Powderhorn Source Water Protection Areas, and Jerry Creek Watershed.* Require that all ground disturbances within source water protection areas and the Jerry Creek Watershed avoid interference with watershed resource values. (Refer to Appendix B.) See Figure 2-47 in Appendix A.	Allowable Use: No similar allowable use.	Allowable Use: **STIPULATION** CSU-4: *Collbran and Mesa/Powderhorn Source Water Protection Areas, and Jerry Creek Watershed.* Require that all ground disturbances within source water protection areas and the Jerry Creek Watershed avoid interference with watershed resource values. (Refer to Appendix B.) See Figure 2-49 in Appendix A.
Allowable Use: **LEASE NOTICE (LN)** 17: *Palisade Municipal Watershed*. The lessee is hereby notified that this lease contains privately owned surface of the Town of Palisade that is within the Town's designated Watershed and is covered by a Watershed Protection Ordinance. (Refer to Appendix B.)	Allowable Use: **LEASE NOTICE** LN-1: *Source Water Protection Areas.* The lease is within source water protection areas, and the lessee is required to implement special protective measures for water resources and to collaborate with municipalities and comply with applicable municipal watershed plans. (Refer to Appendix B.)	Allowable Use: No similar allowable use.	Allowable Use: **LEASE NOTICE** LN-2: *Municipal Watersheds and Source Water Protection Areas.* The lease is within a municipal watershed or source water protection area, and the lessee is required to implement special protective measures for water resources and to collaborate with municipalities and comply with applicable municipal watershed plans. (Refer to Appendix B.)

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: No similar action in current RMP.	Action: Within *Water Intake Zone 3*, prohibit the storage and use of hazardous chemicals, require green completions and green fracking fluids, and prohibit oil and gas pits. See Figure 2-72 in Appendix A.	Action: No similar action.	Action: No similar action.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: No similar allowable use.	Allowable Use: **STIPULATION** NSO-7: *Water Intake Zone 3.* Prohibit surface occupancy and other surface-disturbing activities within state identified sensitivity Zone 3. In cases where this zone could not be determined through analytic calculations, Zone 3 would be defined as a 2.5-mile radius around the intake or be based on professional interpretation of geology, topography, and location of municipal wells. The boundary of zone 3 is subject to change based on increased knowledge of groundwater hydrology in these areas. (Refer to Appendix B.) See Figure 2-44 in Appendix A.	Allowable Use: No similar allowable use.
Action: No similar action in current RMP.	Action: Oil and gas operations near domestic water supplies using a groundwater well or spring will be restricted. Siting of oil and gas operations may be permitted following NEPA analysis conducted for a specific location, and the application of protections that may include conditions of approval, mitigation and design features developed in the NEPA analysis, and the regulations at 43 CFR 3101.1-2.		Action: No similar action.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: No similar action in current RMP.	Action: Conduct gain/loss studies of local streams to characterize natural flow regimes and identify locally important recharge/discharge zones. Characterize groundwater movement (locally and regionally), and groundwater interaction with surface water especially for springs and fen areas. Prioritize study locations based on potential use/alteration of surface and groundwater resources given reasonably foreseeable resource use potential. Coordinate studies with private entities as well as other government agencies to ensure land/resource management actions outside BLM jurisdiction are incorporated in studies. Utilize information gained through studies to modify, develop, and effectively implement appropriate BMPs necessary to protect water resources while allowing development of other natural resources (e.g. coal, uranium, natural gas, gravel, and related infrastructure).		
Objective: No similar objective.	Objective: Characterize, monitor, maintain, and/or restore surface/groundwater quality and quantity to sustain designated beneficial uses in cooperation with other federal, local, and state agencies and private entities.		
Action: Implement stream stabilization work along 63 miles of critically-eroding stream channels.	Action: Monitor morphology and channel stability of streams with concerns identified through land health or PFC assessments or inventories, or streams that could be impacted, to determine appropriate management action. Improve dysfunctional streams caused by unnatural factors. Modify management practices (e.g., grazing systems, recreational uses) and/or stream restoration techniques (e.g., native planting, fencing, energy dissipation structures, bank protection, and drainage structures) as appropriate to address causal factors.		
GOAL: Maintain and protect the quantity and quality of groundwater, as well as aquifer properties.			
Objective: No similar objective in current RMP.	Objective: Manage public lands to maintain functioning condition of all parameters within the hydrologic cycle including groundwater quantity and quality. Ensure the consumption of water resources on public lands resulting from federal actions do not jeopardize the sustainability of water resources or associated riparian/wetland habitats.		
Action: No similar action in current RMP.	Action: Identify, monitor, and evaluate the condition of important aquifers and recharge/discharge areas within the planning area. Assess aquifer properties and groundwater quality on BLM lands and work with stakeholders to prioritize and develop management plans and site-specific actions to maintain groundwater quality within the identified aquifers.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Soil Resources			
GOAL: Ensure upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate, land form, and geologic processes. Adequate soil infiltration and permeability allows for the accumulation of soil moisture necessary for optimal plant growth and vigor, minimizes surface runoff (Land Health Standard 1), and minimizes soil erosion.			
Objective: To reduce soil erosion and sediment yield, costs associated with unsuccessful land/vegetation treatment projects on unsuitable soils, and hazards to life or property from soil failure due to the use of unsuitable soils; to maintain long-term soil productivity; and to provide for the safe and proper use of soils.	Objectives: 1. Minimize or control elevated levels of salt, sediment, and selenium contribution from federal lands to river systems in the planning area. 2. Maintain or improve soil productivity, including retention of topsoil quality and reestablishing soil capability, potential, and functionality when disturbed. 3. Preserve proper function and condition of upland soils. 4. Ensure surface disturbances do not cause accelerated erosion (e.g., rills, soil pedestals, actively eroding gullies) on a watershed scale (e.g., 6th hydrologic unit code scale).		
Action: Treat or limit uses of soils in the following areas: • Critically eroding soils in Cactus Park (1,000 acres): Limited access to area, land treatment (including gully plugs, reseeding, diversion and water-retention structures). • Soil slump hazard area of Baxter-Douglas Pass (53,100 acres): **STIPULATION** *NSO-1: No Surface Occupancy (Soils in the Baxter/Douglas Slump Area).* (Refer to Appendix B.) See *NSO-3: Steep Slopes*. • Soil slump hazard area of Plateau Canyon (930 acres):	Action: No similar action.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
STIPULATION *NSO-1: (Soils in the Plateau Area)*. (Refer to Appendix B.) See also *NSO-3: Steep Slopes*.			
Action: No similar action in current RMP.	Action: Implement appropriate management techniques, guidelines or practices, as outlined in Appendix H, to limit soil loss to an amount not exceeding natural erosion rates and to not affect its long term quality, productivity or hydrological function.		
Action: No similar action in current RMP.	Action: In areas designated as open to OHVs, monitor and identify thresholds for evaluating vulnerability to erosional processes and utilize best available science to limit erosion and sedimentation/salt loading to the Colorado River.	Action: No similar action.	Action: Same as Alternative B.
Action: No similar action in current RMP.	Action: Identify those biologic soil crusts in the planning area which are key to sustaining proper function and condition of upland soil health as determined by BLM Land Health Assessments and/or onsite evaluation. Avoid and mitigate disturbance to biologic soil crusts which are determined to be key in sustaining proper function and condition of upland soil health.		Action: No similar action
Allowable Use: Analyze proposed surface disturbing projects to determine suitability of soils to support such projects.	Allowable Use: Manage fragile soils, mapped Mancos shale areas, and saline soils acres as ROW avoidance areas.		
Action: No similar action in current RMP.	Action: Protect watershed health and water quality by limiting motorized travel over fragile soils during seasonally wet periods. Allow management officials the authority to modify closure dates based on climatological variability.		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-8: *Fragile Soils (Slump Areas)*. Prohibit surface	Allowable Use: **STIPULATION** NSO-9: *Fragile Soils.* Prohibit surface occupancy and surface-	Allowable Use: No similar allowable use.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	occupancy and surface-disturbing activities on the Baxter/Douglas Pass Slump Area and the Plateau Creek Slump Area. (Refer to Appendix B.) See Figure 2-43 in Appendix A.	disturbing activities within a minimum of 25 meters (82 feet) of fragile soils (distance may be extended based on site-specific conditions). Onsite evaluation of site-specific soil characteristics would be conducted by BLM verifying that Natural Resources Conservation Service soil mapping unit descriptions are appropriate to the site. (Refer to Appendix B.) See Figure 2-44 in Appendix A.	
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-5: *Fragile Soils.* Apply CSU (site-specific relocation) restrictions to surface-disturbing activities associated with all other land use authorizations, permits, and leases granted in areas with mapped fragile soils. (Refer to Appendix B.) See Figure 2-47 in Appendix A.	Allowable Use: No similar allowable use.	Allowable Use: No similar allowable use.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-6: *Mapped Mancos Shale and Saline Soils.* Apply CSU (site-specific relocation) restrictions to surface-disturbing activities within mapped Mancos Shale areas and on saline soils. (Refer to Appendix B.) See Figures 2-47 (Alternative B), 2-48 (Alternative C), and 2-49 (Alternative D) in Appendix A.		
Allowable Use: **STIPULATION** *NSO-3*: *Steep Slopes.* Mitigate impacts to soil, water, and vegetation on slopes greater than 40 percent. (Refer to Appendix B.) See Figure 2-42 in Appendix A.	Allowable Use: **STIPULATION** NSO-10: *Steep Slopes Greater Than or Equal to 40 Percent.* Prohibit surface occupancy and surface-disturbing activities on slopes greater than or equal to 40 percent to maintain site stability. (Refer to Appendix B.) See Figures 2-43 (Alternative B), 2-44 (Alternative C), and 2-45 (Alternative D) in Appendix A.		
Allowable Use: No similar allowable use in current	Allowable Use: **STIPULATION** CSU-7: *Natural Slopes.* Apply CSU (site-specific relocation)		Allowable Use: No similar allowable use.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
RMP.	restrictions to surface-disturbing activities associated with all other land use authorizations, permits, and leases granted in areas with natural slopes in the range of 25 to 40 percent. (Refer to Appendix B.) See Figures 2-47 (Alternative B) and 2-48 (Alternative C) in Appendix A.		
Action: Prohibit surface-disturbing activities during periods when soil is saturated and prohibit construction when soils are frozen.	Action: See **STIPULATION** NSO-8: *Fragile Soils (Slump Areas)*, NSO-9: *Fragile Soils*, and NSO-10: *Steep Slopes Greater Than or Equal to 40 Percent*. See Figures 2-43 (Alternative B), 2-44 (Alternative C), and 2-45 (Alternative D) in Appendix A.		
Vegetation			
Vegetation—General			
GOAL: Restore and maintain healthy, productive plant communities of native and other desirable species at self-sustaining population levels commensurate with the species' and habitats' potentials. Ensure plants and animals at both the community and population level are productive, resilient, diverse, vigorous, and able to reproduce and sustain natural fluctuations and ecological processes (based on Land Health Standard 3).			
Objective: No similar action in current RMP.	Objective: Manage for a healthy diversity of successional-stage plant communities.		
Action: No similar action in current RMP.	Action: Restore natural disturbance regimes such as fire, and use vegetative treatments to accomplish biodiversity objectives in resilient plant communities. Avoid prescribed fire and fires managed for resource benefit in black brush and salt desert shrub communities.		
Action: No similar action in current RMP.	Action: Use new fire starts and prescribed fire where suitable to meet resource objectives as deemed appropriate by Land Health Assessments, Ecological Site Inventories, Emergency Stabilization & Rehabilitation monitoring, and prescribed fire monitoring.		
Objective: No similar objective in current RMP.	Objective: Provide the public with native plant materials through the sale of wilding permits (e.g., live plants and plant material products exceeding personal use amounts), commercial seed-collecting permits, and free use	Objective: Provide the public with native plant materials through the sale of wilding permits (e.g., live plants and plant material products exceeding personal use amounts) and free use permits (consistent with 43 CFR 8365.1-5, and	Objective: Same as Alternative B.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	permits (consistent with 43 CFR 8365.1-5, and BLM Manual 5500 [Nonsale Disposals]), while protecting other resources.	BLM Manual 5500 [Nonsale Disposals]), while protecting other resources.	
Action: No similar action in current RMP.	Action: Make 834,300 acres available for wilding permits. Issue commercial seed permits on a case-by-case basis. Close the following areas to wilding permits: • WSAs; • ACECs; • Lands managed for wilderness characteristics; • Occupied threatened and endangered plant habitat; and • Occupied special status plant species habitat. *Note: Occupied threatened and endangered plant habitat, and special status plant species is not included in total acreage. Plants that are identified by a Tribe as important for traditional, religious or ceremonial purposes and are not widely available would not be offered as wilding plants for the general public.*	Action: Make 626,700 acres available for wilding permits. Close the following areas to wilding permits: • WSAs; • ACECs; • Lands managed for wilderness characteristics; • Occupied threatened and endangered plant habitat; and • Occupied special status plant species habitat. *Note: Occupied threatened and endangered plant habitat, and special status plant species is not included in total acreage. Plants that are identified by a Tribe as important for traditional, religious or ceremonial purposes and are not widely available would not be offered as wilding plants for the general public.*	Action: Make 931,700 acres available for wilding permits. Close the following areas to wilding permits: • WSAs; • ACECs; • Occupied threatened and endangered plant habitat; and • Occupied special status plant species habitat. *Note: Occupied threatened and endangered plant habitat, and special status plant species is not included in total acreage. Plants that are identified by a Tribe as important for traditional, religious or ceremonial purposes and are not widely available would not be offered as wilding plants for the general public.*

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Vegetation—Desired Plant Communities			
GOAL: Manage pinyon-juniper, upper and lower elevation sagebrush, salt desert shrub, forests and woodlands, and riparian areas (the dominant plant communities of the GJFO planning area) as desired plant communities or to emphasize native vegetation, wildlife habitat, watershed health, and biodiversity.			
Objective: No similar objective in current RMP.	Objective: Manage vegetation to meet BLM Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado (Appendix E) while taking in to account site potential as determined by ecological site inventories, Range/Ecological Site Descriptions, Soils, completed Land Health Assessments, and site-specific management objectives.		
Action: No similar action in current RMP.	Action: Use native plant material and restoration techniques to establish desired plant communities focusing on native communities and intact ecosystems. Allow non-native species on a case-by-case basis, only if: • Suitable native species are not available; • The natural biological diversity of the proposed management area would not be diminished; • Exotic and naturalized species can be confined within the proposed management area; • Analysis of ecological site inventory information indicates that a site would not support reestablishment of a species that historically was part of the natural environment; and, • Resource management objectives cannot be met with native species. (see BLM's Integrated Vegetation Management Handbook, Chapter 8, H-1740-2)		
Objective: No similar objective in current RMP.	Objective: Manage vegetation resources to balance soil and watershed protection, wildlife habitat, livestock grazing, forestry, and biodiversity values, while maintaining or enhancing special status species habitat.	Objective: Manage vegetation resources with an emphasis on maintaining or enhancing special status species habitat.	Objective: Manage vegetation resources with an emphasis on grazing, forestry, and other commodity uses, while complying with existing regulations pertaining to sensitive resources.
Action: Rest vegetation treatments a minimum of two seasons to provide adequate time for new seedlings to become established.	Action: Defer or exclude livestock grazing, where necessary, for a minimum of two growing seasons (longer than 18 months) on disturbed areas (e.g., a fire event, reclamation of disturbed lands, seedings, surface-disturbing vegetation treatments) or until site-specific analysis and/or monitoring data indicates that vegetative cover, species composition, and litter accumulation are adequate to		Action: Determine rest periods on a case-by-case basis to meet BLM Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	support and protect watershed values, meet vegetation objectives, and sustain grazing use.		(Appendix E).
Action: No similar objective in current RMP.	Action: Maintain or restore vegetative communities to provide soil stability and resistance to erosion. Use vegetative treatments to improve diversity, reduce noxious and invasive species, and restore native plant communities to support wildlife and livestock. Ensure that managed activities (grazing, recreation, energy development, etc.) are not leading to degraded conditions.	Action: Use vegetative treatments to reduce noxious and invasive species and restore native plant communities. Limit grazing in occupied special status species habitat if monitoring determines livestock are contributing to a diminished native plant community or desired habitat conditions.	Action: Implement vegetation treatments to increase forage production.
Objective: No similar objective in current RMP.	Objective: In lower-elevation vegetation, occupied by the potential natural community, manage for a late- or mid-seral stage as the desired plant community.		
Action: No similar action in current RMP.	Action: Maintain present composition of late- to mid-seral plant communities providing suitable habitat for wildlife. Minimize activities that would result in a persistent early-seral stage in the lower elevations.		
Salt Desert Shrub Desired Plant Community			
GOAL: Manage the salt desert shrub communities to maintain viable populations of kit fox (*Vulpes macrotis*), burrowing owl (*Athene cunicularia*), white-tailed prairie dog (*Cynomys leucurus*), and other obligate species. Preserve undisturbed patches of salt desert shrub communities with little to no cheatgrass (*Bromus tectorum)*, halogeton (*Halogeton glomeratus)*, or other exotic species. Identify and initiate restoration and rehabilitation of unhealthy areas.			
Objective: No similar objective in current RMP.	Objective: Manage the salt desert shrub community to improve vigor, composition, diversity, and cover of native understory species and biological soil crusts.		Objective: Manage the salt desert shrub community at current levels of vigor, composition, diversity, and cover of native understory species and biological crusts.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: No similar action in current RMP.	Action: Suppress all fires in Salt Desert Shrub communities.		
Action: No similar action in current RMP.	Action: In the lower desert setting, manage grazing to allow the recovery of native perennials. Ensure utilization levels are sustainable, provide periods of rest as needed, and adjust season of use to ensure adequate soil moisture levels post grazing (for plant growth).		
Action: No similar action in current RMP.	Action: In greasewood *(Sarcobatus vermiculatus)* communities where head-cutting is just beginning, consider management actions to arrest continued erosion (e.g., armoring, wattles). Stop erosion with armoring and wattles before extensive head-cutting occurs.		
Action: Utilize approved methods of cheatgrass control.	Action: As advances in cheatgrass-control methods are made, prioritize vegetation treatments to treat cheatgrass and to restore native perennials in the North Desert, Grand Mesa Slopes, and other degraded areas in the lower desert (excluding OHV open areas).	Action: As advances in cheatgrass-control methods are made, prioritize vegetation treatments to treat cheatgrass and to restore native perennials in the North Desert, Grand Mesa Slopes, areas north of the airport, and other degraded areas in the lower desert.	Action: Same as Alternative A.
Lower-elevation Sagebrush (below 7,500 feet) Desired Plant Community			
GOAL: Manage the sagebrush *(Artemisia* spp.*)* biome to maintain viable populations of sagebrush-obligate species. Identify and initiate restoration and rehabilitation of sagebrush habitat, while maintaining a mosaic of canopy cover and successional stages. Maintain or improve sage-grouse winter habitat.			
Objective: No similar objective in current RMP.	Objective: Maintain or improve high-quality sagebrush habitats consistent with the natural range of variability for sagebrush communities. Restore the species composition and diversity of seral stages of sagebrush communities.		
Action: No similar action in current RMP.	Action: Implement treatments designed to replenish the native seed bank and control noxious and invasive species.	Action: Implement habitat improvement projects that focus on controlling cheatgrass and restoring the native seed bank, and continue to study effectiveness of treatments.	Action: Implement treatments designed to replenish the native seed bank and control noxious and invasive species.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Objective: No similar objective in current RMP.	Objective: Sustain, restore, and rehabilitate the integrity of the sagebrush biome to provide the amount, continuity, and quality of habitat that is necessary to maintain sustainable populations of sagebrush-obligate species.		
Action: No similar action in current RMP.	Action: Inventory upper-elevation sagebrush to identify non-functioning habitat and develop restoration plans within priority management units to increase patch size and connectivity through vegetation treatments and consolidation of disturbance to support sagebrush obligate species. Prioritize management of upper-elevation sagebrush in the following order: 1. Greater sage-grouse *(Centrocercus urophasianus)* and Gunnison sage-grouse *(Centrocercus minimus)* important winter habitat. 2. Critical and severe big-game winter range. 3. Areas not meeting land health.		Action: Maintain patch size of lower elevation sagebrush habitat to restore habitat connectivity and function for sagebrush obligate species.
Action: No similar action in current RMP.	Action: Avoid natural and prescribed fire in low-elevation cheatgrass-infested sage-brush communities. Mechanical treatments in low-elevation sage require seeding.		Action: Allow fire and mechanized treatments in low-elevation sage-brush that include reseeding.
Action: No similar action in current RMP.	Action: Inventory low-elevation sage-brush to identify non-functioning habitat. Develop restoration plans that prioritize efforts to achieve specific species and habitat goals. Habitat goals include but are not limited to increased patch size and connectivity through vegetation treatments and consolidation of disturbance to support sage-brush obligate species.		Action: Maintain patch size of low-elevation sage-brush habitat to restore habitat connectivity and function for sage-brush obligate species.
Action: No similar action in current RMP.	Action: Prioritize the following greater sage-grouse and Gunnison sage-grouse winter areas for treatment and restoration: • winter habitat areas in need of enhancement; • areas that pose a fire risk to key winter habitats; and • areas to meet habitat condition objectives (e.g., Sunny Side and Wagon Track Ridge).		
Upper-elevation Sagebrush (7,500 feet and higher) Desired Plant Community			
GOAL: Manage the sagebrush biome to maintain viable populations of greater and Gunnison sage-grouse and other sagebrush-obligate species. Identify and initiate restoration and rehabilitation of sagebrush habitat while maintaining a mosaic of canopy cover and successional stages.			

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Objective: No similar objective in current RMP.	Objective: Maintain or improve high-quality sagebrush habitats consistent with the natural range of variability for sagebrush communities. Restore the species composition and diversity of successional stages of sagebrush communities.		
Action: No similar action in current RMP.	Action: Implement treatments designed to reduce pinyon-juniper and conifer encroachment, replenish diminished native seed banks, control noxious and invasive species, and provide periods of grazing rest or reduced usage during drought.		Action: Manage to maximize forage production for livestock. Implement treatments to pinyon-juniper and conifer encroachment, and to increase forage.
Objective: No similar objective in current RMP.	Objective: Prioritize the following areas for Land Health Assessments, vegetation restoration efforts, and protection of existing intact environments: 1-4. Restoration plans would emphasize increasing patch size and connectivity through vegetation treatments. Disturbances should also be consolidated through BMPs to reduce disturbance and maintain sagebrush-obligate species.		
Action: No similar action in current RMP.	Action: Inventory upper-elevation sagebrush to identify non-functioning habitat and develop restoration plans within priority management units to increase patch size and connectivity through vegetation treatments and consolidation of disturbance to support sagebrush obligate species. Prioritize management of upper-elevation sagebrush in the following order: 1. Greater and Gunnison sage-grouse important habitat, including but not limited to Glade Park, Brush Mountain, and 4A Mountain. 2. Critical and severe big-game winter range. 3. Areas not meeting land health. 4. Areas that pose a fire risk to key habitats.		Action: Maintain patch size of upper elevation sagebrush habitat to restore habitat connectivity and function for sagebrush obligate species.
Action: No similar action in current RMP.	Action: Reduce the encroachment of juniper (*Juniperus* spp.) and other woody tree species in sagebrush habitat. Sites should have evidence of past sagebrush plant communities as evidenced by residual native plants or soils that support a rangeland not a woodland ecological site.		
Action: No similar action in current RMP.	Action: Maintain and/or create connections between key sagebrush habitats by encouraging placement of new utility developments (power lines, pipelines, etc.) and transportation routes (roads, trails etc.) in existing utility or transportation corridors to minimize fragmentation of sagebrush vegetation.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: No similar action in current RMP.	Action: Remove sagebrush to create small openings in continuous or dense sagebrush to create a mosaic of multiple age classes and associated understory diversity across the landscape to benefit many sagebrush-dependent species. Factors that help determine the mosaic are soil types, topography, aspect, climate and local weather patterns, and current and potential plant communities.		
Mountain Shrub			
GOAL: Manage mountain shrub communities to maintain vigorous stands of deciduous shrubs.			
Objective: No similar objective in current RMP.	Objective: Emphasize perpetuating late- to mid-seral plant communities that provide suitable habitat for wildlife.		Objective: Manage for diversity in age class of late- to mid-seral plant communities providing suitable habitat for wildlife and livestock.
Action: No similar action in current RMP.	Action: Avoid treatments in mature Gambel oak *(Quercus gambelii)* stands (those stands where the average stem diameter is greater than six inches), except in wildland-urban interface (WUI) areas.		Action: Allow treatment and harvest of Gambel oak stands.
Action: No similar action in current RMP.	Action: Use prescribed fire, natural ignitions, and mechanical treatments to create openings within dense stands.	Action: Use prescribed fire and natural ignitions to create openings within dense stands.	Action: Same as Alternative B.
Vegetation— Forestry/Woodlands			
GOAL: Maintain and restore pinyon-juniper woodlands to meet requirements for land health and to supply wildlife habitat, livestock forage, and consumer products (e.g., posts, poles, firewood, biomass).			
Objective: Manage present plant composition in late- and mid-seral conditions as desired plant communities.	Objective: Manage for pinyon *(Pinus edulis)* and juniper with a balance of seral stages.	Objective: Manage for pinyon and juniper with emphasis on old growth retention.	Objective: Manage for pinyon and juniper with emphasis on mid-seral woodlands for harvest and treatment.
Action: No similar action in current RMP.	Action: Maintain current acreage of old	Action: Manage for increased acreage of old	Action: No similar action.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	growth pinyon and juniper except in area of high wildfire hazard in the wildland urban interface.	growth pinyon and juniper on suitable sites.	
Action: No similar action in current RMP.	Action: Manage past and future treatment areas in pinyon and juniper with an emphasis on creating a mosaic of pinyon and juniper age classes and forage producing sites. Allow additional forage/habitat producing treatments on pinyon and juniper woodland sites.	Action: Manage past treatment areas in pinyon and juniper toward mature pinyon-juniper woodlands. Prohibit additional treatments of woodlands for forage production.	Action: Increase forage producing treatments on pinyon and juniper woodland sites. Allow additional forage/habitat producing treatments on pinyon and juniper woodland sites.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-8: *Old Growth Forests and Woodlands.* Apply CSU (site-specific relocation) restrictions within all old growth forests and woodlands. (Refer to Appendix B.) See Figures 2-47 (Alternative B), 2-48 (Alternative C), and 2-49 (Alternative D) in Appendix A.		
GOAL: Maintain forests and woodlands for a healthy mix of successional stages within the natural range of variation that incorporates diverse structure and composition.			
Objective: Maintain present plant composition in late- and mid-seral conditions as desired plant communities.	Objective: Manage ponderosa pine (*Pinus ponderosa*), Douglas-fir (*Pseudotsuga menziesii)*, aspen *(Populus tremuloides)*, and spruce/fir to mimic natural stand conditions and natural regeneration.		
Action: No similar action in current RMP.	Action: Use prescribed fire and mechanical, chemical, and biological treatments as necessary to reduce the risk of disease vectors and to increase the resilience to beetles and disease.		
Action: No similar action in current RMP.	Action: Use silvicultural methods, including mechanized and non-mechanized thinning, prescribed burns, and commercial harvesters to maintain and develop natural patch sizes, shapes, connectivity, and species composition and age-class diversity.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: No similar action in current RMP.	Action: Conserve mature riparian forests (e.g., cottonwood *[Populus fremontii]* galleries) in suitable habitat to maintain their integrity for use as bald eagle *(Haliaeetus leucocephalus)* nesting, roosting, or perching substrate.		
Vegetation— Riparian			
GOAL: Provide for Proper Functioning Condition of riparian and wetland areas while preserving and enhancing riparian functions/structure on streams with special values (e.g., water quality, fisheries, and special status species).			
Objective: To maintain the existing riparian acreage and manage it for the greatest diversity in plant heights and for the species appropriate (native) to each site.	Objective: Protect and restore riparian areas/wetlands through sound management practices.		
Action: Manage riparian habitat in compliance with the Land Health Standard 2: Riparian systems associated with both running and standing water function properly and have the ability to recover from major disturbances such as fire, severe grazing, or 100-year floods. Riparian vegetation captures sediment and provides forage habitat and biodiversity. Water quality is improved or maintained. Stable soils store and release water.			
Action: No similar action in current RMP.	Action: Mitigate to reduce impacts to riparian areas: • Monitor cattle and wildlife grazing impacts in riparian zones and adjust grazing allocations, season of use, and rest rotations as necessary to ensure PFC is achieved and maintained; • Where feasible, consistent with user safety, locate/relocate developed travel routes away from riparian wetland areas; • Monitor recreational use on riparian areas. Where adverse impacts are determined to not meet land health standards for riparian habitats, modify recreation management to improve camping opportunities outside of riparian areas; require the use of designated camping sites; install fencing, energy dissipation structures, and bank protection features as appropriate; • Where necessary, control recreational use by changing location or kind of activity, season, intensity, distribution and/or duration; • Prohibit firewood harvest, except where appropriate to allow for removal of		Action: Mitigate to reduce impacts to riparian areas; • Where feasible, consistent with user safety, locate/relocate developed travel routes from riparian wetland areas; • Avoid camping in riparian areas; • Where necessary, control recreational use by changing location or kind of activity, season, intensity, distribution and/or duration; and • Close the river corridors of the three major rivers (Colorado,

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	undesirable invasive species; and • Close the river corridors of the three major rivers (Colorado, Dolores, and Gunnison) to mineral material disposal and non-energy solid mineral leasing and development.		Dolores, and Gunnison) to mineral material disposal and non-energy solid mineral leasing and development.
Allowable use: Protect riparian areas by prohibiting surface disturbance in these areas year round.	Allowable Use: **STIPULATION** NSO-2: *Streams/Springs Possessing Lotic Riparian Characteristics.* Prohibit surface occupancy and surface-disturbing activities within a minimum distance of 100 meters (328 feet) from the edge of the ordinary high-water mark (bank-full stage). Where the riparian corridor width is greater than 100 meters (328 feet) from bank-full, prohibit surface occupancy and surface-disturbing activities within the riparian zone. (Refer to Appendix B.) See Figures 2-43 (Alternative B) and 2-44 (Alternative C) in Appendix A.		Allowable use: No similar allowable use.
Allowable use: Protect riparian areas by prohibiting surface disturbance in these areas year round.	Allowable Use: **STIPULATION** NSO-4: *Lentic Riparian Areas (including springs, seeps, and fens)*. Prohibit surface occupancy and surface-disturbing activities within a minimum distance of 100 meters (328 feet) from the edge of the riparian zone. (Refer to Appendix B.) See Figures 2-43 (Alternative B) and 2-44 (Alternative C) in Appendix A.		Allowable use: No similar allowable use.
Allowable Use: No similar action in current RMP.	Allowable Use: Identify areas with lentic and lotic riparian characteristics as ROW avoidance areas.		Allowable Use: No similar allowable use in current RMP.
Action: No similar action in current RMP.	Action: Give priority for riparian management to areas identified as special status species habitat and those riparian areas not meeting Proper Functioning Condition (e.g., Roan, Carr, Hawxhurst, Coon Creek, and Plateau Creeks; the Gunnison, Colorado, and Dolores Rivers; and Unaweep Seep).		
Action: No similar action in current RMP.	Action: In priority management areas and in areas not meeting Proper Functioning Condition, use the Multiple Indicator Method for monitoring to the extent feasible. Tailor the monitoring method to the objectives determined for each stream.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: Protect riparian areas by prohibiting surface disturbances in these areas year round.	Action: Consider the following management actions for improvement or protection of riparian values: riparian grazing pastures, exclosures, land acquisition, adjustments to grazing management, stream structures, and plantings.		
Action: No similar action in current RMP.	Action: Where conditions are appropriate, allow removal of tamarisk *(Tamarix* spp.*)*, non-native elms *(Ulmus* spp.*)*, and Russian olive *(Elaeagnus angustifolia)* material for biomass or personal use.		
Vegetation— Adaptive Drought Management			
GOAL: Develop management prescriptions for all surface-disturbing resource uses during times of extended drought.			
Objective: Establish criteria for restricting activities during drought.			
Action: No similar action in current RMP.	Action: Implement the following measures/parameters for restricting activities during drought (Refer to Table 2-3, Drought Severity Classification): *Severe (D2):* • Send drought letters to grazing permittees and other permitted land users requesting coordination with BLM. • Coordinate with CPW for big game herd management. • Prepare local seasonal precipitation graphs. • Suspend or limit seed-collecting activities. *Extreme (D3):* • Prohibit new surface-disturbing activities in areas with sensitive soils, subject to valid existing rights or actions associated with other valid permitted activities. • Base changes in livestock use on site-specific data on those allotments that are affected by drought. • Temporarily close OHV open areas and designated routes as needed during periods of drought and wind events to reduce particulate matter. • Require additional erosion-control techniques/BMPs for surface-disturbing activities (e.g., hydromulching). • Limit prescribed burns and vegetation treatments (exceptions: pile burning and hand thinning). *Exceptional (D4):* • Base changes in livestock use on site-specific data on those allotments that are affected by drought.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	• Prohibit new surface-disturbing activities, subject to valid existing rights or actions associated with other valid permitted activities. • Consider closing areas to public entry.		
Vegetation—Weeds			
GOAL: Reduce the occurrence of noxious and invasive species through the use of an Integrated Pest Management Program across the planning area.			
Objective: Apply integrated control methods (physical, cultural, biological, chemical, fire) to noxious and invasive pest populations.			
Action: Prioritize treatment areas for priority noxious and invasive species based on the following criteria: • Current state, county, and BLM priority weed lists; • Appropriate time of year for the most effective treatment; and • River restoration projects.			
Action: Continue early detection of new infestations, and a rapid treatment response (National Early Detection and Rapid Response Strategy).			
Objective: Require weed prevention on appropriate actions authorized within the planning area.			
Action (prevention): Implement preventative measures for activities associated with oil and gas operations; ROWs; range developments; special recreation permits (SRP); and construction and mechanical vegetation treatment activities as authorized in contracts and permits.			
Special Status Species			
GOAL: Manage special status species habitats to provide for their conservation and restoration as part of an ecologically healthy system.			
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-9: *BLM Sensitive Plant Species Occupied Habitat*. For plant species listed as sensitive by BLM, special design, construction, and implementation measures within a 100-meter (328 feet) buffer from the edge of occupied habitat may be required. In	Allowable Use: No similar allowable use.	Allowable Use: No similar allowable use.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	addition, relocation of operations by more than 200 meters (656 feet) may be required. (Refer to Appendix B.) See Figure 2-47 in Appendix A.		
Allowable Use: No similar allowable use in current RMP, however, currently mitigation and minimization measures are implemented on a case-by-case basis.	Allowable Use: **STIPULATION** CSU-10: *Wildlife Habitat.* Require proponents of surface-disturbing activities to implement specific measures to reduce impacts of operations on wildlife and wildlife habitat within high-value or crucial wildlife habitat. Measures would be determined through biological surveys, onsite inspections, effects of previous actions in the area, and BMPs (Appendix H). (Refer to Appendix B.) See Figures 2-47 (Alternative B) and 2-48 (Alternative C) in Appendix A.		Allowable Use: No similar allowable use.
Allowable Use: **LEASE NOTICE** *LN-13: Threatened and Endangered Species Habitat.* The lessee/operator is required to submit to the BLM's Authorized Officer a plan for avoidance or mitigation of impacts on the identified species. This may require completion of an intensive inventory by a qualified biologist. The plan must be approved prior to any surface disturbance. The BLM's Authorized Officer may require additional mitigation measures, such as relocation of proposed roads, drilling sites, or other facilities. Where impacts cannot be mitigated to the satisfaction of the BLM's Authorized Officer, surface occupancy on that	Allowable Use: **LEASE NOTICE** LN-3: *Biological Inventories.* The operator is required to conduct a biological inventory prior to approval of operations in areas of known or suspected habitat of special status species, or habitat of other species of interest such as but not limited to raptor nests, sage-grouse leks, or significant natural plant communities. The operator, in coordination with the BLM, shall use the inventory to prepare mitigating measures to reduce the impacts on affected species or their habitats. These mitigating measures may include, but are not limited to, relocation of roads and other facilities and fencing operations or habitat. Where impacts cannot be mitigated to the satisfaction of the BLM's Authorized Officer, surface occupancy on that area is prohibited. (Refer to Appendix B.)		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
area is prohibited. (Refer to Appendix B.) • Black-footed ferret; • Spineless hedgehog cactus; and • Colorado hookless cactus *(Sclerocactus glaucus)* (formerly the Uinta Basin hookless cactus).			
Special Status Species—Fish			
Objective: No similar objective in current RMP.	Objective: Maintain or improve the quality of listed (threatened or endangered) fish and sensitive fish habitat by managing public land activities to support species recovery and the benefit of those species.		
Action: No similar action in current RMP.	Action: Identify limiting habitat factors based on site characteristics and habitat capabilities using channel type and geology classifications (e.g., Rosgen). Upon identification of limiting factors, prioritize and implement proven river, stream, lake, and riparian practices (e.g., in-channel habitat structures to create pools, riparian plantings) or by changing management of other program activities (e.g., changing livestock grazing season use) to achieve desired future condition.		
Action: No similar action in current RMP.	Action: Designate the following ACECs to protect habitat for unique, sensitive, and listed fish (see ACECs section for management prescriptions): • Dolores River Riparian ACEC: flannelmouth *(Catostomus latipinnis)* and bluehead sucker *(Catostomus discobolus)*; and • Roan and Carr Creeks: cutthroat trout *(Oncorhynchus clarkii)*.	Action: Designate the following ACECs to protect habitat for unique, sensitive, and listed fish (see ACECs section for management prescriptions): • Same as Alternative B, plus the following: ○ Colorado River Riparian ACEC: razorback sucker *(Xyrauchen texanus)*, bonytail chub *(Gila elegans)*, humpback chub *(Gila cypha)*, and Colorado pikeminnow *(Ptychocheilus lucius)*; ○ Coon Creek: cutthroat trout; ○ Gunnison River Riparian ACEC: razorback sucker, bonytail and humpback chub, Colorado	Action: No similar action.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
		pikeminnow; ○ Hawxhurst Creek: cutthroat trout; and ○ Plateau Creek: roundtail chub *(Gila robusta*), bluehead sucker, and flannelmouth sucker.	
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** TL-1: *Sport and Native Fish.* Prohibit in-channel stream work in all occupied streams during appropriate spring and fall spawning periods. Rainbow trout *(Oncorhynchus mykiss)*, cutthroat trout, bluehead and flannelmouth sucker, roundtail chub, Paiute sculpin *(Cottus beldingii)* and mottled sculpin *(Cottus bairdii*) (April 1 to August 1); brown trout (*Salmo trutta*) and brook trout *(Salvelinus fontinalis)* (October 1 to November 30. (Refer to Appendix B.) See Figure 2-51 in Appendix A.	Allowable Use: **STIPULATION** TL-1: *Sport and Native Fish.* Prohibit in-channel stream work in all occupied streams during appropriate spring and fall spawning periods. Cutthroat trout (May 1-September 1), rainbow trout (March 1-June 30), brown trout (October 1-May 1), brook trout (August 1-May 1), Sculpin (May 1-July 31), bluehead sucker (May 1-July 31), flannelmouth sucker (April 1-July 1), roundtail chub (May 1-July 31), speckled dace (*Rhinichthys osculus*) (May 1-August 31), mountain whitefish *(Prosopium williamsoni*) (October 1-November 30). (Refer to Appendix B.) See Figure 2-52 in Appendix A.	Allowable Use: **STIPULATION** TL-2: *Occupied Cutthroat Trout Waters*. Prohibit in-channel work in all occupied cutthroat trout streams during spring spawning periods of April 1 to August 1. (Refer to Appendix B.) See Figure 2-53 in Appendix A.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: No similar allowable use.		Allowable Use: **STIPULATION** NSO-11: *Conservation Populations of Cutthroat Trout.* Prohibit surface occupancy and surface-disturbing activities within 100 meters (328 feet) from edge of ordinary high-water mark (bank-full stage), of streams containing genetically pure

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
			populations of cutthroat trout. Where the riparian corridor width is greater than 100 meters (328 feet) from stream edge, prohibit surface occupancy and surface-disturbing activities within the riparian zone. (Refer to Appendix B.) See Figure 2-45 in Appendix A.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-1: *Major River Corridors.* Prohibit surface occupancy and surface-disturbing activities within stream channels, stream banks, and the area 0.25-mile either side of the ordinary high-water mark (bank-full stage) or within 100 meters (328 feet) of the 100-year floodplain (whichever area is greatest) of the Colorado, Gunnison, and Dolores Rivers. (Refer to Appendix B.) See Figures 2-43 (Alternative B), 2-44 (Alternative C), and 2-45 (Alternative D) in Appendix A.		
Allowable use: No similar allowable use in current RMP.	Allowable use: **STIPULATION** CSU-1: *Major River Corridors.* Apply CSU (site-specific relocation) (Exhibit Colorado [CO]-28) restrictions from 0.25- to 0.5-mile landward from identified NSO buffer (0.25-mile from ordinary high water mark or within 100 meters [328 feet] of the 100-year floodplain, whichever is greatest) on either side of the Colorado, Gunnison, and Dolores Rivers for fluid mineral development. (Refer to Appendix B.) See Figures 2-47 (Alternative B) and 2-48 (Alternative C) in Appendix A.		Allowable use: No similar allowable use.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-2: *Streams/Springs Possessing Lotic Riparian Characteristics.* Prohibit surface occupancy and surface disturbing activities with a minimum distance of 100 meters (328 feet) from the edge of the ordinary high-water mark (bank-full stage). Where the riparian corridor width is greater than 100 meters (328 feet) from bank-full, prohibit surface occupancy and surface disturbing activities within the riparian zone. (Refer to Appendix B.) See Figures 2-43 (Alternative B) and 2-44 (Alternative C) in Appendix A.		Allowable Use: No similar allowable use.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Allowable Use: No similar allowable use in current RMP.	Allowable Use: Manage the Roan and Carr Creeks ACEC as a ROW avoidance area to protect special status fish species' habitat.	Allowable Use: Manage the following ACECs as ROW avoidance areas to protect special status fish species' habitat: • Coon Creek; • Hawxhurst Creek; • Plateau Creek; and • Roan and Carr Creeks.	Allowable Use: No similar allowable use.
Special Status Species— Plants and Terrestrial Wildlife			
GOAL: Manage special status species and their habitats to provide for their conservation and restoration as part of an ecologically healthy system, and support the goals contained in Standard 4 of the Colorado Standards for Public Land Health (BLM 1997a) (see Appendix E).			
Objective: To conserve plants and animals (and their habitats) listed by federal and Colorado governments as threatened and endangered species, and to conserve plants and animals that are candidates for these lists.	Objective: To conserve plants and animals (and their habitats) listed by federal and Colorado governments as threatened, endangered, sensitive or species of concern, and to conserve plants and animals that are candidates for these lists with the overall objective of improving their populations so that they can be removed from these lists.		Objective: Same as Alternative A.
Action: Manage threatened and endangered species' habitat as ROW avoidance areas. Relocate ROWs if a determination is made that the relocation action would benefit and promote recovery and would not further impact a threatened and endangered species.			
Action: No similar action in current RMP.	Action: Avoid authorizing 2920 permits (such as site facilities and commercial filming) within known threatened and endangered species' habitat. Allow permits only when impacts on threatened and endangered species habitat are shown to be negligible.		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: Manage the following ACECs as ROW exclusion areas to protect threatened and endangered species' habitat: • Atwell Gulch;	Allowable Use: Manage the following ACECs as ROW exclusion areas to protect threatened and endangered species' habitat: • Same as Alternative B, plus the following:	Allowable Use: Manage the Pyramid Rock ACEC as a ROW exclusion area to protect threatened and endangered species' habitat.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	• Pyramid Rock; and • South Shale Ridge (except for ROWs to existing oil and gas leases issues under the 1987 RMP without NSO lease stipulations).	○ Reeder Mesa.	
Allowable Use: No similar allowable use in current RMP.	Allowable Use: Manage the following ACECs as ROW exclusion areas to protect special status species' habitat: • A portion (1,800 acres) of Badger Wash; • Juanita Arch; • Rough Canyon; and • Unaweep Seep.		Allowable Use: Manage the following ACECs as ROW exclusion areas to protect special status species' habitat: • A portion (1,800 acres) of Badger Wash; and • Unaweep Seep.
Action: Protect and maintain unique ecological values for the following habitat locations to improve the habitat for unique, sensitive, and endangered plants and animals: • Badger Wash ACEC: Great Basin silverspot butterfly *(Speyeria nokomis)*, grand buckwheat *(Eriogonum contortum)*, Ferron's milkvetch *(Astragalus musiniensis)*, cliffdweller's cryptantha *(Cryptantha elata)*, Gardner's saltbrush *(Atriplex gardneri)*, and salina wildrye *(Leymus salinus)*; • Colorado River corridor: cottonwood/skunkbrush *(Rhus aromatic)* riparian forest, bald eagle, and great blue heron *(Ardea herodias)*;	Action: Protect and maintain unique ecological values for the following habitat locations to improve the habitat for unique, sensitive, and endangered plants and animals. (See ACECs section for specific management of ACECs.) • Atwell Gulch ACEC: Colorado hookless cactus, DeBeque milkvetch, and Naturita milkvetch *(Astragalus naturitensis)*; • Badger Wash ACEC: grand buckwheat, Ferron's milkvetch, cliffdweller's cryptantha, and Gardner's saltbrush/salina wildrye; • Dolores River Riparian ACEC: peregrine falcon *(Falco peregrinus)*, bald eagle, Kachina daisy *(Erigeron kachinensis)*, Eastwood's	Action: Protect and maintain unique ecological values for the following habitat locations to improve the habitat for unique, sensitive, and endangered plants and animals. • Same as Alternative B, plus the following: ○ Colorado River Riparian ACEC: cottonwood/skunkbrush riparian forest, bald eagle, and great blue heron; ○ Glade Park–Pinyon Mesa ACEC: Gunnison sage-grouse; ○ Gunnison River Riparian ACEC: Colorado hookless cactus, peregrine falcon, bald eagle, and blue herons; ○ John Brown Canyon ACEC: Grace's warbler *(Dendroica graciae)*, old growth pinion, juniper;	Action: Protect and maintain unique ecological values for the following habitat locations to improve the habitat for unique, sensitive, and endangered plants and animals. • Same as Alternative A, plus the following: ○ The Palisade ACEC: peregrine falcon and bald eagle; and ○ Rough Canyon ACEC: canyon treefrog *(Hyla arenicolor)*.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
• Pyramid Rock ACEC/Research Natural Area (RNA): Colorado hookless cactus, DeBeque phacelia *(Phacelia submutica)*, DeBeque milkvetch *(Astragalus debequaeus)*, adobe thistle *(Cirsium perplexans)*, and aromatic Indian breadroot *(Pediomelum aromaticum)*; • Rough Canyon ACEC/ RNA: Gunnison sage-grouse, spineless hedgehog cactus *(Echinocereus triglochidiatus var. inermis)*, Grand Junction milkvetch *(Astragalus linifolius)*, and Eastwood's desert parsley *(Lomatium eastwoodiae)*; • A portion of the Palisade ACEC (23,600 acres): Dolores River skeleton plant *(Lygodesmia doloresensis)*, San Rafael milkvetch *(Astragalus rafaelensis)*, horseshoe milkvetch *(Astragalus equisolensis)*, Fisher Tower's milkvetch *(Astragalus piscator)*, tufted green gentian *(Frasera paniculata)*, and Osterhout's catseye *(Cryptantha osterhoutii)*; and • Unaweep Seep ACEC: Great Basin	monkeyflower, *(Mimulus eastwoodiae)*, San Rafael milkvetch, Dolores River skeleton plant, horseshoe milkvetch, Grand Junction milkvetch, and Gypsum catseye *(Cryptantha crassipes);* • Juanita Arch ACEC: Grand Junction milkvetch; • The Palisade ACEC: peregrine falcon, bald eagle, Dolores River skeleton plant, San Rafael milkvetch, horseshoe milkvetch, Fisher Tower's milkvetch, tufted green gentian, and Osterhout's catseye; • Pyramid Rock ACEC: Colorado hookless cactus, DeBeque phacelia, DeBeque milkvetch, Naturita milkvetch, adobe thistle, and aromatic Indian breadroot; • Rough Canyon ACEC: canyon treefrog, Gunnison sage-grouse, spineless hedgehog cactus, Grand Junction milkvetch, and Eastwood's desert parsley; • Sinbad Valley ACEC: Gypsum catseye; • South Shale Ridge ACEC: Colorado hookless cactus, Naturita milkvetch, and adobe thistle; and • Unaweep Seep ACEC: Great	○ Prairie Canyon ACEC: burrowing owl, long-billed curlew *(Numenius americanus)*, kit fox, and white-tailed prairie dog; ○ Reeder Mesa ACEC: Colorado hookless cactus; and ○ Roan and Carr Creeks ACEC: greater sage-grouse.	

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
silverspot butterfly *(Speyeria nokomis nokomis)* and giant helleborine *(Epipactis gigantea)*. In the remainder of the resource area, improve habitat of these species where opportunities exist.	Basin silverspot butterfly and giant helleborine.		
Action: No similar action in current RMP.	Action: Pursue land tenure adjustments to facilitate the conservation or recovery of special status species. Avoid the disposal of occupied special status species' habitat.	Action: Pursue land tenure adjustments to facilitate the conservation or recovery of special status species. Prohibit the disposal of occupied special status species' habitat.	Action: Same as Alternative B.
Allowable Use: **LEASE NOTICE** *LN-15 (Alternative A)*/LN-4 (Alternatives B, C, and D)*: Colorado Hookless Cactus (formerly Uinta Basin Hookless Cactus).* This lease contains habitat for the Colorado hookless cactus *(Sclerocactus glaucus)*. Prior to undertaking any activity on the lease, including surveying and staking of well locations, the lessee may be required to perform botanical inventories on the lease. Special design and construction measures may also be required in order to minimize impacts to Colorado hookless cactus habitat from drilling and producing operations. (Refer to Appendix B.)			
Plants			
Objective: To conserve plants (and their habitats) listed by federal and Colorado governments as threatened and endangered species, and to conserve plants that are candidates.	Objective: Promote maintenance and recovery of federally listed, proposed, and candidate plant species by protecting occupied habitat. Protect occupied habitat for all BLM sensitive plant species.	Objective: Promote maintenance and recovery of federally listed, proposed, and candidate plant species by protecting occupied and adjacent suitable habitat. Protect occupied habitat for all BLM sensitive plant species.	Objective: Same as Alternative B.
Action: No similar action in current RMP.	Action: Identify the following areas as core conservation populations for special status plant species: • Atwell Gulch; • Logan Wash Mine; • Pyramid Rock ACEC; • South Shale Ridge;		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	• Sunnyside; and • Reeder Mesa. Manage identified habitat to maintain the population. Management tools include but are not limited to weed treatments, inter-seeding, route closures, fencing, and managing timing and intensity of grazing. Identify additional areas as populations are identified and species of concern are modified.		
Action: No similar action in current RMP.	Action: Monitor special status plant populations to determine trends, impacts, and guide future management, with an emphasis on areas near surface-disturbing activities. Utilize monitoring data to determine and modify NSO stipulations applicable to current and historically occupied habitat of threatened, endangered, proposed, and candidate plants.		
Allowable Use: **STIPULATION** *NSO-1: No Surface Occupancy (ACECs: Badger Wash, Pyramid Rock, and Unaweep Seep).* Prohibit surface occupancy in the following areas. (Refer to Appendix B.) See Figure 2-42 in Appendix A. • Hydrologic and sensitive plants study area in Badger Wash ACEC; • Pyramid Rock State Natural Area; and • Unaweep Seep State Natural Area and RNA.	Allowable Use: **STIPULATION** NSO-12: *ACECs.* Prohibit surface occupancy and surface-disturbing activities in the following ACECs to protect threatened, proposed, candidate, and sensitive plants. (Refer to Appendix B.) See Figures 2-43 (Alternative B) and 2-44 (Alternative C) in Appendix A. • Atwell Gulch (threatened and sensitive plants); • Badger Wash (sensitive plants); • Pyramid Rock (threatened and sensitive plants); • South Shale Ridge (threatened and sensitive plants); and • Unaweep Seep (sensitive plants).		Allowable Use: **STIPULATION** NSO-12: *ACECs.* Prohibit surface occupancy and surface-disturbing activities in the following ACECs to protect threatened, proposed, candidate, and sensitive plants. (Refer to Appendix B.) See Figure 2-45 (Alternative D) in Appendix A. • Badger Wash (sensitive plants); • Pyramid Rock (threatened and sensitive plants); and • Unaweep Seep (sensitive plants).
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-13: *Current and Historically Occupied Habitat of Threatened, Endangered, Proposed, and Candidate Species.* Prohibit surface occupancy and surface-disturbing activities to protect threatened, endangered, proposed, and candidate plants and animals from indirect impacts or loss of immediately adjacent suitable habitat. Maintain existing buffer distances where pre-existing disturbance exists. In undisturbed environments and ACECs, prohibit new disturbance within 200 meters (656 feet) of current and historically occupied and suitable habitat. (Refer to Appendix B.) See Figures 2-43 (Alternative B) and 2-44 (Alternative C) in Appendix A.		Allowable Use: **STIPULATION** NSO-14: *Currently Occupied Habitat of Threatened, Endangered, Proposed, and Candidate Species.* Prohibit surface occupancy and surface-disturbing activities to protect threatened, endangered, proposed, and candidate plants and animals from indirect impacts or loss of

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
			immediately adjacent suitable habitat. Maintain existing buffer distances where pre-existing disturbance exists. In undisturbed environments and ACECs, prohibit new disturbance within 200 meters (656 feet) of occupied habitat. (Refer to Appendix B.) See Figure 2-45 in Appendix A.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: No similar allowable use.	Allowable Use: **STIPULATION** NSO-15: *BLM Sensitive Plant Species' Occupied Habitat.* Prohibit surface occupancy and surface-disturbing activities within 100 meters (328 feet) of BLM sensitive plant species' occupied habitat. In addition, relocation of operations by more than 200 meters (656 feet) may be required (Refer to Appendix B.) See Figure 2-44 in Appendix A.	Allowable Use: No similar allowable use.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-11: *Significant Plant Communities.* For those plant communities that meet BLM's criteria for significant plant communities, special design, construction, and implementation measures, including relocation of operations by more than 200 meters (656 feet), may be required. Habitat areas include occupied habitat and habitat necessary for the maintenance or recovery of the species or communities. (Refer to Appendix B.) See Figures 2-47 (Alternative B) and 2-48 (Alternative C) in Appendix A.		Allowable Use: **STIPULATION** CSU-12: *Significant Plant Communities.* For those plant communities that meet BLM's criteria for significant plant communities, special design, construction, and implementation measures, including avoidance, may be required. Habitat areas include occupied habitat and habitat necessary for the maintenance or recovery of the species or communities. (Refer to Appendix B.) See Figure 2-49 in Appendix A.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Migratory Birds			
Objective: No similar objective in current RMP, currently comply with the Migratory Bird Treaty Act.	Objective: Protect breeding habitats of migratory birds with emphasis on avoiding impacts to nesting birds to comply with the Migratory Bird Treaty Act.		Objective: Protect breeding habitats of Birds of Conservation Concern with emphasis on avoiding impacts to nesting birds to comply with the Migratory Bird Treaty Act.
Action: No similar action in current RMP.	Action: Use adaptive management strategies to conserve and avoid impacts to populations of Birds of Conservation Concern, Partners In Flight priority species, and other species of concern.		Action: Use adaptive management strategies to conserve and avoid impacts to populations of Birds of Conservation Concern.
Allowable Use: Currently use COA from May 15 to July 15.	Allowable Use: **STIPULATION** TL-3: *Migratory Bird Habitat*. Prohibit surface occupancy and surface-disturbing activities, including vegetation-altering projects, in migratory bird habitat during nesting season (May 15 to July 15 or as site-specific analysis dictates) when nesting birds are present. (Refer to Appendix B.) See Figure 2-51 in Appendix A.	Allowable Use: **STIPULATION** TL-3: *Migratory Bird Habitat*. Prohibit surface occupancy and surface-disturbing activities, including vegetation-altering projects, in migratory bird habitat during nesting season (April 15 to July 31 or as site-specific analysis dictates) when nesting birds are present. (Refer to Appendix B.) See Figure 2-52 in Appendix A.	Allowable Use: **STIPULATION** TL-4: *Birds of Conservation Concern's Habitat*. Prohibit surface occupancy and surface-disturbing activities, including vegetation-altering projects, in birds of conservation concern's habitat (USFWS 2008) during nesting season (May 15 to July 15 or as site-specific analysis dictates) when nesting birds are present. (Refer to Appendix B.) See Figure 2-53 in Appendix A.
Yellow-billed Cuckoo			
Objective: No similar objective in current RMP.	Objective: Maintain and improve BLM lands for yellow-billed cuckoo habitat.		
Action: No similar action in current RMP.	Action: Where large stands of cottonwoods occur, develop management plans to restore or improve cuckoo habitat and increase canopy cover.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-1: *Major River Corridors.* Prohibit surface occupancy and surface-disturbing activities within stream channels, stream banks, and the area 0.25-mile either side of the ordinary high-water mark (bank-full stage) or within 100 meters (328 feet) of the 100-year floodplain (whichever area is greatest) of the Colorado, Gunnison, and Dolores Rivers. (Refer to Appendix B.) See Figures 2-43 (Alternative B), 2-44 (Alternative C), and 2-45 (Alternative D) in Appendix A.		
Allowable use: No similar allowable use in current RMP.	Allowable use: **STIPULATION** CSU-1: *Major River Corridors.* Apply CSU (site-specific relocation) (Exhibit Colorado [CO]-28) restrictions from 0.25- to 0.5-mile landward from identified NSO buffer (0.25-mile from ordinary high water mark or within 100 meters [328 feet] of the 100-year floodplain, whichever is greatest) on either side of the Colorado, Gunnison, and Dolores Rivers for fluid mineral development. (Refer to Appendix B.) See Figures 2-47 (Alternative B) and 2-48 (Alternative C) in Appendix A.		Allowable use: No similar allowable use.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-2: *Streams/Springs Possessing Lotic Riparian Characteristics.* Prohibit surface occupancy and surface disturbing activities with a minimum distance of 100 meters (328 feet) from the edge of the ordinary high-water mark (bank-full stage). Where the riparian corridor width is greater than 100 meters (328 feet) from bank-full, prohibit surface occupancy and surface disturbing activities within the riparian zone. (Refer to Appendix B.) See Figures 2-43 (Alternative B) and 2-44 (Alternative C) in Appendix A.		Allowable Use: No similar allowable use.
Raptors			
Objective: No similar objective in current RMP.	Objective: Maintain and improve BLM lands for raptor nesting and fledging habitat.		
Action: No similar action in current RMP.	Action: Provide healthy and productive habitat for a variety of raptor species by protecting nest sites, and maintaining important raptor nesting habitat including old-growth pinyon-juniper woodlands.		
The following stipulations are taken from the most recent CPW raptor recommendations; stipulations should be updated as species knowledge and raptor recommendations are updated.			

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-13: *Osprey Nest Sites.* Apply CSU (site-specific relocation) restrictions within 0.25-mile of active osprey *(Pandion haliaetus)* nest sites. (Refer to Appendix B.) See Figure 2-47 in Appendix A.	Allowable Use: **STIPULATION** NSO-16: *Osprey Nest Sites.* Prohibit surface occupancy and surface-disturbing activities (beyond that which historically occurred in the area) within 0.25-mile of active osprey nest sites. (Refer to Appendix B.) See Figure 2-44 in Appendix A.	Allowable Use: **STIPULATION** CSU-13: *Osprey Nest Sites.* Same as Alternative B. (Refer to Appendix B.) See Figure 2-49 in Appendix A.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** TL-5: *Osprey Nests.* Prohibit human encroachment within 0.25-mile of active osprey nests from April 1 to August 31. (Refer to Appendix B.) See Figures 2-51 (Alternative B), 2-52 (Alternative C), and 2-53 (Alternative D) in Appendix A.		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-14: *Ferruginous Hawk Nest Sites.* Apply CSU (site-specific relocation) restrictions within 0.5-mile of active ferruginous hawk *(Buteo regalis)* nest sites and associated alternate nests. (Refer to Appendix B.) See Figure 2-47 in Appendix A.	Allowable Use: **STIPULATION** NSO-17: *Ferruginous Hawk Nest Sites.* Prohibit surface occupancy and surface-disturbing activities (beyond that which historically occurred in the area) within 0.5-mile of active ferruginous hawk nest sites and associated alternate nests. (Refer to Appendix B.) See Figure 2-44 in Appendix A.	Allowable Use: **STIPULATION** CSU-14: *Ferruginous Hawk Nest Sites.* Same as Alternative B. (Refer to Appendix B.) See Figure 2-49 in Appendix A.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** TL-6: *Ferruginous Hawk Nests.* Prohibit human encroachment within 0.25-mile of active ferruginous hawk nests, including any alternate nests, from February 1 to July 15. (Refer to Appendix B.) See Figures 2-51 (Alternative B), 2-52 (Alternative C), and 2-53 (Alternative D) in Appendix A.		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-15: *Red-tailed Hawk Nest Sites.* Apply CSU (site-specific relocation) restrictions within 0.33-mile of active red-tailed hawk *(Buteo jamaicensis)* nest sites	Allowable Use: **STIPULATION** NSO-18: *Red-tailed Hawk Nest Sites.* Prohibit surface occupancy and surface-disturbing activities (beyond that which historically occurred in the area) within 0.33-mile of	Allowable Use: **STIPULATION** CSU-15: *Red-tailed Hawk Nest Sites.* Same as Alternative B. (Refer to Appendix B.) See Figure 2-49 in Appendix A.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	and associated alternate nests. (Refer to Appendix B.) See Figure 2-47 in Appendix A.	active red-tailed hawk nest sites and associated alternate nests. (Refer to Appendix B.) See Figure 2-44 in Appendix A.	
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** TL-7: *Red-tailed Hawk Nest.* Prohibit human encroachment within 0.33-mile of active red-tailed hawk nests, including any alternate nests, from February 15 to July 15. (Refer to Appendix B.) See Figures 2-51 (Alternative B), 2-52 (Alternative C), and 2-53 (Alternative D) in Appendix A.		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-16: *Swainson's Hawk Nest Sites.* Apply CSU (site-specific relocation) restrictions within 0.25-mile of active Swainson's hawk *(Buteo swainsoni)* nest sites and associated alternate nests. (Refer to Appendix B.) See Figure 2-47 in Appendix A.	Allowable Use: **STIPULATION** NSO-19: *Swainson's Hawk Nest Sites.* Prohibit surface occupancy and surface-disturbing activities (beyond that which historically occurred in the area) within 0.25-mile of active Swainson's hawk nest sites and associated alternate nests. (Refer to Appendix B.) See Figure 2-44 in Appendix A.	Allowable Use: **STIPULATION** CSU-16: *Swainson's Hawk Nest Sites.* Same as Alternative B. (Refer to Appendix B.) See Figure 2-49 in Appendix A.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** TL-8: *Swainson's Hawk Nest Sites.* Prohibit human encroachment within 0.25-mile of active Swainson's hawk nests and associated alternate nests from April 1 to July 15. (Refer to Appendix B.) See Figures 2-51 (Alternative B), 2-52 (Alternative C), and 2-53 (Alternative D) in Appendix A.		
Action: No similar action in current RMP.	Action: Due to propensity of peregrine falcons to relocate nest sites, sometimes up to 0.5-mile along cliff faces, it is more appropriate to designate a cliff nesting complex that encompass the cliff system and a 0.5-mile buffer around the cliff nesting complex. Nesting areas have not been designated at this time but may be in the future where high densities of nesting peregrines occur.		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-17: *Peregrine Falcon Nest Sites.* Apply CSU (site-specific relocation) restrictions within 0.5-mile of active peregrine	Allowable Use: **STIPULATION** NSO-20: *Peregrine Falcon Nest Sites.* Prohibit surface occupancy and surface-disturbing activities (beyond that which historically	Allowable Use: **STIPULATION** CSU-17: *Peregrine Falcon Nest Sites.* Same as Alternative B. (Refer to Appendix B.) See Figure 2-49 in Appendix A.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	falcon nest sites. (Refer to Appendix B.) See Figure 2-47 in Appendix A.	occurred in the area) within 0.5-mile of active peregrine falcon nest sites. (Refer to Appendix B.) See Figure 2-44 in Appendix A.	
Allowable Use: **STIPULATION** *TL-14: Threatened and Endangered Seasonal Habitat (Peregrine Falcon Habitat)*. In order to protect important seasonal peregrine falcon habitat, any lease operations which may affect this species will be allowed only during the following period: <BEGIN_DATE> through <END_DATE>. (Refer to Appendix B.) See Figure 2-50 in Appendix A.	Allowable Use: **STIPULATION** TL-9: *Peregrine and Prairie Falcon Nest Sites.* Prohibit human encroachment within 0.5-mile of active peregrine and prairie falcon *(Falco mexicanus)* nest cliff(s) from March 15 to July 31. (Refer to Appendix B.) See Figures 2-51 (Alternative B), 2-52 (Alternative C), and 2-53 (Alternative D) in Appendix A.		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-18: *Prairie Falcon Nest Sites.* Apply CSU (site-specific relocation) restrictions within 0.5-mile of active prairie falcon nest sites. (Refer to Appendix B.) See Figure 2-47 in Appendix A.	Allowable Use: **STIPULATION** NSO-21: *Prairie Falcon Nest Sites.* Prohibit surface occupancy and surface-disturbing activities (beyond that which historically occurred in the area) within 0.5-mile of active prairie falcon nest sites. (Refer to Appendix B.) See Figure 2-44 in Appendix A.	Allowable Use: **STIPULATION** CSU-18: *Prairie Falcon Nest Sites.* Same as Alternative B. (Refer to Appendix B.) See Figure 2-49 in Appendix A.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** TL-10: *Goshawk Nest Sites.* Prohibit surface occupancy and surface-disturbing activities (beyond that which historically occurred in the area) within 0.5-mile of active goshawk *(Accipiter* spp.*)* nest sites from March 1 to September 30. (Refer to Appendix B.) See Figures 2-51 (Alternative B), 2-52 (Alternative C), and 2-53 (Alternative D) in Appendix A.		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** TL-11: *Burrowing Owl Burrows and Nest Sites.* Prohibit surface disturbance and human encroachment within 0.25-mile of active burrows or burrowing owl nest sites from March 1 to August 15. (Refer to Appendix B.) See Figures 2-51 (Alternative B), 2-52 (Alternative C), and 2-53 (Alternative D) in Appendix A.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Allowable Use: Manage for raptors and other migratory birds by avoiding disturbance during the breeding season and/or requiring surveys to ensure absence prior to construction.	Allowable Use: **STIPULATION** CSU-19: *Other Raptor Species (accipiters, falcons [except kestrel], buteos, and owls).* Apply CSU (site-specific relocation) restrictions within 0.125-mile of an active nest site of all accipiters, falcons (except kestrel), buteos, and owls not listed in other CSU stipulations. Raptors that are listed and protected by the Endangered Species Act of 1973 (ESA) and the Bald and Golden Eagle Protection Act are addressed separately. (Refer to Appendix B.) See Figure 2-47 in Appendix A.	Allowable Use: **STIPULATION** NSO-22: *Other Raptor Species (accipiters, falcons [except kestrel], buteos, and owls).* Prohibit surface occupancy and surface-disturbing activities within 0.125-mile of an active nest site of all accipiters, falcons (except kestrel), buteos, and owls not listed in other NSO stipulations. Raptors that are listed and protected by the ESA and the Bald and Golden Eagle Protection Act are addressed separately. (Refer to Appendix B.) See Figure 2-44 in Appendix A.	Allowable Use: **STIPULATION** CSU-19: *Other Raptor Species (accipiters, falcons [except kestrel], buteos, and owls).* Same as Alternative B. (Refer to Appendix B.) See Figure 2-49 in Appendix A.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** TL-12: *Other Raptor Species (accipiters, falcons [except kestrel], buteos, and owls).* Prohibit surface disturbance and human encroachment within 0.25 miles of active nests from February 1 to August 15 (great horned owl), March 1 to August 15 (other owls and raptors), and April 1 to August 15 (Cooper's hawk *(Accipiter cooperii)*, sharp-shinned hawk *(Accipiter striatus)*, and northern harrier *(Circus cyaneus)*. (Refer to Appendix B.) See Figures 2-51 (Alternative B), 2-52 (Alternative C), and 2-53 (Alternative D) in Appendix A.		
Bald and Golden Eagles			
Objective: No similar objective in current RMP.	Objective: Maintain and improve BLM lands for eagle nesting, fledging, foraging and roosting habitat. Protect the bald and golden eagle concentration, nesting, and nest buffer areas by prohibiting activities during certain times of the year consistent with CPW's most recent raptor recommendations.		
Action: Protect the bald eagle concentration, nesting, and falcon nest buffer areas by prohibiting activities during certain times of the year.	Allowable Use: See **STIPULATION** TL-13: *Golden Eagle Nest Sites* and TL-14: *Bald Eagle Nest Sites*.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-23: *Golden Eagle Nest Sites.* Prohibit surface occupancy and surface-disturbing activities (beyond that which historically occurred in the area) within 0.25-mile of active golden eagle nest sites and associated alternate nests. (Refer to Appendix B.) See Figures 2-43 (Alternative B), 2-44 (Alternative C), and 2-45 (Alternative D) in Appendix A.		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** TL-13: *Golden Eagle Nest Sites.* Prohibit human encroachment within 0.25-mile of active golden eagle nests and associated alternate nests from December 15 to July 15. (Refer to Appendix B.) See Figures 2-51 (Alternative B), 2-52 (Alternative C), and 2-53 (Alternative D) in Appendix A.		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-24: *Bald Eagle Nest Sites.* Prohibit surface occupancy and surface-disturbing activities (beyond that which historically occurred in the area) within 0.25-mile of active bald eagle nests. (Refer to Appendix B.) See Figures 2-43 (Alternative B), 2-44 (Alternative C), and 2-45 (Alternative D) in Appendix A.		
Allowable Use: **STIPULATION** *TL-14: Threatened and Endangered Seasonal Habitat (Bald Eagle Habitat)*. In order to protect important seasonal bald eagle habitat, any lease operations which may affect this species will be allowed only during the following period: <BEGIN_DATE> through <END_DATE>. (Refer to Appendix B.) See Figures 2-50 in Appendix A.	Allowable Use: **STIPULATION** TL-14: *Bald Eagle Nest Sites.* Prohibit human encroachment within 0.5-mile of active bald eagle nests from November 15 to July 31. (Refer to Appendix B.) See Figures 2-51 (Alternative B), 2-52 (Alternative C), and 2-53 (Alternative D) in Appendix A.		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** TL-15: *Bald Eagle Winter Roost.* Prohibit activity within 0.25-mile of bald eagle winter roosts from November 15 to March 15. Additional restrictions may be necessary within 0.5-mile of active bald eagle winter roosts if there is a direct line of sight from the roost to the activities. (Refer to Appendix B.) See Figures 2-51 (Alternative B), 2-52 (Alternative C), and 2-53 (Alternative D) in Appendix A.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Waterfowl and Shorebirds			
Objective: No similar objective in current RMP.	Objective: Provide healthy and productive habitat for waterfowl and shorebirds.		
Action: No similar action in current RMP.	Action: Protect migratory pathways of waterfowl and shorebirds (see major river corridor stipulation).		
Action: No similar action in current RMP.	Action: Protect known breeding sites of upland nesting shorebirds, such as the long billed curlew.		
Gunnison and Greater Sage-grouse (Refer to Vegetation – Desired Plant Communities for additional management actions pertaining to sage-grouse)			
Objective: No similar objective in current RMP.	Objective: Advance the conservation of Gunnison and greater sage-grouse and their habitat in accordance with current national, state, and local working group recommendations and policy as well as the most current scientific literature and research.		
Action: No similar action in current RMP.	Action: Consistent with current guidance for sagebrush-dependent species, improve areas of poor quality nesting habitat by implementing the following actions, including but not limited to: • In areas where species diversity is low seed area with grasses and forbs, with an emphasis on forbs if brood-rearing occurs in the area, accompanied by light disking and interseeding, or drill seeding. • Where sage is too dense, conduct thinning by roller-chopping, light disking, Dixie Harrow, Lawson Aerator or other methods. • Conduct vegetation treatments to retain residual cover through fall and winter into nesting season.		
Action: No similar action in current RMP.	Action: When reseeding roads, primitive roads and trails, use appropriate seed mixes (appropriate for sage-grouse ecological conditions) and consider the use of transplanted sagebrush.		
Action: No similar action in current RMP.	Action: Improve brood-rearing habitats by implementing the following action: • Restore old ponds or construct new ponds in areas lacking water, while minimizing potential for promoting mosquito breeding habitat at elevations below 8,000 feet.		
Action: No similar action in current RMP.	Action: Improve lek areas by mechanically treating historic lek areas where sagebrush density has increased.		
Action: No similar action in current RMP.	Action: Remove/modify raptor perches, in PPH sage-grouse habitat (trees, fences, dry-hole markers, and power poles).		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: No similar action in current RMP.	Action: Monitor measureable objectives and evaluate grazing management to assure that management actions are achieving sage-grouse habitat objectives.		
Action: No similar action in current RMP.	Action: Design any new structural range improvements to conserve, enhance, or restore sage-grouse habitat through an improved grazing management system relative to sage-grouse objectives. Structural range improvements, in this context, include but are not limited to: cattleguards, fences, enclosures, corrals or other livestock handling structures; pipelines, troughs, storage tanks (including moveable tanks used in livestock water hauling), windmills, ponds/reservoirs, solar panels and spring developments.		Action: No similar action.
Action: No similar action in current RMP.	Action: To reduce sage-grouse strikes and mortality, remove, modify, or mark fences in high risk areas. When fences are necessary, require a sage-grouse-safe design.		Action: No similar action.
Action: No similar action in current RMP.	Action: Locate supplements (salt or protein blocks) in a manner designed to conserve, enhance, or restore sage-grouse habitat.		Action: No similar action.
Action: No similar action in current RMP.	Action: Offer temporary use on a case-by-case basis in allotments where grazing preference has been relinquished, or non-use warrants to rest other allotments that include important sage-grouse habitat.		Action: No similar action.
Action: No similar action in current RMP.	Action: Apply appropriate seasonal restrictions for implementing vegetation management treatments according to the type of seasonal habitats present in a priority area.		Action: No similar action.
Action: No similar action in current RMP.	Action: Monitor after vegetation treatments for success in meeting objectives and monitor and control invasive vegetation after vegetation treatments in sage-grouse habitat.		
Action: No similar action in current RMP.	Action: Apply post-vegetation treatment management and monitoring to ensure long term persistence of seeded native plants. Outline temporary or long-term changes in livestock grazing, wild horse and burro, and travel management, etc., to achieve and maintain vegetation management objectives to benefit sage-grouse and their habitats.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: No similar action in current RMP.	Action: Design vegetation treatments in sage-grouse habitats to strategically reduce wildfire threats in the greatest area. This may involve spatially arranging new vegetation treatments with past treatments, vegetation with fire-resistant serial stages, natural barriers, and roads in order to constrain fire spread and growth. This may require vegetation treatments to be implemented in a more linear versus block design.		
Action: No similar action in current RMP.	Action: Include sage-grouse habitat parameters as defined by Connelly et al. (2000), Hagen et al. (2007) or if available, state sage-grouse conservation plans and appropriate local information in habitat restoration objectives. Make maintaining these objectives within priority sage-grouse habitat areas a high restoration priority.		
Action: No similar action in current RMP.	Action: Choose native plant seeds for vegetation treatments based on availability, adaptation (site potential), probability for success, and the vegetation management objectives for the area covered by the treatment. Where probability of success or native seed availability is low, use species that meet soil stability and hydrologic function objectives as well as vegetation and sage-grouse habitat objectives.		
Action: No similar action in current RMP.	Action: Manage the following areas to protect sage-grouse habitat: • Wildlife Emphasis Areas: ○ Roan and Carr Creek; ○ Glade Park; and ○ Sunnyside.	Action: Manage the following areas to protect sage-grouse habitat: • ACECs: ○ Roan and Carr Creek; and ○ Glade Park. • Sunnyside Wildlife Emphasis Area	Action: Manage the following areas to protect sage-grouse habitat: • Roan and Carr Creek Wildlife Emphasis Area.
Allowable Use: No similar allowable use in current RMP.	Allowable use: Identify the following as ROW exclusion areas: • Within a 0.6-mile radius of sage-grouse leks.	Allowable use: Identify the following as ROW exclusion areas: • Within a 0.6-mile radius of sage-grouse leks for below-ground facilities and a 4-mile radius for above-ground facilities.	Allowable Use: No similar allowable use.
Allowable Use: No similar allowable use in current RMP.	Allowable use: Identify the following as ROW avoidance areas: • Sage-grouse occupied habitat; and • Within a 4-mile radius of sage-	Allowable use: Identify the following as ROW avoidance areas: • Sage-grouse occupied, suitable habitat; and	Allowable Use: No similar allowable use.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	grouse leks.	• Within a 4-mile radius of sage-grouse leks.	
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **No Leasing:** *Sage-grouse.* Close all occupied Gunnison sage-grouse habitat (10,600 acres) to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-39 in Appendix A:	Allowable Use: **No Leasing:** *Sage-grouse.* Close all occupied Gunnison and greater sage-grouse habitat (18,900 acres) to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-40 in Appendix A.	Allowable Use: No similar allowable use.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **No Leasing:** *Split-estate.* Manage 12,200 acres of Private and State surface/federal fluid mineral estate in all occupied Gunnison sage-grouse habitat as closed to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-39 in Appendix A.	Allowable Use: **No Leasing:** *Split-estate.* Manage 17,600 acres of Private and State surface/federal fluid mineral estate in occupied Gunnison and greater sage-grouse habitat as closed to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-40 in Appendix A.	Allowable Use: No similar allowable use.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** TL-16: *Occupied Sage-grouse Winter Habitat.* Prohibit surface occupancy and surface-disturbing activities in occupied sage-grouse winter habitat from December 16 to March 15. (Refer to Appendix B.) See Figures 2-51 (Alternative B) and 2-52 (Alternative C) in Appendix A.		Allowable Use: No similar allowable use.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-25: *Sage-grouse Leks, Nesting, and Early Brood-rearing Habitat.* Prohibit surface occupancy and surface-disturbing activities within 4 miles of an active lek or within sage-grouse nesting and early brood-rearing habitat. (Refer to Appendix B.) See Figures 2-43 (Alternative B) and 2-44 (Alternative C) in Appendix A.		Allowable Use: No similar allowable use.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: See NSO-25: *Sage-grouse Leks, Nesting, and Early Brood-rearing Habitat.*		Allowable Use: **STIPULATION** CSU-20: *Sage-grouse Nesting and Early Brood-rearing*

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
			Habitat. Apply CSU (site-specific relocation) restrictions to protect sage-grouse nesting and early brood rearing habitat within 4 miles of an active lek or within sage-grouse nesting and early brood-rearing habitat. (Refer to Appendix B.) See Figure 2-49 in Appendix A.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** TL-17: *Sage-grouse Leks.* Prohibit surface occupancy and surface-disturbing activities within 4 miles of sage-grouse leks from March 1 to June 30. (Refer to Appendix B.) See Figure 2-51 in Appendix A.	Allowable Use: See NSO-25: *Sage-grouse Leks, Nesting, and Early Brood-rearing Habitat.*	Allowable Use: **STIPULATION** TL-18: *Sage-grouse Leks, Nesting, and Early Brood-rearing Habitat.* Prohibit surface occupancy and surface-disturbing activities from March 1 to June 30 within 0.6-mile of the lek or within sage-grouse nesting and early brood-rearing habitat. (Refer to Appendix B.) See Figure 2-53 in Appendix A.
Reptiles and Amphibians			
Objective: No similar objective in current RMP.	Objective: Maintain and improve BLM lands for priority reptile and amphibian habitat.		
Action: Protect special status reptile and amphibian habitat by avoiding impacts during critical seasons in areas of known importance to the species. Conduct surveys to increase knowledge of critical areas.	Action: Identify important areas for key species such as canyon tree frog, great basin spadefoot *(Spea intermontana)*, northern leopard frog *(Rana pipiens)*, boreal toad *(Anaxyrus boreas boreas)*, and midget faded rattlesnake *(Crotalus oreganus concolor)*. Protect habitat by avoiding impacts during critical seasons and maintain integrity and species accessibility of these areas.		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-26: *Canyon Treefrog, Midget Faded Rattlesnake, Northern Leopard Frog, Great Basin*	Allowable Use: **STIPULATION** NSO-27: *Canyon Treefrog, Midget Faded Rattlesnake, Northern Leopard Frog, Great Basin*	Allowable Use: **STIPULATION** NSO-26: *Canyon Treefrog, Midget Faded Rattlesnake, Northern Leopard Frog, Great Basin*

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	Spadefoot, Boreal Toad. Prohibit surface occupancy and surface-disturbing activities within all identified canyon treefrog, northern leopard frog, midget faded rattlesnake, Great Basin spadefoot, and boreal toad breeding and denning sites. (Refer to Appendix B.) See Figure 2-43 in Appendix A.	*Spadefoot, Boreal Toad.* Prohibit surface occupancy and surface-disturbing activities within 0.5-mile of all identified canyon treefrog, northern leopard frog, midget faded rattlesnake, Great Basin spadefoot, and boreal toad breeding and denning sites. (Refer to Appendix B.) See Figure 2-44 in Appendix A.	*Spadefoot, Boreal Toad.* Same as Alternative B. See Figure 2-45 in Appendix A.
Bats			
Objective: No similar objective in current RMP.	Objective: Maintain and improve BLM lands for bat roosting, maternity sites and winter hibernacula.		
Action: Protect maternity roost of Townsend big-eared bat through locatable minerals withdrawals. Extend current locatable mineral withdrawal when it is up for review if the status of the Townsend big-eared bat has not improved.	Action: Identify and protect important areas for bat roosting (including maternity roosts) and hibernacula, such as the Pup Tent Mine, and take appropriate action to protect resources as identified, such as recreational closures, mineral withdrawals, and mine closures with bat gates.		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-28: *Special Status Bat Species' Roost Sites and Winter Hibernacula*. Prohibit surface occupancy and surface-disturbing activities within 0.25-mile radius of special status bat species' roost sites and winter hibernacula. (Refer to Appendix B.) See Figures 2-43 (Alternative B) and 2-44 (Alternative C) in Appendix A.		Allowable Use: **STIPULATION** CSU-21: *Special Status Bat Species' Roost Sites and Winter Hibernacula.* Require mitigation and minimization measures (as determined by the BLM biologist) for all surface occupancy and surface-disturbing activities within 0.25-mile of special status bat species' roost sites and winter hibernacula. (Refer to Appendix B.) See Figure 2-49 in Appendix A.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: No similar action in current RMP.	Action: Where bat roosting, maternity sites and winter hibernacula occur, bat gates would be required for closing abandon mine lands.		
River Otters			
Objective: No similar objective in current RMP.	Objective: Maintain and improve BLM lands for river otter *(Lontra canadensis)* habitat.		
Action: No similar action in current RMP.	Action: Within occupied river otter habitat, prohibit removal and disturbance of potential den sites such as hollow trunks of large trees, beaver dens, hollow logs, log jams, or drift piles.		Action: No similar action.
Canada Lynx			
Objective: No similar objective in current RMP.	Objective: Maintain and improve BLM-managed portions of Lynx Analysis Units for Lynx habitat.		
Action: No similar action in current RMP.	Action: Close lynx *(Lynx canadensis)* habitat in Lynx Analysis Units to the following: • Timber harvest; and • Over-snow motorized travel.		Action: No similar action.
Kit Fox			
Objective: No similar objective in current RMP.	Objective: Maintain and improve BLM lands for kit fox habitat		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-29: *Active Kit Fox Dens.* Prohibit surface occupancy and surface-disturbing activities within 200 meters (656 feet) of active kit fox dens. (Refer to Appendix B.) See Figures 2-43 (Alternative B) 2-44 (Alternative C) in Appendix A.		Allowable Use: **STIPULATION** CSU-22: *Kit Fox Dens.* Apply CSU (site-specific relocation) restrictions to, and require mitigation and minimization measures (as determined by the BLM biologist) of, surface occupancy and surface-disturbing activities within 200 meters (656 feet) of active kit fox dens. (Refer to Appendix B.) See Figure 2-49 in Appendix A.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
White-tailed Prairie Dog			
Objective: No similar objective in current RMP.	Objective: Maintain or improve white-tailed prairie dog habitat and distribution (Figure 2-73, Appendix A).		Objective: Maintain at least 80 percent of the mapped white-tailed prairie dog habitat and distribution (Figure 2-73, Appendix A).
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-30: *Occupied Prairie Dog Towns (no buffer).* Prohibit surface occupancy and surface-disturbing activities within active white-tailed prairie dog towns. (Refer to Appendix B.) See Figure 2-43 in Appendix A.	Allowable Use: **STIPULATION** NSO-31: *Occupied Prairie Dog Towns (46-meter buffer).* Prohibit surface occupancy and surface-disturbing activities within 46 meters (150 feet) of active white-tailed prairie dog towns. (Refer to Appendix B.) See Figure 2-44 in Appendix A.	Allowable Use: **STIPULATION** CSU-23: *Occupied Prairie Dog Towns.* Apply CSU (site-specific relocation) restrictions to surface-disturbing activities within active white-tailed prairie dog towns to avoid the center of active towns, while maintaining the integrity of the town's social structure. (Refer to Appendix B.) See Figure 2-49 in Appendix A.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: See NSO-30: *Occupied Prairie Dog Towns (no buffer).*	Allowable Use: See NSO-31: *Occupied Prairie Dog Towns (46-meter buffer).*	Allowable Use: **STIPULATION** TL-19 *Occupied Prairie Dog Towns.* Prohibit surface occupancy and surface-disturbing activities within active white-tailed prairie dog towns from April 1 to July 15. (Refer to Appendix B.) See Figure 2-53 in Appendix A.
Action: No similar action in current RMP.	Action: Allow prairie dog relocation activities in existing, occupied, or historic prairie dog complexes where consistent with other management and ecosystem objectives, in areas where plague is not a concern, and in coordination with CPW and the Mesa County Health Department.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
FISH AND WILDLIFE			
Invasive Fish and Wildlife Species and Disease Transmission			
GOAL: Minimize the spread of invasive fish and wildlife species and fish and wildlife diseases.			
Action: No similar action in current RMP.	Action: To prevent the spread of whirling disease, New Zealand mud snails *(Potamopyrgus antipodarum)*, zebra mussels *(Dreissena polymorpha)*, quagga mussels *(Dreissena bugensis)*, and other nuisance aquatic organisms, treat all equipment associated with actions permitted by the BLM, included but not limited to SRPs, to be conducted within or near perennial water sources equipment previously used in water bodies with known invasive species, with accepted disinfection practices prior to construction/launch. Firefighting and other emergency equipment would follow appropriate policy as noted in relevant chapters of the 2012 Interagency Standards for Fire and Fire Aviation Operations (Red Book) (US DOI and US Forest Service 2012).		
Action: No similar action in current RMP.	Action: Caves and other structures utilized by bats may be closed to public access in the event of a White Nose Syndrome outbreak or other transmittable diseases that threaten bats, as needed to avoid the risk of humans transmitting the disease.		
Action: No similar action in current RMP.	Action: Remove aquatic competitors (such as bullfrogs) from active native aquatic breeding grounds.		
Fisheries and Aquatic Wildlife			
GOAL: Provide for aquatic, riparian, and wetland habitats for abundance and diversity of fish and wildlife with self-sustaining populations.			
Objective: Increase fish production on the producing aquatic areas and to improve the cool water fisheries potential on marginal streams.	Objective: Maintain and improve BLM lands for priority habitat requirements for highly valued species such as, but not limited to, coldwater sport fishes, including rainbow, brown, and brook trout.		Objective: Maintain BLM lands for priority habitat requirements for highly valued species such as, but not limited to, coldwater sport fishes, including rainbow, brown, and brook trout.
Action: Actively manage the following areas, placing management emphasis on the key species shown: aquatic-riparian –	Action: Designate the following priority habitats: perennial water sources, riparian areas, intermittent streams	Action: Designate the following priority habitats: perennial water sources, riparian areas, intermittent streams and ponds,	Action: Designate the following priority habitats: perennial water sources, riparian areas, and intermittent

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
trout.	and ponds, and ephemeral/seasonal waters.	ephemeral/seasonal waters, and upland habitats within the drainage area of perennial water.	streams and ponds.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** TL-1: *Sport and Native Fish.* Prohibit in-channel stream work in all occupied streams during appropriate spring and fall spawning periods. Rainbow trout, cutthroat trout, bluehead and flannelmouth sucker, roundtail chub, Paiute and mottled sculpin (April 1 to August 1); brown and brook trout (October 1 to November 30. (Refer to Appendix B.) See Figure 2-51 in Appendix A.	Allowable Use: **STIPULATION** TL-1: *Sport and Native Fish.* Prohibit in-channel stream work in all occupied streams during appropriate spring and fall spawning periods. Cutthroat trout (May 1-September 1), rainbow trout (March 1-June 30), brown trout (October 1-May 1), brook trout (August 1-May 1), sculpin (May 1-July 31), bluehead sucker (May 1-July 31), flannelmouth sucker (April 1-July 1), roundtail chub (May 1-July 31), speckled dace (May 1-August 31), mountain whitefish (October 1-November 30). (Refer to Appendix B.) See Figure 2-52 in Appendix A.	Allowable Use: **STIPULATION** TL-2: *Occupied Cutthroat Trout Waters*. Prohibit in-channel work in all occupied cutthroat trout streams during spring spawning periods of April 1 to August 1. (Refer to Appendix B.) See Figure 2-53 in Appendix A.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-1: *Major River Corridors.* Prohibit surface occupancy and surface-disturbing activities within stream channels, stream banks, and the area 0.25-mile either side of the ordinary high-water mark (bank-full stage) or within 100 meters (328 feet) of the 100-year floodplain (whichever area is greatest) of the Colorado, Gunnison, and Dolores Rivers. (Refer to Appendix B.) See Figures 2-43 (Alternative B), 2-44 (Alternative C), and 2-45 (Alternative D) in Appendix A.		
Allowable use: No similar allowable use in current RMP.	Allowable use: **STIPULATION** CSU-1: *Major River Corridors.* Apply CSU (site-specific relocation) (Exhibit Colorado [CO]-28) restrictions from 0.25- to 0.5-mile landward from identified NSO buffer (0.25-mile from ordinary high water mark or within 100 meters [328 feet] of the 100-year floodplain, whichever is greatest) on either side of the Colorado, Gunnison, and Dolores Rivers for fluid mineral development. (Refer to Appendix B.) See Figures 2-47 (Alternative B) and 2-48 (Alternative C) in Appendix A.		Allowable use: No similar allowable use.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-2: *Streams/Springs Possessing Lotic Riparian Characteristics.* Prohibit surface occupancy and surface disturbing activities with a minimum distance of 100 meters (328 feet) from the edge of the ordinary high-water mark (bank-full stage). Where the riparian corridor width is greater than 100 meters (328 feet) from bank-full, prohibit surface occupancy and surface disturbing activities within the riparian zone. (Refer to Appendix B.) See Figures 2-43 (Alternative B), 2-44 (Alternative C), and 2-45 (Alternative D) in Appendix A.		Allowable Use: No similar allowable use.
Terrestrial Wildlife			
GOAL: Provide terrestrial habitats for abundance and diversity of native and desirable nonnative wildlife species with self-sustaining populations.			
Objective: Maintain the existing species in the GJFO and improve the habitat of each species of game and nongame primarily according to the species' susceptibility to BLM influence and secondarily to the evidence of human demand.	Objective: Maintain and improve BLM lands for priority habitat requirements for the following high-value species: • Critical and severe winter range, winter concentration areas, production areas, and big game migrations corridors for big games species (e.g., mule deer *(Odocoileus hemionus)*, elk *(Cervus canadensis)*, antelope *(Antilocapra americana)*, bighorn sheep *(Ovis canadensis)*, moose *(Alces alces)*; and • Proper functioning condition riparian and wetland habitat for all species (see Vegetation—Riparian section). Habitat standards and desired wildlife populations levels are determined by species-specific plans and strategies in order to meet BLM Colorado's Standards for Public Land Health and Guidelines for Livestock Grazing Management (BLM 1997a).		Objective: Maintain and improve BLM lands for priority habitat requirements for the following high-value species: • Severe winter range, winter concentration areas, production areas, big game migrations corridors for big games species (e.g., mule deer, elk, antelope, bighorn sheep, moose); and • Proper functioning condition riparian and wetland habitat for all species (see Vegetation—Riparian section). Habitat standards and desired wildlife populations levels are determined by species specific plans and strategies in order to meet BLM Colorado's Standards for Public Land Health.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: Actively manage the following areas, placing management emphasis on the key species shown: • Roan Creek: deer; • Kannah Creek: deer, elk, pronghorn antelope, and waterfowl; • Grand Valley: pronghorn, waterfowl, and desert game; • Rough Canyon: amphibian habitat; • Book to Roan Cliffs: deer, elk, and bear; • Aquatic-riparian: riparian wildlife habitat; • Collbran: deer and elk; • Ute to Mesa Creek: deer and elk; • Unaweep to Dugway: deer and elk; • Dolores West: deer and elk; • Bangs – Dominguez: deer and elk • Glade Park: deer, elk, and wild turkey; and • WSAs: pristine wildlife conditions.	Action: Actively manage the following areas, placing management emphasis on the key species shown: • Atwell Gulch ACEC: mule deer and rocky mountain bighorn sheep; • Dolores River Riparian ACEC: riparian obligate bird species; • Indian Creek ACEC: deer and elk; • The Palisade ACEC: riparian obligate birds; • Sinbad Valley ACEC: mule deer and elk; • Beehive Wildlife Emphasis Area: mule deer and elk; • Blue Mesa Wildlife Emphasis Area: mule deer and elk; • Bull Hill Wildlife Emphasis Area: mule deer and elk; • East Salt Creek Wildlife Emphasis Area: mule deer and elk; • Glade Park Wildlife Emphasis Area: Gunnison sage-grouse, mule deer, and elk; • Prairie Canyon Wildlife Emphasis Area: long billed curlew, long eared owl, pronghorn antelope, white-tailed prairie dog, kit fox, and burrowing owl; • Rapid Creek Wildlife Emphasis Area: mule deer and elk;	Action: Actively manage the following areas, placing management emphasis on the key species shown: • Atwell Gulch ACEC: mule deer and rocky mountain bighorn sheep; • Colorado River Riparian ACEC: riparian obligate birds; • Dolores River Riparian ACEC: riparian obligate bird species; • Gunnison River Riparian ACEC: riparian obligate birds; • Indian Creek ACEC: deer and elk; • John Brown Canyon ACEC: pinion- and juniper-obligate bird species; • The Palisade ACEC: riparian obligate birds; • Plateau Creek ACEC: special status species fish; • Prairie Canyon ACEC: pronghorn antelope, sage sparrow *(Artemisiospiza belli)*, Scott's oriole *(Icterus parisorum)*, and long-eared owl *(Asio otus)*; • Sinbad Valley ACEC: mule deer and elk; • South Shale Ridge ACEC: deer and elk; • Beehive Wildlife Emphasis Area: mule deer and elk; • Blue Mesa Wildlife Emphasis Area: mule deer and elk; • Bull Hill Wildlife Emphasis Area: mule deer and elk;	Action: Actively manage the following areas, placing management emphasis on the key species shown: • The Palisade ACEC: riparian obligate birds; and • Roan and Carr Creeks Wildlife Emphasis Area: cutthroat trout and sage-grouse.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	• Roan and Carr Creeks Wildlife Emphasis Area: cutthroat trout and sage-grouse; • South Shale Ridge Wildlife Emphasis Area: deer and elk; • Sunnyside Wildlife Emphasis Area: mule deer, elk, and sage-grouse; and • Timber Ridge Wildlife Emphasis Area: mule deer, elk, and sage-grouse.	• Casto Wildlife Emphasis Area: mule deer and elk; • East Salt Creek Wildlife Emphasis Area: mule deer and elk; • Hawxhurst Wildlife Emphasis Area: bighorn sheep, mule deer, and elk; • Indian Point Wildlife Emphasis Area: pronghorn antelope, mule deer, and elk; • Prairie Canyon Wildlife Emphasis Area: long billed curlew, long eared owl, pronghorn antelope, white-tailed prairie dog, kit fox, and burrowing owl; • Rapid Creek Wildlife Emphasis Area: mule deer and elk; • Red Mountain Wildlife Emphasis Area: mule deer and elk; • South Shale Ridge Wildlife Emphasis Area: deer and elk; • Sunnyside Wildlife Emphasis Area: mule deer, elk, and sage-grouse; and • Timber Ridge Wildlife Emphasis Area: mule deer, elk, and sage-grouse.	
Allowable Use: No similar allowable use in current RMP; however, surveys are required for special status species.	Allowable Use: **LEASE NOTICE** LN-3: *Biological Inventories.* The operator is required to conduct a biological inventory prior to approval of operations in areas of known or suspected habitat of special status species, or habitat of other species of interest such as but not limited to raptor nests, sage-grouse leks, or significant natural plant communities. The operator, in coordination with the BLM, shall use the inventory to prepare mitigating measures to reduce the impacts on affected species or their habitats. These mitigating measures may include, but are not limited to, relocation of roads and other facilities and fencing operations or habitat. Where impacts cannot be mitigated to the satisfaction of the BLM's Authorized Officer, surface occupancy on that area is prohibited. (Refer to Appendix B.)		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Allowable Use: No similar allowable use in current RMP, however, mitigation and minimization measures are implemented on a case-by-case basis.	Allowable Use: **STIPULATION** CSU-10: *Wildlife Habitat.* Require proponents of surface-disturbing activities to implement specific measures to reduce impacts of operations on wildlife and wildlife habitat within high-value or crucial wildlife habitat. Measures would be determined through biological surveys, onsite inspections, effects of previous actions in the area, and BMPs (Appendix H). (Refer to Appendix B.) See Figures 2-47 (Alternative B) and 2-48 (Alternative C) in Appendix A.		Allowable Use: No similar allowable use.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** LN-5: *Working in Wildlife Habitat.* Require operators to establish and submit to the GJFO a set of operating procedures for employees and contractors working in important wildlife habitats. Design such procedures to inform employees and contractors of ways to minimize the effect of their presence on wildlife and wildlife habitats. Procedures may address items such as working in bear or snake country, controlling dogs, not feeding wildlife, and understanding and abiding by hunting and firearms regulations. (Refer to Appendix B.)		Allowable Use: No similar allowable use.
Objective: No similar objective in current RMP.	Objective: Maintain the integrity of ongoing biological research locations.		
Action: No similar action in current RMP.	Action: Manage the Ant Research Site as a ROW exclusion area (including renewable energy sites such as solar, wind, hydro, and biomass development).		
Action: No similar action in current RMP.	Action: Manage the Owl Banding Station as a ROW avoidance area.		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-32: *Research Sites.* Prohibit surface occupancy and surface-disturbing activities in approved research sites including, but not limited to, the Ant Research Area (16 Road) and the Owl Banding Station (south of DeBeque). (Refer to Appendix B.) See Figures 2-43 (Alternative B), 2-44 (Alternative C), and 2-45 (Alternative D) in Appendix A.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Big Game Species (deer, elk, moose, and bighorn sheep)			
Objective: Provide sufficient forage, cover, and protection from disturbance to maintain a population of 15,500 deer and 870 elk in summer and 34,400 deer and 2,950 elk in winter, commensurate with BLM public land health standards.	Objective: Provide sufficient forage, cover, and protection from disturbance for large ungulates (deer, elk, bighorn sheep, pronghorn antelope, and moose) to maintain healthy viable populations across the landscape commensurate with BLM Colorado's Standards for Public Land Health (BLM 1997a).		
Action: Manage deer habitat to allow deer to increase to 15,500 in summer and 34,400 in winter. Manage elk habitat to allow elk to increase to 870 in summer and 2,950 in winter.	Action: Deer and elk habitat would be managed to meet BLM Colorado's Standards for Public Land Health and Guidelines for Livestock Grazing Management.		
Action: Use standard design practices listed in Appendix B of the 1987 RMP (BLM 1987) in designing wildlife projects.	Action: Use COAs listed in Appendix B and standard operating procedures and BMPs listed in Appendix H in designing wildlife projects.		
Allowable Use: Implement the following seasonal travel closures from December 1 to May 1: • Beehive; • Blue Mesa; • Chalk Mountain; • Coal Canyon; • Garvey Canyon; • Grand Mesa Slopes; • Indian Point; and • Post/Lapham Canyons.	Allowable Use: Implement the following seasonal travel limitations for motorized travel from December 1 to May 1. Same as Alternative A, plus the following areas: • Demaree Canyon outside of the WSA; and • Howard Canyon Flats. Seasonal limitations may be extended to include mechanized use in areas where monitoring indicates	Allowable Use: Implement the following seasonal travel limitations for motorized travel from December 1 to May 1. Restrict mechanized and nonmotorized use to designated routes: • Same as Alternative B. Seasonal limitation periods may be reduced based on coordination with CPW (e.g., mild winters, late hunting seasons, etc.).	Allowable Use: Implement the following seasonal travel limitations for motorized travel from December 1 to May 1: • Beehive; • Chalk Mountain; • Coal Canyon; • Garvey Canyon; • Grand Mesa Slopes; • Indian Point; and • Post/Lapham Canyons. Seasonal limitation periods may be

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	mechanized use is causing excessive disturbance to wildlife. Seasonal limitation periods may be reduced based on coordination with CPW (e.g., mild winters, late hunting seasons, etc.).		reduced based on coordination with CPW (e.g., mild winters, late hunting seasons, etc.).
Allowable Use: **STIPULATION** *NSO-1: No Surface Occupancy (Wildlife Habitat in Rough Canyon).* Prohibit occupancy and other activities in Rough Canyon. (Refer to Appendix B.) See Figure 2-42 in Appendix A.	Allowable Use: **STIPULATION** NSO-12: *ACECs.* Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figure 2-43 in Appendix A. • Atwell Gulch; • Indian Creek; • The Palisade; • Rough Canyon; • Sinbad Valley; and • South Shale Ridge.	Allowable Use: **STIPULATION** NSO-12: *ACECs.* Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figure 2-44 in Appendix A. • Atwell Gulch; • Colorado River Riparian; • Glade Park-Pinyon Mesa; • Indian Creek; • The Palisade; • Plateau Creek; • Prairie Canyon; • Roan and Carr Creeks; • Rough Canyon; • Sinbad Valley; and • South Shale Ridge.	Allowable Use: **STIPULATION** NSO-12: *ACECs.* Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figure 2-45 in Appendix A. • The Palisade; and • Rough Canyon.
Allowable Use: **STIPULATION** *TL-12: Deer and Elk Winter Range*. Lease activities such as exploration, drilling, and other development will be allowed only during the period from May 1 to December 1. (Refer to Appendix B.) See Figure 2-50 in Appendix A.	Allowable Use: **STIPULATION** TL-20: *Big Game Winter Range*. Prohibit surface occupancy and surface-disturbing activities from December 1 to May 1 to protect big game winter range as mapped by the CPW. Certain areas within big game winter range may be closed to foot, horse, motorized, and/or mechanized travel from December 1 to May 1. (Refer to Appendix B.) See Figures 2-51 (Alternative B), 2-52 (Alternative C), and 2-53 (Alternative D) in Appendix A.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Allowable Use: **STIPULATION** *TL-9: Bighorn Seasonal Stipulation*. Lease activities such as exploration, drilling, and other development will be allowed only during the period from May 1 to December 1. (Refer to Appendix B.) See Figure 2-50 in Appendix A.	Allowable Use: *See TL-20: Big Game Winter Range*.		
Objective: No similar objective in current RMP.	Objective: Protect state wildlife areas from unnecessary surface occupancy and surface-disturbing activities.		Objective: No similar objective.
Allowable Use: **STIPULATION** *NSO-1: No Surface Occupancy (State Wildlife Areas)*. Prohibit occupancy and other activities in the following areas (Refer to Appendix B.) See Figure 2-1 in Appendix A: • Highline Reservoir recreation site (1,800 acres); • Horsethief Canyon (1,300 acres); • Jerry Creek Reservoir (7,200 acres); and • Vega Reservoir Recreation Site (1,980* acres). *Acreage includes surface water resources.	Allowable Use: **STIPULATION** NSO-33: *Jerry Creek Reservoir, Plateau Creek, and Horsethief Canyon State Wildlife Areas, and Highline and Vega State Parks.* Prohibit surface occupancy and surface-disturbing activities in areas where BLM manages the fluid mineral rights under the following state wildlife areas and state parks. (Refer to Appendix B.) See Figure 2-43 in Appendix A: • Horsethief Canyon State Wildlife Area (1,400 acres); • Jerry Creek Reservoir State Wildlife Area (870 acres); • Plateau Creek State Wildlife Area (1,400 acres); • Highline State Park (350 acres); and • Vega State Park (2,000 acres).	Allowable Use: **No Leasing:** *Split-estate.* Manage 4,400 acres of Private and State surface/federal fluid mineral estate as closed to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-40 in Appendix A: • Horsethief Canyon State Wildlife Area (1,300 acres); • Jerry Creek Reservoir State Wildlife Area (900 acres); • Plateau Creek State Wildlife Area (1,400 acres); • Highline State Park (350 acres); and • Vega State Park (470 acres).	Allowable Use: No similar allowable use; allow leasing on 169,800 acres of private and State surface/federal fluid mineral estate.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Objective: No similar objective in current RMP.	Objective: Minimize habitat fragmentation and restore habitat connectivity on big game winter ranges, winter concentration areas, severe winter ranges, and movement corridors.		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-24: *Deer and Elk Migration and Movement Corridors*. Apply CSU (site-specific relocation) restrictions to surface-disturbing activities within migration and movement corridors for deer and elk. (Refer to Appendix B.) See Figures 2-47 (Alternative B) and 2-48 (Alternative C) in Appendix A.		Allowable Use: No similar allowable use.
Action: Allow domestic sheep grazing in allotments on case-by-case basis.	Action: Prohibit domestic sheep grazing on allotments within occupied bighorn sheep habitat.		Action: Avoid domestic sheep grazing on allotments within occupied bighorn sheep habitat.
Action: No similar action in current RMP.	Action: Permit domestic sheep grazing on allotments outside of occupied bighorn sheep habitat on a case-by-case basis per the following criteria: • Presence of topographic features (e.g., natural barriers, rivers) to separate domestic and bighorn sheep; • Adequate buffer zones to separate domestic and bighorn sheep; • Current bighorn sheep management plan direction; • The need to protect potential habitat; • Local and national research results; • Risk assessments from wildlife agencies; • Timing of domestic sheep grazing; or	Action: Prohibit domestic sheep grazing on allotments within historic, occupied, and potential bighorn sheep habitat.	Action: Permit domestic sheep grazing on allotments outside of occupied bighorn sheep habitat.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	• Monitoring results indicating conflicts.		
Allowable Use: **STIPULATION** *NSO-1: No Surface Occupancy (Elk Calving Sites)*. Prohibit occupancy and other activities in elk calving sites. (Refer to Appendix B.) See Figure 2-42 in Appendix A.	Allowable Use: **STIPULATION** NSO-34: *Elk Production Area.* Prohibit surface occupancy and surface-disturbing activities in elk production areas year-round. (Refer to Appendix B.) See Figures 2-43 (Alternative B), 2-44 (Alternative C), and 2-45 (Alternative D) in Appendix A.		
Allowable Use: **STIPULATION** *TL-4: Elk Calving Area.* Lease activities such as exploration, drilling, and other development will be allowed only during the period from June 15 to May 15. (Refer to Appendix B.) See Figure 2-50 in Appendix A.	Allowable Use: **STIPULATION** TL-21: *Big Game Production Areas.* Prohibit activities, including motorized travel, in elk production areas from May 15 to June 15; in antelope production areas from April 15 to June 30; in Rocky Mountain bighorn sheep production areas from April 15 to June 30; in Moose production areas from April 15 to June 30; and in desert bighorn sheep production areas from February 1 to May 1. (Refer to Appendix B.) See Figures 2-51 (Alternative B), 2-52 (Alternative C), and 2-53 (Alternative D) in Appendix A.		Allowable Use: No similar allowable use.
Pronghorn Antelope			
Objective: No similar objective in current RMP.	Objective: Improve pronghorn antelope habitat on BLM lands.		
Action: No similar action in current RMP.	Action: Prioritize habitat improvement projects to increase habitat quality in pronghorn antelope range including projects that improve fawning cover, reduce cheatgrass, increase in native forage including warm season grasses, and improve water availability.		Action: No similar action in current RMP.
Action: No similar action in current RMP.	Action: Within pronghorn range, minimize the number of fences, construct fences to accommodate passage by pronghorn, and replace existing fence that does not accommodate pronghorn passage.		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** TL-22: *Pronghorn Wintering Habitat.* Prohibit surface occupancy and surface-disturbing activities in pronghorn wintering habitat from January 1 to March 31. (Refer to Appendix B.) See Figures 2-51 (Alternative B), 2-52 (Alternative C), and 2-53 (Alternative D) in Appendix A.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Wildlife Emphasis Areas An emphasis area is an area of high wildlife value and significance for wildlife species including but not limited to sage-grouse, pronghorn antelope, mule deer, elk, bighorn sheep, prairie dog, and kit fox. Fire rehabilitation efforts and vegetation treatments to improve land health and/or wildlife habitat are not considered ground disturbance, as described in the actions under each emphasis area below. Wildlife emphasis areas are not designations, but rather polygons where more management emphasis is placed on protection and enhancement of the wildlife resource.			
Objective: No similar objective in current RMP.	Objective: Emphasis areas meet GJFO BLM Colorado's Standards for Public Land Health and Guidelines (BLM 1997a). Prioritize those areas that do not meet land health standards as management action areas where actions are taken to work toward meeting land health standards.		Objective: No similar objective.
Action: No similar action in current RMP.	Action: In wildlife emphasis areas not managed as ROW exclusion or avoidance areas, apply BMPs to consolidate ROWs in existing disturbance and to avoid fragmentation of unfragmented habitat.		Action: No similar action
Action: No similar action in current RMP.	Action: Consolidate surface occupancy and surface-disturbing activities within existing disturbance to avoid fragmentation of unfragmented habitat.		Action: No similar action
Action: No similar action in current RMP.	Action: Give priority to wildlife emphasis areas in carrying out actions to improve land health.		Action: No similar action
Action: No similar action in current RMP.	Action: Focus management in emphasis areas on wildlife. Adopt additional management actions deemed necessary by the BLM (such as closing additional roads to maintain effective habitat patch size).		Action: No similar action
Beehive Wildlife Emphasis Area			
Objective: No similar objective in current RMP.	Objective: Maintain or improve wildlife habitat in the Beehive wildlife emphasis area (4,700 acres) with an emphasis on wintering and migratory habitat for mule deer and elk (Figures 2-1 [Alternative B] and 2-2 [Alternative C], Appendix A).		Objective: No similar objective.
Action: No similar action in current RMP.	Action: Install a winter closure gate and enforce closure from December 1 to May 1 annually.		Action: No similar action.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Allowable Use: No similar allowable use in current RMP.	Allowable Use: No similar allowable use.	Allowable Use: **No Leasing**: *Wildlife Emphasis Areas*. Close the wildlife emphasis area to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-40 in Appendix A.	Allowable Use: No similar allowable use.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: No similar allowable use.	Allowable Use: **STIPULATION** NSO-35: *Wildlife Emphasis Areas.* Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figure 2-44 in Appendix A.	Allowable Use: No similar allowable use.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-25: *Wildlife Emphasis Areas.* Apply CSU (site-specific relocation) restrictions to surface-disturbing activities within the wildlife emphasis area. (Refer to Appendix B.) See Figure 2-47 in Appendix A.	Allowable Use: No similar allowable use.	
Blue Mesa Wildlife Emphasis Area			
Objective: No similar objective in current RMP.	Objective: Maintain or improve wildlife habitat in the Blue Mesa wildlife emphasis area (9,300 acres) with an emphasis on wintering habitat for mule deer and elk (Figures 2-1 [Alternative B] and 2-2 [Alternative C], Appendix A).		Objective: No similar objective.
Action: No similar action in current RMP.	Action: Install a winter closure gate and enforce closure from December 1 to May 1 annually.		Action: No similar action.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: No similar allowable use.	Allowable Use: **No Leasing**: *Wildlife Emphasis Areas*. Close the wildlife emphasis area to fluid mineral leasing and geophysical	Allowable Use: No similar allowable use.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
		exploration. (Refer to Appendix B.) See Figure 2-40 in Appendix A.	
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-35: *Wildlife Emphasis Areas.* Prohibit surface occupancy and surface-disturbing activities within the wildlife emphasis area. (Refer to Appendix B.) See Figures 2-43 (Alternative B), 2-44 (Alternative C), and 2-45 (Alternative D) in Appendix A.		Allowable Use: No similar allowable use.
Bull Hill Wildlife Emphasis Area			
Objective: No similar objective in current RMP.	Objective: Maintain or improve wildlife habitat in the Bull Hill wildlife emphasis area (4,800 acres) with an emphasis on wintering habitat for mule deer and elk (Figures 2-1 [Alternative B] and 2-2 [Alternative C], Appendix A).		Objective: No similar objective.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: No similar allowable use.	Allowable Use: **No Leasing**: *Wildlife Emphasis Areas*. Close the wildlife emphasis area to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-40 in Appendix A.	Allowable Use: No similar allowable use.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-35: *Wildlife Emphasis Areas.* Prohibit surface occupancy and surface-disturbing activities within the wildlife emphasis area. (Refer to Appendix B.) See Figures 2-43 (Alternative B) and 2-44 (Alternative C) in Appendix A.		Allowable Use: No similar allowable use.
Casto Wildlife Emphasis Area			
Objective: No similar objective in current RMP.	Objective: No similar objective.	Objective: Maintain or improve wildlife habitat in the Casto wildlife emphasis area (4,200 acres) with an emphasis on wintering habitat for mule deer and elk (Figure 2-2, Appendix A).	Objective: No similar objective.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Allowable Use: No similar allowable use in current RMP.	Allowable Use: No similar allowable use.	Allowable Use: **No Leasing:** *Wildlife Emphasis Areas.* Close the wildlife emphasis area to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-40 in Appendix A.	Allowable Use: No similar allowable use.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: No similar allowable use.	Allowable Use: **STIPULATION** NSO-35: *Wildlife Emphasis Areas.* Prohibit surface occupancy and surface-disturbing activities within the wildlife emphasis area. (Refer to Appendix B.) See Figure 2-44 in Appendix A.	Allowable Use: No similar allowable use.
East Salt Creek Wildlife Emphasis Area			
Objective: No similar objective in current RMP.	Objective: Maintain or improve wildlife habitat in the East Salt Creek wildlife emphasis area (26,100 acres) with an emphasis on wintering habitat for mule deer and elk (Figures 2-1 [Alternative B] and 2-2 [Alternative C], Appendix A).		Objective: No similar objective.
Action: No similar action in current RMP.	Action: Install a winter closure gate and enforce closure from December 1 to May 1 annually.		Action: No similar action.
Action: No similar action in current RMP.	Action: Manage the area east of the Demaree Canyon WSA as a ROW exclusion area (including renewable energy sites such as solar, wind, hydro, and biomass development).		Action: No similar action.
Action: No similar action in current RMP.	Action: Designate the area between the Demaree Canyon WSA and Highway 139 as closed to motorized vehicles.		Action: No similar action.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Allowable Use: No similar allowable use in current RMP.	Allowable Use: No similar allowable use.	Allowable Use: **No Leasing:** *Wildlife Emphasis Areas.* Close the wildlife emphasis area to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-40 in Appendix A.	Allowable Use: No similar allowable use.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-35: *Wildlife Emphasis Areas.* Prohibit surface occupancy and surface-disturbing activities within a portion of the wildlife emphasis area (4,100 acres). (Refer to Appendix B.) See Figures 2-43 (Alternative B) and 2-44 (Alternative C) in Appendix A.		Allowable Use: No similar allowable use.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-25: *Wildlife Emphasis Areas.* Apply CSU (site-specific relocation) restrictions to surface-disturbing activities within a portion of the wildlife emphasis area (21,700 acres). (Refer to Appendix B.) See Figures 2-47 (Alternative B) and 2-48 (Alternative C) in Appendix A.		Allowable Use: No similar allowable use.
Glade Park Wildlife Emphasis Area			
Objective: No similar objective in current RMP.	Objective: Maintain or improve wildlife habitat in the Glade Park wildlife emphasis area (27,200 acres) with an emphasis on Gunnison sage-grouse, mule deer, and elk habitat (Figure 2-1, Appendix A).	Objective: No similar objective. Area proposed to be managed as the Glade Park – Pinyon Mesa ACEC (see ACEC section).	Objective: No similar objective.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-25: *Wildlife Emphasis Areas.* Apply CSU (site-specific relocation) restrictions to surface-disturbing activities within the wildlife emphasis area. (Refer to Appendix B.) See Figure 2-47 in Appendix A.	Allowable Use: No similar allowable use. Area proposed to be managed as the Glade Park – Pinyon Mesa ACEC (see ACEC).	Allowable Use: No similar allowable use.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Hawxhurst Wildlife Emphasis Area			
Objective: No similar objective in current RMP.	Objective: No similar objective.	Objective: Maintain or improve wildlife habitat in the Hawxhurst wildlife emphasis area (9,400 acres) with an emphasis on wintering and migratory habitat for bighorn sheep, mule deer, and elk. (Figure 2-2, Appendix A).	Objective: No similar objective.
Action: No similar action in current RMP.	Action: No similar action.	Action: Close to motorized over-snow travel.	Action: No similar action.
Action: No similar action in current RMP.	Action: No similar action.	Action: Close to motorized and mechanized travel.	Action: No similar action.
Action: No similar action in current RMP.	Action: No similar action.	Action: Manage the wildlife emphasis area as a ROW avoidance area (including renewable energy sites such as solar, wind, hydro, and biomass development).	Action: No similar action.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: No similar allowable use.	Allowable Use: **STIPULATION** CSU-25: *Wildlife Emphasis Areas.* Apply CSU (site-specific relocation) restrictions to surface-disturbing activities within the wildlife emphasis area. (Refer to Appendix B.) See Figure 2-48 in Appendix A.	Allowable Use: No similar allowable use.
Indian Point Wildlife Emphasis Area			
Objective: No similar objective in current RMP.	Objective: No similar objective.	Objective: Maintain or improve wildlife habitat in the Indian Point wildlife emphasis area (11,400 acres) with an emphasis on habitat for pronghorn antelope and wintering habitat for mule deer and elk. See Figure 2-2, Appendix A.	Objective: No similar objective.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: No similar action in current RMP.	Action: No similar action.	Action: Install a winter closure gate on Indian Point and enforce closure from December 1 to May 1 annually.	Action: No similar action.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: No similar allowable use.	Allowable Use: **No Leasing:** *Wildlife Emphasis Areas.* Close the wildlife emphasis area to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-40 in Appendix A.	Allowable Use: No similar allowable use.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: No similar allowable use.	Allowable Use: **STIPULATION** CSU-25: *Wildlife Emphasis Areas.* Apply CSU (site-specific relocation) restrictions to surface-disturbing activities within the wildlife emphasis area. (Refer to Appendix B.) See Figure 2-48 in Appendix A.	Allowable Use: No similar allowable use.
Prairie Canyon Wildlife Emphasis Area			
Objective: No similar objective in current RMP.	Objective: Maintain or improve wildlife habitat in the Prairie Canyon wildlife emphasis area (22,200 acres) with an emphasis on long billed curlew, long eared owl, pronghorn antelope, white-tailed prairie dog, kit fox, and burrowing owl habitat (Figure 2-1, Appendix A).	Objective: Maintain or improve wildlife habitat in the Prairie Canyon wildlife emphasis area (15,300 acres) with an emphasis on long billed curlew, long eared owl, pronghorn antelope, white-tailed prairie dog, kit fox, and burrowing owl habitat (Figure 2-2, Appendix A). A portion of this area would also be managed as the Prairie Canyon ACEC (see ACEC).	Objective: No similar objective.
Action: No similar action in current RMP.	Action: Manage the pronghorn antelope migratory corridor as a ROW avoidance area for above-ground	Action: Manage the pronghorn antelope migratory corridor as a ROW exclusion area for above-ground facilities (including	Action: No similar action.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	facilities (including renewable energy sites such as solar, wind, hydro, and biomass development).	renewable energy sites such as solar, wind, hydro, and biomass development).	
Allowable Use: No similar allowable use in current RMP.	Allowable Use: No similar allowable use.	Allowable Use: **No Leasing:** *Wildlife Emphasis Areas.* Close the wildlife emphasis area to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-40 in Appendix A.	Allowable Use: No similar allowable use.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: No similar allowable use.	Allowable Use: **STIPULATION** NSO-35: *Wildlife Emphasis Areas.* Prohibit surface occupancy and surface-disturbing activities within a portion of the wildlife emphasis area (5,600 acres). (Refer to Appendix B.) See Figure 2-44 in Appendix A.	Allowable Use: No similar allowable use.
Action: No similar action in current RMP.	Action: Within the area designated for pronghorn migration, seek to avoid additional disturbance and apply CSU-25 (Wildlife Emphasis Areas) to avoid consolidate disturbance and minimize potential impacts to migrating pronghorn		Action: No similar allowable use.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-25: *Wildlife Emphasis Areas.* Apply CSU (site-specific relocation) restrictions to surface-disturbing activities within a portion the wildlife emphasis area (16,600 acres). (Refer to Appendix B.) See Figure 2-47 in Appendix A.	Allowable Use: **STIPULATION** CSU-25: *Wildlife Emphasis Areas.* Apply CSU (site-specific relocation) restrictions to surface-disturbing activities within a portion the wildlife emphasis area (12,500 acres). (Refer to Appendix B.) See Figure 2-48 in Appendix A.	Allowable Use: No similar allowable use.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Rapid Creek Wildlife Emphasis Area			
Objective: No similar objective in current RMP.	Objective: Maintain or improve wildlife habitat in the Rapid Creek wildlife emphasis area (28,600 acres) with an emphasis on wintering and migratory habitat for mule deer and elk (Figures 2-1 [Alternative B] and 2-2 [Alternative C], Appendix A).		Objective: No similar objective.
Action: Close the Lands End area (6,400 acres) from December 1 to June 1 to protect big game winter range.	Action: Enforce winter closure from December 1 to May 1 annually, to include installation and maintenance of winter closure gates.		Action: No similar action.
Action: No similar action in current RMP.	Action: Manage the portion of the wildlife emphasis area that is currently undisturbed as a ROW avoidance area (including renewable energy sites such as solar, wind, hydro, and biomass development). See Figure 2-27 and Figure 2-28 (Appendix A).		Action: No similar action.
Action: No similar action in current RMP.	Action: No similar action.	Action: Close an unroaded portion (200 acres) to motorized travel.	Action: No similar action.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: No similar allowable use.	Allowable Use: **No Leasing:** *Wildlife Emphasis Areas.* Close the wildlife emphasis area to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-40 in Appendix A.	Allowable Use: No similar allowable use.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: No similar allowable use.	Allowable Use: **STIPULATION** NSO-35: *Wildlife Emphasis Areas.* Prohibit surface occupancy and surface-disturbing activities within a portion the wildlife emphasis area (1,700 acres). Refer to Appendix B.) See Figure2-44 (Alternative C) in Appendix A.	Allowable Use: No similar allowable use.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: No similar action in current RMP.	Action: In the currently roadless, undisturbed section of the emphasis area that is ROW avoidance, seek to avoid disturbance and apply CSU-25 (Wildlife Emphasis Areas) to avoid fragmenting the roadless area.		Action: No similar action.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-25: *Wildlife Emphasis Areas.* Apply CSU (site-specific relocation) restrictions to surface-disturbing activities within the wildlife emphasis area. (Refer to Appendix B.) See Figure 2-47 in Appendix A.	Allowable Use: **STIPULATION** CSU-25: *Wildlife Emphasis Areas.* Apply CSU (site-specific relocation) restrictions to surface-disturbing activities within a portion of the wildlife emphasis area (26,900 acres). (Refer to Appendix B.) See Figure 2-48 in Appendix A.	Allowable Use: No similar allowable use.
Red Mountain Wildlife Emphasis Area			
Objective: No similar objective in current RMP.	Objective: No similar objective	Objective: Maintain or improve wildlife habitat in the Red Mountain wildlife emphasis area (5,000 acres) with an emphasis on wintering and migratory habitat for mule deer and elk (Figure 2-2, Appendix A).	Objective: No similar objective
Action: No similar action in current RMP.	Action: No similar action.	Action: Close to motorized over-snow travel.	Action: No similar action.
Action: No similar action in current RMP.	Action: No similar action.	Action: Close to motorized and mechanized travel.	Action: No similar action.
Action: No similar action in current RMP.	Action: No similar action.	Action: Manage the wildlife emphasis area as a ROW avoidance area (including renewable energy sites such as solar, wind, hydro, and biomass development).	Action: No similar action.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: No similar allowable use.	Allowable Use: **STIPULATION** CSU-25: *Wildlife Emphasis Areas.* Apply CSU (site-specific	Allowable Use: No similar allowable use.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
		relocation) restrictions to surface-disturbing activities within the wildlife emphasis area. (Refer to Appendix B.) See Figure 2-48 in Appendix A.	
Roan and Carr Creeks Wildlife Emphasis Area			
Objective: No similar objective in current RMP.	Objective: Maintain or improve wildlife habitat in the Roan and Carr Creeks wildlife emphasis areas (17,700 acres) with an emphasis on habitat for cutthroat trout and greater sage-grouse (Figure 2-1, Appendix A).	Objective: No similar objective. Area proposed to be managed as the Roan and Carr Creeks ACEC (see ACEC section).	Objective: Maintain or improve wildlife habitat in the Roan and Carr Creeks wildlife emphasis areas (33,400 acres) with an emphasis on cutthroat trout and greater sage-grouse (Figure 2-3, Appendix A).
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-25: *Wildlife Emphasis Areas.* Apply CSU (site-specific relocation) restrictions to surface-disturbing activities within the wildlife emphasis area. (Refer to Appendix B.) See Figure 2-47 in Appendix A.	Allowable Use: No similar allowable use.	Allowable Use: **STIPULATION** CSU-25: *Wildlife Emphasis Areas.* Apply CSU (site-specific relocation) restrictions to surface-disturbing activities within the wildlife emphasis area. (Refer to Appendix B.) See Figure 2-49 in Appendix A.
South Shale Ridge Wildlife Emphasis Area			
Objective: No similar objective in current RMP.	Objective: Maintain wildlife habitat in the South Shale Ridge wildlife emphasis area (3,500 acres) with an emphasis on deer and elk wintering grounds (Figure 2-1, Appendix A).	Objective: Maintain wildlife habitat in the South Shale Ridge wildlife emphasis area (3,500 acres) with an emphasis on deer and elk wintering grounds (Figure 2-2, Appendix A).	Objective: No similar objective.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: No similar allowable use.	Allowable Use: **No Leasing:** *Wildlife Emphasis Areas.* Close the wildlife emphasis area to fluid mineral leasing and geophysical	Allowable Use: No similar allowable use.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
		exploration. (Refer to Appendix B.) See Figure 2-40 in Appendix A.	
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-25: *Wildlife Emphasis Areas.* Apply CSU (site-specific relocation) restrictions to surface-disturbing activities within the wildlife emphasis area. (Refer to Appendix B.) See Figures 2-47 (Alternative B) and 2-48 (Alternative C) in Appendix A.		Allowable Use: No similar allowable use.
Sunnyside Wildlife Emphasis Area			
Objective: No similar objective in current RMP.	Objective: Maintain or improve wildlife habitat in the Sunnyside wildlife emphasis area (14,500 acres) with an emphasis on bighorn sheep, mule deer, elk, and greater sage-grouse (Figure 2-1, Appendix A).	Objective: Maintain or improve wildlife habitat in the Sunnyside wildlife emphasis area (11,300 acres) with an emphasis on bighorn sheep, mule deer, elk, and greater sage-grouse (Figure 2-2, Appendix A).	Objective: No similar objective.
Action: No similar action in current RMP.	Action: Manage the portions of the wildlife emphasis area that are not contained in the West-wide Energy Corridor as a ROW avoidance area for above-ground facilities (including renewable energy sites such as solar, wind, hydro, and biomass development).		Action: No similar action.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-35: *Wildlife Emphasis Areas.* Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figure 2-43 in Appendix A.	Allowable Use: **STIPULATION** NSO-35: *Wildlife Emphasis Areas.* Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figure 2-44 in Appendix A.	Allowable Use: No similar allowable use.
Timber Ridge Wildlife Emphasis Area			
Objective: No similar objective in current RMP.	Objective: Maintain or improve wildlife habitat in the Timber Ridge wildlife emphasis area (11,900 acres) with an emphasis on habitat for mule deer, elk, and sage-grouse (Figures 2-1 [Alternative B] and 2-2 [Alternative C], Appendix A).		Objective: No similar objective.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: No similar action in current RMP.	Action: Close to motorized and mechanized travel. Allow for game retrieval carts.		Action: No similar action.
Action: No similar action in current RMP.	Action: Manage the wildlife emphasis area as a ROW avoidance area (including renewable energy sites such as solar, wind, hydro, and biomass development), except along 9.8 Road.		Action: No similar action.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: No similar allowable use.	Allowable Use: **No Leasing**: *Wildlife Emphasis Areas*. Close the wildlife emphasis area to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-40 in Appendix A.	Allowable Use: No similar allowable use.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-35: *Wildlife Emphasis Areas*. Prohibit surface occupancy and surface-disturbing activities within the wildlife emphasis area. (Refer to Appendix B.) See Figures 2-43 (Alternative B) and 2-44 (Alternative C) in Appendix A.		Allowable Use: No similar allowable use.
Wild Horses			
GOAL: Manage the administratively designated Little Book Cliffs Wild Horse Range (LBCWHR) to sustain a healthy viable wild horse population while maintaining a thriving natural ecological balance of resources and uses. (Figure 2-4, Appendix A).			
Objective: Emphasize protection of wild horses in the LBCWHR and minimize impacts to their population and habitat.			
Action: Continue to prohibit livestock grazing within the LBCWHR.			
Objective: Emphasize management of wild horses in the LBCWHR.			
Action: Manage the LBCWHR (35,200 acres) to accommodate an appropriate management level of 90 to 150 wild horses.	Action: Manage the LBCWHR (35,200 acres) at appropriate management level, currently identified as a range of 90 to 150 wild horses. The appropriate management level is a dynamic number that would be adjusted as range conditions warrant and in accordance with BLM policy.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: Utilize periodic removals and fertility control to maintain the appropriate management level.			
Action: Monitor and maintain genetic diversity within the LBCWHR by implementing the following actions, including but not limited to: • Based on genetic analysis, periodically introduce wild horses from other wild horse areas into the LBCWHR; and • Periodically conduct a genetic analysis for the wild horse population.			
Objective: Manipulate pure stands of sagebrush and pinyon-juniper within the LBCWHR with prescribed and natural fires to improve the ecological diversity and improve the habitat for wildlife and wild horses.	Objective: Manage vegetative communities within the LBCWHR to maintain a forage base to support the established appropriate management levels.		
Action: Allow for some use of naturally occurring fires and reseed with a desirable mixture of grasses, forbs, and browse to produce additional forage.	Action: Utilize prescribed or wildland fire and mechanized, biological, and chemical treatments to maintain the vegetative types in a state advantageous to wild horse use while meeting land health standards.	Action: Minimize the use of mechanized and chemical treatments and primarily use fire (prescribed or wildland) to maintain the vegetative types in a state advantageous to wild horse use while meeting land health standards.	Action: Same as Alternative B.
Objective: Protect wild horses in the LBCWHR by limiting activities which disturb or harass wild horses during critical time periods.			
Action: No similar action	Action: Prohibit target shooting in the Coal Canyon and Main Canyon areas.		Action: No similar action.
Action: No similar action.	Action: Close the LBCWHR to motorized over-snow travel.		Action: No similar action.
Action: Close Coal Canyon to motorized use from December 1 to May 1.	Action: Close Coal Canyon to motorized and mechanized travel from December 1 to May 1.		
Action: Maintain and construct range improvements to ensure that the horses are confined to the LBCWHR and have adequate water and forage.			

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Allowable Use: Identify Coal Canyon as available for placement of mine mouth facilities.	Allowable Use: No similar allowable use.		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: See NSO-36, *Little Book Cliffs Wild Horse Range*.	Allowable Use: **No Leasing**: *Little Book Cliffs Wild Horse Range:* Close the LBCWHR to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-40, Appendix A.	Allowable Use: See CSU-26, *Little Book Cliffs Wild Horse Range.*
Allowable Use: **STIPULATION** *TL-10: Wild Horse Winter Range*: Lease activities such as exploration, drilling, and other development will only be allowed during the period from May 1 to December 1. (Refer to Appendix B.) See Figure 2-50, Appendix A.	Allowable Use: No similar allowable use.		
Allowable Use: **STIPULATION** *TL-11: Wild Horse Foaling Area*. Lease activities such as exploration, drilling, and other development will be allowed only during the period from July 1 to March 1. (Refer to Appendix B.) See Figure 2-50, Appendix A.	Allowable Use: No similar allowable use.		Allowable Use: **STIPULATION** TL-23: *Wild Horse Foaling Area*: Same as Alternative A. See Figure 2-53 in Appendix A.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-36: *Little Book Cliffs Wild Horse Range:* Prohibit surface occupancy and surface-disturbing activities in the LBCWHR. (Refer to Appendix B.) See Figures 2-43 (Alternative B) and 2-44 (Alternative C) in Appendix A.		Allowable Use: No similar allowable use.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Allowable Use: **STIPULATION** *CSU-2: Scenic and Natural Values (Little Book Cliffs Wild Horse Area)*. Special design and reclamation measures may be required to protect the outstanding scenic and natural landscape value. (Refer to Appendix B.) See Figure 2-46 in Appendix A.	Allowable Use: No similar allowable use.		Allowable Use: **STIPULATION** CSU-26: *Little Book Cliffs Wild Horse Range*. Apply CSU (site-specific relocation) restrictions to surface-disturbing activities within the LBCWHR. (Refer to Appendix B.) See Figure 2-49 in Appendix A.
Allowable Use: Prohibit new ROWs or other surface-disturbing activities that would change the semi-primitive character of the LBCWHR.	Allowable Use: Manage the LBCWHR as a ROW avoidance area outside of the Little Book Cliffs WSA.	Allowable Use: Manage the LBCWHR as a ROW exclusion area, except for within the existing Coal Canyon Utilities ROW corridor.	Allowable Use: Same as Alternative B.
Cultural Resources			
GOAL: Identify, preserve, and protect significant cultural resources in order to ensure they are available for appropriate uses by present and future generations (i.e., for research, education, and preservation of cultural heritage).			
Objective: Review and assess extant site data for values, protection, and preservation needs.	Objective: Allocate all cultural resources currently recorded, or projected to occur on the basis of existing data synthesis, to use allocations according to their nature and relative preservation value (BLM Manual Section 8110.42 and Planning Handbook H-1601-1 [Appendix C]). Cultural Use Allocations include:		

Use Category Allocation	Management Action	Desired Outcome
a. Scientific Use	Permit appropriate research including data recovery	Preserved until research or data recovery potential is realized
b. Conservation for Future Use	Propose protective measures/designation	Preserved until conditions for use are met
c. Traditional Use	Consult with tribes, determine limitations	Long-term preservation
d. Public Use	Determine permitted use	Long-term preservation, on-site interpretation

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	e. Experimental Use	Determine nature of experiment	Protected until used
	f. Discharge from Management	Remove protective measures	No use after recordation; not preserved
Action: No similar action in current RMP.	Action: Allocate all cultural resources currently recorded in Appendix I to category use allocations.		
Action: No similar action in current RMP.	Action: Assign use category allocations to discovered cultural resource sites and/or areas and apply appropriate management actions to achieve the desired outcome.		
Action: No similar action in current RMP.	Action: Use category allocations may be revised in response to changing site conditions or as additional data and information are obtained. Criteria allowing for revising allocation includes: 1) environmental change or human caused impacts that alter the significance or scientific potential; 2) through changes brought about by mitigation and/or data recovery; 3) new discovery that adds to the sites potential and changes its eligibility to the National Register of Historic Places; 4) new information or techniques that reveal a new scientific value that was not previously recognized; and 5) new information shared through Native American consultation.		
Objective: No similar objective in current RMP.	Objective: Assign existing cultural resource sites and/or areas to (a) the Scientific Use category. These cultural resources generally meet National Register of Historic Places criterion D; they will yield significant archaeological information about prehistory and history. These cultural resources are available for permitted research and study (Appendix I).		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-27: *Allocation to Scientific Use Category.* Prohibit surface occupancy and surface-disturbing activities, except archaeological documentation and excavation, within 100 meters (328 feet) around eligible or potentially eligible sites allocated to Scientific Use. (Refer to Appendix B.) See Figures 2-47 (Alternative B), 2-48 (Alternative C), and 2-49 (Alternative D) in Appendix A.		
Action: No similar action in current RMP.	Action: Prioritize Scientific Use sites and/or areas for listing on the National Register of Historic Places and develop a cultural resource management plan for Scientific Use sites that outlines specific management objectives and actions for protection.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Objective: No similar objective in current RMP.	Objective: Assign existing cultural resource sites and/or areas to (b) the Conservation for Future Use category. These cultural resources generally meet any of the criteria of the National Register of Historic Places. They are set aside for long-term preservation because of their national and regional significance to prehistory and history (Appendix I).		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-37: *Allocation to Conservation Use Category*. Prohibit surface occupancy and surface-disturbing activities, including archaeological excavation, within 100 meters (328 feet) around eligible sites allocated to Conservation Use. (Refer to Appendix B.) See Figures 2-43 (Alternative B), 2-44 (Alternative C), and 2-45 (Alternative D) in Appendix A.		
Action: No similar action in current RMP.	Action: Prioritize Conservation Use sites for listing on the National Register of Historic Places and within two years from the listing, develop a cultural resource management plan for Conservation Use sites that would outline specific management objectives and actions for protection.		
Objective: No similar objective in current RMP	Objective: Assign existing cultural resource sites and/or areas to (c) the Traditional Use category. These cultural resources generally meet any of the significance criteria of the National Register of Historic Places and are identified as traditional cultural properties and sacred sites in consultation with Native American Tribes. They are set aside for long-term preservation because of their cultural and religious value to Native American Tribes (Appendix I).		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-38: *Allocation to Traditional Use Category*. Prohibit surface occupancy and surface-disturbing activities within 200 meters (656 feet) around eligible or potentially eligible sites allocated to Traditional Use. In addition, consider visual impacts that projects may have on sites allocated to this use, and apply appropriate mitigation, which may include redesign. (Refer to Appendix B.) See Figures 2-43 (Alternative B), 2-44 (Alternative C), and 2-45 (Alternative D) in Appendix A.		
Objective: No similar objective in current RMP	Objective: Assign existing cultural resource sites and/or areas to (d) the Public Use Category. Public Use sites are set aside for their educational and interpretive value to the public. These cultural resources may meet any of the significance criteria of the National Register of Historic Places, or they may not be eligible for nomination to the National Register of Historic Places but hold a local or regionally recognized visual value (e.g., historic cabins, railroad grades, roads and trails, mine ruins and mine workings) (Appendix I).		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-28: *Allocation to Public Use Category*. Prohibit surface occupancy and surface-disturbing activities within 100 meters (328 feet) around sites allocated to Public Use. In addition, consider factors such as integrity of setting, recreation opportunity, or visual impacts that projects may have on sites allocated to this use. (Refer to Appendix B.) See Figures 2-47 (Alternative B), 2-48 (Alternative C), and 2-49 (Alternative D) in Appendix A.		
Action: No similar action in current RMP.	Action: Allocate historical sites on the uranium mesas (e.g., Tenderfoot, Calamity, Outlaw, Blue Mesa, Hubbard, and Dolores Point); Rough Canyon sites for environmental heritage education; historical buildings that may be suitable for adaptive use, historical roads and trails (e.g., Old Spanish National Historic Trail, Tabeguache Trail, Old Mill Road); and select rock art sites (e.g., Site 5ME4947 on the slopes of the Grand Mesa) to Public Use.		
Objective: Promote public awareness and education.			
Action: No similar action in current RMP.	Action: Prioritize Public Use sites and as demand for use of these sites for heritage tourism or other public uses is proposed develop cultural resource management plans (CRMP) that develop site specific management actions for those Public Use sites. CRMPs include outlines for specific management objectives and actions for Heritage Tourism including retrieval of scientific information, hardening for public use, interpretation and long-term protection strategies.		
Action: No similar action in current RMP.	Action: Manage, protect, and use cultural resources allocated to Public Use, including traditional cultural properties with a secondary allocation to Public Use by implementing the following actions, including but not limited to: • Developing heritage tourism at sites designated to Public Use using BMPs; • Interpreting sites; and • Organizing and conducting ongoing educational programs for tribal groups, the public, school groups, vocational archaeology groups, project proponents, permittees, contractors, and others about cultural resource ethics, and encouraging their assistance in reporting new discoveries and vandalism incidents.		
Objective: No similar objective in current RMP	Objective: Assign existing cultural resource sites and/or areas to (e) the Experimental Use category. These cultural resources may meet criterion D of the National Register of Historic Places but would not have a primary allocation to the Conservation, Traditional or Public Use categories. They are set aside for studying such problems as natural or human caused deterioration and may be damaged or destroyed in the process of experimentation or mitigation (scientific excavation of inadvertent discovery).		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: No similar action in current RMP.	Action: Prioritize the Experimental use sites focusing on sites allocated to this use in the Sunnyside, Grand Mesa Slopes, and Indian Creek areas. As permitted activities are authorized that may affect these sites develop cultural resource management plans for allowable use on all Experimental Use sites in the Sunnyside, Grand Mesa Slopes, and Indian Creek areas to outline research objectives and identify experimental parameters.		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-29: *Sub-surface Inventory*. Require sub-surface inventory for deep sub-surface-disturbing activities and buried ROW in the following locations. (Refer to Appendix B.) See Figure 2-47 in Appendix A: • Indian Creek (20,200 acres); • Grand Mesa Slopes (16,000 acres); and • Sunnyside (17,300 acres).	Allowable Use: **STIPULATION** CSU-29: *Sub-surface Inventory*. Require sub-surface inventory for deep sub-surface-disturbing activities and buried ROW in the following locations. (Refer to Appendix B.) See Figure 2-48 in Appendix A: • Indian Creek (20,200 acres); • Grand Mesa Slopes (24,400 acres); and • Sunnyside (24,000 acres).	Allowable Use: **STIPULATION** CSU-29: *Sub-surface Inventory*. Require sub-surface inventory for deep sub-surface-disturbing activities and buried ROW in the following locations. (Refer to Appendix B.) See Figure 2-49 in Appendix A: • Indian Creek (20,200 acres); • Grand Mesa Slopes (16,000 acres); and • Sunnyside (15,400 acres).
Objective: No similar objective in current RMP.	Objective: Assign existing cultural resource sites assigned to (f) the Discharged from Management category. These cultural resources generally are not eligible for the National Register of Historic Places and are not assigned to other use allocations. They are not protected from other resource uses.		
Action: No similar action in current RMP.	Action: On an annual basis develop a list of sites to allocate to the Discharge Use category, reevaluate as needed and compile supporting documentation, and submit for consultation with the State Historic Preservation Officer (SHPO).		
Objective: No similar objective in current RMP.	Objective: Manage areas with scientifically and publicly valuable archaeological and cultural resources through documentation and nomination to the National Register of Historic Places and completion of Cultural Resource Management Plans.		
Action: Complete cultural resource management plans to actively manage the following sites, which are in priority order:	Action: Develop a cultural resource management plan to guide research and long term protection of two cultural properties associated with the Indian Creek Area: • West Area (730 acres); and • East Area (1,700 acres).		Action: Develop a cultural resource management plan to guide research and long term protection of two cultural properties associated with

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
• Indian Creek (1,300 acres); • Transect 7 (14,300 acres); • Rough Canyon (2,700 acres); • Sinbad Valley *(area to be determined)*; • Ladder Springs (370 acres); and • 5ME1358 (160 acres). Address in these cultural resource management plans the following types of actions: special designations, physical and administrative needs and measures, public interpretation or educational/scientific uses, data recovery and recordation needs, monitoring, and patrol schedules.			the Indian Creek Area: • West Area (730 acres); and • East Area (520 acres).
Allowable Use: **STIPULATION** *NSO-1: No Surface Occupancy (Cultural Resources).* Prohibit surface occupancy for the following sites. See Figure 2-42 in Appendix A: • Site 5ME1358 (Exhibit GJ-1HF) (170 acres); • Indian Creek (Exhibit GJ-1HA) (1,400 acres); • Rough Canyon (Exhibit GJ-1HB) (2,600 acres); and • Ladder Springs (Exhibit GJ-1HG) (460 acres).	Allowable Use: **STIPULATION** NSO-39: *Indian Creek.* Prohibit surface occupancy and surface-disturbing activities in the following areas to protect cultural resources. See Figures 2-43 (Alternative B), 2-44 (Alternative C), and 2-45 (Alternative D) in Appendix A: • West Indian Creek (520 acres); and • East Indian Creek (1,200 acres).		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Allowable Use: **STIPULATION** *CSU-5: Known Cultural Resource Value*. Surface-disturbing activities must avoid important known cultural resources. (Refer to Appendix B.) See Figure 2-46 in Appendix A.	Allowable Use: No similar allowable use.		
GOAL: Seek to reduce imminent threats and resolve potential conflicts from natural or human-caused deterioration, or potential conflict with other resource uses (FLPMA Sec. 103(c), National Historic Preservation Act (NHPA) 106, 110 (a) (2)) by ensuring that all authorizations for land use and resource use will comply with the NHPA Section 106.			
Objective: No similar objective in current RMP.	Objective: Allocate all cultural resources recorded to use allocations according to their nature and relative preservation value (BLM Manual Section 8110.42 and Planning Handbook H-1601-1 [Appendix C]) as part of the evaluation and determination of eligibility process.		
Action: No similar objective in current RMP.	Action: Manage the integrity of cultural resources that are not included in sensitive site areas and mitigate impacts based on maintaining the integrity of the desired outcome of the cultural resource Use Category Allocations. This may require redesign of proposed projects or mitigation.		
GOAL: Uphold Native American trust responsibilities and accommodate traditional uses. The GJFO is part of the Ute traditional homeland where physical remains of their occupation will be protected and preserved. Maintain and, where possible, improve natural and cultural resource conditions to enhance opportunities to exercise Native American use of cultural landscapes and cultural properties in their traditional homeland.			
Objective: No similar objective in current RMP.	Objective: Continue the Ute Ethnohistory Project to compile information regarding traditional cultural properties, sacred sites, traditional uses, and cultural landscapes.		
Action: Accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and to avoid adversely affecting the physical integrity of sacred sites.			
Action: No similar action in current RMP.	Action: Manage recorded traditional cultural properties and natural resources of importance to the Ute Tribes to enhance opportunities to exercise Native American use of these resources.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: No similar action in current RMP.	Action: The following sites of concern have been identified through consultation and would be a priority for nomination to the National Register of Historic Places and development of cultural resource management plans that would outline specific management objectives and actions for protection: • Wickiup camps and open camps with definitive Ute occupation (associated to Ute rock art, artifact assemblages and/or trails); • Isolated rock art; • Culturally Modified Trees (includes Scarred and Prayer Trees); and • Ceremonial features (e.g., eagle traps, vision circles, and special structures). This list is in no way intended to be a comprehensive list and may continue to grow through consultation.		
Action: No similar action in current RMP.	Action: In cooperation with the recreation program, manage Unaweep Canyon/West and East Creek as a Ute heritage area, rename the West and East Creek Day Use areas in consultation with the Ute Tribes. With local partners and Ute tribal members interpret Ute Cultural Heritage for the public at this location.		
Action: No similar action in current RMP.	Action: Identify tribal plant gathering needs and establish tribal protocol for gathering materials for cultural and religious purposes. Do not charge members of federally recognized Tribes fees for the collection of non-commercial or personal-use quantities of plants or minerals used for food, medicine, utilitarian items, traditional use items, or items necessary for traditional, religious or ceremonial purposes. Threatened, endangered, candidate, proposed, or sensitive plants are not included as authorized for collection. Plants that are identified by a Tribe as important for traditional, religious or ceremonial purposes and are not widely available would not be offered as wilding plants for the general public.		
Action: No similar action in current RMP.	Action: In coordination with the recreation resource management objectives, collaborate with Ute tribal cultural departments and members to identify, allocate to appropriate Use Category, reestablish and interpret traditionally used trails.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Paleontological Resources			
GOAL: Provide for the identification, protection, and management of paleontological resources for the preservation, interpretation and scientific uses by present and future generations.			
Objective: Manage paleontological resource to protect significant paleontological values.			
Action: No similar action in current RMP.	Action: No similar action.	Action: Designate the Nine-mile Hill Boulders ACEC to protect paleontological values.	Action: No similar action.
Action: No similar action in current RMP.	Action: Enhance, promote, and protect the dinosaur resources of the Dinosaur Diamond Prehistoric Highway (National Scenic Byway and All American Road).		
Objective: No similar objective in current RMP.	Objective: Identify and protect priority geographic areas.		
Action: No similar action in current RMP.	Action: Conduct field inventories and document highly sensitive paleontological sites.		
Action: Manage paleontological resources according to their Potential Fossil Yield Classification (Figure 2-74, Appendix A). *Class 1*- Xb Biotitic Gneiss, Schist, Migmatite, Yg Granitic Rocks of 1400 m.y., Xg *Granitic Rocks of 1700 m.y., YXg *Granitic Rocks of 1400 and 1700 m.y. *Class 2*- Pennh Hermosa *Class 3*- Pc Cutler, TRm Moenkopi, JTRgc *Glen Canyon Group, TRwc *Wingate, TRkc *Kayenta, JTRgc *Navajo, Jmwe *Entrada, Jmse *Summerville, KJdw *Burro Canyon Sandstone, Kd *Dakota Sandstone, Km *Mancos Shale, Kmv Mesaverde Group (Undivided), Kmvu Hunter Canyon, Kmvl Mount Garfield, Kh Sego Sandstone, Two Ohio Creek Formation, Tgl Green River Fm., Lower Part, Tgp Green River Fm., Parachute Creek Member, Tg Green River (Undivided), Tu Uinta, Q Quaternary deposits (Undifferentiated) *Class 4–5* - TRc *Chinle, Jmwe *Morrison, Two Wasatch (De Beque)			
Allowable Use: **LEASE NOTICE:** LN-6: *Class 4 and 5 Paleontological Areas.* Have a permitted paleontologist approved by the BLM's Authorized Officer perform an inventory of surface-disturbing activities in Class 4 and 5 paleontological areas. (Refer to Appendix B.)			

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Visual Resources			
GOAL: Maintain the scenic quality of river canyons, open space landscapes, cultural landscapes, and other areas having high quality visual resources. Generally maintain the existing "footprint" of cultural landscapes (facilities, projects, and improvements).			
Objective: Protect the quality of the scenic values on public lands where VRM is an issue or where high value visual resources exist, and protect areas having high scenic quality, visual sensitivity, and public visibility.	Objective: Manage visual resource values in accordance with VRM classifications identified below.		
Action: Adopt the visual resources management classes listed below. Modify, relocate, mitigate, or deny proposed projects that conflict with the objectives of these classes. (Figure 2-5, Appendix A) • VRM I = 27,100 acres • VRM II = 132,100 acres • VRM III = 206,100 acres • Undesignated = 696,100 acres	Action: Manage visual resources on BLM-administered land according to the objectives for each class as follows (Figure 2-6, Appendix A): • VRM I = 98,500 acres • VRM II = 314,500 acres • VRM III = 458,600 acres • VRM IV = 189,800 acres Manage visual resources on BLM land according to the objectives for each class.	Action: Manage visual resources on BLM-administered land according to the objectives for each class as follows (Figure 2-7, Appendix A): • VRM I = 100,100 acres • VRM II = 556,600 acres • VRM III = 215,000 acres • VRM IV = 189,700 acres Manage visual resources on BLM land according to the objectives for each class.	Action: Manage visual resources on BLM-administered land according to the objectives for each class as follows (Figure 2-8, Appendix A): • VRM I = 96,500 acres • VRM II = 194,800 acres • VRM III = 530,100 acres • VRM IV = 240,000 acres Manage visual resources on BLM land according to the objectives for each class.

Action:
Manage 27,100 acres of BLM lands according to VRM Class I, including the following areas:
• WSAs:
  ○ Sewemup Mesa
• ACECs:
  ○ The Palisade Outstanding Natural
	Action:
	Manage 98,500 acres of BLM lands according to VRM Class I objectives, including the following areas:
	• WSAs:
	  ○ Demaree Canyon;
	  ○ Little Book Cliffs;
	  ○ The Palisade; and
		Action:
		Manage 100,100 acres of BLM lands according to VRM Class I objectives, including the following areas:
		• WSAs:
		  ○ Same as Alternative B
		• ACECs:
		  ○ Same as Alternative B
			Action:
			Manage 96,500 acres of BLM lands according to VRM Class I objectives, including the following areas:
			• WSAs:
			  ○ Same as Alternative B.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Area (ONA) • Wild and Scenic River segments that are found to be eligible which have been classified as wild: ○ North Fork West Creek • Other VRM Class I areas: ○ Mt. Garfield; and ○ Cliffs of Sinbad Valley.	○ Sewemup Mesa • ACECs: ○ Mt. Garfield (except for Coal Canyon corridor); and ○ A portion of The Palisade (26,700 acres within The Palisade WSA).	• Wild and Scenic River segments that are found to be suitable which have been classified as wild: ○ North Fork West Creek.	
Allowable Use: No similar allowable use in current RMP.	Allowable Use: Manage VRM Class I areas as ROW exclusion areas.		
Action: Manage 132,100 acres of BLM lands under VRM Class II objectives, including the following areas: • Bangs, Rough, Ladder, and Northeast Creek Canyons; • Cliffs of Unaweep Canyon; • Cliffs of Hunter/Garvey Canyons; • Gunnison River corridor; • Vega Reservoir; • Foreground of Interstate 70; • US Highway 50; • Cliffs adjacent to Mt. Garfield; • Dolores River corridor; and • Juanita Arch.	Action: Manage 314,500 acres of BLM lands according to VRM Class II objectives, including the following areas: • ACECs: ○ A portion of the Palisade (5,500 acres outside of the Palisade WSA); ○ Dolores River Riparian; ○ Juanita Arch; ○ Rough Canyon; and ○ Unaweep Seep. • Lands managed for wilderness characteristics • SRMAs: ○ Bangs (exemption for recreation facilities); and ○ Dolores River Canyon (non-WSA portion and exemption for recreation and maintenance	Action: Manage 556,600 acres of BLM lands according to VRM Class II objectives, including the following areas: • ACECs: ○ Same as Alternative B, plus the following: ▪ Atwell Gulch; ▪ Badger Wash; ▪ Colorado River Riparian; ▪ Glade Park-Pinyon Mesa; ▪ Gunnison River Riparian; ▪ Indian Creek; ▪ John Brown Canyon; ▪ Nine-mile Hill Boulders; ▪ Plateau Creek; ▪ Prairie Canyon; ▪ Pyramid Rock; ▪ Roan and Carr Creeks; ▪ Sinbad Valley; and ▪ South Shale Ridge.	Action: Manage 194,800 acres of BLM lands according to VRM Class II objectives, including the following areas: • ACECs: ○ A portion of the Palisade (1,900 acres outside of the Palisade WSA); ○ Rough Canyon; and ○ Unaweep Seep • SRMAs: ○ Bangs (exemption for recreation facilities) • Byways: ○ Lands End Backcountry Byway; ○ John Brown Canyon Backcountry Byway; ○ Niche to Blue Mesa – Uranium Trail Backcountry Byway; and • Other VRM Class II areas:

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	facilities). • Byways: ○ A portion of Dinosaur Diamond Prehistoric Highway (from the Bookcliffs north); ○ Grand Mesa Scenic and Historic Byway; and ○ Unaweep-Tabeguache Scenic and Historic Byway. • Other VRM Class II areas: ○ Same as Alternative A, plus the following: ▪ Colorado River corridor. Exception: Utility projects within delineated ROW corridors, facilities necessary for development of federally leased coal, and temporary actions associated with coal exploration within VRM Class II areas would be required to meet VRM Class III objectives.	• Wild and Scenic River segments that are found to be suitable which have been classified as scenic: ○ Blue Creek; ○ Carr Creek; ○ North Fork Mesa Creek; ○ Roan Creek; ○ Rough Canyon Creek; and ○ Ute Creek • Wild and Scenic River segments that are found to be suitable which have been classified as recreational: ○ Colorado River Segment 1; ○ Colorado River Segment 2; ○ Dolores River; ○ East Creek; ○ Gunnison River Segment 2; and ○ West Creek • Lands managed for wilderness characteristics • SRMAs: ○ Bangs (exemption for recreation facilities) ○ North Fruita Desert (RMZ 1) • Byways: ○ Dinosaur Diamond Prehistoric Highway; ○ Grand Mesa Scenic and Historic Byway; and ○ Unaweep-Tabeguache Scenic and Historic Byway Exception: Utility projects within	○ Same as Alternative A, plus the following: ▪ Mt. Garfield

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
		delineated ROW corridors, facilities necessary for development of federally leased coal, and temporary actions associated with coal exploration within VRM Class II areas would be required to meet VRM Class III objectives.	
Action: Manage 206,100 acres of BLM lands according to VRM Class III objectives, including the following areas: • Baxter/Douglas Pass roads; • Benches in the Bangs Canyon Intensive Recreation Management Area; • De Beque Canyon; • Face of the Book Cliffs west of Carpenter Trail; • Hunter/Garvey Canyon benches; • Slopes of the Grand Mesa south of Watson Draw; • Sinbad Valley bottom; and • Valley of Unaweep Canyon.	Action: Manage 458,600 acres of BLM lands according to VRM Class III objectives, including, but not limited to, the following areas: • Wildlife Emphasis Areas: ○ Timber Ridge • ACECs: ○ Atwell Gulch; ○ Indian Creek; ○ Pyramid Rock; ○ Roan and Carr Creeks; ○ Sinbad Valley; and ○ South Shale Ridge. • SRMAs: ○ North Fruita Desert • Byways: ○ A portion of Dinosaur Diamond Prehistoric Highway (from Ashford Canyon south). • Other VRM Class III areas: ○ West Salt Creek corridor; and ○ Coal Canyon corridor.	Action: Manage 215,000 acres of BLM lands according to VRM Class III objectives, including, but not limited to, the following areas: • ACECs: ○ Coon Creek; ○ Hawxhurst Creek; and ○ Reader Mesa. • SRMAs: ○ North Fruita Desert (RMZ 2). • National Historic and Scenic Trails: ○ Old Spanish National Historic Trail. • Other VRM Class III areas: ○ West Salt Creek corridor.	Action: Manage 530,100 acres of BLM lands according to VRM Class III objectives, including, but not limited to, the following areas: • SRMAs: ○ Castle Rock; ○ Gunnison River Bluffs; ○ North Fruita Desert (RMZ 1); and ○ Palisade Rims. • Byways: ○ Dinosaur Diamond Prehistoric Highway; ○ Grand Mesa Scenic and Historic Byway; ○ Unaweep-Tabeguache Scenic and Historic Byway; and ○ Winter Flats Road Backcountry Byway. • Other VRM Class III areas: ○ Roan and Carr Creek; ○ South Shale Ridge; and ○ Coal Canyon corridor.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: No similar action in current RMP. The remainder of the GJFO (696,100 acres) is undesignated.	Action: Manage 189,800 acres of BLM lands according to VRM Class IV objectives, including the following areas: • ACECs: ○ Badger Wash. • National Historic and Scenic Trails: ○ Old Spanish National Historic Trail. • All other areas not identified as VRM Class I, II, or III.	Action: Manage 189,700 acres of BLM lands according to VRM Class IV objectives, including the following areas: • All other areas not identified as VRM Class I, II, or III.	Action: Manage 240,000 acres of BLM lands according to VRM Class IV objectives, including the following areas: • ACECs: ○ Badger Wash; ○ Pyramid Rock; and ○ South Shale Ridge. • SRMAs: ○ Grand Valley; and ○ North Fruita Desert (RMZ 2). • National Historic and Scenic Trails: ○ Old Spanish National Historic Trail. • Coal Canyon corridor • All other areas not identified as VRM Class I, II, or III.
Objective: No similar objective in current RMP.	Objective: Protect the visual integrity of the landscape by managing all project proposals to meet or exceed objectives of the prescribed VRM classes by incorporating visual design BMPs (Appendix H).		
Action: No similar action in current RMP.	Action: Ecosystem restoration projects would ensure that visual impacts are minimized in the short term (5 years) and that VRM objectives in the project area are met in the long term (life of the project) when such projects are a) considered essential for public safety, achieving desired future conditions, or reducing hazardous fuels buildups; and b) expected to be visually prominent.		
Objective: No similar objective in current RMP.	Objective: Maintain dark night sky conditions that are affected primarily by natural light sources.		
Action: No similar action in current RMP.	Action: Prohibit permanent outdoor lighting in VRM Class I areas.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: No similar action in current RMP.	Action: Prohibit structural lighting in excess of the minimum safety requirements.		Action: No similar action.
Allowable Use: **STIPULATION** *NSO-1: No Surface Occupancy (Visual Resources)*. Prohibit occupancy and other activities in the following areas to protect visual resources (Refer to Appendix B.) See Figure 2-42 in Appendix A: • Juanita Arch; • The Goblins; • Dolores River corridor; • Gunnison River corridor; • The Book Cliffs; • Bangs Canyon; • Sinbad Cliffs; • Granite Creek Canyon/Cliffs; • Unaweep Canyon; • Hunter/Garvey Cliffs; and • Vega State Recreation Area.	Allowable Use: **STIPULATION** NSO-40: *VRM*. Prohibit surface occupancy and surface-disturbing activities within the following areas: (Refer to Appendix B.) See Figures 2-43 (Alternative B), 2-44 (Alternative C), and 2-45 (Alternative D) in Appendix A. • All VRM Class I areas; and • The Goblins.		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-30: *VRM Class II.* Apply CSU (site-specific relocation) restrictions to fluid mineral leasing and other surface-disturbing activities within all areas designated as VRM Class II. Require that surface-disturbing activities meet the objectives of VRM Class II. (Refer to Appendix B.) See Figures 2-47 (Alternative B), 2-48 (Alternative C), and 2-49 (Alternative D) in Appendix A.		
Allowable Use: **STIPULATION** *CSU-2 Scenic and Natural Landscape Values.* Apply special design and reclamation measures to protect the outstanding scenic and natural landscape value of the following areas. (Refer to	Allowable Use: No similar allowable use.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Appendix B.) See Figure 2-46 in Appendix A: • Bangs Benches (32,000 acres); • The Book Cliffs (31,100 acres); • Established BLM Recreation Sites (1,000 acres); • Grand Mesa Slopes (62,000 acres); • Granite Creek Benches (32,400 acres); • Gunnison River Corridor (1,200 acres); • Highway Corridors (69,400 acres); • Hunter/Garvey (24,700 acres); • Little Book Cliffs Wild Horse Area (33,000 acres); • Sinbad Valley (6,400 acres); • South Shale Ridge (24,400 acres); and • Unaweep Valley (2,000 acres).			
Wildland Fire Management			
GOAL: Providing for firefighter and public safety, manage fire to maximize ecological health benefits.			
Objective: Minimize cost and loss, complement resource management objectives, and sustain the productivity of the biological ecosystems through fire management.	Objective: Use a full range of wildfire management actions, from full suppression to resource benefits on unplanned ignitions.		
Action: Allow unplanned ignitions for resource benefit on 417,100 acres as	Action: Allow unplanned fire on 857,400 acres for resource benefit to manage diversity in desired plant communities in those areas identified in Figure 2-76 in Appendix		Action: Allow unplanned fire on 96,000 acres for resource benefit to

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
shown in Figure 2-75 in Appendix A	A.		manage diversity in desired plant communities in those areas identified Figure 2-77 in Appendix A.
Objective: No similar objective in current RMP.	Objective: Work to restore Fire Regime Condition Classes 2 and 3 towards Class 1, and maintain areas of Fire Regime Condition Class 1.		
Action: No similar action in current RMP.	Action: Implement fuels treatments actions that may include, but are not limited to: • Mechanical treatments, including mowing, weed-whacking, chopping (roller chopper), chipping, grinding (hydro-ax), chaining, tilling, and cutting. • Manual treatments, including hand cutting (chainsaw/handsaw) and hand-piling. • Prescribed fire, including pile and broadcast burning. • Chemical spraying or biological treatments, such as insects or goats. • Seeding, including aerial or ground application.		
Objective: Minimize cost and loss, complement resource management objectives, and sustain the productivity of the biological ecosystems through fire management.	Objective: Integrate fire and fuels management to meet Land Health Standards, WUI, and natural and cultural resource objectives across all levels of government and jurisdictional boundaries.		
Action: Prescribed Fire: Intentionally ignite fires in order to meet land and resource management objectives.	Action: Use a combination of planned and unplanned fire along with fuels treatments including mechanical, manual, chemical, and seeding to meet resource objectives. The priority would be using any of the above treatments based on strategic goals for site-specific projects.	Action: Use a combination of planned and unplanned fire along with fuels treatments including mechanical, manual, chemical, and seeding to meet resource objectives. The priority would be using planned and unplanned fire treatments.	Action: Use a combination of planned and unplanned fire along with fuels treatments including mechanical, manual, chemical, and seeding to meet resource objectives. The priority would be using manual and mechanical treatments.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: No similar action in current RMP.	Action: Prioritize vegetation treatments that are designed to strategically reduce wildfire threat in areas of high fire risk rather than where the probability of fire is low and the potential for natural post-fire recovery is high.		
Objective: No similar objective in current RMP.	Objective: Implement the Programmatic ES&R Plan (PESRP) to meet emergency stabilization and rehabilitation (ESR) needs to comply with current ESR policy and guidance. The PESRP is a programmatic implementation plan authorizing treatment options specific to vegetative communities and is dependent upon post-wildland fire conditions and other site-specific considerations.		
Action: No similar action in current RMP.	Action: Design ESR treatment actions based on the severity of the wildfire impacts. ESR priorities include, but are not limited to, areas where: • Life, safety, or property requires protection. • Unique or sensitive cultural resources are at risk. • Soils are highly susceptible to accelerated erosion or water quality protection is required. • Perennial grasses and forbs are not expected to provide soil and watershed protection within two years. • Unacceptable vegetation, such as noxious weeds, may invade and become established. • It is necessary to quickly restore threatened, endangered, or special species habitat populations to prevent adverse impacts. • Stabilization and rehabilitation are necessary to meet RMP resource objectives.		
Objectives: No similar objective in current RMP.	Objective: In partnership with local, state, and federal partners, conduct fire mitigation and fire-prevention activities to reduce human-caused wildfire ignition and improve public safety.		
Action: No similar action in current RMP.	Action: Use signage, mass media, personal contacts, assistance with Community Wildfire Protection Plans, and other associated activities to reduce human ignition and other threats from wildfire.		
Lands with Wilderness Characteristics Outside Existing WSAs			
GOAL: No similar goal in current RMP.	**GOAL**: Provide appropriate levels of protection to preserve inventoried wilderness characteristics of areas determined to possess wilderness characteristics (e.g., appearance of naturalness, outstanding opportunities for primitive and unconfined recreation or solitude) outside of existing WSAs, while considering competing resource demands and manageability.		**GOAL**: No similar goal.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Objective: No similar objective in current RMP.	Objective: Protect wilderness characteristics in identified areas.		Objective: No similar objective.
Action: No similar action in current RMP.	Action: Manage 24,400 acres to protect wilderness characteristics in the following areas: • Maverick (17,800 acres); • Unaweep (6,700 acres); and • West Creek (adjacent) (20 acres). Refer to Appendix F for the draft wilderness characteristics assessment. See Figure 2-9 in Appendix A.	Action: Manage 171,200 acres to protect wilderness characteristics in the following areas: • Bangs Canyon (20,400 acres); • East Demaree Canyon (4,800 acres); • East Salt Creek (17,000 acres) • Hunter Canyon (32,200 acres); • Kings Canyon (9,600 acres); • Lumsden Canyon (10,100 acres); • Maverick (20,400 acres); • South Shale Ridge (27,500 acres); • Spink Canyon (13,100 acres); • Spring Canyon (8,800 acres); • Unaweep (7,200 acres); and • West Creek (adjacent) (100 acres). Refer to Appendix F for the draft wilderness characteristics assessment. See Figure 2-10 in Appendix A.	Action: No similar action.
Action: No similar action in current RMP.	Action: Protect wilderness characteristics in identified areas by applying the following management: • Issue no SRPs for competitive events. • Close to motorized travel, including over-snow travel. • Close to mechanized travel (exception for the Pickett Trail in	Action: Protect wilderness characteristics in identified areas by applying the following management: • Same as Alternative B, except that all areas would be closed to mechanized travel, including the Pickett Trail in the Maverick unit.	Action: No similar action.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	the Maverick unit). • Close to wood product sales and/or harvest, including Christmas tree cutting. • Manage as a ROW exclusion area. • Close to mineral material disposal. • Close to non-energy leasable mineral exploration and/or development. • Manage as VRM Class II. • **No Leasing**: *Lands with wilderness characteristics outside WSAs*. Close to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-39, Appendix A. • Allowable Use: **STIPULATION** NSO-41: *Lands Managed for Wilderness Characteristics.* Prohibit surface occupancy and surface-disturbing activities on lands managed for wilderness characteristics outside of existing WSAs. (Refer to Appendix B.) See Figures 2-43 (Alternative B) and 2-44 (Alternative C) in Appendix A.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
RESOURCE USES			
Forestry			
GOAL: Provide for use of forest and woodland products.			
Objective: Manage the suitable pinyon-juniper woodlands and commercial forest land to maintain stand productivity and help meet fuelwood and sawtimber demands.	Objective: Use a variety of silvicultural techniques and harvest systems to manage for healthy forests and woodlands while offering a variety of forest products and meeting other resource objectives.		
Action: No similar action in current RMP.	Action: Identify the following areas as forestry zones for management purposes: • Bangs Canyon: 59,100 acres • Book Cliffs: 214,300 acres • Gateway: 194,300 acres • Glade Park: 67,100 acres • Grand Mesa Slopes: 60,700 acres • Grand Valley: 155,600 acres • Plateau Valley: 66,800 acres • Roan Creek: 243,300 acres		
Action: Make the following forest lands suitable for forest harvest: • Commercial forest land: 1,319 acres; and • Pinyon-juniper woodlands: 111,244 acres. Make 542,700 acres unsuitable for forest harvest, including the following forest lands (Figure 2-78 Appendix A):	Action: Allow harvest of forest and woodland products in portions of the following forestry zones that are determined suitable for harvest in activity-level plans or site-specific analyses: • Pinyon-juniper: ○ Glade Park; ○ Gateway; ○ Book Cliffs; ○ Plateau Valley; ○ Grand Mesa Slopes; and ○ Roan Creek. • Aspen: ○ Roan Creek;		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
• Commercial Forest Land: 37,800 acres; and • Pinyon-juniper woodlands: 504,900 acres.	○ Book Cliffs; ○ Plateau Valley; ○ Grand Mesa Slopes; and ○ Glade Park. • Spruce ○ Book Cliffs; ○ Plateau Valley; ○ Grand Mesa Slopes; and ○ Roan Creek. • Douglas fir ○ Book Cliffs; and ○ Roan Creek.		
Action: Commercial forest land unsuitable for management due to either sensitive or critical management areas include: • Municipal watersheds; • WSAs; • Recreation areas; • Wildlife areas; • Special status species habitat; and • Areas of high cultural sensitivity. Pinyon-juniper woodlands unsuitable for management include: • Poor stocking steep slopes; • Fragile soils; • Municipal watersheds; • WSAs; • Recreation areas; • Wildlife areas; • Special status species habitat; and • Areas of high cultural sensitivity.	Action: Close the following areas (approximately 231,200 acres) to wood product sales and/or harvest (not including Christmas tree harvest). (Figure 2-79, Appendix A). Additional areas may be found as unsuitable for harvest in the site specific forest/woodland management plans: • The Palisade municipal watershed; • Known lynx habitat; • VRM Class I areas; • WSAs; • Lands managed for wilderness characteristics; and • ACECs. Exception: Allow wood product sales and/or harvest to meet desired resource conditions.	Action: Close the following areas (approximately 435,300 acres) to wood product sales and/or harvest (not including Christmas tree harvest). (Figure 2-80, Appendix A). Additional areas may be found as unsuitable for harvest in the site specific forest/woodland management plans: • The Palisade municipal watershed; • Known lynx habitat; • VRM Class I areas; • SRMAs; • WSAs; • Lands managed for wilderness characteristics; and • ACECs. Exception: Allow wood product sales and/or harvest to meet desired resource conditions.	Action: Close the following areas (approximately 108,600 acres) to wood product sales and/or harvest (not including Christmas tree harvest). (Figure 2-81, Appendix A). Additional areas may be found as unsuitable for harvest in the site specific forest/woodland management plans: • The Palisade municipal watershed; • Gunnison River Bluffs SRMA; • WSAs; and • ACECs. Exception: Allow wood product sales and/or harvest to meet desired resource conditions.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

<table>
<tr><th>Alterative A (No Action)</th><th>Alternative B (Preferred)</th><th>Alternative C</th><th>Alternative D</th></tr>
<tr><td>Action:
No similar action in current RMP.</td><td>Action:
Allow Christmas tree cutting based off of yearly delineated tree cutting areas.

Close the following areas to Christmas tree cutting:
• Areas identified as over harvested;
• ACECs;
• Douglas Pass;
• Lands managed for wilderness characteristics; and
• WSAs.</td><td>Action:
Allow Christmas tree cutting based off of yearly delineated tree cutting areas.

Close the following areas to Christmas tree cutting:
• Areas identified as over harvested;
• ACECs;
• Douglas Pass;
• Lands managed for wilderness characteristics; and
• WSAs.</td><td>Action:
Allow Christmas tree cutting based off of yearly delineated tree cutting areas.

Close the following areas to Christmas tree cutting:
• Areas identified as over harvested;
• ACECs;
• Douglas Pass; and
• WSAs.</td></tr>
<tr><td>Action:
No similar action in current RMP.</td><td colspan="2">Action:
Prohibit commercial and private harvesting of tamarisk, Russian olive, and other invasive woody species.</td><td>Action:
Where conditions are appropriate, allow removal of tamarisk and Russian olive material for biomass or personal use.</td></tr>
<tr><td colspan="4">Action:
In the LBCWHR, limit fuelwood sales to 30 acres or less and to commercial operators only. Design fuelwood sales to meet management objectives for wild horses.</td></tr>
<tr><td>Action:
Prohibit slash to be burned in the pinyon-juniper and aspen types.</td><td colspan="3">Action:
No similar action.</td></tr>
<tr><td>Action:
Discourage clear cuts in small, isolated tall conifer stands and/or mature pinyon-juniper woodlands under 160 acres.</td><td colspan="3">Action:
Discourage clear cuts in small, isolated, and tall conifer stands and/or mature pinyon-juniper woodlands under 160 acres, unless such practices meet other resource objectives.</td></tr>
</table>

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Allowable Use: Reserve from cutting the cavity-rich portions of aspen stands.	Action: Allow treatments of aspen stands to stimulate regeneration through either mechanical or fuels projects. Allow fuelwood cutting of dead and down aspen only in areas identified for allowable harvest.		
Action: No similar action in current RMP.	Action: Based upon tribal and public demand, allow collection of unconventional forest products. Limit permitted use of vegetal collection of commonly available renewable resources (e.g., seeds, cones, wildlings, berries, mushrooms, nuts) for non-commercial use to the following amounts consistent with other resource goals/objectives: • Boughs, All Coniferous Species: 50 pounds per person per year • Cones – Ornamental: two bushels per person per year (one bushel is equal to 9 gallons or 35 liters) • Cones – Nuts: one bushel per person per year • Medicinal: one bushel per person per year (collection prohibited within WSAs and ACECs) • Mushrooms: five gallons per species per person per year • Wildings: 15 meters (50 feet) per species per person per year (collection prohibited within WSAs and ACECs) • Traditional, religious, or ceremonial plants that are not widely available may be harvested for personal use by Native American tribal members and would not be offered as wilding plants for the general public		
Livestock Grazing			
GOAL: Provide adequate forage for livestock while attaining healthy rangelands, in accordance with land health standards and in balance with other resources and uses, to contribute to local economies, ranching livelihoods, and the rural western character integral to many communities.			
Objective: Manage livestock grazing as described in the Grand Junction Grazing Management EIS (1979), as modified by the RMP using the new priorities (Table 13 of 1987 RMP) (BLM 1987), general management categories, and the BLM Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado (BLM 1997a) (Appendix E).	Objective: Meet the forage demands of livestock operations based on current active preference (animal unit-months [AUMs]) while meeting the BLM Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado (BLM 1997a) (Appendix E).	Objective: Meet the forage demands of livestock operations based on current active preference (AUMs), with an emphasis on other resources for forage demand (e.g., wildlife), while meeting the BLM Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado (BLM 1997a) (Appendix E).	Objective: Same as Alternative B.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: Manage livestock grazing in accordance with the BLM Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado (BLM 1997a) (Appendix E).			
Action: Adjust carrying capacities based on ecological site inventories and other monitoring data.	Action: Periodically evaluate current active preference and adjust as needed based on land health assessments, vegetative inventories, riparian monitoring, rangeland monitoring data, or other pertinent information. Allocate increases in forage availability to meet the greatest need (e.g., livestock, wildlife, watershed health).	Action: Periodically evaluate current active preference and adjust as needed based on land health assessments, vegetative inventories, riparian monitoring, rangeland monitoring data, or other pertinent information. Allocate increases in forage availability to wildlife species.	Action: Periodically evaluate current active preference and adjust as needed based on land health assessments, vegetative inventories, rangeland monitoring data, or other pertinent information. Allocate increases in forage availability to livestock.
Action: Make 978,600 acres available for livestock grazing. Provide 61,270 AUMs of livestock forage commensurate with public land health standards (BLM 1997a) (Appendix J). (Figure 2-11, Appendix A.)	Action: Make 961,100 acres available for livestock grazing. Provide up to 60,633 AUMs of livestock forage commensurate with public land health standards (BLM 1997a) (Appendix J). (Figure 2-12, Appendix A.)	Action: Make 586,600 acres available for livestock grazing. Provide up to 32,658 AUMs of livestock forage commensurate with public land health standards (BLM 1997a) (Appendix J). (Figure 2-13, Appendix A.)	Action: Make 977,200 acres available for livestock grazing. Provide up to 61,270 AUMs of livestock forage commensurate with public land health standards (BLM 1997a) (Appendix J). (Figure 2-14, Appendix A.)
Action: Make 48,600 acres of allotments, portions of allotments, and areas unavailable for livestock grazing. Refer to Appendix J, Livestock Grazing Allotments and Allotment Levels.	**Action:** Make 66,000 acres unavailable for livestock grazing, which includes allotments, portions of allotments, and unalloted land. The purpose includes steep slopes, conflict with BLM recreation sites, or avoidance of sensitive resources such as those described in the *Areas of Critical Environmental Concern* section. Refer	**Action:** Make 440,400 acres unavailable for livestock grazing, which includes allotments, portions of allotments, and unalloted land. The purpose includes suitability of grazing and private land conflict. Refer to Appendix J, Livestock Grazing Allotments.	**Action:** Make 49,900 acres unavailable for livestock grazing, which includes allotments, portions of allotments, and unalloted land. The purpose includes steep slopes, conflict with BLM recreation sites, or avoidance of sensitive resources such as those described in the *Areas of Critical Environmental Concern* section. Refer

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	to Appendix J, Livestock Grazing Allotments.		to Appendix J, Livestock Grazing Allotments.
Action: Close the following allotments to livestock use (see Appendix J): • LBCWHR; and • Sewemup Mesa.	Action: Close the following allotments to livestock use (see Appendix J): • Same as Alternative A plus the following: ○ Baldridge Mesa; ○ Bevan; ○ Boulder Canyon; ○ Browns Place; ○ Brush Creek; ○ Clifton; ○ Clover Gulch; ○ Coon Creek; ○ Dead Horse; ○ Dry Kimball; ○ Eby Point; ○ Erven; ○ Etcheverry; ○ Heely; ○ Hight; ○ Horizon; ○ Hunter; ○ Logan Wash; ○ Parkes Place; ○ Plateau Creek; ○ Red Mountain; ○ Webber; ○ Webb Isolated Tracts; and ○ Whitewater Hill.	Action: Close the following allotments to livestock use (see Appendix J): • Same as Alternative B, plus the following: ○ 4A Ind; ○ Ames; ○ Badger Wash; ○ Baker Canyon; ○ Berthoud Place; ○ B Hawkins; ○ Charlesworth; ○ Conn Mountain Common; ○ Davis Amp; ○ East of Collbran; ○ EHL; ○ Fetters; ○ Guthrie Place; ○ Hamilton; ○ Highway 50; ○ J.L.; ○ Kannah Creek Individual; ○ Lloyd; ○ Lorimor; ○ Lower Rapid-Cottonwood; ○ Mogensen ○ Molina Place; ○ Robbins; ○ Tom Casto; ○ West Creek; and ○ West Logan Wash.	Action: Same as Alternative A.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: No similar action in current RMP.	Action: In open allotments, close the following areas to livestock use: • Ant Research Area; • Badger Wash paired plots; • Miracle Rock picnic area; • Mud Springs picnic area; • North Fruita Desert campground; • Pyramid Rock ACEC; • Study area exclosures; and • West Creek picnic area.	Action: In open allotments, close the following areas to livestock use: • Same as Alternative B, plus: ○ East Creek day use area; ○ Grand Junction Municipal Watershed; ○ Occupied sage-grouse habitat; and ○ Palisade municipal watershed.	Action: Same as Alternative B.
Action: No similar action in current RMP.	Action: Periodically evaluate whether to close other allotments or portions of allotments to livestock grazing, and implement with project level analysis, based on the following criteria: • Areas identified as BLM disposal tracts; • Lack of administrative access to public land; • Small percentage of forage in allotment is contributed by BLM lands in allotment (less than 15 percent); • Areas not accessible to livestock grazing (e.g., steep slopes); • "C" category allotments that are relinquished and determined to be impractical for the administration of livestock grazing	Action: Periodically evaluate whether to close other allotments or portions of allotments to livestock grazing, and implement with project level analysis, based on the following criteria: • Same as Alternative B, plus: ○ ACECs; and ○ All "C" category allotments.	Action: No similar action.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	by the Authorized Officer; • Major impact to wildlife or threatened and endangered species (e.g., competition for forage, winter range, sage-grouse habitat), or sensitive fish habitat, as determined by data analysis; • Public health and safety; • High intensity recreation areas/ facilities; • Resource objectives for municipal watersheds; • Impacts to cultural resources; and • Conflicts with adjoining private lands (development).		
Action: Work cooperatively with permittees, lessees, and other landowners to develop grazing management strategies that integrate both public and private lands into single management units.			
Action: No similar action in current RMP.	Action: Identify appropriate utilization levels based on allotment or site-specific management practices, such as season-of-use, grazing intensity and duration, and utilization patterns, as well as vegetative conditions, riparian conditions, the presence or absence of range improvements, and resource issues or concerns. Use utilization levels and distribution of use as an indicator to evaluate if current grazing use is within the capacity of the land and appropriate to meet resource objectives for the area.		
Action: Revise or implement allotment management plans/grazing use agreements to resolve conflicts between grazing and management of soils, riparian, and water resources.	Action: Implement changes in livestock use through allotment management plans, grazing use agreements, and terms and conditions on grazing permits for priority allotments based on the current prioritization process and/or land health issues.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: No similar action in current RMP.	Action: Allow modification of allotment boundaries to correspond with fence lines and natural features, and allow consolidation of allotments and pastures into a new allotment.		
Action: Construct range improvement projects on priority allotments to implement changes in grazing management to improve vegetative conditions, riparian conditions, or reduce conflicts with other resources or public land users.			Action: Construct range-improvement projects on allotments to improve forage conditions for livestock use.
Action: Conduct vegetation manipulation projects when consistent with land health standards (BLM 1997a) to improve the quantity and quality of forage available for livestock and wildlife.	Action: Implement vegetation treatments, including mechanical, chemical, and fire, on priority allotments to improve rangeland health or reduce conflicts with other resources or public land users.	Action: Utilize fire (prescribed or wildland) to improve rangeland health.	Action: Conduct vegetation treatments, including mechanical, chemical, and fire, on allotments when consistent with land health standards to improve the quantity and quality of forage available for livestock.
Objective: No similar objective in current RMP.	Objective: Provide periodic rest during active growth periods of forage plants to maintain or improve plant vigor and health.		
Action: No similar action in current RMP.	Action: When deemed necessary by the BLM's Authorized Officer, defer or exclude livestock grazing for a minimum of two growing seasons on disturbed areas (e.g., a fire event, reclamation of disturbed lands, seedings, surface-disturbing vegetation treatments) or until site-specific analysis and/or monitoring data indicates that vegetative cover, species composition, and litter accumulation are adequate to support and protect watershed values, meet vegetation objectives, and sustain grazing use.		Action: Determine rest periods on a case-by-case basis to meet BLM Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado (BLM 1997a) (Appendix E).
Action: No similar action in current RMP.	Action: Include periodic rest during the active growing season as part of authorized grazing use on Improve (I) category allotments.	Action: Include periodic rest during active growing season as part of authorized grazing use on all Improve (I) and Maintain (M) allotments.	Action: Provide periodic rest during the active growing season on allotments on a case by case basis.
Action: No similar action in current RMP.	Action: In limited precipitation zones (below 6,000 feet) of the Grand	Action: Close allotments or portions of allotments that are in limited precipitation	Action: In limited precipitation zones (below 6,000 feet), determine

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	Valley and Kannah Creek management areas (176,800 acres), limit the grazing use period to October 1 to April 15, unless otherwise specified in an allotment management plan or grazing use agreement (Figure 2-12, Appendix A).	zones (below 6,000 feet) (344,300 acres) to mitigate land health, riparian, and rare plant issues (Figure 2-13, Appendix A).	grazing on a case by case basis.
Action: No similar action in current RMP.	Action: Authorize new water developments for diversions from spring or seep source only when priority sage-grouse habitat would benefit on both upland and riparian habitat from the development or there are no negative impacts to sage grouse. This includes developing new water sources for livestock as part of an AMP/conservation plan to improve sage-grouse habitat.		Action: No similar action.
Action: No similar action in current RMP.	Action: Design any new structural range improvements to conserve, enhance, or restore sage-grouse habitat through an improved grazing management system relative to sage-grouse objectives. Structural range improvements, in this context, include but are not limited to: cattleguards, fences, enclosures, corrals or other livestock handling structures; pipelines, troughs, storage tanks (including moveable tanks used in livestock water hauling), windmills, ponds/reservoirs, solar panels and spring developments.		Action: No similar action.
Action: No similar action in current RMP.	Action: To reduce sage-grouse strikes and mortality, remove, modify, or mark fences in high risk areas. When fences are necessary, require a sage-grouse-safe design.		Action: No similar action.
Action: No similar action in current RMP.	Action: Locate supplements (salt or protein blocks) in a manner designed to conserve, enhance, or restore sage-grouse habitat.		Action: No similar action.
Action: No similar action in current RMP.	Action: Offer temporary use on a case-by-case basis in allotments where grazing preference has been relinquished, or non-use warrants to rest other allotments that include important sage-grouse habitat.		Action: No similar action.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

<table>
<tr><th>Alterative A (No Action)</th><th>Alternative B (Preferred)</th><th>Alternative C</th><th>Alternative D</th></tr>
<tr><td colspan="4">Action:
When conducting NEPA analysis for water developments or other rangeland improvements, address the direct and indirect effects to sage-grouse populations and habitat.</td></tr>
<tr><td>Action:
No similar action in current RMP.</td><td colspan="3">Action:
Pursue the opportunity to establish grass banks from unallotted grazing allotments to provide management options on other allotments (e.g. fire, drought, vegetation treatments, and allotments not meeting land health).</td></tr>
<tr><td>Objective:
No similar objective in current RMP.</td><td colspan="3">Objective:
Manage allotments to protect bighorn sheep.</td></tr>
<tr><td>Action:
Allow domestic sheep grazing in allotments on case-by-case basis.</td><td colspan="2">Action:
Prohibit domestic sheep grazing on allotments within occupied bighorn sheep habitat.</td><td>Action:
Avoid domestic sheep grazing on allotments within occupied bighorn sheep habitat.</td></tr>
<tr><td>Action:
No similar action in current RMP.</td><td>Action:
Permit domestic sheep grazing on allotments outside of occupied bighorn sheep habitat on a case-by-case basis using the following criteria:
• Presence of topographic features (e.g., natural barriers for rivers) to separate domestic and bighorn sheep;
• Adequate buffer zones to separate domestic and bighorn sheep;
• Direction from current bighorn sheep management plans;
• The need to protect potential habitat;
• Local and national research results;
• Risk assessments from wildlife</td><td>Action:
Prohibit domestic sheep grazing within historic and potential bighorn sheep habitat.</td><td>Action:
Permit domestic sheep grazing on allotments outside of occupied bighorn sheep habitat.</td></tr>
</table>

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	agencies; • Timing of domestic sheep grazing; or • Monitoring results indicating conflicts.		
Recreation and Visitor Services			
GOAL: Produce a diversity of quality recreational opportunities that support outdoor-oriented lifestyles and add to participants' quality of life, enhance the quality of local communities, and foster protection of natural and cultural resources.			
Objective: To ensure the continued availability of outdoor recreation opportunities which the public seeks and which are not readily available from other public or private entities. To protect resources, meet legal requirements for visitor health and safety, and mitigate resource user conflicts.	Objectives: Resource-protection. Increase awareness, understanding, and a sense of stewardship in recreational activity participants so their conduct safeguards cultural and natural resources as defined by Colorado Standards for Public Land Health or area-specific (e.g., ACEC, Wild and Scenic Rivers) objectives. Visitor Health and Safety. Ensure that visitors are not exposed to unhealthy or unsafe human-created conditions (defined by a repeat incident in the same year, of the same type, in the same location, due to the same cause). Use/User Conflict. Achieve a minimum level of conflict between recreation participants to: 1) allow other resources/programs to achieve their RMP objectives; 2) curb illegal trespass and property damage; and 3) maintain a diversity of recreation activity participation. Community Growth Area. Increase collaboration with community partners to maintain appropriate activity-based recreation opportunities in community growth areas (BLM lands adjacent to, between, and surrounding communities; also referred to as wildland urban interface areas).		
Allowable Use: *Camping Limits.* Unless otherwise posted, implement a 14-day camping limit in areas open to camping and overnight use on BLM lands. A limit of less than 14 days or greater than 14 days may be applied in certain areas if applicable due to resource and social impacts.			
Allowable Use: No similar allowable use in current RMP.	Allowable Use: Allow undeveloped camping where not specifically restricted. Undeveloped camping may be closed seasonally or as impacts or environmental conditions warrant.		
Allowable Use: *Camping Closures:* Close the following BLM lands to camping and overnight use outside of designated campsites	Allowable Use: *Camping Closures:* Close the following BLM lands to camping and overnight use (11pm to 5am).	Allowable Use: *Camping Closures:* Close the following BLM lands to camping and overnight use (11pm to 5am).	Allowable Use: *Camping Closures*: Close the following BLM lands to camping and overnight use (11pm to 5am).

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
and developed campgrounds. • Unaweep Seep ACEC See Appendix K, Recreation and Visitor Services Management Framework, for a list of camping closures.	• 34 and C Road extensive recreation management area (ERMA); • Bangs SRMA (certain areas, see Appendix K, Recreation and Visitor Services Management Framework); • Castle Rock ERMA; • Palisade Rims ERMA; • Pyramid Rock ACEC; • Target shooting zones; • Unaweep Seep ACEC; and • Within 100 meters of the following historic sites: ○ Calamity Camp; and ○ New Verde. If BLM determines there is a public health and safety issue or resource concern with a cultural resource or historic structure, the site may be closed to camping and overnight use. See Appendix K, Recreation and Visitor Services Management Framework, for a list of camping closures.	• Bangs SRMA (certain areas, see Appendix K, Recreation and Visitor Services Management Framework); • Pyramid Rock ACEC; • Unaweep Seep ACEC; and • Within 100 meters of the following historic sites: ○ Calamity Camp; and ○ New Verde. If BLM determines there is a public health and safety issue or resource concern with a cultural resource or historic structure, the site may be closed to camping and overnight use. See Appendix K, Recreation and Visitor Services Management Framework, for a list of camping closures.	• Bangs SRMA (certain areas, see Appendix K, Recreation and Visitor Services Management Framework); • Pyramid Rock ACEC; • Target shooting zones; • Unaweep Seep ACEC; and • Within 100 meters of the following historic sites: ○ Calamity Camp; and ○ New Verde. If BLM determines there is a public health and safety issue or resource concern with a cultural resource or historic structure, the site may be closed to camping and overnight use. See Appendix K, Recreation and Visitor Services Management Framework, for a list of camping closures.
Action: Continue to manage the existing developed recreation sites: • Miracle Rock; and • Mud Spring.	Action: Manage developed recreation sites as necessary, under the authority of 43 CFR Part 8360, inclusive of published closures, restrictions, and supplemental rules developed for BLM-managed lands within the GJFO, to protect visitor health and safety, reduce visitor conflicts, and provide for the protection of government property and resources. Same as Alternative A.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Allowable Use: **STIPULATION** *NSO-1: No Surface Occupancy (Recreational Resources)*. Prohibit occupancy and other activities in the following areas (Refer to Appendix B.) See Figure 2-42 in Appendix A: • The Palisade ONA; • Established recreation sites; • Island Acres; • Vega State Recreation Area; • Highline Reservoir Recreation Area; • Rough Canyon ACEC; • Hunter/Garvey backcountry; • Granite Creek Canyons/Cliffs; • Bangs Canyon; • Dolores River; and • Gunnison River.	Allowable Use: No similar allowable use.		
Allowable Use: **STIPULATION** *CSU-2: Scenic and Natural Landscape Values (Recreation Resources).* Special design and reclamation measures may be required to protect the outstanding scenic and natural landscape value of the following areas. (Refer to Appendix B.) See Figure 2-46 in Appendix A. • Bangs Benches; • Granite Creek Benches;	Allowable Use: **STIPULATION** CSU-31: *Recreation.* Apply CSU (site-specific relocation) restrictions to surface occupancy and surface-disturbing activities to minimize conflicts with developed (and future) recreation sites and to mapped (and future) national/regional trails, local system trails that connect communities, and trailheads and interpretive sites with exceptional recreation values or significant public interest. (Refer to Appendix B.) See Figures 2-47 (Alternative B), 2-48 (Alternative C), and 2-49 (Alternative D) in Appendix A.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
• Hunter/Garvey Benches; and • Lower Gunnison River.			
Action: No similar action in current RMP.	Action: The public would be notified if areas are closed or restricted from recreational shooting where monitoring or related data suggest that recreational shooting is causing or would cause considerable adverse impacts to public safety, or other sensitive resources (e.g., areas adjacent to a new housing development). Hunting in accordance with state regulations would continue to be allowed.		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: The discharge of firearms for recreational target shooting is permitted on BLM lands, outside of areas with firearm use restrictions, provided that the firearm is discharged toward a proper backstop sufficient to stop the projectile's forward progress beyond the intended target. Targets shall be constructed of wood, cardboard and paper or similar non-breakable materials. All targets, clays and shells are considered litter after use and must be removed and properly discarded.		
Allowable Use: *Firearm Use:* Allow target shooting on 1,034,500 acres of BLM land.	Allowable Use: *Firearm Use:* Allow the discharge of firearms for recreational target shooting on 1,021,400 acres of BLM lands.	Allowable Use: *Firearm Use:* Allow the discharge of firearms for recreational target shooting on 1,007,800 acres of BLM lands.	Allowable Use: *Firearm Use:* Allow the discharge of firearms for recreational target shooting on 1,044,300 acres of BLM lands.
Allowable Use: *Firearm Use Restrictions:* Close 26,900 acres of BLM land in the following areas to target shooting (Figure 2-82, Appendix A): • A portion of the Bangs Canyon SRMA (6,600 acres in the Little Park Road corridor); • The North Fruita Desert Bicycle Emphasis Area (5,300 acres); • Three OHV open areas in the Grand Valley (12,000 acres); and • The Mt. Garfield area (3,000 acres).	Allowable Use: *Firearm Use Restrictions:* Prohibit the discharge of firearms for recreational target shooting on 40,000 acres of BLM lands (Figure 2-83, Appendix A). The purpose of the restriction is to protect visitor safety by minimizing potential for accidental shootings and/or to protect sensitive resources (43 CFR 8364.1). • Bangs SRMA (17,200 acres); • Coal Canyon and Main Canyon areas (4,000 acres); • Developed recreation sites;	Allowable Use: *Firearm Use Restrictions:* Prohibit the discharge of firearms for recreational target shooting on 53,600 acres of BLM lands (Figure 2-84, Appendix A). The purpose of the restriction is to protect visitor safety by minimizing potential for accidental shootings and/or to protect sensitive resources (43 CFR 8364.1). • Bangs SRMA (17,200 acres); • Coal Canyon and Main Canyon areas (4,000 acres); • Developed recreation sites; • Gunnison River Bluffs (800 acres); • Lands identified at 34 and C Road (600	Allowable Use: *Firearm Use Restrictions:* Prohibit the discharge of firearms for recreational target shooting on 17,100 acres of BLM lands (Figure 2-85, Appendix A). The purpose of the restriction is to protect visitor safety by minimizing potential for accidental shootings and/or to protect sensitive resources (43 CFR 8364.1). • A portion of the Bangs SRMA (6,600 acres in the Little Park Road corridor); • A portion of the Grand Valley

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	• Grand Valley ERMA (4,900 acres); • Gunnison River Bluffs (800 acres); • Lands identified at 34 and C Road (600 acres); • Mt. Garfield ACEC (3,500 acres); • Portions of the North Fruita Desert SRMA ○ Open area (170 acres) ○ No Shooting Area (7,500 acres); and • Pyramid Rock ACEC (1,300 acres). Continue to allow hunting in accordance with CPW regulations.	acres); • Mt. Garfield ACEC (5,700 acres); • North Fruita Desert SRMA (RMZ 1; 23,800 acres)); • Plateau Creek ACEC (200 acres); and • Pyramid Rock ACEC (1,300 acres). Continue to allow hunting in accordance with CPW regulations.	SRMA (5,000 acres); and • Portions of the North Fruita Desert SRMA ○ Open area (170 acres) ○ No Shooting Area (5,300 acres) Continue to allow hunting in accordance with CPW regulations.
Action: No similar action in current RMP.	Action: Issue Special Recreation Permits (SRPs) as a discretionary action as a means to: help meet management objectives, provide opportunities for economic activity, facilitate recreational use of the public lands, control visitor use, protect recreational and natural resources, and provide for the health and safety of visitors. Cost recovery procedures for issuing SRPs would be applied where appropriate. All new SRP proposals would be reviewed using the Special Recreation Permit Evaluation as outlined in Appendix L, Special Recreation Permits.		
Action: No similar action in current RMP.	Action: All SRPs would contain standard stipulations appropriate for the type of activity and may include additional stipulations necessary to protect lands or resources, reduce user conflicts, or minimize health and safety concerns.		
Action: No similar action in current RMP.	Action: *Fees.* As provided by the guidelines in the Federal Lands Recreation Enhancement Act (Public Law 108-447), or other comparable federal legislation regarding recreation fees, implement recreation fees as appropriate to maintain visitor services and facilities through management of sites or areas as a US Fee Area.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: Allow motorized/mechanized big game retrieval for up to 200 meters off designated routes.	Action: Prohibit cross-country motorized/mechanized travel for big game retrieval. Hand-held wheeled game retrieval carts are allowed.		
Extensive Recreation Management Areas			
Objective: No similar objective in current RMP.	Objective: Recognize and manage individual ERMAs to provide for targeted recreation opportunities.		
Action: Identify those BLM lands not included in SRMAs, Special Management Areas (SMA), or IRMAs (below) as part of the Grand Junction ERMA (703,100 acres) (Figure 2-15, Appendix A). See Appendix K, Recreation and Visitor Services Management Framework, for details on recreation management in ERMAs.	Action: No similar action.		
Action: No similar current action in current RMP.	Action: Identify the following areas as separate ERMAs to specifically address local recreation issues (totaling 176,000 acres) (Figure 2-16, Appendix A): • 34 and C Road Open Area (500 acres); • Barrel Springs (10,300 acres); • Castle Rock (4,400 acres); • Dolores River Canyon (151,200 acres); • Grand Valley (5,600 acres); • Gunnison River Bluffs (800 acres); and	Action: No similar action.	Action: Identify the following areas as separate ERMAs to specifically address local recreation issues (totaling 61,900 acres) (Figure 2-17, Appendix A): • 34 and C Road Open Area (500 acres); • Barrel Springs (10,300 acres); • Dolores River Canyon (16,800 acres) • Grand Valley Ranges (800 acres); • South Shale Ridge (21,600 acres); • Timber Ridge (11,900 acres).

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	• Palisade Rims (2,700 acres). See Appendix K, Recreation and Visitor Services Management Framework, for details on recreation management in ERMAs.		See Appendix K, Recreation and Visitor Services Management Framework, for details on recreation management in ERMAs.
Action: No similar current action in current RMP.	Action: Apply the following administrative, management, information, and monitoring support actions to all ERMAs: • *Management.* Develop new recreation facilities (e.g., trails, trailheads, restrooms) to effectively address recreation activity demand created by growing communities and recreation-tourism if: 1) the proposal is consistent with interdisciplinary land use plan objectives; and 2) sufficient funding and long-term management commitments are secured from managing partners, visitor fees, or other sources. • *Funding.* Prioritize BLM funding and staff toward effectively addressing visitor health and safety and use/user conflict and resource protection issues created by recreation activities. • *Visitor Services.* Provide visitor services (e.g., visitor	Action: No similar action.	Action: Same as Alternative B.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	information/maps, directional signage, facilities, on-the-ground staff presence) at the level to maintain activity participation and achieve ERMA objectives. • *Access.* Maintain recreation access to and through BLM lands by creating route connectivity and by creating loop trails. Maintain and develop appropriate parking and trailhead facilities to facilitate recreation. • *Partnerships.* Develop partnerships to maintain recreation activity opportunities (e.g., partner with the business community to encourage collaborative efforts on BLM lands). • *Information/Education.* Develop information boards, web-based materials, brochures, etc. that explains conditions of use for recreation participants and encourage stewardship. • *Information.* Partner with local chambers of commerce, tourism boards and private service providers to communicate definitive recreation information (e.g., accurate recreation information, user ethics, distinctiveness of the area and		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	use/user expectations). • *Monitoring.* Monitor visitor use, visitor safety, and resource conditions through BLM staff, volunteers and recreation-tourism partnerships (e.g., towns, outfitters, recreation organizations, CPW). Monitoring methods would include direct visitor contact, electronic traffic counters, visitor surveys, and physical resource condition measurements.		
Special Recreation Management Areas			
Objective: No similar objective in current RMP.	Objective: Recognize and manage individual SRMAs to provide for targeted recreation opportunities and associated benefits.		
Action: Administratively recognize one SRMA for the protection of the recreation outcomes and setting prescriptions (Figure 2-18, Appendix A): • Bangs Canyon (54,700 acres). Administratively recognize one SMA for the protection of the recreation outcomes and setting prescriptions (Figure 2-18, Appendix A): • North Fruita Desert SMA (63,300 acres). Manage the Gateway area as an Intensive Recreation Management Area (IRMA) to protect high value	Action: Administratively recognize three SRMAs for the protection of the recreation outcomes and setting prescriptions (78,300 acres) (Figure 2-19, Appendix A): • Bangs (17,300 acres); • Dolores River Canyon (16,900 acres); and • North Fruita Desert (44,100 acres). See Appendix K, Recreation and Visitor Services Management Framework, for details on recreation management in SRMAs.	Action: Administratively recognize two SRMAs for the protection of the recreation outcomes and setting prescriptions (60,000 acres) (Figure 2-20, Appendix A): • Bangs (17,300 acres); and • North Fruita Desert (42,700 acres). See Appendix K, Recreation and Visitor Services Management Framework, for details on recreation management in SRMAs.	Action: Administratively recognize six SRMAs for the protection of the recreation outcomes and setting prescriptions (79,000 acres) (Figure 2-21, Appendix A): • Bangs (17,300 acres); • Castle Rock (4,400 acres); • Grand Valley (9,700 acres); • Gunnison River Bluffs (800 acres). • North Fruita Desert (44,100 acres); and • Palisade Rims (2,700 acres). See Appendix K, Recreation and Visitor Services Management

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
recreation sites (120,700 acres). (Figure 2-18, Appendix A) Manage the Grand Valley area as an IRMA to protect sensitive areas in the Grand Valley (119,600 acres). Emphasize supervision of public use. (Figure 2-18, Appendix A)			Framework, for details on recreation management in SRMAs.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **No Leasing**: *Special Recreation Management Areas.* Close the following SRMAs to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-39, Appendix A: • Bangs; and • Dolores River Canyon.	Allowable Use: **No Leasing**: *Special Recreation Management Areas.* Close the following SRMAs to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-40, Appendix A: • Bangs; and • North Fruita Desert: RMZ 1.	Allowable Use: No similar allowable use.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-42: *Special Recreation Management Areas.* Prohibit surface occupancy and surface-disturbing activities in the following SRMAs for the protection of the recreation activities, outcomes, and setting characteristics: • Bangs; and • Dolores River Canyon. (Refer to Appendix B.) See Figure 2-43 in Appendix A.	Allowable Use: **STIPULATION** NSO-42: *Special Recreation Management Areas.* Prohibit surface occupancy and surface-disturbing activities in the following SRMAs for the protection of the recreation activities, outcomes, and setting characteristics: • Bangs. (Refer to Appendix B.) See Figure 2-44 in Appendix A.	Allowable Use: **STIPULATION** NSO-42: *Special Recreation Management Areas.* Prohibit surface occupancy and surface-disturbing activities in the following SRMAs for the protection of the recreation activities, outcomes, and setting characteristics: • Bangs; • Gunnison River Bluffs; and • Palisade Rims. (Refer to Appendix B.) See Figure 2-45 in Appendix A.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-32: *Special Recreation Management Areas.* Apply CSU (site-specific relocation) restrictions in the following SRMA: • North Fruita Desert: RMZs 1 and 2. (Refer to Appendix B.) See Figure 2-47 in Appendix A.	Allowable Use: **STIPULATION** CSU-32: *Special Recreation Management Areas.* Apply CSU (site-specific relocation) restrictions in the following SRMA: • North Fruita Desert: RMZs 1 and 2. (Refer to Appendix B.) See Figure 2-48 in Appendix A.	Allowable Use: **STIPULATION** CSU-32: *Special Recreation Management Areas.* Apply CSU (site-specific relocation) restrictions in the following SRMAs: • Castle Rock; • Grand Valley; and • North Fruita Desert: RMZs 1 and 2. (Refer to Appendix B.) See Figure 2-49 in Appendix A.
Comprehensive Travel and Transportation Management			
GOAL: Manage the travel system to support the BLM mission, achieve resource management goals and objectives, and provide for appropriate public and administrative access.			
Objective: Designate all public land for off-road vehicle use and use restrictions by September 30, 1987.	Objective: Maintain a comprehensive travel network that best meets the full range of public, resource management, and administrative access needs.		
Action: Assign off-road vehicle designations to all public land as follows (Figure 2-22, Appendix A): • Open (Intensive): 12,500 acres • Open to cross-country travel: 445,400 acres • Closed: 35,300 acres • Limited to designated roads: 225,500 acres (includes 5,500 acres with seasonal limitations) • Limited to existing roads and trails: 342,700 acres (includes 108,000 acres with seasonal limitations)	Action: Designate motorized travel in the GJFO as follows (Figure 2-23, Appendix A): • Open: 5,400 acres • Closed: 187,900 acres • Limited to designated routes: 868,100 acres (includes 69,800 acres with seasonal limitations)	Action: Designate motorized travel in the GJFO as follows (Figure 2-24, Appendix A): • Open: 0 acres • Closed: 379,500 acres • Limited to designated routes: 681,900 acres (includes 50,100 acres with seasonal limitations)	Action: Designate motorized travel in the GJFO as follows (Figure 2-25, Appendix A): • Open: 10,200 acres • Closed: 111,200 acres • Limited to designated routes: 939,900 acres (includes 54,700 acres with seasonal limitations)

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: Manage 12,500 acres as *open*. • 25 Road (300 acres); • Grand Valley (11,400 acres); • North Fruita Desert (350 acres); and • Whitewater Hill (400 acres).	Action: Manage 5,400 acres as *open* to motorized travel. • Grand Valley (4,900 acres); • North Fruita Desert (170 acres); • Skinny Ridge (10 acres); and • 34 and C Road (330 acres).	Action: No similar action.	Action: Manage 10,200 acres as *open* to motorized travel. • Grand Valley (9,700 acres); • North Fruita Desert (170 acres); and • 34 and C Road (330 acres).
Action: No similar action in current RMP.	Action: Manage the Grand Valley Open Area as a ROW avoidance area.	Action: No similar action.	Action: Upon receipt of application for development and subsequent approval within the Grand Valley Open Area, the open area boundary could be modified to accommodate solar development.
Action: Manage 35,300 acres as *closed* to OHV use: • Palisade municipal watershed • Whitewater Hill Sensitive Plant Study Site • Pyramid Rock ACEC	Action: Manage 187,900 acres as *closed* to motorized travel (administrative and permitted vehicular access only): • WSAs • ACECs: ○ Atwell Gulch; ○ Juanita Arch; ○ Mt. Garfield; ○ Pyramid Rock; ○ Roan and Carr Creek; and ○ Unaweep Seep • Lands managed for wilderness characteristics • Critical Habitat and Research Areas: ○ Ant Research Area; ○ Sieber Canyon (deer/elk);	Action: Manage 379,500 acres as *closed* to motorized travel (administrative and permitted vehicular access only): • Garvey Canyon • WSAs • ACECs: ○ Same as Alternative B, plus the following: ▪ Nine-mile Hill Boulders • WSR segments: ○ North Fork West Creek (wild classification) • Lands managed for wilderness characteristics • Critical Habitat and Research Areas: ○ Same as Alternative B, plus the following:	Action: Manage 111,200 acres as *closed* to motorized travel (administrative and permitted vehicular access only): • WSAs • Unaweep Seep ACEC • Critical Habitat and Research Areas: ○ Ant Research Area

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	○ Snyder Flats (deer/elk); ○ Renegade Point(deer/elk); and ○ Reeder Mesa Cactus Study Site • Wildlife Emphasis Areas: ○ Timber Ridge (deer/elk/grouse); ○ A portion of East Salt between Demaree Canyon WSA and Highway 139) (deer/elk/kit fox); and ○ A portion of Rapid Creek (deer/elk).	▪ Whitewater Hill Sensitive Plant Study Site • Wildlife Emphasis Areas: ○ Same as Alternative B, plus the following: ▪ Casto (deer/elk); ▪ Hawxhurst (deer/elk/bighorn sheep); and ▪ Red Mountain (deer/elk).	
Action: Manage 220,000 acres as limited to designated routes; acreage does not include seasonal limitations.	Action: Manage motorized travel on the remaining portion of the GJFO as limited to designated routes (798,300 acres); acreage does not include seasonal limitations. Refer to BLM's Travel Management Plan (Appendix M) for route designations in limited areas.	Action: Manage motorized travel on the remaining portion of the GJFO as limited to designated routes (631,800 acres); acreage does not include seasonal limitations. Refer to BLM's Travel Management Plan (Appendix M) for route designations in limited areas.	Action: Manage motorized travel on the remaining portion of the GJFO as limited to designated routes (885,200 acres); acreage does not include seasonal limitations. Refer to BLM's Travel Management Plan (Appendix M) for route designations in limited areas.
Action: Manage 234,700 acres as limited to existing routes (not including those acres with seasonal limitations).	Action: No similar action.		
Allowable Use: Implement the following seasonal travel closures from December 1 to May 1 (106,200 acres): • Beehive; • Blue Mesa; • Chalk Mountain; • Coal Canyon;	Allowable Use: Implement the following seasonal travel limitations for motorized and mechanized travel from December 1 to May 1 (69,800 acres): • Beehive; • Blue Mesa; • Chalk Mountain;	Allowable Use: Implement the following seasonal travel limitations for motorized and mechanized travel from December 1 to May 1 (50,100 acres): • Beehive; • Blue Mesa; • Chalk Mountain;	Allowable Use: Implement the following seasonal travel limitations for motorized and mechanized travel from December 1 to May 1 (54,700 acres): • Beehive; • Chalk Mountain; • Coal Canyon;

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
• Garvey Canyon; • Grand Mesa Slopes; • Indian Point; and • Post/Lapham Canyons.	• Coal Canyon; • Demaree Canyon outside of the WSA; • Garvey Canyon; • Grand Mesa Slopes; • Howard Canyon Flats; • Indian Point; and • Post/Lapham Canyons.	• Coal Canyon; • Demaree Canyon outside of the WSA; • Grand Mesa Slopes; • Howard Canyon Flats; • Indian Point; and • Post/Lapham Canyons.	• Garvey Canyon; • Grand Mesa Slopes; • Indian Point; and • Post/Lapham Canyons.
Allowable Use: Implement the following seasonal travel closures for vehicular use from March 1 – June 30: • Coal Canyon (7,300 acres)	Allowable Use: No similar allowable use.		
Action: No similar action in current RMP.	Action: Designate mechanized travel in the GJFO as follows (Figure 2-23, Appendix A): • Open: 5,400 acres • Closed: 158,500 acres • Limited to designated routes: 897,500 acres (includes 69,800 acres with seasonal limitations)	Action: Designate mechanized travel in the GJFO as follows (Figure 2-24, Appendix A): • Open: 0 acres • Closed: 367,000 acres • Limited to designated routes: 694,400 acres (includes 50,100 acres with seasonal limitations)	Action: Designate mechanized travel in the GJFO as follows (Figure 2-25, Appendix A): • Open: 10,200 acres • Closed: 98,000 acres • Limited to designated routes: 953,200 acres (includes 54,700 acres with seasonal limitations)
Action: No similar action in current RMP.	Action: Manage 5,400 acres as *open* to mechanized travel. • Grand Valley (4,900 acres); • North Fruita Desert (170 acres); • Skinny Ridge (10 acres); and • 34 and C Road (330 acres).	Action: Manage 0 acres as *open* to mechanized travel.	Action: Manage 10,200 acres as *open* to mechanized travel. • Grand Valley (9,700 acres); • North Fruita Desert (170 acres); and • 34 and C Road (330 acres).

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: Manage 80 acres as *closed* to mechanized travel: • Unaweep Seep ACEC.	Action: Manage 158,500 acres as *closed* to mechanized travel: • WSAs • ACECs: ○ Atwell Gulch; ○ Mt. Garfield; ○ Pyramid Rock; ○ Roan and Carr Creek; and ○ Unaweep Seep • Wildlife Emphasis Areas: ○ Timber Ridge (deer/elk/grouse) • Lands Managed for wilderness characteristics (exception for the Pickett Trail in the Maverick unit).	Action: Manage 367,000 acres as *closed* to mechanized travel: • WSAs • ACECs: ○ Atwell Gulch (except for Sunnyside Road); ○ Juanita Arch; ○ Mt. Garfield; ○ Nine-mile Hill Boulders; ○ Pyramid Rock; ○ Roan and Carr Creek; and ○ Unaweep Seep • Wildlife Emphasis Areas: ○ Same as Alternative B, plus the following: ▪ Hawxhurst (fish); and ▪ Red Mountain (deer/elk). • Lands managed for wilderness characteristics.	Action: Manage 98,000 acres as *closed* to mechanized travel: • WSAs • Unaweep Seep ACEC • Critical Habitat and Research Areas: ○ Ant Research Area.
Action: Limit mechanized travel to designated routes in the following areas (6,200 acres): • Bangs Canyon SRMA (RMZs 1, 2, and 3).	Action: Manage mechanized travel on the remaining portion of the GJFO as limited to designated routes (827,700 acres); acreage does not include seasonal limitations. Refer to BLM's Travel Management Plan (Appendix M) for route designations in limited areas.	Action: Manage mechanized travel on the remaining portion of the GJFO as limited to designated routes (644,300 acres); acreage does not include seasonal limitations. Refer to BLM's Travel Management Plan (Appendix M) for route designations in limited areas.	Action: Manage mechanized travel on the remaining portion of the GJFO as limited to designated routes (898,500 acres); acreage does not include seasonal limitations. Refer to BLM's Travel Management Plan (Appendix M) for route designations in limited areas.
Action: No similar action in current RMP.	Action: Designate equestrian travel in the GJFO as follows (Figure 2-23,	Action: Designate equestrian travel in the GJFO as follows (Figure 2-24, Appendix A):	Action: Designate equestrian travel in the GJFO as follows (Figure 2-25,

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	Appendix A): • Open: 1,035,500 acres • Closed: 1,300 acres • Limited to designated routes: 24,600 acres	• Open: 1,023,800 acres • Closed: 1,300 acres • Limited to designated routes: 36,300 acres	Appendix A): • Open: 1,042,400 acres • Closed: 1,300 acres • Limited to designated routes: 17,700 acres
Action: No similar action in current RMP.	Action: Manage 1,035,500 acres as *open* to equestrian travel.	Action: Manage 1,023,800 acres as *open* to equestrian travel.	Action: Manage 1,042,400 acres as *open* to equestrian travel.
Action: No similar action in current RMP.	Action: Manage 1,300 acres as *closed* to equestrian travel: • Pyramid Rock ACEC		
Action: Limit equestrian travel to designated routes in the following areas (6,200 acres): • Bangs Canyon SRMA (RMZs 1, 2, and 3).	Action: Limit equestrian travel to designated routes in the following areas (24,600 acres) (Refer to Appendix M for route designations in limited areas): • Palisade Rims ERMA; • SRMAs: ○ Bangs (RMZs 1 and 3); and ○ North Fruita Desert (RMZ 1).	Action: Limit equestrian travel to designated routes in the following areas (36,300 acres) (Refer to Appendix M for route designations in limited areas): • Palisade Rims area (2,700 acres); • SRMAs: ○ Bangs (RMZs 1 and 3); and ○ North Fruita Desert (RMZ 1).	Action: Limit equestrian travel to designated routes in the following areas (17,700 acres) (Refer to Appendix M for route designations in limited areas): • SRMAs: ○ Bangs (RMZs 1 and 3); ○ Castle Rock; and ○ Palisade Rims.
Action: No similar action in current RMP.	Action: Designate foot travel in the GJFO as follows (Figure 2-23, Appendix A): • Open: 1,025,000 acres • Closed: 0 acres • Limited to designated routes: 24,600 acres	Action: Designate foot travel in the GJFO as follows (Figure 2-24, Appendix A): • Open: 1,013,300 acres • Closed: 1,300 acres • Limited to designated routes: 36,300 acres	Action: Designate foot travel in the GJFO as follows (Figure 2-25, Appendix A): • Open: 1,043,700 acres • Closed: 0 acres • Limited to designated routes: 17,700 acres
Action: No similar action in current RMP.	Action: Manage 1,055,200 acres as *open* to foot travel.	Action: Manage 1,023,800 acres as *open* to foot travel.	Action: Manage 1,043,700 acres as *open* to foot travel.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: No similar action in current RMP.	Action: Manage 0 acres as *closed* to foot travel.	Action: Manage 1,300 acres as *closed* to foot travel. • Pyramid Rock ACEC.	Action: Same as Alternative B.
Action: Limit foot travel to designated routes in the following areas (6,200 acres): • Bangs Canyon SRMA (RMZs 1, 2, and 3).	Action: Limit foot travel to designated routes in the following areas (24,600 acres) (Refer to Appendix M for route designations in limited areas): • Palisade Rims ERMA; • SRMAs: ○ Bangs (RMZs 1 and 3); and ○ North Fruita Desert (RMZ 1).	Action: Limit foot travel to designated routes in the following areas (36,300acres) (Refer to Appendix M for route designations in limited areas): • Palisade Rims area (2,700 acres); • SRMAs: ○ Bangs (RMZs 1 and 3); and ○ North Fruita Desert (RMZ 1).	Action: Limit foot travel to designated routes in the following areas (17,700 acres) (Refer to Appendix M for route designations in limited areas): • SRMAs: ○ Bangs (RMZs 1 and 3); ○ Castle Rock; and ○ Palisade Rims.
Action: Manage the Unaweep Seep ACEC/RNA as *closed* to over-snow motorized travel.	Action: Manage the following areas as *closed* to over-snow motorized travel: • Lynx habitat within a Lynx Analysis Unit • LBCWHR • Lands managed for wilderness characteristics • ACECs: ○ Atwell Gulch; ○ Mount Garfield; ○ Pyramid Rock; ○ Roan and Carr Creeks; and ○ Unaweep Seep.	Action: Manage the following areas as *closed* to over-snow motorized travel: • Lynx habitat within a Lynx Analysis Unit • LBCWHR • Wildlife Emphasis Areas: ○ Hawxhurst; and ○ Red Mountain • Lands managed for wilderness characteristics • ACECs: ○ Atwell Gulch; ○ Mount Garfield; ○ Nine-mile Hill Boulders; ○ Pyramid Rock; ○ Roan and Carr Creeks; and ○ Unaweep Seep.	Action: Manage the following areas as *closed* to over-snow motorized travel: • Lynx habitat within a Lynx Analysis Unit; and • Unaweep Seep ACEC.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: No similar action in current RMP.	Action: Prohibit cross-country motorized/mechanized travel for big game retrieval. Allow hand-held wheeled game retrieval carts.		
Action: Additional closures or seasonal restrictions on areas or routes may be implemented to reduce resource conflicts, public health and safety concerns, or road and trail damage as necessary.			
Action: No similar action in current RMP.	Action: Open areas and designated routes may be closed during wind events to reduce particulate matter (e.g. during National Weather Service high wind warning).	Action: Designated routes may be closed during wind events to reduce particulate matter (e.g. during National Weather Service high wind warning).	Action: No similar action.
Action: No similar action in current RMP.	Action: Require proper road design, construction, and/or surfacing on BLM authorized roads to reduce fugitive dust emissions.		
GOAL: No similar goal in current RMP.	**GOAL**: To manage a comprehensive travel and transportation management system that allows for diverse recreational use of motorized and nonmotorized interests; promotes the safety of all users; minimizes conflicts among federal land uses; communicates with the public about available opportunities, and monitors the effects of use.		
Objective: No similar objective in current RMP.	Objective: Seek to effectively manage new modes of travel that cannot be foreseen through this planning effort.		
Action: No similar action in current RMP.	Action: Analyze any new modes of travel that are determined to have a potential to impact the current uses and or natural or cultural resources for their appropriateness on public lands. Restrictions, closures, and/or new management actions may be implemented based on this analysis.		
GOAL: No similar goal in current RMP.	**GOAL**: To manage a comprehensive travel and transportation management system that minimizes damage to natural and cultural resources (historical and archeological sites, traditional cultural properties and natural resources of importance to Native Americans, soil, water, air, vegetation, scenic values, etc.) and minimizes harassment of wildlife and/or significant disruption of wildlife habitats.		
Objective: No similar objective in current RMP.	Objective: Manage motorized travel consistent with outcomes defined by resource programs.		
Action: No similar action in current RMP.	Action: In accordance with 43 CFR 8341.2, where monitoring or related data suggest that OHVs are causing or would cause		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	considerable adverse impacts, areas may be closed or restricted from OHV use. The public would be notified. The BLM could impose limitations on types of vehicles allowed on specific designated routes if monitoring indicates that a particular type of vehicle is causing unacceptable disturbance to the soil, wildlife habitat, special status species habitat, cultural or vegetative resources, or other sensitive resources, especially by off-road travel in an area that is limited to designated routes.		
Action: There are a number of locations throughout the GJFO that are commonly known and consistently used for aircraft landing and departure activities that, through such casual use, have evolved into backcountry airstrips (the definition contained in Section 345 of Public Law 106-914, the Interior and Related Agencies Appropriation Act of 2001). In accordance with that law, require full public notice, consultation with local and state government officials, the Federal Aviation Administration, and compliance with all applicable laws, including NEPA, when considering any closure of an aircraft landing strip.			
Objective: No similar objective in current RMP.	Objective: Manage nonmotorized travel consistent with outcomes defined by resource programs.		
Action: No similar action in current RMP.	Action: Where monitoring or related data suggest that mechanized travel, horseback use or nonmechanized, cross-country travel are causing or would cause considerable adverse impacts, areas may be closed or travel restricted. The public would be notified. The BLM could impose limitations on types of use allowed on specific designated routes or areas if monitoring indicates that a particular type of use is causing disturbance to the soil, wildlife habitat, cultural or vegetative resources.		
Action: No similar action in current RMP.	Action: Limit nonmechanized/nonmotorized travel to designated roads and trails in specific areas to protect resource values, provide for public safety, and/or maintain an identified opportunity. These areas include urban interface and high density use areas. Refer to Appendix M for nonmechanized/nonmotorized route designations.		
Lands and Realty			
GOAL: Meet resource needs while providing public use authorizations such as Rights-of-Way (ROWs), renewable energy sources, permits, and leases.			
Objective: To respond, in a timely manner, to requests for utility and public use authorizations on public land, while considering environmental, social, economic, and interagency concerns.	Objective: Provide for the development and operation of transportation systems, pipelines, transmission lines, communication sites, renewable energy resources, and other land use authorizations in an environmentally responsible and timely manner.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Allowable Use: Identify approximately 234,900 acres as unsuitable for public utilities. Deny proposals in these zones on the basis that utility project impacts could not be mitigated to prevent undue damage to the resources of concern. Areas of Resource Concern identified as unsuitable include (Figure 2-26, Appendix A): • ACECs: ○ A portion of Badger Wash (685 acres); ○ A portion of The Palisade (1,920 acres); ○ A portion of Pyramid Rock (470 acres); ○ A portion of Rough Canyon (2,560 acres); and ○ Unaweep Seep (80 acres). • Soils: ○ Douglas/Baxter Soil Slumps; and ○ Plateau Creek Slump. • Water Resources Management: ○ Badger Wash Study Area (685 acres); ○ Grand Junction municipal watershed; and ○ Indian Wash Dam. • Wildlife: ○ Rough Canyon • Threatened and Endangered	Allowable Use: ROW Exclusion Areas (including renewable energy sites such as solar, wind, hydroelectric, and biomass development): Manage 204,200 acres as ROW exclusion areas that are not available for the location of ROWs or other realty authorizations under any conditions, to include the following (Figure 2-27, Appendix A): • ACECs: ○ A portion of Atwell Gulch (2,600 acres); ○ A portion of Badger Wash (1,800 acres); ○ Indian Creek; ○ Juanita Arch; ○ Mt. Garfield (excluding the Coal Canyon Corridor); ○ Pyramid Rock; ○ Rough Canyon; ○ South Shale Ridge (except for ROWs to existing oil and gas leases issued under the 1987 RMP without NSO stipulations); and ○ Unaweep Seep • Ant Study Area • LBCWHR (22,800 acres inside WSA) • Lands managed for wilderness	Allowable Use: ROW Exclusion Areas (including renewable energy sites such as solar, wind, hydroelectric, and biomass development): Manage 365,800 acres as ROW exclusion areas that are not available for the location of ROWs or other realty authorizations under any conditions, to include the following (Figure 2-28, Appendix A): • ACECs: ○ A portion of Atwell Gulch (5,900 acres) ○ A portion of Badger Wash (1,800 acres); ○ Indian Creek; ○ Juanita Arch; ○ Mt. Garfield (excluding the Coal Canyon Corridor); ○ Nine-mile Hill Boulders; ○ A portion of Prairie Canyon (2,800 acres within Prairie Canyon antelope migratory corridor); ○ Pyramid Rock; ○ Reeder Mesa; ○ Rough Canyon; ○ South Shale Ridge (allow for ROWs to existing oil and gas leases issued under the 1987 RMP without NSO stipulations); and ○ Unaweep Seep. • Ant Study Area	Allowable Use: ROW Exclusion Areas (including renewable energy sites such as solar, wind, hydroelectric, and biomass development): Manage 104,100 acres as ROW exclusion areas that are not available for the location of ROWs or other realty authorizations under any conditions, to include the following (Figure 2-29, Appendix A): • ACECs: ○ A portion of Badger Wash (1,800 acres); ○ Pyramid Rock; ○ Rough Canyon; ○ A portion of The Palisade (1,400 acres); and ○ Unaweep Seep. • Indian Creek • LBCWHR (22,800 acres inside WSA) • Parachute penstemon occupied habitat • VRM Class I • WSAs

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Species: ○ Bald eagle concentrations areas; ○ Pyramid Rock; and ○ Unaweep Seep. • VRM: ○ Juanita Arch; ○ The Goblins; ○ Dolores River Canyon; ○ Gunnison River Corridor; ○ Mt. Garfield Cliffs; ○ Bangs Canyon Area; ○ Sinbad Valley; ○ Granite Creek; ○ Unaweep Canyon Area; ○ Hunter/Garvey Canyons Areas; and ○ Vega Reservoir Viewshed. • Cultural Resource Management: ○ Indian Creek; ○ Rough Canyon (1,000 acres); ○ Site 5ME1358; and ○ Ladder Springs. • Recreation Resource Management: ○ A portion of Rough Canyon ACEC (2,560 acres); and ○ The Palisade ONA. • Developed Recreation Sites: ○ Island Acres; ○ Vega Reservoir; and ○ Highline Reservoir. • Wilderness Management: ○ Sewemup Mesa WSA	characteristics • Parachute penstemon occupied habitat • SRMAs: ○ Dolores River Canyon (exception for 75-meter buffer along Highway 141); and ○ North Fruita Desert (RMZ 1) (allow for ROWs to existing oil and gas leases issued under the 1987 RMP that do not impact developed recreation facilities or have NSO stipulations) • VRM Class I • Wildlife emphasis areas: ○ A portion of East Salt Creek (west of Highway 139 [4,100 acres]) • Within a 0.6-mile radius of sage-grouse leks • WSAs (allow for ROWs to existing leases without an NSO stipulation issued under the 1987 RMP) • High sensitivity zone of the Palisade municipal watershed, except for the Lands End Communication Site.	• LBCWHR, excluding the Coal Canyon Corridor (40,100 acres) • Lands managed for wilderness characteristics • Parachute penstemon occupied habitat • SRMAs: ○ North Fruita Desert (RMZ 1) • Suitable segments for inclusion in the NWSRS: ○ North Fork West Creek • VRM Class I • Wildlife Emphasis Areas: ○ A portion of East Salt Creek (west of Highway 139 [4,100 acres]); and ○ Prairie Canyon antelope migratory corridor. • Within a 0.6-mile radius of sage-grouse leks for below-ground facilities and a 4-mile radius for above-ground facilities • WSAs • High sensitivity zone of the Palisade municipal watershed, except for the Lands End Communication Site.	

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Allowable Use: Identify 441,400 acres as sensitive to public utility development. Design utility routes and projects in these zones to protect resources of concern from undue damage (Figure 2-26, Appendix A) (note: corresponding stipulations [i.e., NSO, CSU, TL] are found in Appendix B): • ACECs: ○ A portion of Badger Wash (1,230 acres); and ○ A portion of The Palisade (17,258 acres). • Soils: ○ Steep slopes • Water Resources Management: ○ Palisade municipal watershed; ○ Jerry Creek Reservoirs; and ○ Perennial streams. • Wildlife: ○ Deer and elk winter range; ○ Bighorn sheep winter range; and ○ Elk calving areas. • Threatened and Endangered Species: ○ Badger Wash uplands; ○ Cutthroat trout; ○ *Cryptantha eleta* site; ○ Peregrine falcon habitat; ○ Sensitive plant species; and ○ Colorado hookless cactus	Allowable Use: ROW Avoidance Areas: Manage 740,900 acres as ROW avoidance areas (Figure 2-27, Appendix A) (see Appendix B): • ACECs: ○ A portion of Atwell Gulch (260 acres) ○ A portion of Badger Wash (400 acres) ○ Dolores River Riparian ○ The Palisade ○ Sinbad Valley ○ Roan and Carr Creeks • Administrative sites (e.g., study sites, monitoring plots, range exclosures) • Developed recreation sites • Disposal parcels • Fragile soils • Floodplains • National Historic, Scenic, and Recreation Trails (e.g., Old Spanish National Historic Trail) • LBCWHR (6,500 acres outside of WSA) • Mapped Mancos shale areas • OHV open areas (except for areas in delineated ROW corridors) • Owl banding station • Sage-grouse: occupied habitat	Allowable Use: ROW Avoidance Areas: Manage 627,000 acres as ROW avoidance areas (Figure 2-28, Appendix A) (see Appendix B): • ACECs: ○ A portion of Atwell Gulch (260 acres) ○ A portion of Badger Wash (400 acres) ○ Colorado River Riparian ○ Coon Creek ○ Dolores River Riparian ○ Glade Park-Pinyon Mesa ○ Hawxhurst Creek ○ The Palisade ○ Plateau Creek ○ A portion of Prairie Canyon (2,600 acres) ○ Sinbad Valley ○ Roan and Carr Creeks • Administrative sites (e.g., study sites, monitoring plots, range exclosures) • Developed recreation sites • Disposal parcels • Fragile soils • Floodplains • National Historic, Scenic, and Recreation Trails (e.g., Old Spanish National Historic Trail) • Mapped Mancos shale areas • Owl banding station • Palisade Watershed (low and moderate	Allowable Use: ROW Avoidance Areas: Manage 80,500 acres as ROW avoidance areas (Figure 2-29, Appendix A) (see Appendix B): • ACECs: ○ A portion of Badger Wash (400 acres) • Ant Study Area • LBCWHR (12,400 acres outside of WSA) • SRMAs: ○ Bangs, exception for Little Park Road and Monument Road (100-meter setback) ○ Castle Rock ○ Grand Valley ○ North Fruita Desert (RMZ 1) ○ Palisade Rims • Old growth forests and woodlands

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
(formerly known as Uinta Basin hookless cactus). • LBCWHR: ○ Horse Range; ○ LBCWHR winter range; and ○ LBCWHR foaling area. • VRM: ○ Bang's Canyon area (25,920 acres); ○ Face of the Book Cliffs; ○ Grand Mesa slopes; ○ Granite Creek (12,760 acres); ○ Gunnison River Corridor (9,040 acres); ○ Highway corridors; ○ Hunter/Garvey Canyons area (11,400 acres); ○ South Shale Ridge; ○ Sinbad Valley (7,490 acres); and ○ Unaweep Canyon area (6,400 acres). • Cultural Resource Management: ○ Transect 7 • Recreation Resource Management: ○ Little Park Road; ○ Pine Mountain roadside; and ○ The Palisade ONA.	• Sage-grouse: within a 4-mile radius of leks • Scenic byways (except for areas within corridors) • SRMAs: ○ Bangs, exception for Little Park Road and Monument Road (75-meter setback) ○ North Fruita Desert (RMZ 2) • Special status species occupied and suitable habitat • Steep slopes greater than or equal to 40 percent • Streams/springs possessing lotic/lentic riparian characteristics • Segment suitable for inclusion in the NWSRS: ○ Dolores River • Areas designated as VRM Class II (except for areas within delineated ROW corridors). • Wetlands, springs, seeps, and riparian area • Wildlife Emphasis Areas: ○ Prairie Canyon antelope migratory corridor; ○ Rapid Creek (except for West-wide Energy Corridor); ○ Sunnyside (outside of West-wide Energy Corridor); and ○ Timber Ridge (exception along 9.8 Road).	sensitivity) • Sage-grouse: occupied, suitable habitat • Sage-grouse: within a 4-mile radius of leks • Scenic byways (except for areas within corridors) • SRMAs: ○ Bangs, exception for Little Park Road and Monument Road (50-meter setback) ○ North Fruita Desert (RMZ 2) • Special status species occupied, suitable, and potential habitat • Steep slopes greater than or equal to 40 percent • Streams/springs possessing lotic/lentic riparian characteristics • Segments suitable for inclusion in the NWSRS: ○ Blue Creek ○ Carr Creek ○ Colorado River Segments 1 and 2 ○ Dolores River ○ East Creek ○ Gunnison River Segment 2 ○ North Fork Mesa Creek ○ Roan Creek ○ Rough Canyon Creek ○ Ute Creek ○ West Creek • Areas designated as VRM Class II (except for areas within delineated	

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	• Wildlife habitat treatments • Old growth forests and woodlands.	ROW corridors) • Wetlands, springs, seeps, and riparian areas • Wildlife Emphasis Areas: ○ Hawxhurst; ○ Prairie Canyon (except for antelope migratory corridor); ○ Rapid Creek (except for West-wide Energy Corridor); ○ Red Mountain; ○ Sunnyside (outside of West-wide Energy Corridor); and ○ Timber Ridge (exception along 9.8 Road) • Wildlife habitat treatments • Old growth forests and woodlands	
Allowable Use: Manage the remaining public land not identified as ROW exclusion or avoidance areas as suitable for consideration for public utilities. Consider proposals in these zones.			
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-29: *Sub-surface Inventory*. Require sub-surface inventory for deep sub-surface-disturbing activities and buried ROW in the following locations. (Refer to Appendix B.) See Figure 2-47 in Appendix A: • Indian Creek (20,200 acres); • Grand Mesa Slopes (16,000 acres); and • Sunnyside (17,300 acres).	Allowable Use: **STIPULATION** CSU -29: *Sub-surface Inventory*. Require sub-surface inventory for deep sub-surface-disturbing activities and buried ROW in the following locations. (Refer to Appendix B.) See Figure 2-48 in Appendix A: • Indian Creek (20,200 acres); • Grand Mesa Slopes (24,400 acres); and • Sunnyside (24,000 acres).	Allowable Use: **STIPULATION** CSU -29: *Sub-surface Inventory*. Require sub-surface inventory for deep sub-surface-disturbing activities and buried ROW in the following locations. (Refer to Appendix B.) See Figure 2-49 in Appendix A: • Indian Creek (20,200 acres); • Grand Mesa Slopes (16,000 acres); and • Sunnyside (15,400 acres).

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Renewable Energy			
Action: No similar action in current RMP.	Action: Manage 9,200 acres as Solar Energy Zones (SEZ) that allow for development of facilities that generate more than 20 megawatts (Figure 2-86, Appendix A). Manage additional areas as identified and determined suitable for development in an environmentally responsible and economically feasible manner. ROW exclusion areas apply. Manage for development through competitive leasing in identified and future SEZs. All other ROWs and realty authorizations shall be relocated to avoid sensitive resources. Special stipulations shall also be applied to protect sensitive resources in avoidance areas.	Action: No similar action.	Action: Same as Alternative B.
Action: No similar action in current RMP.	Action: Manage 12,200 acres as emphasis areas for solar energy development and operation, and 2,600 acres as emphasis areas for wind energy development and operation (Figure 2-87, Appendix A). Manage additional areas as identified and determined suitable for development in an environmentally responsible and economically	Action: Manage 5,300 acres as emphasis areas for solar energy development and operation, and 2,600 acres as emphasis areas for wind energy development and operation (Figure 2-88, Appendix A). Manage additional areas as identified and determined suitable for development in an environmentally responsible and economically feasible manner. ROW avoidance and exclusion areas apply. All	Action: Manage 36,300 acres as emphasis areas for solar energy development and operation, and 3,700 acres as emphasis areas for wind energy development and operation (Figure 2-89, Appendix A). Manage additional areas as identified and determined suitable for development in an environmentally responsible and economically

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	feasible manner. ROW avoidance and exclusion areas apply. Manage for development through competitive leasing in identified renewable energy emphasis areas, and in new emphasis areas as identified in the future. All ROWs and other realty authorizations shall be relocated to avoid sensitive resources. Special stipulations shall also be applied to protect sensitive resources in avoidance areas.	ROWs and other realty authorizations shall be relocated to avoid sensitive resources. Special stipulations shall also be applied to protect sensitive resources in avoidance areas.	feasible manner. ROW avoidance and exclusion areas apply. Manage for development through competitive leasing in identified renewable energy emphasis areas, and in new emphasis areas as identified in the future. All ROWs and other realty authorizations shall be relocated to avoid sensitive resources. Special stipulations shall also be applied to protect sensitive resources in avoidance areas.
Action: No similar action in current RMP.	Action: Upon receipt of application for development and subsequent approval within solar and wind emphasis areas (Figures 2-87, 2-88, and 2-89, Appendix A), consider modification of route designations to accommodate development.		
Action: No similar action in current RMP.	Action: During development of the 2 Road solar emphasis area (Figures 2-87 and 2-88, Appendix A), require special mitigation to ensure compatibility with the Prairie Canyon Wildlife Emphasis Area.		Action: No similar action.
Action: Approve applications for communication site facilities that meet resource program objectives.	Action: Communication Sites: Work with applicants to prioritize co-locating communication site facilities and use existing sites, as feasible. Consider new communication sites may if these requirements cannot be met.		
Objective: No similar objective in current RMP.	Objective: Manage corridors for public utilities and other facilities, and establish new corridors in an environmentally responsible manner as necessary to meet future demands and protect sensitive resources.		
Allowable Use: Encourage use of existing corridors or upgrading of existing facilities in sensitive and suitable zones.	Allowable Use: Encourage the placement of new facilities or upgrades to existing facilities in delineated corridors or in other areas with previous disturbance and existing facilities, as consistent with other resource values.	Allowable Use: Require the placement of new facilities or upgrades to existing facilities in delineated corridors or in other areas with previous disturbance and existing facilities, as determined practical, consistent with other resource values.	Allowable Use: Determine the placement of new facilities or upgrades to existing facilities on a case-by-case basis.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Allowable Use: Manage seven corridors (88,600 acres) as public utility corridors. Encourage utility companies to use these corridors, including: • Coal Canyon ○ Major power lines ○ 0.5-mile wide • Along MAPCO pipeline in West Salt Creek ○ Major pipelines and power lines ○ 0.5-mile wide • Along Northwest Pipeline and State Highway 139 ○ Major pipelines and power lines ○ 0.5-mile wide • From DeBeque to southern boundary of resource are ○ Major power lines ○ 4 miles wide • Along Roan Creek from DeBeque to Community Center ○ Railroads, power lines, major water and oil and gas pipelines ○ 1 mile wide • Along Clear Creek from Community Center to northern resource area boundary ○ Major power lines and pipelines ○ 0.5-mile wide • Unaweep Canyon ○ Telephone/fiber optic and power	Allowable Use: Manage six corridors (96,400 acres) (widths are approximate) for public utilities and other facilities, including: • Coal Canyon ○ Telephone/fiber optic and power lines (wood poles only) ○ 0.5-mile wide • Dolores River ○ Telephone/fiber optic and power lines (wood poles only) ○ 75 meters wide • Highway 139 ○ All facilities ○ 0.5-mile wide • Unaweep Canyon ○ Telephone/fiber optic and power lines (wood poles only) ○ 0.5-mile wide • West Salt Creek ○ All facilities ○ 0.5-mile wide • West-wide Energy Corridor ○ All facilities ○ 1 to 5 miles wide	Allowable Use: Manage six corridors (92,100 acres) (widths are approximate) for public utilities and other facilities, including: • Coal Canyon ○ Telephone/fiber optic and power lines (wood poles only) ○ 0.5-mile wide • Dolores River ○ Small telephone/fiber optic and power lines (wood poles only) ○ 50 meters wide • Highway 139 ○ Major pipelines and subsurface power lines ○ 0.5-mile wide • Unaweep Canyon ○ Telephone/fiber optic and power lines (wood poles only) ○ 0.5-mile wide (0.25-mile wide adjacent to Bangs SRMA and Dominguez-Escalante NCA) • West Salt Creek ○ Major pipelines and power lines ○ 0.5-mile wide • West-wide Energy Corridor ○ All facilities ○ 1 to 5 miles wide	Allowable Use: Manage eight corridors (119,100 acres) (widths are approximate) for public utilities and other facilities, including: • Coal Canyon ○ All facilities ○ 1 mile wide • Dolores River ○ All facilities ○ 100 meters wide • Highway 139 ○ All facilities ○ 1 mile wide • Little Park Road Corridor ○ Telephone/fiber optic and power lines ○ 150 meters wide • Unaweep Canyon ○ All facilities ○ 0.5-mile wide • West Salt Creek ○ All facilities ○ 1 mile wide • West-wide Energy Corridor ○ All facilities ○ 1 to 5 miles wide

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
lines ○ 0.5-mile wide			
Allowable Use: No similar action in current RMP.	Allowable Use: Require bonding for projects within the Unaweep, Dolores River, and Highway 139 Corridors to ensure that reclamation, visual, and other objectives are met.		Allowable Use: No similar allowable use.
Allowable Use: Delineate an additional corridor upon issuance of ROW grants for a pending utility project proposal: Grand Valley Conversion Project through Coal Canyon.	Allowable Use: Coal Canyon Corridor management is discussed above.		
Allowable Use: **STIPULATION** *LN-16 (Alternative A)*/LN-7 (Alternatives B and D)*:* *Powderhorn Ski Area*. If drilling operations are proposed, the lessee is hereby notified that there are concerns about ski lift structures, other facilities, and ski runs within the Powderhorn ski area. The lessee is hereby notified that special design, construction, and scheduling measures may be required in order to minimize the impacts of drilling and production operations. Proposed drilling and production facilities and operations would be relocated and rescheduled as needed to avoid physical interference with ski area facilities and recreation use. This can include relocations of more than 200 meters (656 feet) or seasonal closures of more than 60 days. (Refer to Appendix B.)		Allowable Use: No similar allowable use.	Allowable Use: Same as Alternative A.
Objective: Provide for the development and operation of actions authorized under 2920 permits (such as site facilities and commercial filming) in an environmentally responsible and timely manner.			
Allowable Use: No similar allowable use in current RMP.	Allowable Use: Restrict 2920 permit activities in areas identified as ROW avoidance areas and prohibit activities in areas identified as ROW exclusion areas.		
Action: No similar action in current RMP.	Action: Limit applications for filming permits involving motorized, mechanized, or	Action: Authorize film permits on a case-by-case basis.	Action: Same as Alternative B.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	other intensive uses to existing highways, roads, and pull-outs, and previously disturbed or cleared areas. Issue permits only if the following criteria of minimal impact are met without requiring any NEPA analysis. Prior to permit approval, filming projects that do not meet these criteria would be subject to site-specific NEPA analysis, or use of programmatic NEPA documents, including EAs that may be developed on a local, state, or BLM-wide basis. • Project would not impact sensitive habitat or species. • Project would not impact cultural resources or traditional cultural properties and natural resources of importance to Native Americans. • Project would not involve use of pyrotechnics. • Project would not involve more than minimum impacts to land, air, or water. (Minimum is defined as temporary impact only and does not include permanent impacts or surface disturbance that cannot be raked out or rehabilitated so that there is no sign of activity at the end of the		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	filming). • Project would not involve use of explosives. • Project would not involve use of exotic plant or animal species that could cause danger of introduction into the area. • Project would not involve WSAs or lands managed for wilderness characteristics. • Project would not involve adverse impacts to sensitive surface resource values including historic, cultural, or paleontological sites; sensitive soils; relict environments; wetlands or riparian areas; or ACECs. • Project would not involve substantial restriction of public access. • Project would not involve substantial use of domestic livestock. • Project would not involve 10 production vehicles within sensitive areas. • Project would not involve 60 or more people within sensitive areas. • Filming activity within sensitive areas would not continue in excess of 10 days.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	• Refueling would not occur within sensitive areas. • Aircraft use in area with wildlife concerns is not proposed during crucial wildlife periods. • Aircraft use in area with no wildlife concerns is proposed for no more than two days and does not exceed frequency of three projects per 30-day period. • Use of aircraft is not proposed within 0.5-mile of a designated campground located within a sensitive area, and the number of low-elevation passes would not exceed four passes per day. • Filming activities are not proposed in developed recreation sites on weekends or during times of anticipated high use.		
Objective: No similar objective in current RMP.	Objective: Resolve trespass uses as they are identified and prioritized.		
Action: No similar action in current RMP.	Action: Monitor for trespass actions and manage as appropriate through ROW authorization or trespass procedures for removal and site restoration.		
GOAL: Adjust BLM land ownership patterns and implement other realty actions (e.g., withdrawals and easements) to meet resource and community needs.			
Objective: Adjust public land patterns to consolidate public land for improved management efficiency, and acquire suitable private land with special resource values.	Objective: Consolidate the BLM's land ownership patterns through land tenure adjustments.	Objective: Consolidate the BLM's land ownership patterns through land tenure adjustments to maximize resource protection.	Objective: Consolidate the BLM's land ownership patterns through land tenure adjustments to provide for community and economic development.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D

Allowable Use:
Disposals. Place 126 tracts totaling 16,100 acres in a disposal category. Disposal tracts are lands that will be considered for sale, transfer through exchange or the Recreation and Public Purposes (R&PP) Act, or boundary adjustment. Public land to be considered for disposal includes (Figure 2-30, Appendix A):
• Land proximate to cities, towns, or development areas;
• Isolated nonurban tracts so located as to make effective and efficient management impractical; and
• Lands designated for agricultural, commercial, or industrial development as the highest use or otherwise most appropriate use.
 	
When an application is submitted, work with the Federal Aviation Administration and the Grand Junction Regional Airport Authority on the potential airport expansion involving approximately 2,100 acres of public land.
	Allowable Use:
	Disposals. Identify 12,500 acres as available for disposal through exchanges, state selections, boundary adjustments, R&PP Act leases and patents, leases under Section 302 of FLPMA, sales under Sections 203 and 209 of FLPMA, and sales under the Federal Land Transaction Facilitation Act. (Figure 2-31, Appendix A)
	
	Disposal lands would meet one or more of the following criteria:
	• Lands suitable for public purposes adjacent to or of special importance to local communities and to state or federal agencies for purposes such as community expansion, extended community services, or economic development.
	• Isolated parcels that are small or so located as to make effective and efficient management impractical.
	• Lands identified for the Grand Junction Regional Airport expansion (2,100 acres).*
	• Unintentional occupancy trespasses in existence prior to 2010.
	• Parcels containing or integral to
		Allowable Use:
		Disposals. Identify 2,600 acres as available for disposal through exchanges, state selections, boundary adjustments, R&PP Act leases and patents, leases under Section 302 of FLPMA, sales under Sections 203 and 209 of FLPMA, and sales under the Federal Land Transaction Facilitation Act. (Figure 2-32, Appendix A)
		
		Disposal lands would meet one or more of the following criteria:
		• Same as Alternative B, with the following exception: retain lands that contain special status species occupied or potential habitat and other resource values of interest such as big game critical and severe winter range.
			Allowable Use:
			Disposals. Identify 18,000 acres as available for disposal through exchanges, state selections, boundary adjustments, R&PP Act leases and patents, desert land entries, leases under Section 302 of FLPMA, sales under Sections 203 and 209 of FLPMA, and sales under the Federal Land Transaction Facilitation Act. (Figure 2-33, Appendix A)
			
			Disposal lands would meet one or more of the following criteria:
			• Same as Alternative B, plus:
			  ○ Lands proximate to cities, towns, or development areas.
			  ○ Isolated parcels of any configuration that makes the land difficult or uneconomic to manage.
			  ○ Lands without legal public access.
			  ○ Lands identified for future industrial growth north of the Grand Junction Regional Airport expansion area (2,100 acres).

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	significant habitat for special status species would be disposed of only if the habitat for the species of concern can be maintained and if the Fish and Wildlife Service concurs. • Parcels containing or integral to NRHP eligible cultural resources would be disposed of only if the resources can be mitigated through data recovery and if the SHPO concurs with the proposed mitigation. • Additional lands may be identified for disposal in urbanizing areas on a case-by-case basis to meet community expansion needs and where the public interest would be well served. * Lands identified for the Grand Junction Regional Airport expansion may be reclassified as retention lands if a future update to the Airport Master Plan determines that the lands are not needed for airport expansion.		
Action: Dispose isolated tracts of public lands not presently shown on the base map (Alternative A) that become known in the future and that are not required to meet other resource objectives. See Figure 2-30 (Alternative A), 2-31 (Alternative B), 2-32 (Alternative C), and 2-33 (Alternative D), in Appendix A.			
Action: Reserve public access in patents where it would benefit the public.			

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Allowable Use: Place five tracts totaling 240 acres in a cooperative management agreement category (Figure 2-30, Appendix A). Offer these tracts to qualified agencies or interest groups for management or exchange. Retain any tracts not exchanged or managed cooperatively, but generally expend no public funds for their management.	Allowable Use: Identify 22 tracts totaling 5,600 acres for cooperative management (Figure 2-31, Appendix A). Offer these tracts to qualified agencies or entities for management, transfer, or exchange. Tracts that are not in the process of being transferred or do not have a cooperative management agreement in place within 10 years of signing of the record of decision for this RMP would become available for disposal.	Allowable Use: Identify 12 tracts totaling 3,000 acres for cooperative management (Figure 2-32, Appendix A). Offer these tracts to qualified agencies or entities for management, transfer, or exchange. Tracts that are not in the process of being transferred or do not have a cooperative management agreement in place within 10 years of signing of the record of decision for this RMP would become available for disposal.	Allowable Use: Identify 13 tracts totaling 2,700 acres for cooperative management (Figure 2-33, Appendix A). Offer these tracts to qualified agencies or entities for management, transfer, or exchange. Tracts that are not in the process of being transferred or do not have a cooperative management agreement in place within 10 years of signing of the record of decision for this RMP would become available for disposal.
Action: *Retention Areas.* Identify the remaining public land (not identified for disposal) (1,035,900 acres) for retention (Figure 2-30, Appendix A).	Action: *Retention Areas.* Retain for long-term management the remaining public lands (not identified for disposal), totaling 1,043,300 acres (Figure 2-31, Appendix A).	Action: *Retention Areas.* Retain for long-term management the remaining public lands (not identified for disposal), totaling 1,055,800 acres (Figure 2-32, Appendix A).	Action: *Retention Areas.* Retain for long-term management the remaining public lands (not identified for disposal), totaling 1,040,700 acres (Figure 2-33, Appendix A).
Action: Consider land exchanges in retention areas on a case-by-case basis in order to meet resource objectives if the exchange is in the public interest and would: 1) improve management efficiency; or 2) result in the acquisition of private property with high resource values.			
Allocation: Identify 7,800 acres within the Grand Mesa Slopes Special Management Area (Figure 2-18, Appendix A) as available for exchanges with the City of Grand Junction or Town of Palisade.	Allocation: No similar allocation.		
Action: Consider applications in retention areas to meet community or organization needs under the R&PP Act in accordance with resource objectives.			

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-33: *Disposal Tracts.* Special design, construction, and implementation measures, including relocation of operations by more than 200 meters (656 feet), may be required on disposal tracts. (Refer to Appendix B.) See Figures 2-47 (Alternative B) and 2-49 (Alternative D) in Appendix A.	Action: No similar allowable use.	Allowable Use: Same as Alternative B.
Objective: Acquire lands or interests in lands through exchanges, purchases, easements, or donations to facilitate resource goals and objectives.			
Action: Consider acquisition of lands that meet the following criteria: • Private land within areas recommended as suitable for designation as wilderness; • Private land needed for management of Wild and Scenic Rivers; • Potential national or historic trails; • Potential natural or RNAs; • Potential areas for cultural or natural history designation; • Potential ACECs; • Private land within designated wild horse preserves; • Private land with potential for other congressional designations; • Threatened or endangered species habitat areas;	Action: Consider acquisition of lands that meet the following criteria: • Lands within or adjacent to WSAs; • Lands needed for management of Wild and Scenic Rivers; • National cultural, historic, or scenic trails and byways; • Areas for cultural, paleontological, or natural history designation; • Lands within or adjacent to ACECs; • Habitat for species of concern (including, but not limited to, special status species); • Lands that would help conserve, enhance, or restore sage-grouse habitat; • Lands within or adjacent to lands	Action: Consider acquisition of lands that meet the following criteria: • Same as Alternative B, plus the following: ○ Lands within or adjacent to wildlife emphasis areas; ○ Habitat for species of concern (including, but not limited to, special status species); ○ Big game critical and severe winter range; ○ Riparian areas; and ○ Valuable recreation areas.	Action: Consider acquisition of lands that meet the following criteria: • Lands within or adjacent to WSAs; and • Lands within or adjacent to ACECs.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
• Riparian habitat areas; • Valuable recreation areas; • Wetland areas as defined in Executive Order 11990, dated May 24, 1977; and • Floodplain areas (100-year) as defined in Executive Order 11988, dated May 24, 1977.	managed for wilderness characteristics; • Lands within or adjacent to the LBCWHR; • Lands within or adjacent to SRMAs; • Lands that provide public or administrative access; • Lands that consolidate BLM ownership and improve management efficiency; • Lands that meet the intent of the Land and Water Conservation Fund or Federal Land Transaction Facilitation Act; • Wetland areas as defined in Executive Order 11990, dated May 24, 1977; • Floodplain areas (100-year) as defined in Executive Order 11988, dated May 24, 1977; and • Other lands for other administrative purposes.		
Action: Manage lands or interests in acquired lands in a manner consistent with management of other public lands in the surrounding area.			
Objective: No similar objective in current RMP.	Objective: Meet resource and other agency needs by withdrawing lands from the public land laws or mining laws.		
Action: Continue to manage approximately 20,100 acres as withdrawn from mineral entry (Figure 2-54, Appendix A): • West Creek and the Unaweep Seep (1,500 acres) • Rough Canyon ACEC (2,700 acres) • Pup Tent Mine (1 acre)			

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

<table>
<tr><th>Alterative A (No Action)</th><th>Alternative B (Preferred)</th><th>Alternative C</th><th>Alternative D</th></tr>
<tr><td colspan="4">• Developed recreation sites
○ Mud Springs (40 acres)
○ Miracle Rock (50 acres)
• Grand Junction Regional Airport expansion withdrawal (2,100 acres)
• Department of Energy uranium withdrawal (5,800 acres)
• Existing Bureau of Reclamation (BOR) withdrawals (7,900 acres[1])

Also see Locatable Minerals section.
[1] Of the 7,900 acres of BOR withdrawals, 4,700 surface acres are managed by BOR and 3,200 surface acres are managed by BLM.</td></tr>
<tr><td colspan="4">Action:
Review withdrawals, as needed, and recommend their renewal, continuation, or termination. Continue all existing withdrawals initiated by other agencies unless the initiating agency requests that the withdrawal be terminated. Following revocation of a withdrawal and issuance of an opening order, manage the lands in a manner consistent with adjacent or comparable public land within the planning area.

Existing BOR withdrawals include:
• Grand Valley Project (2,400 acres);
• Grand Valley Salinity Unit, Colorado River Basin Salinity Control Project (900 acres);
• Collbran Project (1,000 acres);
• Dominguez Project (3,000 acres)*; and
• Horsethief State Wildlife Area (600 acres).

*Project not authorized for construction.</td></tr>
<tr><td>Action:
No similar action in current RMP.</td><td colspan="3">Action:
Recommend termination of the Dominguez Project withdrawal as requested by the BOR. Following termination of the withdrawal and issuance of an opening order, manage the lands in a manner consistent with adjacent or comparable public land within the planning area.</td></tr>
<tr><td>Action:
No similar action in current RMP.</td><td>Action:
Petition the Secretary of Interior for withdrawal of the following areas (20,700 acres) from mineral entry and close the area to mineral location and development (Figure 2-55, Appendix A):</td><td>Action:
Petition the Secretary of Interior for withdrawal of the following areas (45,100 acres) from mineral entry and close the area to mineral location and development (Figure 2-56, Appendix A):
• ACECs:</td><td>Action:
Petition the Secretary of Interior for withdrawal of the following areas (1,300 acres) from mineral entry and close the area to mineral location and development (Figure 2-57, Appendix A):</td></tr>
</table>

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	• ACECs: ○ Badger Wash; ○ Juanita Arch; ○ Mt. Garfield; ○ A portion of The Palisade (5,600 acres); ○ Pyramid Rock; ○ Sinbad Valley; • Recreation sites: ○ Campgrounds; ○ Target shooting zones; ○ Trailheads/picnic areas; and • Logan Wash Mine Site. Also see Locatable Minerals section.	○ Badger Wash; ○ Dolores River Riparian; ○ Juanita Arch; ○ Mt. Garfield; ○ Nine-mile Hill Boulders; ○ A portion of The Palisade (5,600 acres); ○ Pyramid Rock; ○ Reeder Mesa; and ○ Sinbad Valley; • East and West Creek (Unaweep Canyon); • Municipal watersheds (Grand Junction and Palisade); • Recreation sites: ○ Campgrounds; ○ Target shooting zones; and ○ Trailheads/picnic areas. Also see Locatable Minerals section.	• Pyramid Rock ACEC; and • Recreation sites ○ Campgrounds ○ Target shooting zones ○ Trailheads/picnic areas. Also see Locatable Minerals section.
Action: No similar current action.	Action: Consider disposal of any withdrawn lands only upon concurrence by the holding agency and revocation or modification of the withdrawal.		
Coal			
GOAL: Provide opportunities for environmentally sound exploration and development of coal resources.			
Objective: Maintain coal leasing, exploration, and development within the planning area while minimizing impacts to other resource values.			
Allowable Use: Within the coal resource development potential area, manage 300,700 acres* as acceptable for further coal leasing and development	Allowable Use: Within the coal resource development potential area, manage 253,400 acres* as acceptable for further coal leasing and	Allowable Use: Within the coal resource development potential area, manage 251,200 acres* as acceptable for further coal leasing and development per Screens 1 and 3, set	Allowable Use: Within the coal resource development potential area, manage 265,600 acres* as acceptable for further coal leasing and

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
per Screens 1 and 3, set forth in 43 CFR 3420.1. See Figure 2-34, Appendix A. *Acreage based off a maximum development depth of 1,500 feet.	development per Screens 1 and 3, set forth in 43 CFR 3420.1. See Figure 2-35, Appendix A. *Acreage based off a maximum development depth of 2,500 feet.	forth in 43 CFR 3420.1. See Figure 2-36, Appendix A. *Acreage based off a maximum development depth of 2,500 feet.	development per Screens 1 and 3, set forth in 43 CFR 3420.1. See Figure 2-37, Appendix A. *Acreage based off a maximum development depth of 2,500 feet.
Allowable Use: Manage areas identified in Screen 2 criteria, set forth in 43 CFR 3461.5, as acceptable for further consideration for coal leasing but unsuitable for surface mining or surface mining operations, and subject to the resource objectives outlined in the RMP (Appendix N, Coal Screening Criteria in the GJFO).			
Allowable Use: Manage 36,700 acres in the coal resource development potential area as unacceptable for further consideration of leasing and development per Screen 3, set forth in 43 CFR 3420.1 (Appendix N, Coal Screening Criteria in the GJFO). See Figure 2-34 in Appendix A): • Demaree Canyon WSA; and • Little Book Cliffs WSA.	Allowable Use: Manage 56,000 acres in the coal resource development potential area as unacceptable for further consideration of leasing and development per Screen 3, set forth in 43 CFR 3420.1 (Appendix N, Coal Screening Criteria in the GJFO). See Figure 2-35 in Appendix A): • Same as Alternative A, plus the following: ○ Colorado River corridor; and ○ The Grand Junction and Palisade municipal watersheds.	Allowable Use: Manage 58,200 acres in the coal resource development potential area as unacceptable for further consideration of leasing and development per Screen 3, set forth in 43 CFR 3420.1 (Appendix N, Coal Screening Criteria in the GJFO). See Figure 2-36 in Appendix A): • Same as Alternative A, plus the following: ○ Colorado River Corridor; ○ The Grand Junction and Palisade municipal watersheds; ○ Mesa/Powderhorn source water protection area; ○ Plateau Creek ACEC; ○ Pyramid Rock ACEC; and ○ Roan Creek WSR segment.	Allowable Use: Manage 43,800 acres in the coal resource development potential area as unacceptable for further consideration of leasing and development per Screen 3, set forth in 43 CFR 3420.1 (Appendix N, Coal Screening Criteria in the GJFO). See Figure 2-37 in Appendix A): • Same as Alternative A.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: Apply special conditions that must be met during more-detailed planning, lease sale, or post-lease activities, including measures required to protect other resource values, as outlined in Appendix B (Stipulations Applicable to Fluid Mineral Leasing and Other Surface-disturbing Activities) and Appendix H (Best Management Practices and Standard Operating Procedures).		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-34 (CSU CO-25): *Federally Leased Coal.* Where applicable, apply CSU (site-specific relocation) restrictions to oil and gas operations within the area of federally leased coal. Relocate oil and gas operations outside the area to be mined or locate to accommodate room and pillar mining operations. (Refer to Appendix B.) See Figures 2-47 (Alternative B), 2-48 (Alternative C), and 2-49 (Alternative D) in Appendix A.		
Fluid Minerals (Oil and Gas, Geothermal, and Oil Shale Resources)			
GOAL: Provide opportunities for environmentally responsible exploration and development of fluid mineral resources subject to appropriate BLM policies, laws, and regulations. Establish conditions of use to protect other resource values.			
Oil and Gas and Geothermal Resources			
Objective: Make federal oil and gas resources available for leasing, except where prohibited by law or where administrative action is justified in the national interest. Make public land available for economically and environmentally sound exploration and development projects. Allow geothermal leasing on a case-by-case basis, using the oil and gas leasing designations as a guide for geothermal resources.	Objective: Facilitate orderly, economic, and environmentally sound exploration and development of oil and gas and geothermal resources, using the best available technology.		
Action: Lease Notices (all Lease Notices): Use a Lease Notice to alert oil and gas and geothermal lessees of special inventory requirements or reporting requirements in certain areas to protect resources. (Refer to Appendix B.)			
Action: No similar action in current RMP.	Action: Apply lease stipulations and lease notices to all new leases.		
Action: No similar action in current RMP.	Action: BLM has the discretion to modify surface operations to change or add specific mitigation measures when supported by scientific analysis. All mitigation/conservation measures not already required as stipulations would be analyzed in a site-specific NEPA document, and be incorporated, as appropriate, into COAs of the permit, plan of development, and/or other use authorizations.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: Develop and apply COAs for authorizations such as, but not limited to, applications for permit to drill, sundry notices, and geophysical exploration to supplement regulation and policy, provided the COAs are consistent with lease rights granted.			
Action: In areas being actively developed, the operator would be encouraged to submit a Master Development Plan (formerly known as Geographic Area Proposal) that describes a minimum of two to three years activity for operator-controlled federal leases within a reasonable geographic area (to be determined jointly with BLM). Use the Master Development Plan to plan development of federal leases within the area to account for well locations, roads, and pipelines, and to identify cumulative environmental effects and appropriate mitigation. The extent of the analysis would be dependent on the extent of surface ownership, extent of lease holdings, topography, access, and resource concerns. This requirement for a Master Development Plan may be waived for individual or small groups of exploratory wells, for directional wells drilled on previously developed well pads.			
Action: No similar action in current RMP.	Action: Require proper containment and prompt removal of refuse to avoid attracting predators.		Action: No similar action.
Action: No similar action in current RMP.	Action: Resource condition objectives identified in this RMP would guide reclamation activities of areas that are currently under development and areas to be developed prior to their abandonment.		
Allowable Use: **Leasing:** Place 1,134,600 acres of the federal mineral estate in the open leasing category: • BLM surface/federal minerals: 964,800 acres (Figure 2-38, Appendix A) • Private and State surface/federal fluid mineral estate: 169,800 acres.	Allowable Use: **Leasing:** Manage 1,028,800 acres of the federal mineral estate as open to fluid mineral leasing and geophysical exploration: • BLM surface/federal minerals: 878,700 acres (Figure 2-39, Appendix A) • Private and State surface/federal fluid mineral estate: 150,100 acres	Allowable Use: **Leasing:** Manage 607,600 acres of the federal mineral estate as open to fluid mineral leasing and geophysical exploration: • BLM surface/federal minerals 506,700 acres (Figure 2-40, Appendix A) • Private and State surface/federal fluid mineral estate: 100,900 acres	Allowable Use: **Leasing:** Manage 1,133,700 acres of the federal mineral estate as open to fluid mineral leasing and geophysical exploration: • BLM surface/federal minerals 961,400 acres (Figure 2-41, Appendix A) • Private and State surface/federal fluid mineral estate: 169,300 acres
Allowable Use: **No Leasing:** *BLM surface/federal minerals.* Manage 96,500 acres of the federal mineral estate underlying BLM surface as closed to fluid mineral leasing and geophysical exploration.	Allowable Use: **No Leasing:** *BLM surface/federal minerals.* Manage 182,700 acres of the federal mineral estate underlying BLM surface as closed to fluid mineral leasing and geophysical	Allowable Use: **No Leasing:** *BLM surface/federal minerals.* Manage 554,700 acres of the federal mineral estate underlying BLM surface as closed to fluid mineral leasing and geophysical exploration. (Refer to	Allowable Use: **No Leasing:** *BLM surface/federal minerals.* Manage 100,000 acres of the federal mineral estate underlying BLM surface as closed to fluid mineral leasing and geophysical

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
(Refer to Appendix B.) See Figure 2-38 in Appendix A: • Unaweep Seep ACEC; and • WSAs.	exploration. (Refer to Appendix B.) See Figure 2-39 in Appendix A: • Same as Alternative A, plus the following: ○ Occupied Gunnison sage-grouse habitat; ○ ACECs: ▪ Badger Wash (1,700 acres) ▪ Dolores River Riparian (7,400 acres) ▪ Juanita Arch (1,600 acres) ▪ The Palisade (32,200 acres) ▪ Rough Canyon (2,800 acres) ▪ Sinbad Valley (6,400 acres) ○ Lands managed for wilderness characteristics (24,400 acres) ○ SRMAs: ▪ Bangs (17,300 acres) ▪ Dolores River Canyon (16,900 acres) ○ Watersheds: ▪ Grand Junction (1,900 acres) ▪ Palisade (5,200 acres)	Appendix B.) See Figure 2-40 in Appendix A: • Same as Alternative A, plus the following: ○ Occupied Gunnison and greater sage-grouse habitat ○ ACECs: ▪ Atwell Gulch (6,100 acres) ▪ Badger Wash (2,200 acres) ▪ Dolores River Riparian (7,400 acres) ▪ Glade Park – Pinyon Mesa (27,200 acres) ▪ John Brown Canyon (1,400 acres) ▪ Juanita Arch (1,600 acres) ▪ Mt. Garfield (5,700 acres) ▪ The Palisade (32,200 acres) ▪ Prairie Canyon (6,900 acres) ▪ Pyramid Rock (1,300 acres) ▪ Roan and Carr Creek (33,600 acres) ▪ Rough Canyon (2,800 acres) ▪ Sinbad Valley (6,400 acres) ▪ South Shale Ridge (28,200 acres) ○ Lands managed for wilderness characteristics (171,200 acres) ○ Wildlife Emphasis Areas: ▪ Beehive (4,700 acres) ▪ Blue Mesa (9,300 acres) ▪ Bull Hill (4,800 acres) ▪ Casto (4,200 acres) ▪ East Salt Creek (26,100 acres)	exploration. (Refer to Appendix B.) See Figure 2-41 in Appendix A: • Same as Alternative A, plus the following: ○ BOR withdrawals where the surface is managed by BLM.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
		▪ Indian Point (11,400 acres) ▪ Prairie Canyon (15,300 acres) ▪ Rapid Creek (28,600 acres) ▪ South Shale Ridge (3,500 acres) ▪ Timber Ridge (11,900 acres) ○ SRMAs: ▪ Bangs (17,300 acres) ▪ North Fruita Desert (RMZ 1) (23,800 acres) ○ LBCWHR (35,200 acres) ○ Watersheds: ▪ Collbran source water protection area (2,100 acres) ▪ Grand Junction (1,900 acres) ▪ Jerry Creek (2,200 acres) ▪ Mesa/Powderhorn source water protection area (15,300 acres) ▪ Palisade (5,200 acres)	
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **No Leasing:** *Split-estate.* Manage 19,700 acres of Private and State surface/federal fluid mineral estate as closed to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-39 in Appendix A: • City of Grand Junction Municipal Watershed (1,300 acres); • Palisade Municipal Watershed (7,100 acres); and • Occupied Gunnison sage-grouse habitat (12,700 acres).	Allowable Use: **No Leasing:** *Split-estate.* Manage 68,900 acres of Private and State surface/federal fluid mineral estate as closed to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-40 in Appendix A: • City of Grand Junction Municipal Watershed (1,300 acres); • Palisade Municipal Watershed (7,100 acres); • Occupied Gunnison and greater sage-grouse habitat (28,600 acres); • Dolores River Corridor (5,600 acres);	Allowable Use: **No Leasing:** *Split-estate.* Manage 500 acres of Private and State surface/federal fluid mineral estate as closed to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-41 in Appendix A: • A portion of BOR withdrawals (500 acres)

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
		• Glade Park (600 acres); • Bangs Canyon (700 acres); • Chalk Mountain (1,200 acres); • Sunnyside (100 acres); • Plateau Creek (200 acres); • Atwell Gulch (700 acres); • Hunter Canyon (600 acres); • Prairie Canyon (600 acres); • Collbran sourcewater protection area (14,100 acres) • Mesa/Powderhorn sourcewater protection area (15,300 acres); • Horsethief Canyon State Wildlife Area (530 acres); • Jerry Creek Reservoir State Wildlife Area (490 acres); • Plateau Creek State Wildlife Area (300 acres); • Highline State Park (350 acres); and • Vega State Park (470 acres).	
Allowable Use: **STIPULATION** *NSO-1: No Surface Occupancy (State Wildlife Areas)*. Prohibit occupancy and other activities in the following areas (Refer to Appendix B.) See Figure 2-42 in Appendix A: • Highline Reservoir recreation site (1,800 acres) • Horsethief Canyon (1,300 acres) • Jerry Creek Reservoir (7,200 acres)	Allowable Use: **STIPULATION** NSO-33: *Jerry Creek Reservoir, Plateau Creek, and Horsethief Canyon State Wildlife Areas, and Highline and Vega State Parks.* Prohibit surface occupancy and surface-disturbing activities in areas where BLM manages the fluid mineral rights under the following state wildlife areas and state parks (Refer to Appendix B.) See Figure 2-	Allowable Use: No similar allowable use.	

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
• Vega Reservoir Recreation Site (1,980* acres) *Acreage includes surface water resources.	43 in Appendix A: • Horsethief Canyon State Wildlife Area (1,400 acres) • Jerry Creek Reservoir State Wildlife Area (870 acres) • Plateau Creek State Wildlife Area (1,400 acres) • Highline State Park (350 acres) • Vega State Park (2,000 acres)		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: Where drainage is likely, the BLM may issue new leases with an NSO stipulation with appropriate exception, waiver, and modification criteria.		
Allowable Use: STIPULATION *NSO* (all NSOs): Apply major constraints (NSO/no surface-disturbing activities) to 433,000 acres that are open to fluid mineral leasing and geophysical exploration. Lease areas with fluid minerals NSO stipulations to protect resources (Refer to Appendix B): • BLM surface/federal minerals: 433,000 acres (Figure 2-42, Appendix A) • Private and State surface/federal fluid mineral estate: 0 acres.	Allowable Use: STIPULATION *NSO* (all NSOs): Apply major constraints (NSO/no surface-disturbing activities) to 429,100 acres that are open to fluid mineral leasing and geophysical exploration. Lease areas with fluid minerals NSO stipulations to protect resources (Refer to Appendix B): • BLM surface/federal minerals: 382,200 acres (Figure 2-43, Appendix A) • Private and State surface/federal fluid mineral estate: 46,900 acres.	Allowable Use: STIPULATION *NSO* (all NSOs): Apply major constraints (NSO/no surface-disturbing activities) to 302,900 acres that are open to fluid mineral leasing and geophysical exploration. Lease areas with fluid minerals NSO stipulations to protect resources (Refer to Appendix B): • BLM surface/federal minerals: 266,300 acres (Figure 2-44, Appendix A) • Private and State surface/federal fluid mineral estate: 36,600 acres.	Allowable Use: STIPULATION *NSO* (all NSOs): Apply major constraints (NSO/no surface-disturbing activities) to 400,900 acres that are open to fluid mineral leasing and geophysical exploration. Lease areas with fluid minerals NSO stipulations to protect resources (Refer to Appendix B): • BLM surface/federal minerals: 349,700 acres (Figure 2-45, Appendix A) • Private and State surface/federal fluid mineral estate: 51,200 acres.
Allowable Use: STIPULATION *CSU* (all CSUs): Apply moderate constraints (CSUs) to 74,100 acres that are open to fluid mineral leasing and geophysical	Allowable Use: STIPULATION *CSU* (all CSUs): Apply moderate constraints (CSUs) to 563,500 acres that are open to fluid mineral leasing and geophysical	Allowable Use: STIPULATION *CSU* (all CSUs): Apply moderate constraints (CSUs) to 326,800 acres that are open to fluid mineral leasing and geophysical exploration. Lease	Allowable Use: STIPULATION *CSU* (all CSUs): Apply moderate constraints (CSUs) to 445,800 acres that are open to fluid mineral leasing and geophysical

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
exploration. Lease areas with CSU stipulations to protect resources (Refer to Appendix B): • BLM surface/federal minerals: 74,100 acres (Figure 2-46, Appendix A) • Private and State surface/federal fluid mineral estate: 0 acres.	exploration. Lease areas with CSU stipulations to protect resources (Refer to Appendix B): • BLM surface/federal minerals: 527,500 acres (Figure 2-47, Appendix A) • Private and State surface/federal fluid mineral estate: 36,000 acres.	areas with CSU stipulations to protect resources (Refer to Appendix B): • BLM surface/federal minerals: 303,500 acres (Figure 2-48, Appendix A) • Private and State surface/federal fluid mineral estate: 23,300 acres.	exploration. Lease areas with CSU stipulations to protect resources (Refer to Appendix B): • BLM surface/federal minerals: 433,000 acres (Figure 2-49, Appendix A) • Private and State surface/federal fluid mineral estate: 12,800 acres.
Allowable Use: STIPULATION *TL* (all TLs): Apply moderate constraints (TLs) to 233,000 acres that are open to fluid mineral leasing and geophysical exploration. Lease areas with TL stipulations to protect resources (Refer to Appendix B): • BLM surface/federal minerals: 233,000 acres (Figure 2-50, Appendix A) • Private and State surface/federal fluid mineral estate: 0 acres.	Allowable Use: STIPULATION *TL* (all TLs): Apply moderate constraints (TLs) to 401,600 acres that are open to fluid mineral leasing and geophysical exploration. Lease areas with TL stipulations to protect resources (Refer to Appendix B): • BLM surface/federal minerals: 349,400 acres (Figure 2-51, Appendix A) • Private and State surface/federal fluid mineral estate: 52,200 acres.	Allowable Use: STIPULATION *TL* (all TLs): Apply moderate constraints (TLs) to 241,600 acres that are open to fluid mineral leasing and geophysical exploration. Lease areas with TL stipulations to protect resources (Refer to Appendix B): • BLM surface/federal minerals: 197,600 acres (Figure 2-52, Appendix A) • Private and State surface/federal fluid mineral estate: 44,000 acres.	Allowable Use: STIPULATION *TL* (all TLs): Apply moderate constraints (TLs) to 438,700 acres that are open to fluid mineral leasing and geophysical exploration. Lease areas with TL stipulations to protect resources (Refer to Appendix B): • BLM surface/federal minerals: 405,900 acres (Figure 2-53, Appendix A) • Private and State surface/federal fluid mineral estate: 32,800 acres.
Oil Shale			
Objective: Maintain opportunities to lease oil shale with further NEPA analysis while minimizing impacts to other resources.			
Allowable Use: Accept applications to lease oil shale on 560 acres of the federal mineral estate within the GJFO, as identified in the *Approved Resource Management Plan Amendments/ROD for Oil Shale and Tar Sands Resources to Address Land Use Allocations in Colorado, Utah, and Wyoming and Final Programmatic Environmental Impact Statement* (BLM 2008c). See Figure 2-90 in Appendix A. Other decisions related to oil shale leasing made in the *Oil Shale and Tar Sands PEIS* (BLM 2008) are also incorporated here by reference. These decisions are currently being revisited by the BLM in a programmatic planning process and any additional decisions would be adopted by this RMP, as applicable.			
Allowable Use: Applications for commercial leases using surface mining technologies would not be permitted.			

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: Accept applications for commercial leasing using underground mining technologies. The BLM would then publish a notice in the Federal Register. Prior to making any leasing decision, the BLM would conduct site specific NEPA analysis and assess the conformance of leasing with this RMP. If the application is not in conformance with the RMP, then a plan amendment would be required.			
Action: Consider and give priority to the use of land exchanges, where appropriate and feasible, to consolidate land ownership and mineral interests within the oil shale basins.		Action: No similar action.	Action: Same as Alternative A.
Locatable Minerals, Mineral Materials, and Non-energy Leasable Minerals			
GOAL: Provide opportunities to develop locatable minerals, mineral materials, and non-energy leasable minerals consistent with other resource goals and uses to meet local and national energy and mineral needs.			
Locatable Minerals			
Objective: Make public land available for exploration and development under the general mining laws unless otherwise withdrawn from mineral entry to protect other resources.	Objective: Facilitate environmentally responsible exploration and development of locatable minerals subject to BLM policies, laws, and regulations.		
Action: Allow mineral exploration and development (locatable minerals) under the General Mining Law of 1872 on all BLM-administered lands unless it is proposed for administrative withdrawal or wilderness designation. Regulate locatable mineral exploration and development on BLM land under 43 CFR 3800. Open all surface estate (1,061,400 acres), except the withdrawn areas identified below, to location of mining claims activity (Figure 2-54, Appendix A).			

Allowable Use:
Maintain the following areas as withdrawn from mineral entry, per the Secretary of the Interior:
• West Creek and the Unaweep Seep (1,500 acres)
• Rough Canyon ACEC (2,700 acres)
• Pup Tent Mine (1 acre)
• Developed recreation sites
  ○ Mud Springs (40 acres)
  ○ Miracle Rock (50 acres)
• Grand Junction Regional Airport expansion withdrawal (2,100 acres)			

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
• Existing BOR withdrawals (7,900 acres) Also see Lands and Realty section.			
Allowable Use: No similar allowable use in current RMP.	Action: Petition to the Secretary of the Interior for withdrawal of the following areas (15,200 acres) from mineral entry (Figure 2-55, Appendix A): • ACECs: ○ Badger Wash; ○ Juanita Arch; ○ Mt. Garfield; ○ A portion of The Palisade (5,600 acres); ○ Pyramid Rock; ○ Sinbad Valley; • Recreation sites: ○ Campgrounds; ○ Target shooting zones; ○ Trailheads/picnic areas; and • Logan Wash Mine Site. Also see Lands and Realty section.	Action: Petition to the Secretary of the Interior for withdrawal of the following areas (45,400 acres) from mineral entry (Figure 2-56, Appendix A): • ACECs: ○ Badger Wash; ○ Dolores River Riparian; ○ Juanita Arch; ○ Mt. Garfield; ○ Nine-mile Hill Boulders; ○ A portion of The Palisade (5,600 acres); ○ Pyramid Rock; ○ Reeder Mesa; and ○ Sinbad Valley; • East and West Creek (Unaweep Canyon); • Municipal watersheds (Grand Junction and Palisade); • Recreation sites: ○ Campgrounds; ○ Target shooting zones; and ○ Trailheads/picnic areas. Also see Lands and Realty section.	Action: Petition to the Secretary of the Interior for withdrawal of the following areas (1,300 acres) from mineral entry (Figure 2-57, Appendix A): • Pyramid Rock ACEC; and • Recreation sites: ○ Campgrounds; ○ Target shooting zones; ○ Trailheads/picnic areas. Also see Lands and Realty section.
Action: No similar action in current RMP.	Action: Petition lands for withdrawal from locatable mineral development on a case-by-case basis for the protection of important resource values. The size of any mineral withdrawal would be commensurate with what is desirable to protect the values requiring the withdrawal.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Mineral Materials (Salable Minerals)			
Objective: Make areas available for the disposal of mineral material (salable minerals) while protecting other resource values.	Objective: Manage mineral material (salable minerals) resources to provide for the needs of individuals, municipalities, and businesses while ensuring compatibility with other resource objectives.		
Action: No similar action in current RMP.	Action: Identify additional common use areas in locations and sizes to meet the existing and reasonably foreseeable demand for the commodity(ies) available at each site, where compatible with resource objectives.		
Action: No similar action in current RMP.	Action: Prohibit commercial sales of petrified wood products due to limited availability of such resources.		
Action: No similar action in current RMP.	Action: Permit future common use areas where compatible with resource objectives. Establish sites in appropriate locations and with sufficient capacity while avoiding a proliferation of sites for similar materials in a given area.		
Action: Maintain designated bentonite common use area on Little Park Road.		Action: Close the bentonite common use area on Little Park Road.	Action: Same as Alternative A.
Allowable Use: Allow disposal of mineral material (salable minerals) on public land not closed to such development (787,100 acres). (Figure 2-58, Appendix A)	Allowable Use: Identify 809,000 acres as open for consideration for mineral material disposal on a case-by-case basis. (Figure 2-59, Appendix A)	Allowable Use: Identify 609,400 acres as open for consideration for mineral material disposal on a case-by-case basis. (Figure 2-60, Appendix A)	Allowable Use: Identify 906,100 acres as open for consideration for mineral material disposal on a case-by-case basis. (Figure 2-61, Appendix A)
Allowable Use: Close 274,300 acres to mineral material disposal (Figure 2-58, Appendix A): • Badger Wash hydrologic research area; • Grand Junction municipal watershed; • Jerry Creek Reservoirs; • Baxter/Douglas soil slump hazard	Allowable Use: Close 252,400 acres to mineral material disposal (Figure 2-59, Appendix A): • Colorado, Dolores, and Gunnison River Corridors; • WSAs; • ACECs; • Lands managed for wilderness characteristics;	Allowable Use: Close 452,000 acres to mineral material disposal (Figure 2-60, Appendix A): • Colorado, Dolores, and Gunnison River Corridors; • WSAs; • ACECs; • Lands managed for wilderness characteristics; and • SRMAs.	Allowable Use: Close 155,300 acres to mineral material disposal (Figure 2-61, Appendix A): • Colorado, Dolores, and Gunnison River Corridors; • WSAs; • ACECs; • SRMAs: ○ Bangs;

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
area; • Plateau Creek soil slump hazard area; • Elk calving area; • Unaweep Seep; • Pyramid Rock; • Little Book Cliffs Wild Horse Range; • Cultural sites; • Recreation sites and VRM Class II areas; • Areas recommended for wilderness designation; and • Utility corridors.	• SRMAs: ○ Bangs; ○ Dolores River(exception for area near Niche Road); and ○ North Fruita Desert (RMZ 1).		○ Castle Rock; ○ Gunnison River Bluffs; ○ North Fruita Desert (RMZ 1); and ○ Palisade Rims.
Non-energy Leasable Minerals			
Objective: No similar objective in current RMP.	Objective: Provide opportunities for non-energy leasable exploration and/or development subject to standard stipulations (e.g., NSO, CSU, TL).		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: Identify 567,500 acres as open for consideration of non-energy leasable mineral exploration and/or development (e.g., potash), subject to stipulations in Appendix B (Figure 2-62, Appendix A).	Allowable Use: Identify 298,600 acres as open for consideration of non-energy leasable mineral exploration and/or development (e.g., potash), subject to stipulations in Appendix B (Figure 2-63, Appendix A).	Allowable Use: Identify 925,400 acres as open for consideration of non-energy leasable mineral exploration and/or development (e.g., potash), subject to stipulations in Appendix B (Figure 2-64, Appendix A).
Allowable Use: No similar allowable use in current RMP.	Allowable Use: Close 493,900 acres in the following areas to non-energy leasable mineral exploration and/or development (Figure 2-62, Appendix A): • WSAs	Allowable Use: Close 762,900 acres in the following areas to non-energy leasable mineral exploration and/or development (Figure 2-63, Appendix A): • WSAs • ACECs	Allowable Use: Close 136,000 acres in the following areas to non-energy leasable mineral exploration and/or development (Figure 2-64, Appendix A): • WSAs

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	• ACECs • Occupied Gunnison sage-grouse habitat • Lands managed for wilderness characteristics • LBCWHR • SRMAs • Wildlife Emphasis Areas: ○ Blue Mesa ○ Bull Hill ○ Glade Park ○ Timber Ridge • Watersheds: ○ Grand Junction ○ Palisade • VRM Class I and II areas	• All occupied sage-grouse habitat • Lands managed for wilderness characteristics • LBCWHR • SRMAs • Wildlife Emphasis Areas: ○ Beehive ○ Blue Mesa ○ Bull Hill ○ Casto ○ East Salt Creek ○ Indian Point ○ Prairie Canyon ○ Rapid Creek ○ South Shale Ridge ○ Timber Ridge • Watersheds: ○ Collbran source water protection area ○ Grand Junction ○ Mesa/Powderhorn source water protection area ○ Palisade ○ Jerry Creek • VRM Class I and II areas	• ACECs • SRMAs: ○ Gunnison River Bluffs ○ Palisade Rims
Action: No similar action in current RMP.	Action: Issue prospecting permits in areas where potash values are not known, which could lead to issuance of a preference right lease.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
SPECIAL DESIGNATIONS			
Areas of Critical Environmental Concern (Administrative Designation)			
GOAL: Manage ACECs to protect significant resource values and prevent damage to important natural, biological, cultural, recreational, or scenic resources and values, or to protect life and safety from natural hazards.			
Objective: Continue to manage those areas within the GJFO that require some special management and that meet the criteria for ACEC designation.			
Action: Continue to manage the following areas as ACECs and as either RNAs or ONAs (28,900 acres) (Figure 2-65, Appendix A): • Badger Wash (1,900 acres); • The Palisade (23,600 acres); • Pyramid Rock (550 acres); • Rough Canyon (2,700 acres); and • Unaweep Seep (80 acres).	Action: Designate the following areas as ACECs (106,000 acres). (Figure 2-66, Appendix A): • Atwell Gulch (2,900 acres); • Badger Wash (2,200 acres); • Dolores River Riparian (7,400 acres); • Indian Creek (1,700 acres); • Juanita Arch (1,600 acres); • Mt. Garfield (3,500 acres) • The Palisade (32,200 acres); • Pyramid Rock (1,300 acres); • Roan and Carr Creeks (15,700 acres); • Rough Canyon (2,800 acres); • Sinbad Valley (6,400 acres); • South Shale Ridge (28,200 acres); and • Unaweep Seep (85 acres).	Action: Designate the following areas as ACECs (168,000 acres). (Figure 2-67, Appendix A): • Atwell Gulch (6,100 acres); • Badger Wash (2,200 acres); • Colorado River Riparian (880 acres); • Coon Creek (110 acres); • Dolores River Riparian (7,400 acres); • Glade Park–Pinyon Mesa (27,200 acres); • Gunnison River Riparian (460 acres); • Hawxhurst Creek (860 acres); • Indian Creek (1,700 acres); • John Brown Canyon (1,400 acres); • Juanita Arch (1,600 acres); • Mt. Garfield (5,700 acres); • Nine-mile Hill Boulders (90 acres); • The Palisade (32,200 acres); • Plateau Creek (220 acres); • Prairie Canyon (6,900 acres); • Pyramid Rock (1,300 acres); • Reeder Mesa (470 acres); • Roan and Carr Creeks (33,600 acres); • Rough Canyon (2,800 acres);	Action: Designate the following areas as ACECs (33,200 acres). (Figure 2-68, Appendix A): • Badger Wash (2,200 acres); • The Palisade (26,900 acres); • Pyramid Rock (1,300 acres); • Rough Canyon (2,700 acres); and • Unaweep Seep (80 acres).

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
		• Sinbad Valley (6,400 acres); and • South Shale Ridge (28,200 acres); • Unaweep Seep (85 acres).	
Allowable Use No similar allowable use in current RMP.	Allowable Use: Close all ACECs to mineral material disposal and non-energy solid leasable mineral exploration and development.		
Allowable Use No similar allowable use in current RMP.	Allowable Use: Close all ACECs to wood product sales and/or harvest, including Christmas tree cutting.		
Atwell Gulch			
Action: No similar action in current RMP.	Action: Designate the Atwell Gulch ACEC (2,900 acres) to protect rare plants, cultural resources, scenic values, and wildlife habitat. Management actions include the following: • Manage as VRM Class II. • Close to motorized travel, including over-snow motorized travel. • Close to mechanized travel. • Issue no SRPs for competitive events. • Close 2,600 acres to livestock grazing (approximately 250 acres would remain unallotted). • Manage 2,600 acres as a ROW exclusion area. • Manage 260 acres as a ROW avoidance area for natural gas pipelines, water pipelines, and produced water pipelines.	Action: Designate the Atwell Gulch ACEC (6,100 acres) to protect rare plants, cultural resources, scenic values, and wildlife habitat. Management actions are the same as Alternative B, plus the following: • Close to motorized travel, including over-snow motorized travel, except for Sunnyside Road. • Close to mechanized travel, except for Sunnyside Road. • Close 2,900 acres to livestock grazing (approximately 700 acres would remain unallotted). • Open 2,500 acres to livestock grazing. • Manage 5,900 acres as a ROW exclusion area. • Manage 260 acres as a ROW avoidance area for natural gas pipelines, water pipelines, and produced water pipelines. • **No Leasing:** *ACECs.* Close to fluid mineral leasing and geophysical	Action: No similar action.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	• Only allow vegetation treatments for the benefit of the identified relevant and important values. • Close to fossil collection. • Allowable Use: **STIPULATION** NSO-12: *ACECs*. Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figure 2-43, Appendix A.	exploration. (Refer to Appendix B.) See Figure 2-40, Appendix A.	
Badger Wash			
Action: Continue to manage the Badger Wash ACEC (1,900 acres) to protect rare plants and use as a hydrologic study area. Management actions include the following: • Manage the hydrologic study area (685 acres) as unsuitable for ROWs. • No new roads may be built in conjunction with pipeline ROWs. • Classify as *limited to designated routes*. • ROWs will not be cleared. • No construction or maintenance activities will be performed in the spring thaw. • All surface use plans would be developed jointly by BLM, United States Geological Survey (USGS), and the proponent. • Close a portion of the paired study	Action: Designate the Badger Wash ACEC (2,200 acres) to protect rare plants and use as a hydrologic study area. Management actions include the following: • Manage as VRM Class III. • Classify as *limited to designated routes*. • Issue no SRPs for competitive events. • Close to grazing in the paired study watersheds (1,800 acres). • Open to grazing outside of the paired watersheds (400 acres). • Manage the paired watersheds (1,800 acres) as a ROW exclusion area. • Manage 400 acres as ROW avoidance areas. • Petition to the Secretary of the Interior for withdrawal from	Action: Designate the Badger Wash ACEC (2,200 acres) to protect rare plants and use as a hydrologic study area. Management actions include the following: • Manage as VRM Class II. • Classify as *limited to designated routes*. Existing roads within the paired study watershed (1,800 acres) would be closed and reclaimed (re-contouring and reseeding). • Issue no SRPs for competitive events. • Close to grazing in the paired watersheds (1,800 acres). • Open to grazing outside of the paired watersheds (400 acres). • Manage 1,800 acres as a ROW exclusion area. • Manage 400 acres as ROW avoidance areas. • Petition to the Secretary of the Interior for withdrawal from mineral entry.	Action: Designate the Badger Wash ACEC (2,200 acres) to protect rare plants and use as a hydrologic study area. Management actions include the following: • Manage as VRM Class IV. • Classify as *limited to designated routes*. Existing roads within the paired study watersheds (1,800 acres) would be closed and reclaimed (re-contouring and reseeding). • Close to grazing in the paired watersheds (1,800 acres). • Open to grazing outside of the paired watersheds (400 acres). • Manage 1,800 acres as a ROW exclusion area. • Manage 400 acres as ROW avoidance areas. • Allowable Use: **STIPULATION**

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
watersheds to grazing (186 acres). • Open to grazing outside of the paired watersheds (400 acres). • Close the hydrologic study area (685 acres) to mineral material disposal. • Allowable Use: **STIPULATION** *NSO-1: No Surface Occupancy (ACECs).* Prohibit surface occupancy and surface-disturbing activities in the hydrologic study area (700 acres). (Refer to Appendix B.) See Figure 2-42, Appendix A.	mineral entry. • **No Leasing:** *ACECs.* Close to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-39, Appendix A. • Allowable Use: **STIPULATION**: NSO-12: *ACECs*. Prohibit surface occupancy and surface-disturbing activities. See Figure 2-43, Appendix A.	• **No Leasing:** *ACECs.* Close to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-40, Appendix A. • Allowable Use: **STIPULATION** NSO-12: *ACECs.* Prohibit surface occupancy and surface-disturbing activities. See Figure 2-44, Appendix A.	NSO-12: *ACECs*. Prohibit surface occupancy and surface-disturbing activities within the paired study watersheds (1,800 acres). See Figure 2-45, Appendix A.
Colorado River Riparian			
Action: No similar action in current RMP.	Action: No similar action.	Action: Designate the Colorado River Riparian ACEC (880 acres) to protect unique fish, wildlife, scenic values, riparian habitat, and plants. Management actions include the following: • Manage as VRM Class II. • Classify as *limited to designated routes*. • Only allow vegetation treatments for the benefit of the identified relevant and important values. • Manage as a ROW avoidance area. • Classify as unsuitable for coal leasing. • Allowable Use: **STIPULATION** NSO-12: *ACECs*. Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figure 2-44, Appendix A.	Action: No similar action.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Coon Creek			
Action: No similar action in current RMP.	Action: No similar action.	Action: Designate the Coon Creek ACEC (110 acres) to protect from loss of riparian habitat and fisheries values. Management actions include the following: • Manage as VRM Class III. • Classify as *limited to designated routes*. • Manage as ROW avoidance area. • Close to livestock grazing. • Allowable Use: **STIPULATION** NSO-12: *ACECs*. Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figure 2-44, Appendix A.	Action: No similar action.
Dolores River Riparian			
Action: No similar action in current RMP.	Action: Designate the Dolores River Riparian ACEC (7,400 acres) to protect riparian, hydrology, scenic and paleontological resources, and special status species. Management actions include the following: • Manage as VRM Class II. • Manage as ROW avoidance area. • Only allow vegetation treatments for the benefit of the identified relevant and important values. • Classify as *limited to designated routes.* • Only allow camping in designated sites.	Action: Designate the Dolores River Riparian ACEC (7,400 acres) to protect riparian, hydrology, scenic and paleontological resources, and special status species. Management actions are the same as for Alternative B, plus: • Petition to the Secretary of the Interior for withdrawal from mineral entry.	Action: No similar action.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	• Open to livestock grazing. • Close to recreational placer mining. • **No Leasing:** *ACECs.* Close to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-39, Appendix A. • Allowable Use: **STIPULATION** NSO-12: *ACECs*. Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figure 2-43, Appendix A.		
Glade Park–Pinyon Mesa			
Action: No similar action in current RMP.	Action: No similar action.	Action: Designate the Glade Park-Pinyon Mesa ACEC (27,200 acres) to protect occupied Gunnison sage-grouse habitat. Management actions include the following: • Manage as VRM Class II. • Manage as ROW avoidance area. • Classify as *limited to designated routes*. • Only allow vegetation treatments and wildlife habitat improvements for the benefit of the identified relevant and important values. • Open to livestock grazing outside of occupied sage-grouse habitat. • **No Leasing:** *ACECs.* Close to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-40, Appendix A.	Action: No similar action.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
		• Allowable Use: **STIPULATION** NSO-12: *ACECs*. Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figure 2-44, Appendix A.	
Gunnison River Riparian			
Action: No similar action in current RMP.	Action: No similar action.	Action: Designate the Gunnison River Riparian ACEC (460 acres) to protect riparian and fisheries values. Management actions include the following: • Manage as VRM Class II. • Classify as *limited to designated routes*. • Only allow camping in designated sites. • Manage as a ROW avoidance area. • Open to livestock grazing. • Allowable Use: **STIPULATION** NSO-12: *ACECs*. Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figure 2-44, Appendix A.	Action: No similar action.
Hawxhurst Creek			
Action: No similar action in current RMP.	Action: No similar action.	Action: Designate the Hawxhurst Creek ACEC (860 acres) to protect from loss of riparian habitat and fisheries values. Management actions include the following: • Manage as VRM Class III. • Manage as ROW avoidance area. • Classify as *limited to designated routes*. • Open to livestock grazing.	Action: No similar action.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
		• Allowable Use: **STIPULATION** NSO-12: *ACECs*. Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figure 2-44, Appendix A.	
Indian Creek			
Action: No similar action in current RMP.	Action: Designate the Indian Creek ACEC (1,700 acres) to preserve wildlife and cultural values. Management actions include the following: • Manage as VRM Class II. • Manage as a ROW exclusion area. • Classify as *limited to designated routes*. • Open to livestock grazing. • Allowable Use: **STIPULATION** NSO-12: *ACECs*. Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figures 2-43 (Alternative B) and 2-44 (Alternative C) in Appendix A.		Action: No similar action.
John Brown Canyon			
Action: No similar action in current RMP.	Action: No similar action.	Action: Designate the John Brown Canyon ACEC (1,400 acres) to preserve old growth pinion-juniper woodlands. Management actions include the following: • Manage as VRM Class II. • Classify as *limited to designated routes*. • Open to livestock grazing. • **No Leasing:** *ACECs*. Close to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-40, Appendix A. • Allowable Use: **STIPULATION** NSO-12: *ACECs*. Prohibit surface occupancy and surface-disturbing	Action: No similar action.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
		activities. (Refer to Appendix B.) See Figure 2-44, Appendix A.	
Juanita Arch			
Action: No similar action in current RMP.	Action: Designate the Juanita Arch ACEC (1,600 acres) to protect rare plants and geologic values. Management actions include the following: • Manage as VRM Class II. • Close to motorized travel. • Open to livestock grazing. • Manage as a ROW exclusion area. • Petition to the Secretary of the Interior for withdrawal from mineral entry. • **No Leasing:** *ACECs.* Close to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-39, Appendix A. • Allowable Use: **STIPULATION** NSO-12: *ACECs*. Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figure 2-43, Appendix A.	Action: Designate the Juanita Arch ACEC (1,600 acres) to protect rare plants and geologic values. Management actions are the same as for Alternative B, plus: • Close to mechanized travel.	Action: No similar action.
Mt. Garfield			
Action: No similar action in current RMP.	Action: Designate the Mt. Garfield ACEC (3,500 acres) to protect its scenic values. Management actions include the following: • Manage as VRM Class I.	Action: Designate the Mt. Garfield ACEC (5,700 acres) to protect its scenic values. Management actions include the following: • Same as Alternative B, plus:	Action: No similar action.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	• Close to motorized travel, including over-snow motorized travel. • Prohibit target shooting. • Manage as a ROW exclusion area (excluding Coal Canyon corridor). • Close to livestock grazing. • Close to fossil collection. • Petition to the Secretary of the Interior for withdrawal from mineral entry. • Classify as unsuitable for coal leasing. • Allowable Use: **STIPULATION** NSO-12: *ACECs*. Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figure 2-43, Appendix A.	○ **No Leasing:** *ACECs.* Close to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-40, Appendix A.	
Nine-mile Hill Boulders			
Action: No similar action in current RMP.	Action: No similar action.	Action: Designate the Nine-mile Hill Boulders ACEC (90 acres) to protect paleontological values. Management actions include the following: • Manage as VRM Class II. • Close to motorized travel, including over- snow travel. • Close to mechanized travel. • Manage as a ROW exclusion area. • Issue no SRPs for competitive events. • Open to livestock grazing.	Action: No similar action.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
		• Petition to the Secretary of the Interior for withdrawal from mineral entry.	
The Palisade			
Action: Continue to manage the Palisade ACEC/ONA (23,600 acres) to protect its natural, geologic, and scenic values. Management actions include the following: • Classify 4,100 acres as *closed* to OHV use and 19,300 acres as *limited to existing routes*. • Designate 4,100 acres as VRM Class I. • Designate 18,000 acres as VRM Class II. • Designate 1,400 acres as VRM Class III. • Limit forestry cutting units to 20 acres or less in the pinyon-juniper woodlands. • Close to mineral material disposal. • Manage 15,000 acres as unsuitable for ROWs. • Manage 7,700 acres as sensitive for ROWs. • Allowable Use: **STIPULATION** *NSO-1: No Surface Occupancy (ACECs).* Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figure 2-42, Appendix A.	Action: Designate the Palisade ACEC (32,200 acres) to protect rare plant populations and special status wildlife. Management actions include the following: • Manage 26,700 acres that overlap with The Palisade WSA as VRM Class I. • Manage 5,500 acres as VRM Class II. • Classify 26,700 acres as *closed* to OHV use and 5,500 acres as *limited to designated routes*. • Issue no SRPs for competitive events. • Manage as a ROW avoidance area. • Open to livestock grazing. • **No Leasing:** *ACECs.* Close to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-39 (Alternative B) and 2-40 (Alternative C), Appendix A. • Allowable Use: **STIPULATION** NSO-12: *ACECs*. Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.)	Action: Designate the Palisade ACEC (32,200 acres) to protect rare plant populations and special status wildlife. Management actions are the same as Alternative B, plus: • Petition to the Secretary of the Interior for withdrawal from mineral entry (5,600 acres outside of the Palisade WSA).	Action: Designate the Palisade ACEC (26,900 acres) to protect rare plant populations and special status wildlife. Management actions are the same as Alternative A.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	See Figures 2-43 (Alternative B) and 2-44 (Alternative C) in Appendix A.		
Plateau Creek			
Action: No similar action in current RMP.	Action: No similar action.	Action: Designate the Plateau Creek ACEC (220 acres) to protect special status fish species. Management actions include the following: • Manage as VRM Class II. • Classify as *limited to designated routes*. • Only allow camping in designated sites. • Prohibit target shooting. • Only allow vegetation treatments and wildlife habitat improvements for the benefit of the identified relevant and important values. • Manage as a ROW avoidance area. • Close to all types of collection (e.g., fossil, vegetation, rocks, etc.). • Classify as unsuitable for coal leasing. • Issue only Class I and II SRPs. • Close to livestock grazing. • Allowable Use: **STIPULATION** NSO-12: *ACECs*. Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figure 2-44, Appendix A.	Action: No similar action.
Prairie Canyon			
Action: No similar action in current RMP.	Action: No similar action.	Action: Designate the Prairie Canyon ACEC (6,900 acres) to protect rare plants and	Action: No similar action.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
		wildlife habitat. Management actions include the following: • Manage as VRM Class II. • Classify as *limited to designated routes*. • Only allow vegetation treatments and wildlife habitat improvements for the benefit of the identified relevant and important values. • Manage 2,800 acres within Prairie Canyon antelope migratory corridor as a ROW exclusion area. • Manage 2,600 acres as a ROW avoidance area. • Close to vegetative materials sales. • Open to livestock grazing. • **No Leasing:** *ACECs.* Close to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-40, Appendix A. • Allowable Use: **STIPULATION** NSO-12: *ACECs*. Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figure 2-44, Appendix A.	
Pyramid Rock			
Action: Continue to manage the Pyramid Rock ACEC/RNA (550 acres) to preserve habitat for two plant species, one a sensitive and the other a threatened species. Management actions include the following:	Action: Designate the Pyramid Rock ACEC (1,300 acres) to preserve habitat for rare plant species and protect cultural resources. • Manage as VRM Class II. • Close to motorized, mechanized,	Action: Designate the Pyramid Rock ACEC (1,300 acres) to preserve habitat for rare plant species and protect cultural resources. • Manage as VRM Class II. • Close to motorized, mechanized,	Action: Designate the Pyramid Rock ACEC (1,300 acres) to preserve habitat for rare plant species and protect cultural resources. • Manage as VRM Class II. • Close to motorized, mechanized,

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
• Classify as *closed* to OHV use. • Manage as a ROW exclusion area. • Close to mineral materials disposal. • Allowable Use: **STIPULATION** *NSO-1: No Surface Occupancy (ACECs).* Prohibit surface occupancy to protect Pyramid Rock State Natural Area for threatened and sensitive plants. (Refer to Appendix B.) See Figure 2-42, Appendix A.	and equestrian travel, including over-snow motorized travel. • Prohibit target shooting. • Issue no SRPs for competitive events. • Close to camping. • Close to livestock grazing. • Manage as a ROW exclusion area. • Close to all types of collection (e.g., fossil, vegetation, rocks, etc.). • Petition to the Secretary of the Interior for withdrawal from mineral entry. • Allowable Use: **STIPULATION** NSO-12: *ACECs*. Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figure 2-43, Appendix A.	equestrian, and foot travel, including over-snow motorized travel. • Prohibit target shooting. • Issue no SRPs for competitive events. • Close to camping. • Close to livestock grazing. • Manage as a ROW exclusion area. • Close to all types of collection (e.g., fossil, vegetation, rocks, etc.). • Classify as unsuitable for coal leasing. • Petition to the Secretary of the Interior for withdrawal from mineral entry. • Allowable Use: **STIPULATION** NSO-12: *ACECs*. Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figure 2-44, Appendix A. • **No Leasing:** *ACECs.* Close to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-40, Appendix A.	and equestrian travel, including over-snow motorized travel. • Issue no SRPs for competitive events. • Close to camping. • Close to livestock grazing. • Manage as a ROW exclusion area. • Close to all types of collection (e.g., fossil, vegetation, rocks, etc.). • Petition to the Secretary of the Interior for withdrawal from mineral entry. • Allowable Use: **STIPULATION** NSO-12: *ACECs*. Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figure 2-45, Appendix A.
Reeder Mesa			
Action: No similar action in current RMP.	Action: No similar action.	Action: Manage the Reeder Mesa ACEC (470 acres) to protect plant resources. Management actions include the following: • Manage as VRM Class III. • Classify as *limited to designated routes*. • Close to fossil and vegetation collection.	Action: No similar action.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
		• Open to livestock grazing. • Manage as a ROW exclusion area. • Petition to the Secretary of the Interior for withdrawal from mineral entry. • Allowable Use: **STIPULATION** NSO-12: *ACECs*. Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figure 2-44, Appendix A.	
Roan and Carr Creeks			
Action: No similar action in current RMP.	Action: Designate the Roan and Carr Creeks ACEC (15,700 acres) to protect riparian habitats and genetically pure populations of cutthroat trout. Management actions include the following: • Manage as VRM Class II. • Only allow vegetation treatments for the benefit of the identified relevant and important values. • Close to motorized travel, including over-snow motorized travel. • Manage as ROW avoidance area. • Close to mechanized travel. • Open to livestock grazing. • Allowable Use: **STIPULATION** NSO-12: *ACECs*. Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figure 2-43 (Alternative B)	Action: Designate the Roan and Carr Creeks ACEC (33,600 acres) to protect unique riparian habitats, genetically pure populations of cutthroat trout, and greater sage-grouse habitat. Management actions are the same as for Alternative B, plus: • Classify the portion of the ACEC within the coal resource development potential area as unsuitable for coal leasing. • **No Leasing:** *ACECs.* Close to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-40, Appendix A.	Action: No similar action.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	and 2-44 (Alternative C), Appendix A.		
Rough Canyon			
Action: Continue to manage the Rough Canyon ACEC/RNA (2,700 acres) to protect geologic, wildlife habitat, archaeological, and plants. Management actions include the following: • Manage as VRM Class II. • Actively manage as a high value site area. • Manage as unsuitable for public utilities. • Withdrawn from mineral entry. • Close to mineral material disposal. • Allowable Use: **STIPULATION** *NSO-1: No Surface Occupancy (ACECs).* Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figure 2-42, Appendix A.	Action: Designate the Rough Canyon ACEC (2,800 acres) to protect geologic, wildlife habitat, cultural resources, and plants. Management actions include the following: • Manage as VRM Class II. • Classify as *limited to designated routes*. • Manage as a ROW exclusion area. • Open to livestock grazing. • Withdrawn from mineral entry. • **No Leasing:** *ACECs.* Close to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figures 2-43 (Alternative B) and 2-44 (Alternative C), Appendix A. • Allowable Use: **STIPULATION** NSO-12: *ACECs*. Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figures 2-43 (Alternative B) and 2-44 (Alternative C) in Appendix A.		Action: Designate the Rough Canyon ACEC (2,700 acres) to protect geologic, wildlife habitat, cultural resources, and plants. Management actions include the following: • Manage as VRM Class II. • Manage as ROW exclusion area. • Withdrawn from mineral entry. • Allowable Use: **STIPULATION** NSO-12: *ACECs*. Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figures 2-45 in Appendix A.
Sinbad Valley			
Action: No similar action in current RMP.	Action: Designate the Sinbad Valley ACEC (6,400 acres) to protect rare plants, wildlife, cultural resources, geologic and scenic values. Management actions include the following: • Manage as VRM Class II. • Closed to motorized travel, except for Tabeguache Trail. • Manage as a ROW avoidance area. • Open to livestock grazing.		Action: No similar action.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	• Petition to the Secretary of the Interior for withdrawal from mineral entry. • **No Leasing:** *ACECs.* Close to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figures 2-39 (Alternative B) and 2-40 (Alternative C), Appendix A. • Allowable Use: **STIPULATION** NSO-12: *ACECs*. Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figures 2-43 (Alternative B) and 2-44 (Alternative C) in Appendix A.		
South Shale Ridge			
Action: No similar action in current RMP.	Action: Designate the South Shale Ridge ACEC (28,200 acres) to protect rare plants, wildlife habitat, and scenic values. • Issue no SRPs for competitive events. • Classify as *limited to designated routes*. • Manage as VRM Class II • Open to livestock grazing. • Manage as a ROW exclusion area. • Allowable Use: **STIPULATION** NSO-12: *ACECs*. Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figures 2-43 (Alternative B) and 2-44 (Alternative C) in Appendix A.	Action: Designate the South Shale Ridge ACEC (28,200 acres) to protect rare plants, wildlife habitat, and scenic values. Management actions are the same as for Alternative B, plus: • **No Leasing:** *ACECs.* Close to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-40, Appendix A.	Action: No similar action.
Unaweep Seep			
Action: Continue to manage the Unaweep Seep ACEC/RNA (80 acres) to protect habitat for the rare Great	Action: Designate the Unaweep Seep ACEC (85 acres) to protect habitat for the rare Great Basin silverspot butterfly, rare plants, riparian habitat, and hydrologic values. Management actions are the same as those described in Alternative A,		Action: Designate the Unaweep Seep ACEC (80 acres) to protect habitat for the rare Great Basin silverspot

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Basin silverspot butterfly. Management actions include the following (BLM 1999): • Manage as VRM Class II. • Close to unauthorized motorized travel activities, including over-snow travel (see 43 CFR 8342.1). • Closed to mechanized travel. • Prohibit commercial wood product sales, harvesting forest and woodland products, and Christmas tree cutting. • Prohibit camping. • Manage as a ROW exclusion area. • Close to fossil collection. • Open to livestock grazing. • Withdrawn from mineral entry. • Close to mineral material disposal. • **No Leasing:** *ACECs.* Close to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-38, Appendix A. • Allowable Use: **STIPULATION** *NSO-1: No Surface Occupancy (ACECs).* Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figure 2-42, Appendix A.	except: • Issue no SRPs for competitive events; and • Allowable Use: **STIPULATION** NSO-12: *ACECs*. Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figures 2-43 (Alternative B) and 2-44 (Alternative C) in Appendix A.		butterfly, rare plants, riparian habitat, and hydrologic values. Management actions are the same as those described in Alternative A, plus: • Allowable Use: **STIPULATION** NSO-12: *ACECs*. Prohibit surface occupancy and surface-disturbing activities. (Refer to Appendix B.) See Figure 2-45 in Appendix A.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Wilderness Study Areas (Administrative Designation)			
GOAL: Preserve the wilderness characteristics of WSAs.			
Objective: Preserve wilderness characteristics in WSAs in accordance with non-impairment standards as defined under the Interim Management Policy for Lands Under Wilderness Review (BLM Manual H-8550-1 [BLM 1995c]), until Congress either designates these lands as wilderness or releases them for other purposes.			
Action: Manage the four WSAs (96,500 acres) under BLM's Interim Management Policy pending congressional action on wilderness recommendations (Figure 2-69, Appendix A). • Demaree Canyon (22,700 acres) • Little Book Cliffs (29,300 acres) • The Palisade (26,700 acres) • Sewemup Mesa (17,800 acres)			
Action: No similar action in current RMP.	Action: Manage all WSAs as VRM Class I.		
Action: No similar action in current RMP.	Action: Manage all WSAs as closed to motorized and mechanized travel. Travel required for valid existing rights would be allowed.		
Allowable Use: **NO LEASING**. Close the WSAs to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figures 2-38 and 2-69 (Alternative A), 2-39 and 2-69 (Alternative B), 2-40 and 2-69 (Alternative C), and 2-41 and 2-69 (Alternative D) in Appendix A.			
Allowable Use: **STIPULATION** NSO-43: *Wilderness Study Areas.* Prohibit surface occupancy and surface-disturbing activities in WSAs in accordance with the Interim Management Policy for Lands Under Wilderness Review (BLM Manual H-8550-1 [BLM 1995c]). (Refer to Appendix B.) See Figures 2-42 (Alternative A), 2-43 (Alternative B), 2-44 (Alternative C), and 2-45 (Alternative D) in Appendix A.			
Action: In the event Congress designates any of the WSAs as Wilderness, management direction would be adapted to the actions defined in the designating legislation in a manner consistent with the 1964 Wilderness Act, until an activity plan is developed detailing management direction for the area(s).			
GOAL: No similar goal in current RMP.	**GOAL:** Implement management strategies for lands within WSAs, should Congress release one or more of these areas from wilderness consideration.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

<table>
<tr><th>Alterative A (No Action)</th><th>Alternative B (Preferred)</th><th>Alternative C</th><th>Alternative D</th></tr>
<tr><td>Objective:
Following congressional action, manage those WSAs designated non-wilderness as described in other sections of the 1987 RMP.</td><td colspan="3">Objective:
If Congress releases one or more WSAs from wilderness consideration, manage those lands consistent with underlying land use designations.</td></tr>
<tr><td colspan="4">Action:
If Congress releases one or more WSAs from wilderness consideration, update the wilderness characteristics inventory for lands that were formerly WSAs (FLPMA Section 201).</td></tr>
<tr><td>Action:
No similar action in current RMP.</td><td colspan="3">Action:
If Congress Releases WSAs from wilderness consideration, reconsider acceptability for further coal leasing using the Coal Screening Criteria (Appendix N).</td></tr>
<tr><td>Action:
If Congress designates Sewemup Mesa WSA as non-wilderness (i.e., released), manage as described in other sections of the 1987 RMP as follows:
• Close to motor vehicles
• Make unsuitable for forest harvest
• Manage a portion as sensitive to public utility development.
• Manage a portion as unsuitable for public utilities.
• Close to mineral material sales
• Manage as VRM Class I.
• Close to fluid mineral leasing.</td><td>Action:
If Congress releases Sewemup Mesa WSA from Wilderness consideration, manage the area to protect wilderness characteristics by applying the following management:
• Issue no SRPs for competitive events.
• Close to motorized and mechanized travel, including over-snow motorized travel.
• Close to wood product sales and/or harvest (including Christmas tree harvest).
• Manage as a ROW exclusion area.
• Close to mineral material disposal
• Close to non-energy leasable mineral exploration and/or development
• Manage as VRM Class II.</td><td>Action:
If Congress releases Sewemup Mesa WSA from Wilderness consideration, manage the area to protect wilderness characteristics by applying the following management:
• Same as Alternative B</td><td>Action:
If Congress releases Sewemup Mesa WSA from Wilderness consideration apply the following management:
• Consider SRPs for competitive events.
• Limit motorized and mechanized travel to designated routes.
• Close to wood product sales and/or harvest.
• Manage as a ROW avoidance area.
• Manage as VRM Class III.</td></tr>
</table>

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	• **No Leasing**: *Lands with wilderness characteristics outside WSAs*. Close to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figures 2-39 (Alternative B) and 2-40 (Alternative C) in Appendix A. • Allowable Use: **STIPULATION** NSO-41: *Lands Managed for Wilderness Characteristics.* Prohibit surface occupancy and surface-disturbing activities on lands managed for wilderness characteristics outside of existing WSAs. (Refer to Appendix B.) See Figures 2-43 (Alternative B) and 2-44 (Alternative C) in Appendix A.		
Action: If Congress designates Little Book Cliffs WSA as non-wilderness, manage as described in other sections of the 1987 RMP as follows : • Limit motorized travel to designated routes on a portion. • Open to all modes of travel on a portion. • Apply a seasonal closure for motorized vehicles on a portion. • Make unsuitable for forest harvest. • Manage a portion as sensitive to public utility development.	Action: If Congress releases Little Book Cliffs WSA from Wilderness consideration, manage the portion of the WSA within LBCWHR in accordance with the Alternative B management prescriptions for the LBCWHR. For the remainder of the WSA: • Consider SRPs for competitive events. • Close to motorized travel, including over-snow travel. • Limit mechanized travel to	Action: If Congress releases Little Book Cliffs WSA from Wilderness consideration, manage the portion of the WSA within the LBCWHR in accordance with the Alternative C management prescriptions for the LBCWHR. For the remainder of the WSA: • Issue no SRPs for competitive events. • Close to motorized travel, including over-snow travel. • Close to mechanized travel • Close to wood product sales and/or harvest (including Christmas tree	Action: If Congress releases Little Book Cliffs WSA from Wilderness consideration, manage the portion of the WSA within the LBCWHR in accordance with the Alternative D management prescriptions for the LBCWHR. For the remainder of the WSA: • Consider SRPs for competitive events. • Limit motorized and mechanized travel to designated routes. • Manage as ROW avoidance area.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
• Manage a portion as unsuitable for public utilities. • Manage a portion as a public utility corridor. • Close the following lands to mineral material sales: LBCWHR, VRM class II, utility corridors. • Manage a portion as VRM Class II. • Manage a portion as VRM Class III. • Manage a portion as VRM undesignated. • Close to fluid mineral leasing.	designated routes. • Close to wood product sales and/or harvest (including Christmas tree harvest). • Manage as ROW avoidance area. • Close to mineral material disposal. • Close to non-energy leasable mineral exploration and/or development. • Manage as VRM Class II. • Allowable Use: **STIPULATION** NSO-41: *Lands Managed for Wilderness Characteristics.* Prohibit surface occupancy and surface-disturbing activities on lands managed for wilderness characteristics outside of existing WSAs. (Refer to Appendix B.) See Figure 2-43 in Appendix A.	harvest). • Manage as a ROW exclusion area. • Close to mineral material disposal. • Close to non-energy leasable mineral exploration and/or development. • Manage as VRM Class II. • **No Leasing**: *Lands with wilderness characteristics outside WSAs*. Close to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-40 in Appendix A. • Allowable Use: **STIPULATION** NSO-41: *Lands Managed for Wilderness Characteristics.* Prohibit surface occupancy and surface-disturbing activities on lands managed for wilderness characteristics outside of existing WSAs. (Refer to Appendix B.) See Figure 2-44 in Appendix A.	• Manage as VRM Class III.
Action: If Congress designates Demaree Canyon WSA as non-wilderness, manage as described in other sections of the 1987 RMP as follows: • Seasonal closure for motorized vehicles on a portion. • Limit motorized travel to existing routes on a portion. • Make unsuitable for forest harvest. • Manage as sensitive to public utility development.	Action: If Congress releases Demaree Canyon WSA from Wilderness consideration: • Consider SRPs for competitive events. • Limit motorized and mechanized travel to designated routes. • Manage as ROW avoidance area. • Manage as VRM Class II. • Allowable Use: **STIPULATION** NSO-41: *Lands Managed for*	Action: If Congress releases Demaree Canyon WSA from Wilderness consideration, manage the area to protect wilderness characteristics by applying the following management: • Issue no SRPs for competitive events. • Close to motorized travel, including over-snow travel. • Close to mechanized travel • Close to wood product sales and/or harvest (including Christmas tree	Action: If Congress releases Demaree Canyon WSA from Wilderness consideration: • Consider SRPs for competitive events. • Limit motorized and mechanized travel to designated routes. • Manage as ROW avoidance area. • Manage as VRM Class III.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
• Manage as unsuitable for public utilities. • Manage public utility corridors. • Close the following lands to mineral material sales: utility corridors. • Manage a portion as VRM Class III. • Manage a portion as VRM undesignated. • Close to fluid mineral leasing.	*Wilderness Characteristics.* Prohibit surface occupancy and surface-disturbing activities on lands managed for wilderness characteristics outside of existing WSAs. (Refer to Appendix B.) See Figure 2-43 in Appendix A.	harvest). • Manage as a ROW exclusion area. • Close to mineral material disposal. • Close to non-energy leasable mineral exploration and/or development. • Manage as VRM Class II. • **No Leasing**: *Lands with wilderness characteristics outside WSAs*. Close to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-40, Appendix A. • Allowable Use: **STIPULATION** NSO-41: *Lands Managed for Wilderness Characteristics.* Prohibit surface occupancy and surface-disturbing activities on lands managed for wilderness characteristics outside of existing WSAs. (Refer to Appendix B.) See Figure 2-44 in Appendix A.	
Action: If Congress designates The Palisade WSA as non-wilderness, manage as described in other sections of the 1987 RMP as follows: • Limit motorized travel to existing routes on a portion. • Limit motorized travel to designated routes on a portion. • Close a portion to motor vehicles. • Make unsuitable for forest harvest. • Manage a portion as sensitive to public utility development.	Action: If Congress releases The Palisade WSA from Wilderness consideration, manage in accordance with the Alternative B management prescriptions for The Palisade ACEC with the following exceptions: • Close to motorized travel, including over-snow motorized travel. • Limit mechanized travel to designated routes.	Action: If Congress releases The Palisade WSA from Wilderness consideration, manage the area to protect wilderness characteristics by applying the following management: • Issue no SRPs for competitive events. • Close to motorized travel, including over-snow travel. • Close to mechanized travel. • Close to wood product sales and/or harvest (including Christmas tree harvest).	Action: If Congress releases The Palisade WSA from Wilderness consideration, manage in accordance with the Alternative D management prescriptions for The Palisade ACEC with the following exceptions: • Limit motorized and mechanized travel to designated routes. • Manage as VRM Class II. • Manage as a ROW avoidance area.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
• Manage a portion as unsuitable for public utilities. • Close the following lands to mineral material sales: The Palisade ACEC/ONA, VRM Class II. • Manage aportion as VRM Class I. • Manage a portion as VRM Class II. • Manage a portion as VRM class III. • Close to fluid mineral leasing.	• Manage as VRM Class II.	• Manage as a ROW exclusion area. • Close to mineral material disposal. • Close to non-energy leasable mineral exploration and/or development. • Manage as VRM Class II. • **No Leasing**: *Lands with wilderness characteristics outside WSAs*. Close to fluid mineral leasing and geophysical exploration. (Refer to Appendix B.) See Figure 2-40, Appendix A. • Allowable Use: **STIPULATION** NSO-41: *Lands Managed for Wilderness Characteristics*. Prohibit surface occupancy and surface-disturbing activities on lands managed for wilderness characteristics outside of existing WSAs. (Refer to Appendix B.) See Figure 2-44 in Appendix A.	
Wild and Scenic Rivers (Administrative Designation)			
GOAL: Protect NWSRS-eligible segments in accordance with the Wild and Scenic River Act and BLM guidance (see BLM Manual 8351 [BLM 1993c].	**GOAL:** Evaluate eligible river segments and identify suitable segments for inclusion in the NWSRS, protecting them in accordance with the Wild and Scenic River Act and BLM guidance (see BLM Manual 8351 [BLM 1993c]).		
Objective: Preserve the tentative classification of each eligible segment by protecting its free-flowing nature, water quality, and outstandingly remarkable value(s) (ORV), pending congressional action or for the duration of the RMP (Figure 2-70, Appendix A).	Objective: Preserve the recommended classification of each suitable segment by protecting its free-flowing nature, water quality, and ORV(s), pending congressional action or for the duration of the RMP (Figures 2-71 [Alternative B] and 2-70 [Alternative C], Appendix A).		Objective: No similar objective.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D

Action:
Identify the following 14 stream segments as eligible for inclusion in the NWSRS. See Table 2-4, Summary of Wild and Scenic River Study Segments, for total segment lengths and segment study corridor acreages, as well as segment lengths on BLM land and segment study corridor acreages on BLM land (a description of each segment is provided in Appendix C):
• Colorado River (three segments);
• Dolores River;
• North Fork Mesa Creek;
• Blue Creek;
• Gunnison River Segment 2;
• Roan Creek;
• Carr Creek;
• Rough Canyon Creek;
• Unaweep Canyon (two segments):
  ○ East Creek; and
  ○ West Creek;
• North Fork West Creek; and
• Ute Creek.
	Action:
	Determine all eligible stream segments as not suitable for inclusion in the NWSRS, except for the Dolores River (see action below), and release them from interim management protections afforded eligible segments. This concludes the suitability study phase for these segments. See Table 2-4, Summary of Wild and Scenic River Study Segments, for total segment lengths and segment study corridor acreages, as well as segment lengths on BLM land and segment study corridor acreages on BLM land (a description of each segment is provided in Appendix C).
		Action:
		Determine the following 14 stream segments as suitable for inclusion in the NWSRS. See Table 2-4, Summary of Wild and Scenic River Study Segments, for total segment lengths and segment study corridor acreages, as well as segment lengths on BLM land and segment study corridor acreages on BLM land (a description of each segment is provided in Appendix C):
		• Colorado River Segment 1 (recreational classification);
		• Colorado River Segment 2 (recreational classification);
		• Colorado River Segment 3 (scenic classification)
		• Dolores River (recreational classification);
		• North Fork Mesa (scenic classification);
		• Blue Creek (scenic classification);
		• Gunnison River Segment 2 (recreational classification);
		• Roan Creek (scenic classification);
		• Carr Creek (scenic classification);
		• Rough Canyon Creek(scenic classification);
		• East Creek (recreational classification);
		• West Creek (recreational classification);
		• North Fork West Creek (wild classification); and
		• Ute Creek (scenic classification).
			Action:
			Determine all 14 eligible stream segments as not suitable for inclusion in the NWSRS and release them from interim management protections afforded eligible segments. This concludes the suitability study phase for these segments. See Table 2-4, Summary of Wild and Scenic River Suitable Segment Lengths and Corridor Acreages, for total segment lengths and segment study corridor acreages, as well as segment lengths on BLM land and segment study corridor acreages on BLM land (a description of each segment is provided in Appendix C).

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: No similar action in current RMP.	Action: Determine that 11.53 miles of the Dolores River are suitable for inclusion in the NWSRS. Manage the suitable stream miles according to interim protective management guidelines for suitable stream segments until Congressional action occurs. Determine that 7.07 miles are not suitable for inclusion in the NWSRS. Release stream miles determined not suitable from interim management protection afforded to eligible segments. Refer to Wild and Scenic River Suitability Analysis (Appendix C) for exact description of the stream miles determined to be suitable and not suitable.	Action: No similar action.	Action: No similar action.
Action: Establish the following interim protective management guidelines for all eligible segments pending Congressional action or for the duration of the RMP. All interim protective management is subject to valid existing rights. • Approve no actions altering the free-flowing nature of eligible segments through impoundments, diversions, channeling, or riprapping.	Action: Establish the following interim protective management guidelines for segments of the Dolores River determined suitable. All interim protective management is subject to valid existing rights. In addition to actions described in Alternative A: • Manage as VRM Class II. • Manage as ROW avoidance area. • Allowable Use: **STIPULATION** CSU-35: *WSR Study Segments Classified as Scenic and Recreational.*	Action: Establish the following interim protective management guidelines for all suitable segments pending Congressional action or for the duration of the RMP. All interim protective management is subject to valid existing rights. In addition to actions described in Alternative A: • Manage Wild and Scenic River study segments classified as "wild" as VRM Class I. • Manage Wild and Scenic River study segments classified as "scenic" and	Action: No similar action.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
• Approve no action that will have an adverse effect on an eligible segment's identified ORV(s). Enhance identified ORV(s) to the extent practicable. • Approve no action that will modify an eligible segment or its corridor to the degree that its eligibility or tentative classification would be affected. • Approve no action that would diminish water quality to the point that the water quality would no longer support the ORV(s).	Apply CSU (site-specific relocation) restrictions within 0.25-mile on either side of the active river channel (bank-full stage). (Refer to Appendix B.) See Figure 2-47 in Appendix A.	"recreational" as VRM Class II. • Manage Wild and Scenic River study segments classified as "wild" as ROW exclusion areas. • Manage Wild and Scenic River study segments classified as "scenic" and "recreational" as ROW avoidance areas. ○ Exception: Dolores River – 50 meter ROW corridor on the west side of Highway 141. • Allowable Use: **STIPULATION** NSO-44: *WSR Study Segments Classified as Wild.* Prohibit surface occupancy and surface-disturbing activities within 0.25-mile of either side of the active river channel (bank-full stage). (Refer to Appendix B.) See Figure 2-44 in Appendix A. • Allowable Use: **STIPULATION** CSU-35: *WSR Study Segments Classified as Scenic and Recreational.* Apply CSU (site-specific relocation) restrictions within 0.25-mile on either side of the active river channel (bank-full stage). (Refer to Appendix B.) See Figure 2-48 in Appendix A.	
National Trails (Congressional Designation)			
GOAL: Enhance, promote, and protect the scenic, natural, and cultural resource values associated with current and future designated National Scenic and Historic Trails.			

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Objective: Manage the congressionally designated Old Spanish National Historic Trail in consideration of the BLM and National Park Service (NPS) jointly developed trail-wide comprehensive plan and in coordination with the NPS (Figures 2-91 [Alternative A], 2-92 [Alternative B], 2-93 [Alternative C], and 2-94 [Alternative D], Appendix A). Identify the nature and purposes of the Old Spanish National Historic Trail, and, to the greatest extent possible, manage the trail in a manner so as to safeguard the nature and purpose of the trail and in a manner that protects the values for which the trail was designated.			
Action: No similar action in current RMP.	Action: Identify the National Trail Management Corridor for the Old Spanish Trail after additional cultural resource Class III inventories are conducted. The congressionally designated Old Spanish Trail route (currently 6.9 miles on BLM lands within the GJFO planning area) is not based on completed field inventories. Where extant portions of the Old Spanish Trail may exist, complete Class III cultural resource inventories on all BLM parcels. Pursue partners for grant funding where practical to conduct surveys on adjacent lands with land owner's permission. The National Historic Trail designation allows for small location changes without congressional authorization. If the location of the trail changes as a result of Class III inventory the management actions in this RMP would apply to the newly mapped location(s) and may be modified to better address the findings of the inventory. That land no longer identified as trail location, as proven through the archaeological survey, would be managed for similar purposes and with similar VRM class to the adjacent public land.		
Action: No similar action in current RMP.	Action: Establish collaborative partnerships with academic institutions, professional and non-profit organizations, individual scholars, tribes, and other entities to perform research on Old Spanish Trail-related topics. Coordinate with partner groups, interest groups, interested individuals, local communities, and other stakeholders on Old Spanish Trail issues and projects.		
Action: No similar action in current RMP.	Action: Recreation opportunities would be provided consistent with the Old Spanish Trail. Facilities would be developed and placed outside the trail corridor when feasible to protect resource values, provide for visitor safety, and support selected use opportunities. Facilities would be developed within the trail corridor only when needed to protect trail integrity and resources, or to establish an Old Spanish Trail recreation retracement route.		
Action: No similar action in current RMP.	Action: Scientific and historical studies of cultural landscapes, sites, historic trails, and other resources, including excavation, would be allowed by qualified researchers on a case-by-case basis within the Old Spanish Trail corridor with written authorization.		
Action: No similar action in current RMP.	Action: Retain or cooperatively manage	Action: Retain BLM-administered lands and	Action: Same as Alternative B.

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	BLM-administered lands to assure long-term use, protection, and access to areas along the Old Spanish Trail.	acquire available state and private lands and/ or easements to assure long-term use, protection, and access to areas along the Old Spanish Trail. Lands along the Old Spanish Trail corridor shall not be made available for Recreation and Public Purposes Act sales or leases, agricultural entries, or state grants, and shall be classified for retention in accordance with 43 CFR 2400.	
Action: No similar action in current RMP.	Action: No similar action.	Action: Acquire parcels that exhibit characteristics consistent with the landscape setting, or important to management of the Old Spanish Trail, from willing buyers when funds are available.	Action: No similar action.
Action: No similar action in current RMP.	Action: Manage the Old Spanish Trail as VRM Class IV (50 meter buffer). Manage newly located sections of the trail according to their VRI classification.	Action: Manage the Old Spanish Trail as VRM Class III (50 meter buffer). Manage newly located sections of the trail according to their VRI classification.	Action: Manage the Old Spanish Trail as VRM Class IV (50 meter buffer). Manage newly located sections of the trail according to their VRI classification.
Action: No similar action in current RMP.	Action: Manage 50 meters on both sides of the Old Spanish Trail as a ROW avoidance area.		
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** NSO-45: *Old Spanish National Historic Trail.* Prohibit surface occupancy and surface-disturbing activities within a 200-meter (656-foot) buffer from the center line. (Refer to Appendix	Allowable Use: **STIPULATION** NSO-46: *Old Spanish National Historic Trail.* Prohibit surface occupancy and surface-disturbing activities within a 0.5-mile buffer from the center line. (Refer to Appendix B.) See Figure 2-44 (Alternative C) in Appendix A.	Allowable Use: **STIPULATION** NSO-47: *Old Spanish National Historic Trail.* Prohibit surface occupancy and surface-disturbing activities within a 50-meter (164-foot) buffer from the center line. (Refer to Appendix B.)

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	B.) See Figure 2-43 (Alternative B) in Appendix A.		See Figure 2-45 (Alternative D) in Appendix A.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: No similar allowable use.	Allowable Use: **STIPULATION** CSU-36: *Old Spanish National Historic Trail.* Apply CSU (site-specific relocation) restrictions within 5 miles of either side of the Old Spanish Trail. (Refer to Appendix B.) See Figure 2-48 in Appendix A.	Allowable Use: No similar allowable use.
Objective: No similar objective in current RMP.	Objective: Manage the Tabeguache Trail to provide for the ever-increasing outdoor recreation needs of an expanding urban population and to promote the preservation of public access to, travel within, and enjoyment and appreciation of the scenic, natural and cultural resources of the Tabeguache.		
Action: No similar action in current RMP.	Action: Petition the Secretary of Interior to designate the Tabeguache Trail as a National Recreation Trail as described in the National Trails System Act of 2002 (PL 90-543). If designated as a National Recreation Trail, develop an implementation plan according to the guidelines of the National Recreation Trail System Act.		
Action: Seek to acquire legal access for full-size vehicles along the Tabeguache Trail from Little Park Road to Colorado State Highway 141 near Whitewater.	Action: Same as Alternative A.	Action: No similar action.	Action: Same as Alternative A.
Action: No similar action in current RMP.	Action: Seek to acquire easements and/or ROWs on non-federal lands where a trail or facility must cross or be built.		
National, State, and BLM Byways (Administrative Designation)			
GOAL: Enhance, promote, and protect the scenic, natural, and cultural resource values associated with current and future designated byways.			
Objective: No similar objective in current RMP.	Objective: Support efforts of corridor management plans for the designated byways and provide assistance, where feasible, in the development of byway facilities consistent with other decisions of the RMP (Figures 2-92 [Alternative B], 2-93 [Alternative C], and 2-94 [Alternative D], Appendix A).		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: No similar action in current RMP.	Action: Support efforts of corridor management plans for the Grand Mesa Scenic and Historic Byway; provide assistance, where feasible, in the development of byway facilities consistent with other decisions of the RMP.		
Action: No similar action in current RMP.	Action: Support efforts of corridor management plans for the Dinosaur Diamond Prehistoric Highway (National Scenic Byway and All American Road); provide assistance, where feasible, in the development of byway facilities consistent with other decisions of the RMP.		
Action: No similar action in current RMP.	Action: Support efforts of corridor management plans for the Unaweep-Tabeguache Scenic and Historic Byway (Colorado Scenic and Historic Byway); provide assistance, where feasible, in the development of byway facilities consistent with other decisions of the RMP.		
Action: No similar action in current RMP.	Action: No similar action.	Action: No similar action.	Action: Nominate for designation the following BLM Backcountry Byways: • Lands' End; • John Brown Canyon; • Niche to Blue Mesa – Uranium Trail; and, • Winter Flats Road.
Action: No similar action in current RMPs.	Action: Manage the following byways as VRM Class II: • A portion of Dinosaur Diamond Prehistoric Highway (from the Bookcliffs north); • Grand Mesa Scenic and Historic Byway; and • Unaweep-Tabeguache Scenic and Historic Byway.	Action: Manage the following byways as VRM Class II: • Dinosaur Diamond Prehistoric Highway; • Grand Mesa Scenic and Historic Byway; and • Unaweep-Tabeguache Scenic and Historic Byway.	Action: Manage the following byways as VRM Class II: • Lands End Backcountry Byway; • John Brown Canyon Backcountry Byway; • Niche to Blue Mesa – Uranium Trail Backcountry Byway; and • Winter Flats Road.
Action: No similar action in current RMPs.	Action: Manage a portion of Dinosaur Diamond Prehistoric Highway (from	Action: No similar action.	Action: Manage the following byways as VRM Class III:

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	the Bookcliffs south) as VRM Class III.		• Dinosaur Diamond Prehistoric Highway; • Grand Mesa Scenic and Historic Byway; and • Unaweep-Tabeguache Scenic and Historic Byway.
Allowable Use: No similar allowable use in current RMP.	Allowable Use: **STIPULATION** CSU-37: *Scenic Byways.* Apply CSU (site-specific relocation) restrictions to fluid mineral leasing and other surface-disturbing activities within 0.5-mile of scenic byways. (Refer to Appendix B.) See Figures 2-47 (Alternative B) and 2-48 (Alternative C), in Appendix A.		Allowable Use: **STIPULATION** CSU-38: *Scenic Byways.* Apply CSU (site-specific relocation) restrictions to fluid mineral leasing and other surface-disturbing activities within 0.25-mile of scenic byways. (Refer to Appendix B.) See Figure 2-49 in Appendix A.
SUPPORT			
Interpretation and Environmental Education			
GOAL: Provide interpretation, education, and information that promote the health of the land, the appreciation and protection of cultural and natural resources to foster greater community stewardship; and enhance users' experience and safety.			
Objective: No similar objective in current RMP.	Objective: Increase outreach efforts and provide the public with environmental education opportunities.		
Action: Provide interpretation, informational, and educational materials.	Action: Develop an interpretive and information services plan that outlines partnership development, product and service delivery methods (media), key messages or themes, and associated markets (audience).		
Action: No similar action in current RMP.	Action: Seek to develop partnerships with local education institutions, visitor centers, tribes, field institutes, museums, visitor centers, and cooperators.		
Action: No similar action in current RMP.	Action: Provide opportunities for tribal participation in developing key messages and themes.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: No similar action in current RMP.	Action: Pursue multicultural interpretation and environmental education opportunities for outreach, development, and implementation programs. Apply learning modalities and incorporate various learning styles in program design and delivery. Encourage the use of multiple intelligence or other theories for program presentations.		
Action: No similar action in current RMP.	Action: Establish repository of photographs and images that illustrate BLM's mission, including digital photographs and slides for program design.		
Action: No similar action in current RMP.	Action: Allow interpretation signs, facilities, and other delivery methods that address key messages, themes, or program/resource goals and objectives, including those for recreation, travel management, cultural resources, wildlife, and others.		
Transportation Facilities			
GOAL: No similar current goal in current RMP.	**GOAL:** Provide a transportation system that is manageable, maintainable, and meets the needs, as defined by the goals and objectives, for resources and resource uses.		
Objective: Provide access to allow multiple use management of BLM lands.	Objective: Maintain BLM roads and trails to identified maintenance intensity levels (appropriate intensity, frequency, and type of maintenance) consistent with public safety and land use plan objectives.		
Action: No similar in current RMP.	Action: All system roads and trails would be given a unique road/trail number to aid in public navigation, safety, Emergency Medical Services, and maintenance.		
Action: Acquire public or administrative access into 37 areas of public land where legal access does not exist.	Action: Acquire public or administrative access to public lands as opportunities become available.		
Action: Use and improve designated roads where feasible.			
Action: Construct new roads and trails where none exist or where existing roads and trails are inadequate for BLM needs.	Action: No similar action. Refer to the Travel Management section and Appendix M for actions specific to new roads and trails.		

Table 2-2 *(continued)*
Description of Alternatives A, B, C, and D

Alterative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Action: In the remainder of the resource area, consider requests from resource specialists for additional acquisition as needs arise.	Action: No similar action. Refer to the Lands and Realty section for actions specific to new roads and trails.		

Table 2-3
Drought Severity Classification

Category[1]	Description	Possible Impacts	Ranges				
			Palmer Drought Index	Climate Prediction Center Soil Moisture Model (Percentiles)	USGS Weekly Streamflow (Percentiles)	Standardized Precipitation Index	Objective Short and Long-term Drought Indicator Blends (Percentiles)[2]
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered	-1.0 to -1.9	21-30	21-30	-0.5 to -0.7	21-30
D1	Moderate Drought	Some damage to crops, pastures; streams, reservoirs, or wells low, some water shortages developing or imminent; voluntary water-use restrictions requested	-2.0 to -2.9	11-20	11-20	-0.8 to -1.2	11-20
D2	Severe Drought	Crop or pasture losses likely; water shortages common; water restrictions imposed	-3.0 to -3.9	6-10	6-10	-1.3 to -1.5	6-10
D3	Extreme Drought	Major crop/pasture losses; widespread water shortages or restrictions	-4.0 to -4.9	3-5	3-5	-1.6 to -1.9	3-5

Table 2-3
Drought Severity Classification

Category[1]	Description	Possible Impacts	Ranges				
			Palmer Drought Index	Climate Prediction Center Soil Moisture Model (Percentiles)	USGS Weekly Streamflow (Percentiles)	Standardized Precipitation Index	Objective Short and Long-term Drought Indicator Blends (Percentiles) [2]
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells creating water emergencies	-5.0 or less	0-2	0-2	-2.0 or less	0-2

Source: University of Nebraska Lincoln, National Drought Mitigation Center 2008. A partnership consisting of the US Department of Agriculture (Joint Agricultural Weather Facility and National Water and Climate Center), the National Weather Service's Climate Prediction Center, National Climatic Data Center, and the National Drought Mitigation Center at the University of Nebraska Lincoln produces the Drought Monitor. However, advice from many other sources is incorporated in the product, including virtually every government agency dealing with drought.

[1]Drought intensity categories are based on five key indicators and numerous supplementary indicators. This drought severity classification table shows the ranges for each indicator for each dryness level. Because the ranges of the various indicators often do not coincide, the final drought category tends to be based on what the majority of the indicators show. The analysts producing the map also weight the indices according to how well they perform in various parts of the country and at different times of the year. Also, additional indicators are often needed in the West, where winter snowfall has a strong bearing on water supplies.

D0-D4: The drought monitor summary map identifies general drought areas, labeling droughts by intensity, with D1 being the least intense and D4 being the most intense. D0, drought watch areas, are either drying out and possibly heading for drought, or are recovering from drought but not yet back to normal, suffering long-term impacts such as low reservoir levels.

[2]Short-term drought indicator blends focus on 1- to 3-month precipitation. Long-term blends focus on 6 to 60 months. Additional indices used, mainly during the growing season, include the US Department of Agriculture/National Agricultural Statistics Service Topsoil Moisture, Keetch-Byram Drought Index, and National Oceanic and Atmospheric Administration/National Environmental Satellite, Data, and Information Service satellite Vegetation Health Indices. Indices used primarily during the snow season and in the West include snow water content, river basin precipitation, and the Surface Water Supply Index. Other indicators include groundwater levels, reservoir storage, and pasture/range conditions.

Table 2-4
Summary of Wild and Scenic River Study Segments

River or Creek	Total Segment Length (miles)	Length on BLM Land (miles)	Total Wild and Scenic River Study Corridor (acres)	Area on BLM Land (acres)	Tentative Classification	Outstandingly Remarkable Values
Blue Creek	11.2	10.0	3,200	2,900	Scenic	Scenic, Fish, Cultural
Carr Creek	9.8	5.1	3,100	1,700	Scenic	Fish
Colorado River Segment 1	17.8	7.3	5,600	2,200	Recreational	Scenic, Fish, Wildlife
Colorado River Segment 2	3.5	1.3	1,200	100	Recreational	Fish
Colorado River Segment 3	19.7	19.1	6,400	5,700	Scenic	Scenic, Recreation, Fish, Wildlife, Geologic, Historic
Dolores River	32.0	18.6	9,600	6,100	Recreational	Scenic, Fish, Recreation, Geologic, Paleontological
East Creek	18.9	9.0	5,800	2,900	Recreational	Geologic
Gunnison River Segment 2	6.0	3.8	1,900	1,000	Recreational	Fish, Historic
North Fork Mesa Creek	2.1	2.1	700	900	Scenic	Vegetation
North Fork West Creek	3.3	3.3	1,100	1,100	Wild	Scenic
Roan Creek	15.8	6.5	4,500	2,000	Scenic	Fish
Rough Canyon Creek	4.2	4.2	1,400	1,200	Scenic	Scenic, Wildlife, Geologic
Ute Creek	4.2	4.2	1,400	1,400	Scenic	Scenic, Vegetation
West Creek	5.8	4.9	1,900	1,700	Recreational	Scenic, Wildlife, Geologic, Vegetation

2.8 SUMMARY COMPARISON OF ENVIRONMENTAL CONSEQUENCES

Table 2-5
Summary of Environmental Consequences of Alternatives A, B, C, and D

Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Theme: CURRENT MANAGEMENT	Theme: BLENDED (Preferred)	Theme: CONSERVATION	Theme: RESOURCE USE
RESOURCES			
Air			
Potential impacts on air quality due to increased oil and gas and solid mineral development as well as predicted increases in OHV use may occur. Impacts on air quality include potential increases in concentrations of ozone forming pollutants, visibility degradation, fugitive dust, and greenhouse gases.	Potential impacts on air quality would be managed more effectively compared to Alternative A due to the implementation of the ARMP (**Appendix G**) and associated strategies. Restrictions and stipulations related to solid mineral leasing and development would result in reduced impacts on air quality from these sources. A higher rate of oil and gas leasing was assumed for this alternative than for Alternative A which may result in greater impacts on air quality from this source category for Alternative B than Alternative A. However, Alternative B also includes emission control strategies which would be effective at minimizing emissions.	Potential impacts on air quality are likely to be the lowest for this alternative due to the combination of implementation of the ARMP (**Appendix G**), restrictions and stipulations on solid and fluid mineral leasing and development, and emission control strategies.	This alternative assumes the maximum level of reasonably foreseeable development for oil and gas predicted over the life of the plan. Potential impacts on air quality are likely to be greatest for this alternative due to the potential for increased oil and gas and solid mineral development. However, Alternative D also includes implementation of the ARMP (**Appendix G**) and emission control strategies, which would be effective at minimizing emissions.
Soil Resources			
Loss of vegetation, destruction of soil crusts, and destabilization of surface soils would result from	Effects on soils would be reduced through elimination of cross-country motorized use and	Effects on soils would be reduced through elimination of cross-country motorized use. In addition,	Effects on soils would be reduced through elimination of cross-country motorized use and

Table 2-5
Summary of Environmental Consequences of Alternatives A, B, C, and D

Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
dispersed recreation and managing the most acres as open to cross-country and intensive motorized use. Soil productivity is expected to decline over time as user-created routes and dispersed off-road use increase. Fewest NSO and CSU stipulations (433,000 acres and 74,100 acres respectively) of any alternative would limit protection of resources and soil impacts.	reduction in acres open to intensive use (reduced 57 percent from Alternative A). In addition, roads and trails open to public use would decline by 784 miles (24 percent) compared to Alternative A. More areas would be closed to fluid mineral leasing than under Alternative A, and 614,000 and 656,200 acres would be limited by NSO and CSU stipulations, respectively, to protect resources, which would minimize related soil impacts. Minimal overall change to soil health; could decline locally where disturbed, but soil productivity not expected to decline over time.	roads and trails open to public use would decline by 1,267 miles (39 percent) compared to Alternative A. More areas would be closed to fluid mineral leasing than under any other alternative, and 858,000 and 664,400 acres, respectively, would be limited by NSO and CSU stipulations to protect resources, which would minimize related soil impacts. Overall improvement to soil health. Soil productivity expected to increase over time.	reduction in acres open to intensive use (reduced 18 percent from Alternative A). In addition, roads and trails open to public use would decline by 278 miles (8 percent) compared to Alternative A. Fewer NSO and CSU stipulations (497,800 and 471,500 acres respectively) to protect soil resources than under Alternatives B or C. Soil productivity expected to decline over time. Alternative meets Public Land Health Standard 1 only with extensive monitoring, mitigation, and reclamation.
Water Resources			
Current management would maintain or improve water quality, natural stream morphologic conditions, sustainability of water resources (water quantity), groundwater aquifer properties, and natural stream hydrographs. Continue to apply NSO (433,000 acres) and CSU (74,100 acres) stipulations for protect water	Specific actions would maintain or improve water quality, natural stream morphologic conditions, sustainability of water resources (water quantity), groundwater aquifer properties, and natural stream hydrographs. Restrict surface-disturbing activities by applying NSO (614,000 acres) and CSU (656,200 acres)	Similar to Alternative B, but additional actions would maintain or improve water quality, natural stream morphologic conditions, sustainability of water resources (water quantity), groundwater aquifer properties, and natural stream hydrographs. Apply more restrictions on surface-disturbing activities (858,000 acres	Similar to Alternative A, but would provide slightly more protection for water resources, mainly due to the NSO stipulation for major river corridors (totaling 11,800 acres).

Table 2-5
Summary of Environmental Consequences of Alternatives A, B, C, and D

Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
resources. ROW activities, mineral and energy development, forest harvest, recreation (especially motorized use), and livestock grazing are primary land uses that could impact water quality and quantity. Land use restrictions designed to protect water quality and quantity would be relatively limited, and would generally be handled at the project level with design features and mitigation measures.	stipulations, which provide protection for water resources. NSO stipulation specific to major river corridors (totaling 11,800 acres). Compared with Alternative A, fewer areas open to fluid mineral leasing, forest harvest, recreation (especially motorized use), and livestock grazing would reduce impacts on water quality, channel stability, and watershed health. Increased protection of water resources through more lands designated as ACECs and managed to protect wilderness characteristics.	of NSO and 664,400 acres of CSU stipulations) than Alternatives A, B, or D. NSO stipulation specific to major river corridors (totaling 11,800 acres). Compared with Alternative A, fewer lands open to fluid mineral leasing, forest harvest, recreation (especially motorized use), and livestock grazing would reduce impacts on water quality, channel stability, and watershed health over a greater area. More lands than Alternative B would be protected through special designations, which would limit impacts to a smaller area.	
Vegetation			
General Vegetation and Desired Plant Communities			
ROW activities, mineral and energy development, forest harvest, recreation (especially motorized use), and livestock grazing are primary land uses that could impact vegetation. Land use restrictions designed to protect vegetation and plant communities would be relatively limited, and would generally be handled at the project level with	Protective management measures for vegetation and stipulations and restrictions to reduce impacts from resource uses would be implemented. Desired plant communities would be prioritized. More restrictions on surface-disturbing activities (e.g., NSO and CSU stipulations) and fewer areas open to mineral and energy development, forest harvest,	Similar to Alternative B but management would focus on improving vegetation for special status species habitat, which would improve and protect desired plant communities. Alternative C also would emphasize use of fire over mechanical treatments, which could limit vegetation improvement or restoration. This alternative provides the most	Similar to Alternative B but emphasis would be on managing vegetation for commodities and resource uses, as well as maintaining vegetation conditions. As a result, there would be fewer opportunities for resource protection and vegetation improvement or restoration. Fewer restrictions (e.g., NSO, CSU, and TL stipulations) and ROW avoidance and exclusion areas,

Table 2-5
Summary of Environmental Consequences of Alternatives A, B, C, and D

Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
design features and mitigation measures.	recreation (especially motorized use), and livestock grazing, which would reduce impacts related to vegetation disturbance, changes in condition, and fragmentation. Increased protection of vegetation resources with more lands designated as ACECs and managed to protect wilderness characteristics.	restrictions on land use (e.g., NSO and CSU stipulations) and the fewest areas open to mineral and energy development, forest harvest, recreation (especially motorized use), and livestock grazing, which would reduce impacts on vegetation over a greater area.	which reduce surface-disturbing activities and in turn reduce protections for vegetation.
Riparian and Wetland Vegetation			
Timber and woodland harvest would be prohibited in riparian and wetland areas, which would maintain or improve functioning condition. An NSO stipulation would continue on 6,145 acres of riparian vegetation, and 3,000 acres managed for aquatic riparian vegetation would improve or protect these areas. Recreation would have increasing impacts on riparian and wetland areas as regional population and subsequent recreation use increases, by increasing the likelihood for soil compaction, vegetation trampling, and weed introduction and spread.	Applying NSO and CSU stipulations around major river corridors and managing riparian areas and major river corridors as ROW avoidance areas with special stipulations would protect riparian vegetation and reduce impacts from surface-disturbing activities. Actions such as modifying recreation use and prohibiting firewood harvest would reduce impacts on riparian areas. Comprehensive route designation would help reduce impacts on riparian vegetation. Approximately 2,300 acres of riparian areas would be closed to motorized vehicles, 7,100 acres would be limited to designated routes, and 600 acres	Types of impacts on riparian and wetland vegetation from casual use, permitted activities, and changes to vegetation conditions would be the same as under Alternative B, but would occur over a smaller area. Motorized and mechanized travel would be limited to designated routes on 5,300 acres of riparian vegetation, closed on 4,100 acres, and 400 acres would be seasonally closed to motorized travel. Similar to Alternative B, several ACECs would be maintained or designated to protect riparian and wetland vegetation. Fourteen WSR segments would be suitable for inclusion in the NWSRS and restrictions to preserve the	Types of impacts on riparian and wetland vegetation would be the same as under Alternative B, but this alternative would provide slightly less protection to riparian areas around major river corridors; require less stringent design, construction, maintenance, and reclamation plans; and apply ROW avoidance and CSU stipulations around riparian and wetland areas. Motorized and mechanized travel would be limited to designated routes on 8,600 acres, closed on 600 acres, and 600 acres would be seasonally closed to motorized travel. Riparian areas would not benefit from WSR protections since no

Table 2-5
Summary of Environmental Consequences of Alternatives A, B, C, and D

Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Approximately 3,500 acres of riparian vegetation would be open to all modes of travel, 5,400 acres would be either limited to existing or limited to designated routes for motorized travel, and 700 acres would be seasonally closed to motorized travel. Fourteen WSR segments would be eligible for inclusion in the NWSRS and restrictions to preserve the ORVs, free-flowing nature, and tentative classification of the segments would protect riparian vegetation in these areas.	would be seasonally closed to motorized travel. Several ACECs would be maintained or designated to protect riparian and wetland vegetation. One segment along the Dolores River would be suitable for inclusion in the NWSRS and restrictions to preserve the ORVs, free-flowing nature, and tentative classification of this segment would protect riparian vegetation in this area.	ORVs, free-flowing nature, and tentative classification of the segments would protect riparian vegetation in these areas.	segments would be managed as eligible or suitable for inclusion in the NWSRS.
Forest and Woodland Vegetation			
No forest and woodland management plans would guide BLM forestry practices in specific areas to improve forest health, diversity, and achievement of multiple age classes for species.	Current acreage of old growth pinyon and juniper would be maintained. Old growth woodlands would be managed as ROW avoidance areas, and a CSU stipulation would protect these areas from surface-disturbing activities. Planned and unplanned fire and variety of fuel treatments would assist in managing for multiple age classes in non-old-growth forest and woodland areas. Forestry plans would improve forest health, diversity, and	Types of impacts on forest and woodland vegetation from casual use, permitted activities, and changes to vegetation conditions would be the same as under Alternative B. Greater emphasis would be placed on increasing the acreage of old growth pinyon-juniper woodlands and closing the greatest acreage to wood harvest to maintain late seral forest vegetation over the long term.	Types of impacts on forest and woodland vegetation from casual use, permitted activities, and changes to vegetation conditions would be the same as under Alternative B. Alternative D would emphasize mid-seral pinyon-juniper forest and woodlands for harvest and treatment, likely preventing the expansion of old-growth forest communities.

Table 2-5
Summary of Environmental Consequences of Alternatives A, B, C, and D

Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	achievement of multiple age classes for species such as pinyon-juniper, aspen, Douglas fir, spruce, and ponderosa pine.		
Weeds			
Lands and realty management actions (i.e., relatively few exclusion or avoidance areas) would reduce the likelihood of weed spread. Increased recreation users and vehicles would increase weed introduction and spread throughout the decision area. Fewer restrictions on surface disturbing activities would increase likelihood of weeds colonizing disturbance sites. Lack of interpretation and environmental education activities could result in user actions that introduce or spread weeds.	Soil and water protections would decrease the likelihood of weed spread by maintaining topsoil and native seed. Concentrating recreation facilities and visitor use through implementation of SRMAs could increase weed vectors; however, weeds may be easier to manage because use would be concentrated in discrete areas. More restrictions, such as NSO, CSU, and TL stipulations, on surface-disturbing activities (e.g., mining, recreation, grazing) would decrease the likelihood of weeds colonizing disturbed sites.	Types of impacts from casual use, permitted activities, and changes to vegetation conditions on weeds would be the same as under Alternative B. However, with its greater conservation emphasis and additional management actions to restrict surface-disturbing activities, there would be less potential for weed introduction or spread.	Types of impacts on weeds would be the same as those under Alternative B. Increased surface-disturbance from mining, recreation, grazing, and other permitted activities would result from fewer restrictions on surface-disturbing activities. Consequently, this alternative would result in the greatest potential for weed introduction and spread among the action alternatives.
Fish and Wildlife			
Potential for direct and indirect impacts on fish and wildlife species and their habitats. Land use restrictions designed to protect fish and wildlife and their habitat would be relatively limited, and would	Protective management measures would be implemented for fish and wildlife habitats, including 170,500 acres that would be managed as wildlife emphasis areas. Stipulations and restrictions would be	Similar to Alternative B; however, management would focus on improving vegetation for special status species habitat, which would improve and protect fish and wildlife. Approximately 145,500	Similar to Alternative B; however, managing vegetation for commodities and resource uses, as well as maintaining vegetation conditions, would be emphasized. As a result, there would be less

Table 2-5
Summary of Environmental Consequences of Alternatives A, B, C, and D

Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
generally be handled at project level with design features and mitigation measures. No wildlife emphasis areas would be proposed, making it more difficult to effectively and efficiently manage for wildlife.	implemented to reduce impacts from resource uses, which would protect fish and wildlife populations and habitats. More restrictions (e.g., NSO and CSU stipulations) and fewer areas open to mineral and energy development, forest harvest, recreation (especially motorized use), and livestock grazing than Alternative A would reduce impacts related to disturbance from casual use, disturbance from permitted activities, and changes to habitat condition. Healthier vegetation for fish and wildlife would be more resistant to invasive weeds and drought conditions.	acres would be managed as wildlife emphasis areas. More restrictions (e.g., NSO and CSU stipulations) and fewer areas open to mineral and energy development, forest harvest, recreation (especially motorized use), and livestock grazing than Alternatives A and B would provide protection to fish and wildlife over a greater area.	opportunity for resource protection through wildlife emphasis areas (33,400 acres), and fewer ACECs and improvement or habitat restoration projects. Fewer protective measures, such as NSO, CSU, and TL stipulations, as well as ROW avoidance and exclusion areas, which reduce or limit surface-disturbing activities and thereby protect for fish and wildlife.
Special Status Species			
Potential for direct and indirect impacts on special status species and their habitats. ROW activities, mineral and energy development, forest harvest, recreation (especially motorized use), and livestock grazing are primary land uses that could impact species and their habitat. Land use restrictions designed to	Protective management measures for fish, wildlife, and plants, and stipulations and restrictions to reduce impacts from resource uses, would be implemented, which would protect special status species populations and habitats. More restrictions (e.g., NSO and CSU stipulations) and fewer areas open to mineral and energy	Similar to Alternative B; however, management would focus on improving vegetation for special status species habitat, which would improve and protect special status species. More restrictions (e.g., NSO and CSU stipulations) and fewer areas open to mineral and energy development, forest harvest,	Similar to Alternative B; however, managing vegetation for commodities and resource uses, as well as maintaining vegetation conditions, would be emphasized. As a result, there would be less opportunity for resource protection through wildlife emphasis areas and ACECs and improvement or habitat

Table 2-5
Summary of Environmental Consequences of Alternatives A, B, C, and D

Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
protect fish and wildlife and their habitat would be relatively limited, and would generally be handled at project level with design features and mitigation measures. Few restrictions within Gunnison and greater sage-grouse habitat, including PPH and PGH. For example, 5,600 acres (100 percent) of PPH and 6,400 acres (72 percent) of PGH would remain open to all types of vehicles (motorized travel on routes within the remaining PGH would be closed seasonally), increasing the possibility of disturbance and death or injury from collisions. All PPH and PGH would remain open to fluid minerals leasing, resulting in further disturbances to sage-grouse.	development, forest harvest, recreation (especially motorized use), and livestock grazing than Alternative A would reduce impacts related to disturbance from casual use; disturbance from permitted activities; and changes to habitat condition. Limiting motorized vehicle travel to designated routes on 5,200 acres (93 percent) of PPH and 8,100 acres (91 percent) of PGH would reduce disturbance and risk of collision from cross-country travel. Closing all occupied Gunnison sage-grouse habitat (10,600 acres) to fluid mineral leasing and geophysical exploration would protect Gunnison sage-grouse from impact associated with resource development.	recreation (especially motorized use), and livestock grazing than Alternatives A and B would provide protection to special status species over a greater area. Closing 4,900 acres (82 percent) of PPH and 3,500 acres (39 percent) of PGH to motorized travel would reduce disturbance and risk of collision. Closing all occupied Gunnison and greater sage-grouse habitat (18,900 acres) to fluid mineral leasing and geophysical exploration would protect sage-grouse from impact associated with resource development.	restoration. Fewer measures, such as NSO, CSU, and TL stipulations, as well as ROW avoidance and exclusion areas, to reduce or limit surface-disturbing activities which would reduce protections for special status species. Limiting motorized vehicle travel to designated routes on all PPH and PGH would reduce disturbance and risk of collision from cross-country travel. Applying CSU and TL stipulations to leks and nesting and early brood-rearing habitat would provide limited protection for sage-grouse.
Wild Horses			
Greater potential for direct and indirect impacts on wild horses and their habitats compared to the action alternatives. Zero acres would are closed to motorized use, 2,600 would be managed as ROW exclusion area, and zero acres would continue to	Establishment of an AML and allowing adjustments based on defined conditions would benefit wild horses. More restrictions (NSO and CSU stipulations) and fewer areas open to mineral and energy development, forest harvest, and	Managing desired plant communities with an emphasis on maintaining or enhancing special status species habitat would have a greater impact on wild horses than under Alternative B. Approximately 23,600 acres would be closed to motorized use and	Types of impacts from desired plant community management would be the same as under Alternative C. Approximately 22,800 acres would be closed to motorized use, 22,800 acres would be managed as ROW exclusion area, and zero acres

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Summary of Environmental Consequences of Alternatives A, B, C, and D

Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
be managed as an ACEC, providing minimal protection to the wild horses and their habitat. Mineral and energy development, forest harvest, and recreation are other primary land uses that could impact the wild horses and their habitat. Stipulations TL-10, Wild Horse Winter Range, and TL-11, Wild Horse Foaling Area, would prevent forage degradation or harassment of wild horses from other uses of public land.	recreation would reduce impacts related to disturbance from casual use, disturbance from permitted activities, and changes to habitat condition. Approximately 23,400 acres would be closed to motorized use and 24,000 acres would be managed as ROW exclusion area, which would reduce the harassment of wild horses. Designating the Mt. Garfield ACEC (of which 2,000 acres overlaps the LBCWHR) would indirectly protect forage, water sources, and the free-roaming nature of wild horses through ROW exclusions and restrictions on mineral development. Prohibiting target shooting in the Coal Canyon and Main Canyon areas of the LBCWHR would provide more protection for wild horses by reducing the risk of harassment or accidental death.	33,600 acres would be managed as ROW exclusion area, limiting harassment of wild horses. Alternative C would provide additional protection of wild horses by prohibiting mineral material sales, fluid mineral leasing, and non-energy mineral leasing activities. Similar to Alternative B, the Mt. Garfield ACEC would be designated, however under this alternative 3,100 acres would overlap the LBCWHR, providing additional protection for forage, water sources, and the free-roaming nature of wild horses through ROW exclusions and restrictions on mineral development. Similar to Alternative B, target shooting would be prohibited in the Coal Canyon and Main Canyon areas of the LBCWHR.	would be designated as an ACEC, providing more protection to the wild horses and their habitat than Alternative A. Fewer measures (e.g., NSO, CSU, and TL stipulations) and land use restrictions could result in more impacts from casual use, disturbance from permitted activities, and changes to habitat condition. No SRMAs within the LBCWHR would be identified, providing fewer focused recreation opportunities and fewer impacts on wild horses than under Alternative A.
Cultural Resources			
Impacts could occur from any surface-disturbing activities, as well as from natural events (such as soil erosion), all of which could affect	Impacts would vary little from Alternative A; however, more restrictions on surface-disturbances (e.g., NSO and CSU stipulations),	Impacts would be much the same as under Alternative B; however, more restrictions on land use (e.g., NSO and CSU stipulations) and	Impacts on cultural resources would be similar to those under Alternative A and B; however, restrictions in this alternative, while

Table 2-5
Summary of Environmental Consequences of Alternatives A, B, C, and D

Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
the integrity of cultural sites. Authorized surface-disturbing activities could result in the discovery of previously unknown cultural resources, which would lead to the expansion of local knowledge about the history or prehistory of an area. Natural events and unregulated activities (such as from illegal artifact collection, trespass, largely uncontrolled OHV use, and livestock concentrations in sensitive areas) would create impacts on cultural resources that likely would not be mitigated.	emphasis on travel management, and greater use of BMPs and COAs for permitted activities would reduce impacts. More attention to protecting visual resources, soils, and vegetation would result in fewer naturally caused impacts. Uncontrolled impacts (such as from illegal artifact collection), would still occur, much the same as under Alternative A; however, restrictions on access could reduce opportunities for activities that would impact cultural resources.	fewer areas open to mineral and energy development, forest harvest, recreation (especially motorized use), and livestock grazing would provide protection to cultural resources over a greater area.	less stringent than under Alternatives B and C, would provide greater protection for cultural resources than would be provided under Alternative A.
Paleontological Resources			
Impacts could result from any surface-disturbing activities in areas where sediments are prominent. Impact could also result from natural events (such as soil erosion), which could affect the integrity of paleontological sites and damage fossils. Actual impacts on paleontological resources from permitted surface disturbances rarely occur due to the requirements of inventory in advance of any surface disturbance, followed by avoidance or site	Impacts would vary little from Alternative A; however, more restrictions on surface-disturbing activities (especially motorized use), emphasis on travel management, and greater use of BMPs and COAs for permitted activities would reduce impacts. More attention to protecting soils and vegetation would result in fewer naturally caused impacts. Uncontrolled impacts (such as from illegal fossil collection), would still	Impacts would be much the same as under Alternative B; however, more restrictions on land use (NSO and CSU stipulations) and fewer areas open to mineral and energy development, forest harvest, recreation (especially motorized use), and livestock grazing than Alternatives A and B would provide protection to paleontological resources over a greater area.	Impacts would be similar to those under Alternative A and B; however, restrictions in this alternative, while less stringent than under Alternatives B and C, would provide greater protection for paleontological resources than would be provided under Alternative A.

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Summary of Environmental Consequences of Alternatives A, B, C, and D

Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
mitigation measures designed to protect the integrity of those resources. Authorized surface-disturbing activities could result in discovery of previously unknown fossil resources, which would lead to expanding local knowledge about the prehistory of an area. Natural events and unregulated activities (such as from illegal fossil collection, trespass, largely uncontrolled OHV use, and livestock concentrations in sensitive areas) would result in impacts that likely would not be mitigated.	occur, much the same as under Alternative A; however, restrictions on access could reduce opportunities for activities that would impact paleontological resources.		
Visual Resources			
Majority of BLM-managed public lands would remain undesignated. Activities that are not controlled by a use authorization (such as cross-country travel) could result in unmitigated impacts to the visual character of an area or to a landscape. Approximately 110,700 acres of VRI Class II lands, 38,800 acres of VRI Class III lands, and 9,900 acres of VRI Class IV lands are managed	Impacts would be the same as under Alternative A, but the intensity and extent of those impacts would be reduced due to increased acreage in VRM Classes I and II. More acres of VRI Class II, III, and IV lands would be managed as VRM Class I or II than under Alternative A, which would preserve or retain the existing character of the landscape, including the underlying	Impacts would be similar to Alternative B; however more acres would be managed as VRM Class I and II, resulting in less flexibility in designing projects to meet visual resource protection requirements. The most acres of VRI Class II, III, and IV lands would be managed as VRM Class I or II than under the other alternatives. This alternative provides the most protection to visual resources.	Impacts would be similar to Alternative B; however, large areas would remain in VRM Class III and IV, providing flexibility in designing projects to meet visual resource protection requirements. More acres of VRI Class II, III, and IV lands would be managed as VRM Class I or II than under Alternative A, but fewer than the other action alternatives, which would preserve or retain the existing character of

Table 2-5
Summary of Environmental Consequences of Alternatives A, B, C, and D

Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
as VRM Class I or II, which would preserve or retain the existing character of the landscape, including the underlying scenic quality of the area. Approximately 117,400 acres of VRI Class II lands, 72,600 acres of VRI Class III lands, and 15,700 acres of VRI Class IV lands are managed as VRM Class III which would partially retain the existing character of the landscape. Nearly all of the acres that are managed as VRM Class III or Undesignated are scenic quality B landscapes and have high visual sensitivity, so changes to these landscapes would be perceived as more intense than in lower value landscapes. In total, 696,100 acres of the remaining lands do not have an assigned VRM class. VRM classes are assigned to these areas on a case-by-case basis as projects arise.	scenic quality of the area. All of the VRI Class II scenic quality A landscapes and 83 percent of scenic quality B landscapes would be managed as either VRM Class I or II. In addition, 84 percent of the VRI Class II high sensitivity landscapes and 79 percent of VRI Class II medium sensitivity landscapes would be managed as either VRM Class I or II. All of the VRI Class II lands that would be managed as VRM Class III are of scenic quality B. Furthermore, 49,800 acres of VRI Class II high sensitivity landscapes would be managed as VRM Class III, which could result in more intense impacts than modifications to lower value landscapes.	Within the VRI Class II lands that would be managed as VRM Class III, all are of scenic quality B ranking and most (79 percent) have medium sensitivity. The remaining 21 percent are high sensitivity landscapes, and the intensity of perceived impact would be greatest in these areas. However, this only accounts for 800 acres within the decision area.	the landscape, including the underlying scenic quality of the area. Approximately 118,300 acres of VRI Class II lands would be managed according to VRM Class III or IV objectives, which would allow for moderate to major modifications of the existing character of the landscape. This alternative has the greatest potential for impacts to scenic quality of any of the action alternatives. Within the VRI Class II lands that would be managed as VRM Class III, 7,700 acres (8 percent) are scenic quality A landscapes and an additional 85,000 acres (92 percent) are scenic quality B landscapes. Furthermore, 62,300 acres (67 percent) are of high sensitivity and the remaining acres (33 percent) are of medium sensitivity. Within the VRI Class II lands that would be managed as VRM Class IV, all are scenic quality B landscapes but have high sensitivity. Impacts from landscape modifications in these areas would be perceived as more intense than modifications in areas with lower visual value.

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Summary of Environmental Consequences of Alternatives A, B, C, and D

Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Wildland Fire Management			
Wildland fires would continue. There would also be a need to grow and expand the wildland fire and hazardous fuels program as demand on this program increases.	Similar to Alternative A, wildland fires would continue. Alternative B would be the most permissive in allowing unplanned wildland fire as a management tool to meet resource benefit objectives, which would increase flexibility and efficiency by mitigating against unplanned, damaging fires. Most management actions are intended to improve, create, or re-establish healthy ecological conditions in various vegetative types and reduce the risk of catastrophic fire, especially in the WUI. This would promote the most efficient use of wildland fire management program resources. Alternative B provides management flexibility along with reduced large fire costs by maximizing the range of fuel treatment options and providing the possibility to use unplanned wildland fire for resource benefit where appropriate.	Similar to Alternative B; however, this alternative provides the least amount of flexibility in methods used for fuel-reduction treatments.	Alternative D has less flexibility than the other alternatives to manage wildland fires and would require suppression in more circumstances due to fewer acres allowing the management of unplanned wildland fires for resource benefit. This would reduce the efficiency of the wildland fire management program and result in the highest large fire costs of any alternative.
Lands with Wilderness Characteristics Outside Existing WSAs			
Lands with wilderness characteristics outside existing WSAs would not be managed to	Three lands with wilderness characteristics units (24,400 acres or 14 percent) would be managed	Twelve lands with wilderness characteristics units (171,200 acres or 100 percent) would be managed	Impacts on lands with wilderness characteristics would be similar to Alternative A because no special

Table 2-5
Summary of Environmental Consequences of Alternatives A, B, C, and D

Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
protect those characteristics. Management actions to protect other resources and special designation areas would offer some protection of wilderness characteristics, though surface-disturbing activities such as fluid mineral extraction and casual use (e.g., motorized recreation) would have the potential to alter the natural setting as well as reduce opportunities for solitude or primitive recreation for all lands with wilderness characteristics units. Therefore, degradation of wilderness characteristics would be likely.	to protect their wilderness characteristics. Closing these units to fluid minerals leasing, mineral material disposal, and non-energy leasable development and exploration would protect wilderness characteristics by prohibiting development and infrastructure related to those actions, subject to valid existing rights. While NSO restrictions would prevent alteration of wilderness characteristics, the potential for impacts on other lands with wilderness characteristics units would remain. The remaining 146,800 acres of lands with wilderness characteristics would not receive any direct protection. Therefore, degradation of wilderness characteristics in those areas would be likely.	to protect their wilderness characteristics. As a result, protection of wilderness characteristics would be increased in comparison to Alternative A. More restrictions on land use (e.g., NSO and CSU stipulations) and fewer areas open to mineral and energy development, forest harvest, recreation (especially motorized use), and livestock grazing than Alternatives A would also provide greater protection of wilderness characteristics.	management would be enacted to preserve wilderness characteristics in inventoried lands with wilderness characteristics units. While some protection of these qualities may be provided by management actions for other resources program, lack of management actions for lands with wilderness characteristics increases the potential for degradation of these characteristics.

Table 2-5
Summary of Environmental Consequences of Alternatives A, B, C, and D

Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
RESOURCE USES			
Forestry			
Approximately 542,700 acres would be classified as unsuitable for harvest. Harvest of forest and woodland product would continue to be impacted by NSO stipulations for cultural resources that limit or prohibit actions and treatments in areas where they would conflict with cultural resource protection. Management of some ACECs, including Unaweep Seep and the Palisade, would restrict forestry activities and limit the harvest of products from these areas. Management of the 14 WSR study segments would allow for removal of forest products from eligible segments when forestry harvest does not conflict with the protection of ORVs, free-flowing nature, or tentative classification. Restricting development of new roads and trails could result in additional costs or restrictions on harvest because of reduced access. No impact on biomass utilization.	Approximately 203,100 acres (63 percent fewer acres than under Alternative A) would be closed to wood product sales or harvest (not including Christmas tree harvest). Management actions for other resources would place additional limitations (beyond Alternative A) on forestry product development. Increased fuels treatments have the potential to impose additional limits on forest harvest by reducing the quantity of forest products available for harvest. Impacts from WSR management would be similar to those described under Alternative A, but would only apply to the Dolores River pending a suitability determination. Making biomass available represents a direct impact on the regional ability for biomass resources to be utilized.	Approximately 435,300 acres (20 percent fewer acres than under Alternative A) would be closed to wood product sales or harvest (not including Christmas tree harvest). Impacts on forestry from other management actions and fuels treatments would be similar to Alternative B. Restrictions from WSRs would be the same as under Alternative A. Biomass impacts would be the similar to Alternative B.	Approximately 108,600 acres (80 percent fewer acres than under Alternative A) would be closed to wood product sales or harvest (not including Christmas tree harvest). Significant impacts on forestry product harvest would be less likely. Manual and mechanical fuels treatments over the fewest acres of any alternative, thereby protecting the quantity of forest products. There would be no management for lands managed for wilderness characteristics or WSRs under Alternative D, and, as such, there would be no restrictions from these two programs on forestry management or harvest. Tamarisk and Russian olive would be targeted for removal, with the same types of impacts on biomass resource development as under Alternative B.

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Summary of Environmental Consequences of Alternatives A, B, C, and D

Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
Livestock Grazing			
Includes the largest area open to livestock grazing; there would be no net change in the 978,600 acres available for livestock grazing or the assigned AUMs. Acres of allotments open to grazing that would be acceptable for coal leasing and development, open to fluid mineral leasing, and open to mineral material sales under Alternative A represent the greatest potential impact on livestock grazing practices of any alternative. Recreation use would result in more conflicts with livestock grazing under Alternative A than under Alternatives B, C, or D, given the large expanse of undesignated routes.	Provides third-largest area open to grazing: approximately 961,100 acres of allotments would be open to grazing (2 percent fewer acres than under Alternative A), with 176,800 (18 percent) of those acres open with seasonal limitations. Within the acres available to livestock grazing, 60,633 AUMs would be allocated (approximately 1 percent fewer AUMs than under Alternative A). Types of impacts would be the same as under Alternative A, but would occur over a smaller area.	Provides the smallest area open to grazing: approximately 586,600 acres of allotments (40 percent fewer acres than under Alternative A) would be open to grazing and 440,400 acres (43 percent), including all portions of allotments below 6,000 feet, would be closed to grazing. Within the acres available to livestock grazing, 32,658 AUMs would be allocated (approximately 47 percent fewer AUMs than under Alternative A). Types of impacts would be the same as those under Alternative A, but would occur over a smaller area than under any other alternative.	Provides the second-largest area open to grazing: approximately 977,200 acres of allotments (less than 1 percent fewer acres than under Alternative A) would be open to grazing, with seasonal limitations applied on a case-by-case basis. Within the acres available to livestock grazing, 61,270 AUMs would be allocated (the same amount as under Alternative A). Types of impacts would be the same as those under Alternative A, but would occur over a slightly smaller area.
Recreation and Visitor Services			
Certain areas, such as Palisade Rims and the Gunnison River Bluffs, receive heavy recreation use that currently falls under ERMA management. Not providing focused recreation management for these types of areas would likely inhibit desired opportunities, outcomes, and experiences, and	Three SRMAs would be managed for their unique value, importance, and/or distinctiveness. Management actions would largely maintain or enhance the desired recreation setting characteristics. Likewise, anticipated growth in cross-country OHV use and	Two SRMAs would be managed for their unique value, importance, and/or distinctiveness. More stringent resource protection and less focus on proactive recreation management would promote quiet, dispersed recreation at the expense of motorized recreation experiences and those visitors	Six SRMAs would be managed for their unique value, importance, and/or distinctiveness. Greater emphasis on promoting recreation would likely result in an even greater increase in use than Alternative A. The six SRMAs, in particular, would become increasingly popular destinations. A

Table 2-5
Summary of Environmental Consequences of Alternatives A, B, C, and D

Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
result in user conflict and displacement. Similar impacts would be expected where management plans for popular areas like the Grand Valley IRMA fail to provide adequate management direction for emerging recreation trends and increased visitation. These impacts would likely become significant in localized areas over the life of the plan.	competitive events in the Grand Valley Open Area may necessitate SRMA management.	looking for a structured setting. With little emphasis on promotion of the GJFO as a recreation destination, users could eventually gravitate to other parts of the region, making it difficult to sustain front and middle country social setting characteristics in the SRMAs.	resulting demand for additional facilities would likewise push most or all SRMAs towards a rural setting instead of the desired middle and back country setting characteristics.
Lands and Realty			
Managing 234,900 acres as unsuitable for utilities (i.e., ROW exclusion areas) would prohibit the placement of ROWs in these areas, thereby reducing options for ROW placement in the decision area. Areas identified as sensitive for utility development (i.e., ROW avoidance areas) would cover 441,400 acres. These areas could impose design and siting requirements and associated costs on new ROWs or assigned, amended, or renewed ROWs at existing sites. No solar or wind emphasis areas would be identified.	Managing ROW exclusion and avoidance areas would have the same types of impacts as under Alternative A, except that there would be 204,200 acres managed as ROW exclusion areas (13 percent fewer acres than under Alternative A) and 740,900 acres managed as ROW avoidance areas (42 percent more acres than under Alternative A). Alternative B would identify 12,200 acres of solar emphasis areas (including 9,200 acres of SEZs within the solar emphasis area boundaries) and 2,600 acres of wind emphasis areas; processing solar and wind applications would be more efficient.	Managing ROW exclusion and avoidance areas would have the same types of impacts as under Alternative A, except that there would be 365,800 acres managed as ROW exclusion areas (56 percent more acres than under Alternative A), and 627,000 acres as ROW avoidance areas (42 percent more acres than under Alternative A). Alternative C would identify 5,300 acres of solar emphasis areas (57 percent fewer acres than under Alternative B) and 2,600 acres of wind emphasis areas (same as Alternative B). Areas considered for acquisition would be similar to under Alternative B, except that	Managing ROW exclusion and avoidance areas would have similar impacts as under Alternative A, except that there would be 104,100 acres managed as ROW exclusion areas (56 percent fewer than Alternative A), and 80,500 acres managed as ROW avoidance areas (82 percent less than under Alternative A). Alternative D would identify 36,300 acres of solar emphasis areas (3 times more than under Alternative B) (including 9,200 acres of SEZs that are entirely within the solar emphasis area boundaries) and 2,600 acres of wind emphasis areas (same as Alternative B). The boundary of the Grand Valley

Table 2-5
Summary of Environmental Consequences of Alternatives A, B, C, and D

Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	Areas considered for acquisition would be similar to Alternative A, except this alternative would include additional acquisition criteria that could result in additional areas being acquired. A petition to withdraw 20,700 acres from locatable mineral entry would promote resource protection but also limit the location of mineral activities and associated facilities.	Alternative C includes five additional criteria focused on habitat and wildlife range, riparian areas, and recreation areas, which could result in additional areas being acquired. A petition to withdraw 45,100 acres from locatable mineral entry would result in the same type of impacts as those described under Alternative B, but occurring over a larger area.	Open Area could be modified to make more land in the decision area available for solar development, a long-term, direct effect on the utilization of solar resources. Identifying 13 cooperative management agreement tracts would have similar impacts to those described under Alternative A, but impacts would affect 8 more tracts, almost 10 times more than Alternative A. A petition to withdraw 1,300 acres from locatable mineral entry would result in the same type of impacts as those described under Alternative B, but occurring only in the Pyramid Rock ACEC.
Energy and Minerals			
Solid Leasable Minerals – Coal			
11 percent of the decision area with coal potential would remain unacceptable for further coal leasing and development. Management actions that would make other areas unacceptable for coal mining would have little effect on industry's current interest in coal mining.	18 percent of the coal potential area would be managed as unacceptable for coal leasing and development (53 percent more acres than under Alternative A). NSO, CSU, and TL stipulations would restrict the locations and sizes of surface disturbance allowed for potential future exploration and	19 percent of the area with coal potential would be managed as unacceptable for coal leasing and development (59 percent more acres than under Alternative A). Similar to Alternative B, NSO, CSU, and TL stipulations would restrict the locations and sizes of areas of surface disturbance	14 percent of the area with coal potential would be managed as unacceptable for coal leasing and development (19 percent more acres than under Alternative A). Types of impacts from applying stipulations within the coal resource potential development area would be similar to under

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Summary of Environmental Consequences of Alternatives A, B, C, and D

Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	mining activities.	associated with mining activities. Alternative C would be the most restrictive alternative with more NSO stipulations applied than any other alternative.	Alternative B, but Alternative D would apply fewer NSO stipulations than Alternatives B or C and would thus be less restrictive.
Solid Leasable Minerals – Non-Energy Leasables, Potash			
No acres would be closed to non-energy solid minerals leasing; availability of non-energy minerals would remain unrestricted. Sewemup WSA, which overlaps the eastern edge of the potash potential area, would remain closed to potash mining. In the remaining potash potential area, TLs would impact the timing of development.	Within the 2,800-acre potash development potential area, 1,900 acres would be closed and an additional 20 acres open to leasing would be covered by an NSO stipulation, leaving 880 acres available for exploration or development of potential potash resources in the decision area. Impacts from the Sewemup WSA would be the same as those described under Alternative A.	Impacts on potash resources would be the same as those described under Alternative B.	Impacts on potash resources would be similar to those described under Alternative B. However, within the 2,800-acre potash development potential area, 500 acres would be closed and an additional 250 acres open to leasing would be covered by an NSO stipulation, leaving 2,050 acres available for exploration or development of potential potash resources in the decision area.
Fluid Leasable Minerals – Oil, Gas, and Geothermal			
1,134,600 acres (92 percent) of federal mineral estate would remain open to oil and gas and geothermal leasing, and 96,500 acres (8 percent) would remain closed. NSO, CSU, and TL stipulations would restrict where surface-disturbing activities may occur, the manner in which they may be implemented, and when they may	1,028,800 acres (84 percent) of federal mineral estate would be open to future oil and gas and geothermal leasing, a 9 percent decrease from Alternative A. Approximately 202,400 acres (16 percent) would be closed. Approximately 15 percent of the area with geothermal resource potential would be closed to geothermal leasing, including the	607,600 acres (49 percent) of federal mineral estate would be open to future oil and gas and geothermal leasing (46 percent fewer acres than under Alternative A), and 623,600 acres (51 percent) would be closed (6.5 times more acres than under Alternative A). Approximately 53 percent of the area with potential for geothermal resources would be closed to	1,130,700 acres (92 percent) of federal mineral estate would be open to future oil and gas and geothermal leasing (1 percent less acres than under Alternative A), and 100,500 acres (9 percent) would be closed (4 percent more acres than under Alternative A). Approximately 7 percent of the area with potential for geothermal resources would be closed to

Table 2-5
Summary of Environmental Consequences of Alternatives A, B, C, and D

Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
occur in areas where they are applied. 774,200 acres has development potential and would remain open to leasing, 281,500 acres (36 percent) of which would have an NSO stipulation, 59,300 acres (8 percent) would be open with a CSU stipulation, and 179,100 acres (23 percent) would be open with a TL. 344,300 acres (44 percent) has development potential and no stipulations. 6 percent of the area with geothermal potential would remain closed to geothermal leasing.	Bangs Canyon area and the Palisade municipal watershed area. Much of the geothermal potential area east of Palisade would be subject to NSO stipulations. 757,000 acres has development potential and would be open to leasing, 335,400 acres of which would have an NSO stipulation (19 percent more acres than under Alternative A), 435,300 acres would have a CSU stipulation (because many CSU stipulations under Alternative A do not have mapped acreages, an acreage-based comparison is not considered accurate), and 278,700 acres would have a TL stipulation (56 percent more acres than under Alternative A). Stipulations would restrict the locations and sizes of surface disturbance allowed for potential future exploration and development activities.	geothermal leasing, the highest of any alternative. 607,600 acres has development potential and would be open to leasing, 243,000 acres of which would have an NSO stipulation (14 percent less acres than under Alternative A), 228,000 acres would have a CSU stipulation (because many CSU stipulations under Alternative A do not have mapped acreages, an acreage-based comparison is not considered accurate), and 158,800 acres would have a TL stipulation (11 percent less acres than under Alternative A). Stipulations would restrict the locations and sizes of surface disturbance allowed for potential future exploration and development activities.	geothermal leasing, the fewest of the action alternatives. 773,400 acres has development potential and would be open to leasing, 274,100 acres of which would have an NSO stipulation (3 percent less acres than under Alternative A), 316,600 acres would have a CSU stipulation (because many CSU stipulations under Alternative A do not have mapped acreages, an acreage-based comparison is not considered accurate), and 265,000 acres would have a TL stipulation (48 percent more acres than under Alternative A). Stipulations would restrict the locations and sizes of surface disturbance allowed for potential future exploration and development activities.
Locatable Minerals			
No new areas would be recommended for withdrawal from the location of mining claims; therefore, there would be no change in the area currently available to the claiming of locatable	20,700 acres would be petitioned for withdrawal from locatable mineral entry. Combined with the 20,100 acres previously withdrawn (under Alternative A), the availability of locatable minerals	45,100 acres would be petitioned for withdrawal from locatable mineral entry. Combined with the additional 20,100 acres previously withdrawn (under Alternative A), availability of locatable minerals	1,300 acres would be petitioned for withdrawal from locatable mineral entry. Combined with the additional 20,100 acres previously withdrawn (under Alternative A), availability of locatable minerals

Table 2-5
Summary of Environmental Consequences of Alternatives A, B, C, and D

Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
minerals. The areas with high gold potential along the Dolores River would continue to not be withdrawn from future claim staking.	would be limited on 40,800 acres, or 4 percent of the mineral estate underlying BLM-administered lands (2.2 times more acres than under Alternative A). Withdrawing the proposed Sinbad Valley ACEC from mineral entry would reduce potential for the development of a future copper/silver mine in the decision area.	would be limited on 65,200 acres, or 6 percent of the mineral estate underlying BLM-administered lands (3.2 times more acres than under Alternative A). The area with high gold potential along the Dolores River would be withdrawn from claiming under Alternative C, reducing the potential for gold development. Impacts on copper/silver mining would be similar to those described under Alternative B.	would be limited on 21,400 acres, or 2 percent of the mineral estate underlying BLM-administered lands (6 percent more acres than under Alternative A). Impacts along the Dolores River would be similar to those described under Alternative A.
Salable Minerals			
274,300 acres (26 percent) of mineral estate underlying BLM-administered lands would remain closed to the disposition of salable minerals, precluding future mining activities in these areas.	586,600 acres (55 percent) would be closed or limited to the disposition of salable materials. This includes 252,400 acres closed to mineral material development (8 percent fewer acres than under Alternative A) plus 307,000 acres open to mineral material development with NSO stipulations. NSO stipulations would effectively close these areas to mining mineral materials unless an exception is granted. CSU and TL stipulations would restrict the locations, sizes, and timing of surface disturbance	817,600 acres (77 percent) would be closed or limited to the disposition of salable materials. This includes 452,000 acres closed to mineral material development (57 percent more acres than under Alternative A) plus 365,600 acres open to mineral material development with NSO stipulations. Similar to Alternative B, NSO stipulations would effectively close these areas to mining mineral materials unless an exception is granted. Alternative C would be the most restrictive because more	462,800 acres (44 percent) would be closed or limited to the disposition of salable materials. This includes 155,300 acres closed to mineral material development (40 percent fewer acres than under Alternative A), plus 307,500 acres open to mineral material development with NSO stipulations. Similar to Alternative B, NSO stipulations would effectively close these areas to mining mineral materials unless an exception is granted. Alternative D would be more flexible than Alternatives A, B, and

Table 2-5
Summary of Environmental Consequences of Alternatives A, B, C, and D

Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	allowed for potential future mining activities.	stipulations would be applied than under any other alternative.	C with the use of fewer stipulations.
SPECIAL DESIGNATIONS			
Wilderness Study Areas			
Resource uses in WSAs that maintain each area's suitability for preservation as wilderness and protects the viability of current wilderness characteristics would be allowed.	Where lands managed for wilderness characteristics are adjacent to WSAs, a wider expanse of contiguous land containing wilderness characteristics could heighten protection within WSAs and further ensure the integrity of their wilderness characteristics.	Impacts would be similar to those under Alternative B.	Impacts would be similar to those under Alternative A since no lands would be managed for wilderness characteristics contiguous with any existing WSAs.
Areas of Critical Environmental Concern			
Impacts to values of existing ACECs would continue from authorized land uses including forestry, grazing, recreation, motorized use, and utility development. NSO, CSU, and TL stipulations would be applied within ACECs. Ninety-five percent of ACECs would continue to be open to fluid mineral leasing with an NSO stipulation applied. These restrictions would protect ACEC values from surface-disturbing activities associated with leasing fluid minerals.	Fewer impacts to relevant and important values would occur in comparison to Alternative A because more areas would be managed as ACECs (3.7 times more acres than under Alternative A). Acquisition of lands within or adjacent to ACECs could provide for more contiguous BLM-administered land, prevent encroachment of private development, and enhance the relevant and important values for which the ACEC was designated. Management actions, including stipulations (e.g., NSO, CSU, and	Fewer impacts to relevant and important values would occur in comparison to Alternative A because more areas would be managed as ACECs (5.8 times more acres than under Alternative A). Impacts from recreation, land acquisitions, mineral and energy development, grazing, recreation, and travel management would be similar to those described under Alternative B, but would occur over a larger area. Approximately 163,200 acres (97 percent) of ACECs would be closed to fluid mineral leasing,	Fewer impacts to relevant and important values would occur in comparison to Alternative A because more areas would be designated (15 percent more acres than under Alternative A). Impacts from recreation, land acquisitions, mineral and energy development, grazing, recreation, and travel management would be similar to those described under Alternative B, but would occur over a smaller area. The 80-acre Unaweep Seep ACEC (less than one percent of ACECs in this alternative) would be closed to fluid mineral leasing, protecting the

Table 2-5
Summary of Environmental Consequences of Alternatives A, B, C, and D

Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	TL), would be applied to mineral and energy development, grazing, recreation, and travel management in order to protect the values within each ACEC. Approximately 52,800 acres (50 percent) of ACECs would be closed to fluid mineral leasing, protecting relevant and important values by prohibiting related development that could degrade those values.	protecting relevant and important values by prohibiting related development that could degrade those values.	ACEC's relevant and important values by prohibiting related development that could degrade those values.
Wild and Scenic Rivers			
14 river segments identified as eligible for inclusion in NWSRS. Protection of the free-flowing nature, ORVs, and tentative classifications (i.e., wild, scenic, recreational) of the segments until a suitability determination is made for the segments. No action that would adversely affect the free-flowing nature of any of the 14 WSR segments, their ORVs, or tentative classifications would be approved. Potential impacts on WSR values would be minimized where other special management designation overlap a stream segment.	Only the Dolores River would be determined suitable for inclusion in the NWSRS and receive specific management protection. While fewer segments would managed as eligible or suitable than under Alternatives A or C, Alternative B would provide different forms of protection to study segments through VRM objectives, applying travel restrictions, identifying ROW avoidance areas, designating ACECs, and applying stipulations. When compared to Alternative A, 8 percent more acres of stream segments would be protected by NSO stipulations, 1 percent fewer acres would be protected by CSU	All segments would be determined suitable for inclusion in NWSRS. Continued management of segments to protect the free-flowing nature, associated ORVs, and tentative classification. Impacts would be similar to or the same as those described under Alternative A, as no action that would adversely affect the free-flowing nature of any of the 14 WSR segments, their ORVs, or tentative classifications would be approved. Potential impacts to WSR values would be minimized where other special management designation overlap a stream segment.	Least amount of protection for the 14 eligible segments. All eligible segments would be determined nonsuitable, a potential long-term impact on the WSR characteristics of these segments as the ORVs, free-flowing nature, and tentative classification identified during eligibility would not be protected by either eligibility or suitability management. While the BLM would not be obligated to protect the ORVs, free-flowing nature, or tentative classification of the segments, they could still receive indirect protection from other resource management actions.

Table 2-5
Summary of Environmental Consequences of Alternatives A, B, C, and D

Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	stipulations, and 4.3 times more acres would be protected by TL stipulations.	Alternative C would provide the most protection to WSR study segments via stipulations. Compared to Alternative A, 9 percent more acres would be protected by NSO, 1 percent more acres would be protected by CSU, and 4.3 times more acres would be protected by TL stipulations.	
National Trails			
No special restrictions for surface occupancy or fluid mineral leasing surrounding the Old Spanish Trail, which could result in impacts on visual resources or setting for the trail. Visual resource management could impact natural scenic qualities of the trail. Development may be permitted that could impact scenic qualities of the trail. Under Alternative A, the Tabeguache Trail is not a National Recreation Trail.	Applying NSO stipulation (200-meter buffer) and managing 50-meter buffer on either side of the Old Spanish Trail as a ROW avoidance area would provide more protection from surface-disturbing activities than under Alternative A. Managing a 50-meter buffer around the Old Spanish Trail as VRM Class IV would provide limited protection from visual disturbances. No NSO stipulation would be applied on the Tabeguache Trail. Protection against soil erosion and improvement of soils to maintain vegetative cover could impose restrictions on recreational development and management	Applying more-restrictive NSO stipulations (0.5-mile buffer) and managing a 50-meter buffer as VRM Class III would provide more protection from surface-disturbing activities in comparison to Alternative A. Impacts from managing areas as ROW avoidance would be similar to Alternative B. Impacts from fluid mineral leasing on the Old Spanish and Tabeguache Trails would be minimal due to restrictions in place and low development potential adjacent to the trails. Impacts from protecting against soil erosion and improving soils would be similar to Alternative B. Management actions to protect	Applying NSO stipulation (50-meter buffer) and managing a 50-meter buffer on either side of the Old Spanish Trail as a ROW avoidance area would be more restrictive than Alternative A but less than Alternative C. Impacts from VRM on the Old Spanish Trail would be the same as described under Alternative B. Impacts from protecting against soil erosion and improving soils would be similar to Alternative B.

Table 2-5
Summary of Environmental Consequences of Alternatives A, B, C, and D

Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
	activities associated with trails. Potential listing of the Tabeguache Trail as a National Recreation Trail could increase recreational use of the trail, thus providing the potential for greater opportunities for interpretation and education, while also increasing pressure on trail resources. Without land acquisitions or easements, access to portions of the trail that currently pass through private property could be restricted or closed.	Rough Canyon Creek, which would be found suitable for inclusion in the NWSRS, may impact the Tabeguache Trail. All other impacts on the Tabeguache Trail would be similar to those under Alternative B.	
National, State, and BLM Byways			
Efforts to protect scenic ORVs along eligible WSR segments would benefit scenic values of the byways by prohibiting or limiting most surface-disturbing activities. Impacts on adjacent landscapes from fluid mineral development are unlikely due to the limited mineral potential adjacent to byways. Lack of interpretation and environmental education resources could degrade historic or natural qualities of lands adjacent to byways. By not establishing any BLM	No new BLM byways; impacts would be the same as those under Alternative A. Management of the Dolores River WSR segment determined suitable would aid in protection of natural and historic resources along the Unaweep-Tabeguache Byway. Lands adjacent to byways have low fluid mineral potential. As such, fluid minerals development is not likely to impact scenic or historic values of byways. Surface use restrictions proposed for cultural resource protection	No new BLM byways; impacts would be the same as those under Alternative A. Impacts from WSR management actions would be the same as those described under Alternative A. Impacts from fluid minerals would be the same as those described under Alternative B. Impacts from surface use restrictions proposed for cultural resource protection would be the same as those described under Alternative B.	There would be 4 new BLM byways totaling 48 miles; increased visitor traffic could enhance awareness and appreciation and potentially require increased protective actions for lands adjacent to byways. Increased use may enhance awareness and appreciation, as well as strain resources. Impacts from fluid minerals would be the same as those described under Alternative B. Impacts from surface use restrictions proposed for cultural

Table 2-5
Summary of Environmental Consequences of Alternatives A, B, C, and D

Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
byways, resources along those roads would not receive public recognition and traffic would not increase at levels commensurate with an official byway.	would limit impacts on visual resources and therefore protect scenic qualities associated with any adjacent byways.		resource protection would be the same as those described under Alternative B.
SOCIAL AND ECONOMIC CONDITIONS			
Native American Tribal Uses			
There are no known Indian Trust Assets or treaty-based rights or responsibilities of the BLM in the planning area; therefore, no impacts are anticipated.	Same as Alternative A.	Same as Alternative A.	Same as Alternative A.
Public Health and Safety			
Lands open for consideration for mineral material sales and fluid minerals leasing would have potential for future health and safety risks related to mining activities. Lands open for fluid minerals leasing would have potential for future health and safety risks related to oil, gas, and geothermal exploration, development, operation, and decommissioning. Lands acceptable for coal leasing and development would have potential for future health and safety risks related to coal mining. Surface waters and groundwaters	Delisting of impaired water bodies (303d listed) could improve water quality in impaired water bodies and result in lower health risks for users of those waters. Chemical treatments in wildland fire management could increase potential for human health risks through exposure. Risks would be less than Alternative A by implementing safety signs in shooting areas and providing safety guidelines on safe shooting practices. Alternative B contains the most No Shooting Areas.	Similar to Alternative B; however, Alternative C contains fewer No Shooting Areas.	Similar to Alternative B; however, Alternative D contains fewer No Shooting Areas, but more than Alternative C.

Table 2-5
Summary of Environmental Consequences of Alternatives A, B, C, and D

Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
indirectly impacted over the long term from development activities and livestock grazing, which could introduce both chemical and biological (e.g., fecal coliform, nitrogen) contamination into waters. Managing No Shooting Areas would improve public health and safety by limiting the risk of the public being injured by gunfire.			
Socioeconomics			
Note: Dollar amounts and employment numbers provided below represent the quantifiable economic impacts based on the level of activity predicted by alternative in the year 2029. These numbers are estimates based on best available data and should be utilized only for comparison of impacts by alternative. Refer to Section 4.6.3 for detailed assumptions and methodology utilized in economic modeling.			
Livestock grazing under Alternative A would generate $2.8 million in total spending, just under $700,000 in total value added (incomes) and 17.1 full-time equivalent jobs. Economic contributions of energy development would be highest under Alternative A. Three scenarios were analyzed for natural gas drilling; 11, 39 and 197 federal wells per year. Using the mid-level estimate of an average of 39 wells drilled per year, gas drilling would generate nearly $301 million in total spending, $141 million in total value added and 869.6 full time	Livestock grazing economic effects would be slightly less than Alternative A; total spending would be reduced by approximately $7,000 and value added (incomes) would be reduced by approximately $2,000. Full time equivalent jobs would be similar to Alternative A at 17.0 jobs Economic effects from gas drilling would be similar to Alternative A. Fewer acres would be available for coal development so economic effects could be reduced. Emphasis areas for renewable energy development may increase	Livestock grazing economic effects under Alternative C would be reduced by approximately 42 percent in comparison to Alternative A. This alternative would lower sales by nearly $1.16 million, lower value added (incomes) by almost $287,000, and lower employment by 7.2 jobs. Economic effects from gas drilling would be reduced by approximately 9 percent compared to Alternative A. Using an average of 39 wells drilled per year, gas drilling would generate nearly $273 million in total spending, $127	Livestock grazing economic effects would be the same as those discussed under Alternative A. Economic effects from gas drilling would be similar to Alternative A. Acres available for coal development would be less under this alternative; therefore economic effects may be reduced. Alternative D has the most acres identified as emphasis areas for renewable energy development, which may increase both development and associated economic effects.

Table 2-5
Summary of Environmental Consequences of Alternatives A, B, C, and D

Alternative A (No Action)	Alternative B (Preferred)	Alternative C	Alternative D
equivalent jobs by 2029. If NSO stipulations result in higher costs to operators, economic effects would be further increased. Coal, locatable minerals, saleable minerals and renewable energy development would continue to contribute to economic effects in line with current trends and market conditions. Recreation would generate nearly $7.2 million in total spending, $4.4 million in total value added and 90 full-time equivalent jobs by 2029. Specific types of businesses in which spending occurred would be influenced by the type of recreational activities that the visitors participate in.	development and associated economic effects. Locatable and saleable minerals would have similar effects to that described under Alternative A. Economic effects from recreation would be similar but slightly less than Alternative A. Motorized use is anticipated to be slightly less under this alternative, while mechanized and non-mechanized use may increase.	million in total value added (incomes), and 788 full-time equivalent jobs by 2029. Acres available for coal and salable minerals development would be less than Alternative A; therefore economic effects may be reduced. Emphasis areas for renewable energy development would be identified under this alternative but at a lower level than other action alternatives, therefore economic effects may decrease. Locatable minerals would have similar economic effects to that described under Alternative A. Economic effects from recreation would be similar but slightly less than Alternative A; the lowest economic contributions are anticipated under this alternative. Motorized and mechanized uses are anticipated to be less than Alternative A, while non-mechanized use may increase.	Locatable minerals would have similar effects to those described under Alternative A. Lands available for saleable minerals would slightly increase, therefore economic effects may increase. Economic effects from recreation would be similar but slightly less than Alternative A. Motorized and non- mechanized use are anticipated to be slightly reduced under this alternative, while mechanized use may increase.
Environmental Justice			
This alternative would not disproportionately affect low-income or minority populations.	Same as Alternative A.	Same as Alternative A.	Same as Alternative A.

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Chapter 3

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CHAPTER 3
AFFECTED ENVIRONMENT

3.1 INTRODUCTION

The purpose of this chapter is to describe the existing biological, physical, and socioeconomic characteristics of the planning area, including human uses that could be affected by implementing the alternatives described in Chapter 2. Discussions of topic areas are divided into resources, resource uses, special designations, support needs, and social and economic conditions. Each topic area includes both a description of current conditions and a characterization of trends (which express the direction of change between the present and some point in the past).

Certain types of resources that may be present in other planning areas, such as cave and karst resources (which describes significant caves as mandated by the Federal Cave Resources Protection Act of 1988), do not exist in the GJFO and are therefore not covered in this section. Information from broad-scale assessments was used to help set the context for the planning area. The information and direction for BLM resources and resource uses has been further broken down into fine-scale assessments and information. The level of information presented in this chapter is sufficient to assess potential effects discussed in Chapter 4, based on the alternatives presented in Chapter 2.

Acreage figures and other numbers are approximated using Geographic Information Systems (GIS) technology and do not reflect exact measurements or precise calculations.

The planning area includes all lands, regardless of jurisdiction, within the GJFO boundaries. However, the BLM makes decisions on only those lands and federal mineral estate that it administers (the decision area).

3.2 RESOURCES

This section contains a description of the biological and physical resources of the GJFO and follows the order of topics addressed in Chapter 2, as follows:

- Air;
- Climate;
- Geology;
- Soil Resources;
- Water Resources;
- Vegetation;
- Fish and Wildlife;
- Special Status Species;
- Wild Horses;
- Wildland Fire Management;
- Cultural Resources;
- Paleontological Resources;
- Visual Resources; and
- Lands with Wilderness Characteristics outside Existing WSAs.

3.2.1 Air

This section describes air quality in the region potentially affected by the alternatives described in Chapter 2. Air pollutants addressed include criteria pollutants, hazardous air pollutants, greenhouse gases, and compounds that could impair visibility or contribute to atmospheric deposition.

Air pollution control programs are based on a combination of federal and state legislation. The Clean Air Act (42 United States Code [USC] §§ 7401−7642) is the primary federal legislation, with state legislation providing additional air quality management authority. The Clean Air Act established the principal framework for national, state, and local efforts to protect air quality in the US. Under the Act, the Environmental Protection Agency (EPA) has set time-averaged standards known as national ambient air quality standards (NAAQS) for six air pollutants considered to be key indicators of air quality: carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), two categories of particulate matter (particulate matter with an aerodynamic diameter of 10 microns or less [PM_{10}] and particulate matter with an aerodynamic diameter of 2.5 microns or less [$PM_{2.5}$]), ozone, and lead. Ozone is typically not emitted directly from emission sources; rather, it is created by chemical reactions between ozone precursors, including oxides of nitrogen (NO_x) and volatile organic compounds. Therefore, the EPA also regulates emissions of volatile organic compounds. States may adopt their own ambient air quality standards, but they must be at least as stringent as the national standards. Colorado has adopted the NAAQS as its state standards with the addition of a more stringent sulfur dioxide standard.

Criteria air pollutants may have local effects, regional effects, or local and regional effects. Oxides of nitrogen and volatile organic compounds are precursors for producing photochemical smog (ozone) and secondary particulate matter. Ozone (including its precursors), $PM_{2.5}$, and sulfur dioxide are considered regional air pollutants, typically affecting air quality on a regional scale. Pollutants such as carbon monoxide and lead are considered local, typically accumulating close to their emission sources. PM_{10} can be considered both a regional and local air pollutant, depending on the particular source of emissions and meteorological conditions. In addition, long-range transport of nitrogen dioxide, PM_{10}, $PM_{2.5}$, and sulfur dioxide can contribute to regional visibility degradation, as well as atmospheric deposition at sensitive areas (such as national parks and wilderness areas) many miles downwind of individual emission sources.

In addition to criteria pollutants, the Clean Air Act regulates toxic and hazardous air pollutants that are known or suspected to cause cancer or other serious health effects or adverse environmental impacts. EPA has issued rules covering 80 categories of major industrial sources as well as categories of smaller sources that emit hazardous air pollutants. Controls are usually required at the source to limit the release of these air toxics into the atmosphere.

Section 176(c) of the Clean Air Act requires that federal actions conform to the appropriate state implementation plan. A state implementation plan is a plan developed at the state level that provides for the implementation, maintenance, and enforcement of NAAQS and is enforceable by the EPA. The EPA has promulgated rules establishing conformity analysis procedures for transportation-related actions and for other general federal agency actions (40 CFR Parts 6, 51, and 93). The EPA general conformity rule requires preparation of a formal conformity determination document for federal agency actions that are undertaken, approved, or funded in federal nonattainment or maintenance areas when the total net change in direct and indirect emissions of nonattainment pollutants (or their precursors) exceed specified thresholds. Air quality in the planning area is currently in attainment for all national and state ambient air quality standards. General Conformity requirements will not apply unless the area is designated as a nonattainment area for any of the criteria pollutants during the life of the plan.

Air Quality Indicators

Air quality in a geographic area is defined by its visual appearance and measured concentrations of air pollutants. These characteristics can be affected by naturally occurring phenomena such as wind, temperature, humidity, geographic features, vegetation, and wildfire. Air quality characteristics can also be affected by anthropogenic phenomena such as industrial and agricultural activities, fossil fuel combustion, and prescribed fire. Specific air quality indicators include:

- Measured ambient concentrations of criteria air pollutants and hazardous air pollutants;
- Measured ambient concentrations of visibility impairing pollutants, primarily nitrate and sulfate aerosols;
- Measured concentrations of atmospheric deposition compounds in precipitation and surface waters; and
- The classification of air quality or visibility in specific areas as designated in the Clean Air Act or by state, federal, or tribal agencies with responsibility for managing air resources.

Criteria Air Pollutants

The EPA has established primary and secondary NAAQS for six criteria air pollutants. Primary ambient air quality standards define levels of air quality necessary, with an adequate margin of safety, to protect the public health. Secondary ambient air quality standards define levels of air quality necessary to protect the public welfare from known or anticipated adverse effects of a pollutant. Concentrations of air pollutants greater than the national standards represent a risk to human health. Criteria pollutants include carbon monoxide, nitrogen dioxide, ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), sulfur dioxide, and lead (Pb).

Colorado Ambient Air Quality Standards (CAAQS) and NAAQS identify maximum limits for criteria air pollutant concentrations at all locations to which the public has access. The CAAQS and NAAQS are legally enforceable standards. Concentrations above the CAAQS and NAAQS represent a risk to human health that by law, require public safeguards be implemented. State standards must be at least as protective of human health as federal standards and may be more restrictive than the federal standards, as allowed by the CAA.

EPA regulates emissions of oxides of nitrogen (NO_x) and volatile organic compounds, which are precursors for producing photochemical smog (ozone) and secondary particulate matter and, along with $PM_{2.5}$ and sulfur dioxide, are considered to be regional air pollutants affecting air quality on a regional scale. Pollutants such as carbon monoxide and lead accumulate close to their emission sources and are considered to be local pollutants. PM_{10} is considered both a regional and local air pollutant, depending on the source of emissions and meteorological conditions. In addition, long-range transport of nitrogen dioxide, PM_{10}, $PM_{2.5}$, and sulfur dioxide can also contribute to regional visibility degradation and atmospheric deposition (acid rain) at sensitive areas such as national parks and wilderness areas many miles downwind of the individual emission sources.

Air pollutant concentration monitoring networks in Colorado include the State & Local Air Monitoring System (SLAMS), special purpose monitoring, and industrial site monitoring. SLAMS stations are typically located in urban or

residential areas or areas of high industrial development and are operated to establish compliance with criteria pollutant concentration standards. Special purpose and industrial site monitors are used to gather additional air quality data or to determine compliance with air permit conditions.

Table 3-1, Applicable Ambient Air Quality Standards and Existing Representative Concentrations for the Planning Area, provides an overview of applicable CAAQS and NAAQS and recent representative pollutant concentrations measured in the planning area and at nearby sites. Further discussion of pollutant concentrations in the GJFO is included in Section 3.1.1.2.

Table 3-1
Applicable Ambient Air Quality Standards and Existing Representative Concentrations for the Planning Area

Pollutant	Background Levels(1)	Averaging Time	NAAQS		CAAQS (μg/m³)
			Standard	Primary or Secondary(2)	
Carbon Monoxide	1.0 ppm	1-hour(1)	35 ppm (40,000 μg/m³)	P	40,000
Carbon Monoxide	1.0 ppm	8-hour(3)	9 ppm (10,000 μg/m³)	P	10,000
Lead	0.04 μg/m³	Calendar quarter	1.5 μg/m³	P,S	--
Lead	N/A	Rolling 3-month average	0.15 μg/m³	P,S	--
Nitrogen Dioxide	0.049 ppm	1-hour(4)	100 ppb (188 μg/m³)	P	--
Nitrogen Dioxide	0.005 ppm	Annual	0.053 ppm (100 μg/m³)	P,S	100
PM_{10}	30 μg/m³	24-hour(5)	150 μg/m³	P,S	150
PM_{10}	10 μg/m³	Annual	--	--	50
$PM_{2.5}$	12 μg/m³	24-hour(6)	35 μg/m³	P,S	--
$PM_{2.5}$	5 μg/m³	Annual(7)	15 μg/m³	P,S	--
Ozone	172 μg/m³	1-hour	--	--	235
Ozone	145 μg/m³	8-hour(8)	0.075 ppm (147 μg/m³)	P,S	--
Sulfur Dioxide	0.012 ppm	1-hour(9)	075 ppb (196 μg/m³)	P	--
Sulfur Dioxide	0.009 ppm	3-hour(3)	0.5 ppm (1300 μg/m³)	S	700(1)
Sulfur Dioxide	0.005 ppm	24-hour(3)	0.14 ppm (365 μg/m³)	P	--
Sulfur Dioxide	0.002 ppm	Annual	0.03 ppm	P	--

(1) Background data source; CO: American Soda, Parachute 2007-2009(CDPHE 2011); : Industrial, urban in Grand Junction 2001 (BLM 2008c); NO_2: Southern Ute, 1 mile NE of Ignacio, 2006-2008 (CDPHE 2011): PM_{10}: Energy Fuels, 2008-2009 (CDPHE 2011); $PM_{2.5}$: Based on S. Ute, 7571 Hwy 5505, 2009-2010 (CDPHE 2011); Ozone:

Table 3-1
Applicable Ambient Air Quality Standards and Existing Representative Concentrations for the Planning Area

Based on Mesa Verde 2003 for 1-hour and CASTNET in Mesa Verde, Canyonlands, and Gothic for 8-hour: SO_2; 1-hour: Holcim Portland, 2007-2009, SO_2: 3-hour, 24-hour and annual: Unocal 1983-84 (CDPHE 2011); ppm: parts per million.
(2) Primary standards set limits 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 against decreased visibility and damage to animals, crops, vegetation, and buildings.
(3) Not to be exceeded more than once per year.
(4) To attain this standard, the three-year average of the 98th percentile daily maximum 1-hour concentrations must not exceed 100 parts per billion (ppb).
(5) Not to be exceeded more than once per year on average over 3 years.
(6) To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 $\mu g/m^3$ (became effective December 17, 2006).
(7) To attain this standard, the 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 $\mu g/m^3$.
(8) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm (became effective May 27, 2008).
(9) To attain this standard, the three-year average of the 99th percentile daily maximum 1-hour concentrations must not exceed 75 ppb.

Hazardous Air Pollutants

Hazardous air pollutants are those pollutants that are known or suspected to cause cancer or other serious health problems, such as chronic respiratory disease, reproductive disorders or birth defects. The EPA has classified 189 air pollutants as hazardous air pollutants, including formaldehyde, benzene, toluene, ethyl-benzene, xylene, and n-hexane. EPA has not established ambient air quality standards for hazardous air pollutants. However inhalation reference concentrations developed by EPA and other state and federal agencies are often used to estimate the risk of health effects such as chronic inhalation illness and cancer from human exposure to certain hazardous air pollutants.

Visibility

Visibility can be expressed in terms of deciviews, a measure of perceived changes in visibility. One deciview is a change in visibility just perceptible to an average person, which is approximately a 10 percent change in light extinction. To estimate potential visibility impairment, monitored aerosol concentrations are used to reconstruct visibility conditions for each day monitored. These daily values are then ranked from clearest to haziest and divided into three categories to indicate the mean visibility for all days (average), the 20 percent of days with the clearest visibility (20 percent clearest), and the 20 percent of days with the worst visibility (20 percent haziest). Visibility can also be defined by standard visual range measured in miles, and is the farthest distance at which an observer can see a black object viewed against the sky above the horizon; the larger the standard visual range, the cleaner the air.

Since 1980, the Interagency Monitoring of Protected Visual Environments (IMPROVE) network has measured visibility in national parks and wilderness areas. The Clean Air Act amendments of 1977 designated 156 areas (primarily national parks and wilderness) as federally mandated Class I areas accorded strict levels of air quality protection. There are six IMPROVE stations in Colorado, but none are located within the GJFO RMPPA.

Atmospheric Deposition

Atmospheric deposition refers to processes in which air pollutants are removed from the atmosphere and deposited into terrestrial and aquatic ecosystems. Air pollutants can be deposited by either wet precipitation (via rain or snow) or dry (gravitational) settling of particles and adherence of gaseous pollutants to soil, water, and vegetation. Much of the concern about deposition surrounds the secondary formation of acids and other compounds from emitted nitrogen and sulfur species such as nitrogen oxides (NO_x) and sulfur dioxide, which can contribute to acidification of lakes, streams, and soils and affect other ecosystem characteristics, including nutrient cycling and biological diversity.

Substances deposited include:

- Acids, such as sulfuric (H_2SO_4) and nitric (HNO_3), sometimes referred to as acid rain
- Air toxics, such as pesticides, herbicides, and volatile organic compounds
- Heavy metals, such as mercury
- Nutrients, such as nitrates (NO_{3-}) and ammonium (NH_{4+})

Rain, snow, cloud water, particle settling, and gaseous pollutants complicate the accurate measurement of atmospheric deposition. Deposition varies with precipitation and other meteorological variables, such as temperature, humidity, winds, and atmospheric stability, which, in turn, vary with elevation and time. The National Atmospheric Deposition Program is an interagency sponsored network of monitoring stations that measures wet atmospheric deposition. The Clean Air Status and Trends Network (CASTNET) is an interagency network of monitoring stations managed by EPA that measures dry deposition.

Classification of Areas for Prevention of Significant Deterioration and Visibility

Section 162 of the Clean Air Act includes provisions for the Prevention of Significant Deterioration (PSD) of air quality. The goal of the PSD program is "to preserve, protect and enhance the air quality in national parks, national wilderness areas, national monuments, national seashores and other areas of special national or regional natural, recreation, scenic or historic value." A classification system was established identifying allowable amounts of additional air quality degradation which would be allowed above legally established baseline

levels. PSD increments have been established for nitrogen dioxide, sulfur dioxide and PM_{10}.

PSD Class I areas have the greatest limitations, with a very limited amount of additional degradation allowed. National parks greater than 6,000 acres and wilderness areas greater than 5,000 acres that were in existence as of Aug. 7, 1977 were automatically designated as Class I areas under the PSD program. In addition, Section 164(a) and 164(c) give states and tribes, respectively, the right to designate other areas as PSD Class I areas.

The remainder of the nation (excluding non-attainment and maintenance areas) is designated as PSD Class II, where moderate deterioration and controlled growth is allowed. PSD Class III areas allow for maximum growth and degradation up to the NAAQS, however no areas have been designated Class III. Areas that have violated NAAQS are designated non-attainment or maintenance areas, and additional growth and degradation are severely limited in these areas until they are brought back into compliance with the standard.

Section 169A of the Clean Air Act required the Secretary of the Department of Interior (with concurrence from EPA) to promulgate a list of areas where visibility is an important value. This list of federally mandated Class I areas for visibility includes 156 national parks and wilderness areas (all of which are also PSD Class I areas). These areas are afforded special protection with regards to visibility and cannot be downgraded to Class II.

There are 12 federally mandated Class I areas for visibility in Colorado; these areas are also PSD Class I areas. In addition, the State of Colorado has designated the Colorado National Monument (which is outside the RMPPA) and Dinosaur National Monument (north of the RMPPA in the White River Field Office) as Class I areas for sulfur dioxide only. The nearest Class I areas are at the Flat Tops and Maroon Bells Wilderness Areas and the wilderness portion of Black Canyon National Park, all located approximately 50 kilometers or more outside the RMPPA.

Greenhouse Gases

Concentrations of certain gases in the earth's atmosphere have been identified as being effective at trapping heat reflected off the earth's surface thereby creating a "greenhouse effect." As concentrations of these greenhouse gases increase, the earth's surface warms, the composition of the atmosphere changes, and global climate is affected. Concentrations of greenhouse gases have increased dramatically in the earth's atmosphere in the past century. The most prevalent greenhouse gas compounds are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone, and water vapor. The EPA has determined that six greenhouse gases are air pollutants and subject to regulation under The Clean Air Act: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. carbon dioxide, methane, and nitrous oxide are produced naturally by respiration and other physiological processes of

plants, animals, and micro-organisms; by decomposition of organic matter; by volcanic and geothermal activity; by naturally occurring wildfires; and by natural chemical reactions in soil and water. These pollutants are also produced by anthropogenic sources including fossil fuel combustion, methane venting, and other industrial sources. Greenhouse gas emissions and climate change are discussed further in Chapter 4.

Current Conditions

Ozone and particulate matter are the air pollutants of greatest concern within the planning area. Ozone is seldom released directly into the atmosphere but is formed by complex chemical reactions that occur in the presence of sunlight. The atmospheric chemical reaction processes that produce ozone also produce chemically formed particulate matter (secondary $PM_{2.5}$) and acidic compounds. Combustion processes and evaporation of volatile organic compounds are the major emission sources for ozone forming precursors. Combustion processes are the major source of emissions for nitrogen oxides. Common fuel combustion sources include fuel combustion in motor vehicles, fuel combustion in industrial processes, agricultural burning, prescribed burning, and wildfires. Common sources of volatile organic compounds include venting and emissions from industrial sources, paints, solvents, liquid fuels, or liquid chemicals. Biogenic (natural) sources are also a source for volatile organic compound emissions. The major emission source categories for suspended particulate matter include combustion sources (fuel combustion in motor vehicles and industrial processes, agricultural burning, prescribed burning, and wildfires); soil disturbance by construction equipment, agricultural and forestry equipment, recreational vehicles, or other vehicles and equipment; mining and other mineral extraction activities; and wind erosion from exposed soils and sediments. Secondary particulate matter can also be formed by the types of atmospheric chemical reactions that produce ozone and acidic compounds.

Air Pollutant, Visibility, and Deposition Monitoring in the Planning Area

Various state and federal agencies monitor air pollutant concentrations, visibility, and atmospheric deposition throughout Colorado, and there are 5 criteria pollutant monitors in the planning area. **Table 3-2**, Air Quality Monitoring Sites in or Near the Planning Area, lists the available air quality monitoring sites in the planning area and at other nearby sites.

As shown in Table 3-2, CDPHE operates several criteria pollutant monitors, including PM_{10} and $PM_{2.5}$, in Grand Junction as part of the SLAMS network. The US Forest Service operates an IMPROVE monitor in the White River National Forest in Pitkin County (in the Colorado River Valley Field Office RMP planning area). The closest CASTNET and National Acid Deposition Program (NADP) National Trends Network (NTN) site is the Gothic site located in northern Gunnison County within the Gunnison Field Office and measures wet and dry atmospheric deposition of nitrogen, sulfur, and various metals.

Table 3-2
Air Quality Monitoring Sites in or Near the Planning Area

County	Monitor Site Name	Type of Monitor	Parameters	Location	
				Latitude	Longitude
Mesa	South Ave. Grand Junction	SLAMS	PM_{10}, PM2.5	39.0638	-108.5612
	Pitkin Ave. Grand Junction	SLAMS	PM_{10}, CO	39.0643	-108.5616
	Hwy 141 Grand Junction	SLAMS	PM_{10}	39.0625	-108.4574
	Palisade	SLAMS	O_3	39.1306	-108.3138
	Colorado National Monument	SLAMS	O_3	39.1067	-108.7411
Pitkin	White River National Forest – WHR11	IMPROVE	PM2.5, NO3, NH4, nitric acid, SO4, SO2, and meteorology	39.1536	-106.8209
Garfield	Gothic Site – GTH161	CASTNET/ NADP	NO3, NH4, nitric acid, SO4, SO2	38.9564	-106.9858

Trends

Criteria Pollutant Monitoring

Ambient criteria air pollutant concentrations of carbon monoxide, lead, NO_x, PM_{10}, $PM_{2.5}$, ozone, and sulfur dioxide are shown in Table 3-1. These data were provided by CDPHE-APCD as representative of existing conditions the RMPPA. The results of other pollutant monitoring performed in the RMPPA for pollutants of particular regional interest are discussed below. The examination of these data indicates that the current air quality for criteria pollutants in the planning area is considered good overall.

Ozone observations were available at two sites in the RMPPA: Palisade and Colorado National Monument. Both sites meet the current 0.075 parts per million (ppm) 8-hour ozone NAAQS in all years since the monitors were activated. Attainment or nonattainment of the ozone NAAQS is determined by the ozone design value that is defined as the fourth highest daily maximum 8-hour ozone concentrations averaged over three consecutive years. **Table 3-3**, Fourth highest daily-maximum 8-hour Ozone Concentrations and 8-hour Ozone Design Values (DV) at the Palisade and Colorado National Monument Sites Within the Planning Area, lists the fourth highest daily maximum 8-hour ozone for each year of monitoring operation and the ozone design values at the two sites in the RMPPA. The highest ozone design value recorded in the

Table 3-3
Fourth highest daily-maximum 8-hour Ozone Concentrations and 8-hour Ozone Design Values (DV) at the Palisade and Colorado National Monument Sites Within the Planning Area

Year	Palisade Ozone Concentrations (ppm)		Colorado National Monument Ozone Concentrations (ppm)	
	4th High	DV	4th High	DV
2011	0.066	0.066	0.068	0.063
2010	0.068	0.067	0.065	0.063
2009	0.064		0.058	0.064
2008	0.070		0.067	
2007	n/a		0.067	

planning area was 0.067 ppm at the Palisades monitoring site for the three-year period ending in 2010. This is well below the current ozone NAAQS of 0.075 ppm.

Recent ozone monitoring data from air monitors located in Rangely, Colorado, and in the Uinta Basin in Utah indicate periods of elevated winter ozone concentrations north and west (upwind) of the planning area. The three highest daily maximum 8-hour averages in 2011 at the Rangely monitor measured at 88 parts per billion (ppb), 88 ppb, and 81 ppb on February 13, 14, and 15, above the 75 ppb NAAQS. In Utah's Uinta Basin (located in eastern Utah and a portion of western Colorado), 8-hour daily maximum winter ozone exceedances have been measured at the Ouray and Redwash monitoring stations between 2009 and 2011. This winter ozone pattern is similar to ozone monitoring observations made in other oil and gas fields, including the Upper Green River Basin and Jonah-Pinedale Anticline in Wyoming. The EPA issued a final rule on April 30, 2012, designating Duchesne and Uintah counties in Utah as an ozone unclassifiable area. Sweetwater county and portions of other counties in Wyoming were designated as an ozone nonattainment area. The current scientific consensus is that the photochemical processes that form tropospheric ozone in the presence of nitrogen dioxide and free radical volatile organics are heightened by increased concentrations of ozone precursors from the stagnant winter atmospheric conditions and increased solar radiation reflected from the winter snow cover. The higher concentrations of ozone precursors in these regions have been linked to increased emissions from oil and gas development activities.

Table 3-4, Second Highest Annual 1-hour and 8-hour Carbon Monoxide Concentrations at Grand Junction, lists the second highest observed 1-hour and 8-hour carbon monoxide concentrations for the past 10 years at Grand Junction. Since 2004, the Grand Junction monitor has been located at 645 ¼ Pitkin Avenue, which is along the eastbound Interstate 70 business loop. The

Table 3-4
Second Highest Annual 1-hour and 8-hour Carbon Monoxide Concentrations at Grand Junction

Year	1-hour CO (ppm)	8-hour CO (ppm)
2011	1.8	1.1
2010	1.7	1.1
2009	2.3	2.2
2008	6.8	1.5
2007	2.8	1.8
2006	2.8	1.7
2005	2.7	2.0
2004	3.7	2.1
2003	5.6	3.3
2002	5.7	3.6

observed carbon monoxide statistics are well below the 1-hour (35 ppm) and 8-hour (9 ppm) standards for carbon monoxide in each of the past 10 years. There is a general trend towards lower maximum concentrations.

$PM_{2.5}$ is monitored at 650 South Avenue in Grand Junction, located a block to the south of business loop Interstate 70. Attainment or nonattainment of the $PM_{2.5}$ NAAQS is determined by the $PM_{2.5}$ value where the $PM_{2.5}$ NAAQS has an annual threshold of 15 μg/m³ and a 24-hour threshold of 35 μg/m³. The annual $PM_{2.5}$ value is defined as the three-year average of annual average $PM_{2.5}$ concentrations averaged over three consecutive years. The 24-hour $PM_{2.5}$ design value is defined as the 98th percentile 24-hour $PM_{2.5}$ concentrations averaged over three consecutive years. **Table 3-5**, 98th Percentile 24-Hour $PM_{2.5}$ Concentrations and 24-Hour $PM_{2.5}$ Design Values at Grand Junction, lists the 24-hour $PM_{2.5}$ observations for each of the past 10 years at the 98th percentile and the 24-hour $PM_{2.5}$ design values (listed for the last year in the three-year average) at the South Avenue monitoring site in Grand Junction. Samples were collected every third day.

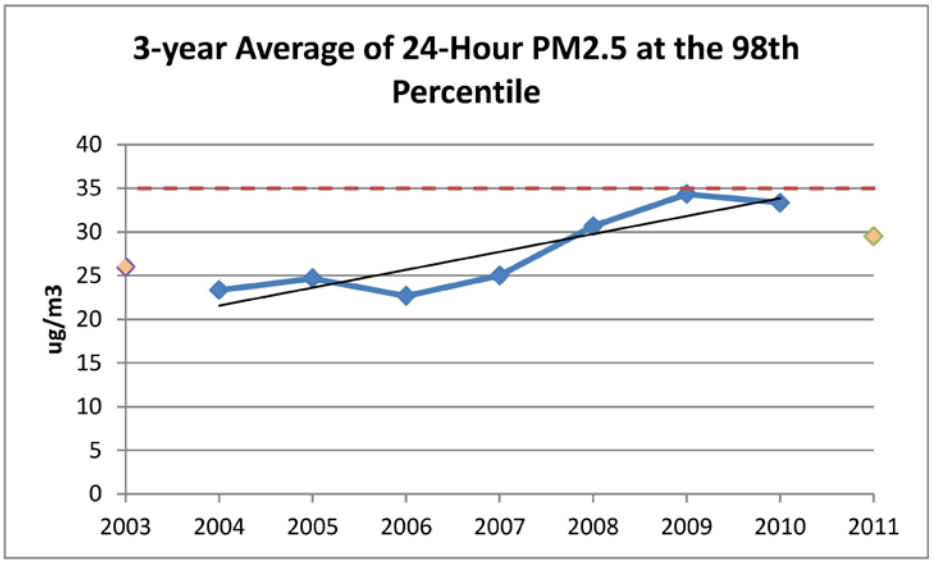
In 2009 and 2010, Grand Junction's 24-hour $PM_{2.5}$ at the 98th percentile exceeded the 35 μg/m³; $PM_{2.5}$ NAAQS level. However, the 24-hour $PM_{2.5}$ design values (i.e., 3-year running averages) for years ending in 2010 and 2011 were 34.3 and 33.3 μg/m³ which does not violate but is close to the 24-hour $PM_{2.5}$ NAAQS standard of 35 μg/m³. **Diagram 3-1,** Time Series of 24-hour $PM_{2.5}$ Design Value Concentrations, displays a time series of the 24-hour $PM_{2.5}$ design values centered on the year. The blue points represent 3-year averages while the orange points are limited to 2-year averages. The linear trend line (excluding 2-year averages) shows $PM_{2.5}$ increasing over time; the rate is slower, but still increasing when including the 2-year averages (not shown). Grand Junction is still in attainment for 24-hour $PM_{2.5}$, but care must be taken to ensure that the attainment status can be achieved in the future given the increasing

Table 3-5
98th Percentile 24-Hour $PM_{2.5}$ Concentrations and 24-Hour $PM_{2.5}$ Design Values at Grand Junction

Year	24-hour $PM_{2.5}$ at 98th Percentile ($\mu g/m^3$)	24-hour $PM_{2.5}$ Design Value ($\mu g/m^3$)
2011	22	33.3
2010	37	34.3
2009	41	30.7
2008	25	25.0
2007	26	22.7
2006	24	24.7
2005	18	23.3
2004	32	26.0(1)
2003	20	N/A
2002(2)	16	N/A

(1) Based on 2-year average
(2) Data excluded. Not enough observations (20- 24-hour observations)

Diagram 3-1
Time Series of 24-hour $PM_{2.5}$ Design Value Concentrations



concentration trend and close proximity of the 24-hour $PM_{2.5}$ design values to the NAAQS.

The annual average $PM_{2.5}$ concentration and annual $PM_{2.5}$ design values at Grand Junction are well within the 15 $\mu g/m^3$ annual $PM_{2.5}$ NAAQS for all years, as shown in **Table 3-6**, Annual $PM_{2.5}$ Concentrations at Grand Junction. The maximum annual $PM_{2.5}$ design value in Grand Junction is 9.5 $\mu g/m_3$, which occurred during the 2004-2006 three-year period and is 37% below the annual $PM_{2.5}$ NAAQS.

Table 3-6
Annual $PM_{2.5}$ Concentrations at Grand Junction

Year	Annual $PM_{2.5}$ ($\mu g/m^3$)	Annual $PM_{2.5}$ Design Value ($\mu g/m^3$)
2011	7.1	8.6
2010	9.0	9.2
2009	9.6	9.4
2008	9.1	9.4
2007	9.5	9.2
2006	9.7	9.5
2005	8.4	9.2
2004	10.4	9.6(1)
2003	8.8	N/A
2002(2)	12.0	N/A

(1) Based on 2-year average
(2) Data excluded due to insufficient observations.

Four monitors have sampled PM_{10} in the GJFO RMPPA. Two are located at 650 South Avenue in Grand Junction, the third is located at 645 ¼ Pitkin Avenue, and the fourth is located at US Highway 141 and D Road at Clifton, just east of Grand Junction.

At the South Avenue site, one sampled PM_{10} approximately once every three days; the second, about once every six days. The second highest 24-hour PM_{10} concentration for each year is listed in **Table 3-7**, Second Highest 24-Hour PM_{10} Concentration, and was the same or higher in the monitor that was sampling at a higher frequency. Data from the Grand Junction Pitkin Avenue monitor (on business loop I-70) and Clifton monitor (US highway 141 and D Road) are also shown in Table 3-7. Dates with exceptional events, like wildfires, have been excluded.

No monitors in the Grand Junction area have exceeded the 24-hour PM_{10} NAAQS of 150 $\mu g/m^3$ over the past 10 years, excluding exceptional events. The Pitkin Avenue monitor is consistently higher than the South Avenue monitor even though they are relatively close to one another. The Pitkin Avenue monitor, which is located on eastbound business loop Interstate 70, is either detecting more particulates from diesel trucks and road dust or is higher because of a higher sampling frequency.

Visibility Monitoring

An environmental concern in the US is the improvement and maintenance of visibility conditions, especially in national parks, recreation areas, wilderness areas, and national forests. There are no such areas within the planning area.

Table 3-7
Second Highest 24-Hour PM_{10} Concentration

Year	Grand Junction (650 South Ave). [μg/m³]	Grand Junction (645 ¼ Pitkin Ave) [μg/m³]	Clifton (US Hwy 141 & D Rd) [μg/m³]
Sampling Frequency	1 in 3 days	Daily	1 in 3 days
2011	39	N/A	54
2010	57*	N/A	66*
2009	61	80	122
2008	103	110	96
2007	68	124	62**
2006	77	110*	N/A
2005	61*	86*	N/A
2004	60	76	N/A
2003	82*	N/A	N/A
2002	62	N/A	N/A

*Data on dates with exceptional events are excluded
** Insufficient annual samples (25 for the year)

Because there are no IMPROVE monitors in the planning area, estimates of visibility in the area are derived from air quality and meteorological measurements from the White River National Forest IMPROVE monitor to the southeast in the adjacent Colorado River Valley Field Office RMP planning area. This document includes data from this IMPROVE monitor to provide the most representative available data for visibility in the Grand Junction Field Office RMP planning area.

Diagrams 3-2 through **3-4** (Standard Visual Range for 20th percent Cleanest Days, White River National Forest IMPROVE Site; Standard Visual Range for 20th percent Middle Days, White River National Forest IMPROVE Site; and Standard Visual Range for 20th percent Worst Visibility Days, White River National Forest IMPROVE Site) show visibility estimates for the 20 percent cleanest days, 20 percent median condition days, and the 20 percent worst days, respectively, for the White River IMPROVE site for the period 2000-2010 (IMPROVE 2012). These data indicate excellent visibility conditions with a trend toward improved visual range in this period.

Atmospheric Deposition Monitoring

The CASTNET/NADP monitoring site located nearest the planning area is the Gothic site (GTH161) located in northern Gunnison County within the Gunnison Field Office. **Diagram 3-5**, Total Annual Wet and Dry Sulfur Deposition (kilograms per hectare per year) at the Gothic CASTNET Site, provides the total (wet and dry) annual sulfur deposition (kilograms per hectare per year) and **Diagram 3-6**, Total Annual Wet and Dry Nitrogen Deposition (kilograms per hectare per year) at the Gothic CASTNET Site, provides the

Diagram 3-2
Standard Visual Range for 20th percent Cleanest Days, White River National Forest IMPROVE Site

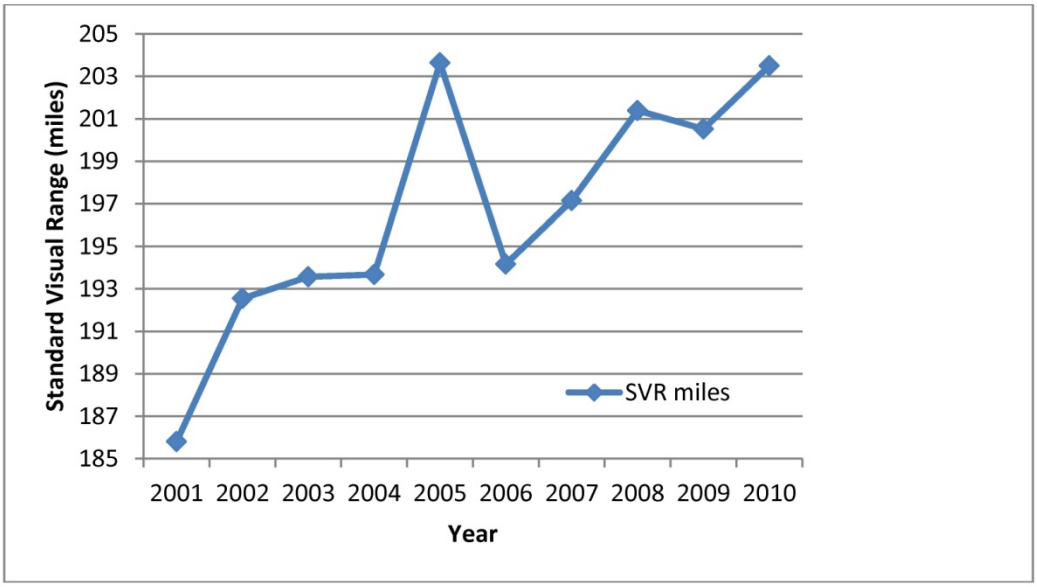


Diagram 3-3
Standard Visual Range for 20th percent Middle Days, White River National Forest IMPROVE Site

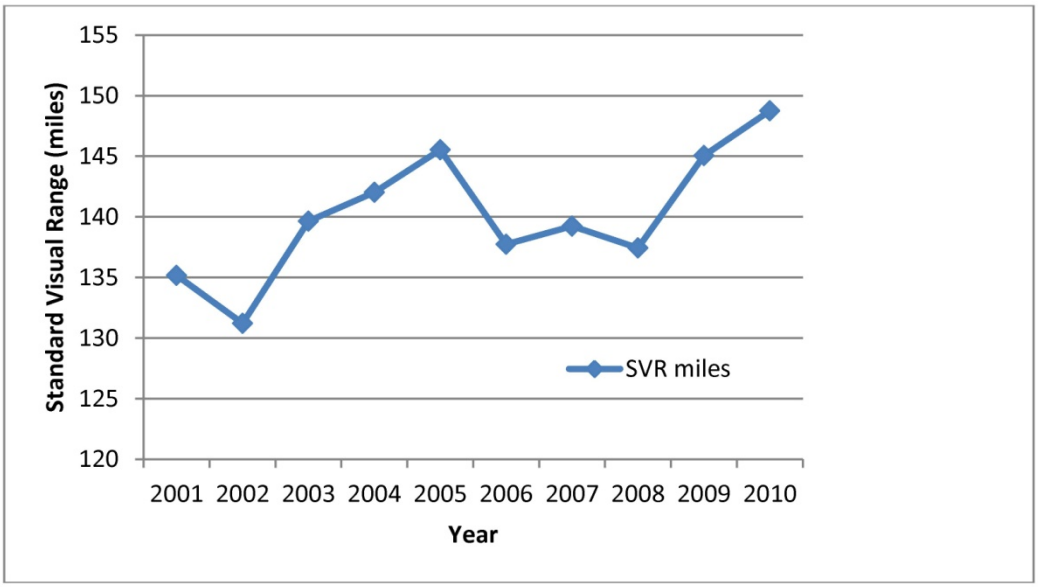


Diagram 3-4
Standard Visual Range for 20th percent Worst Visibility Days, White River National Forest IMPROVE Site

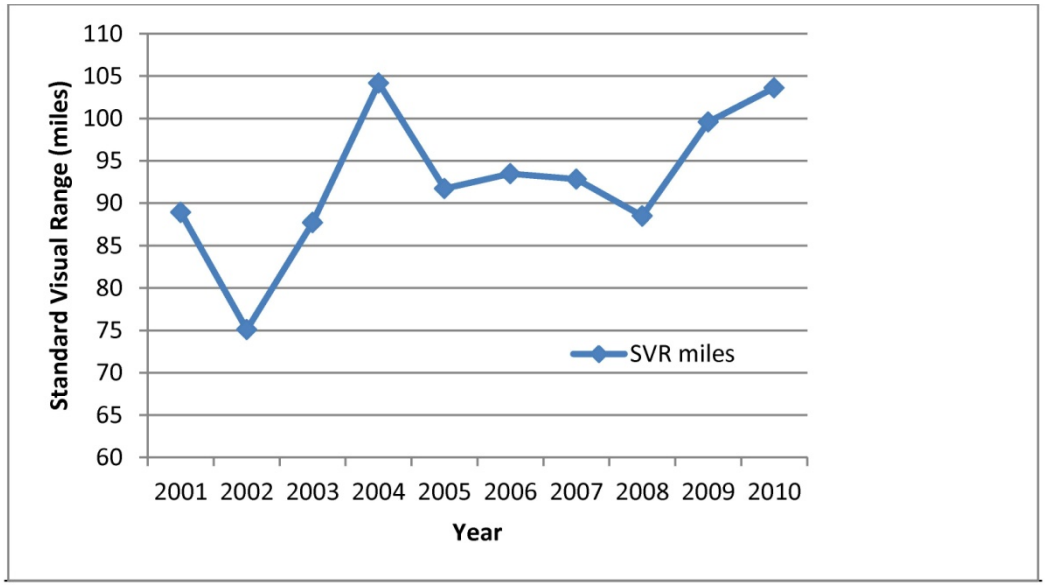


Diagram 3-5
Total Annual Wet and Dry Sulfur Deposition (kilograms per hectare per year) at the Gothic CASTNET Site

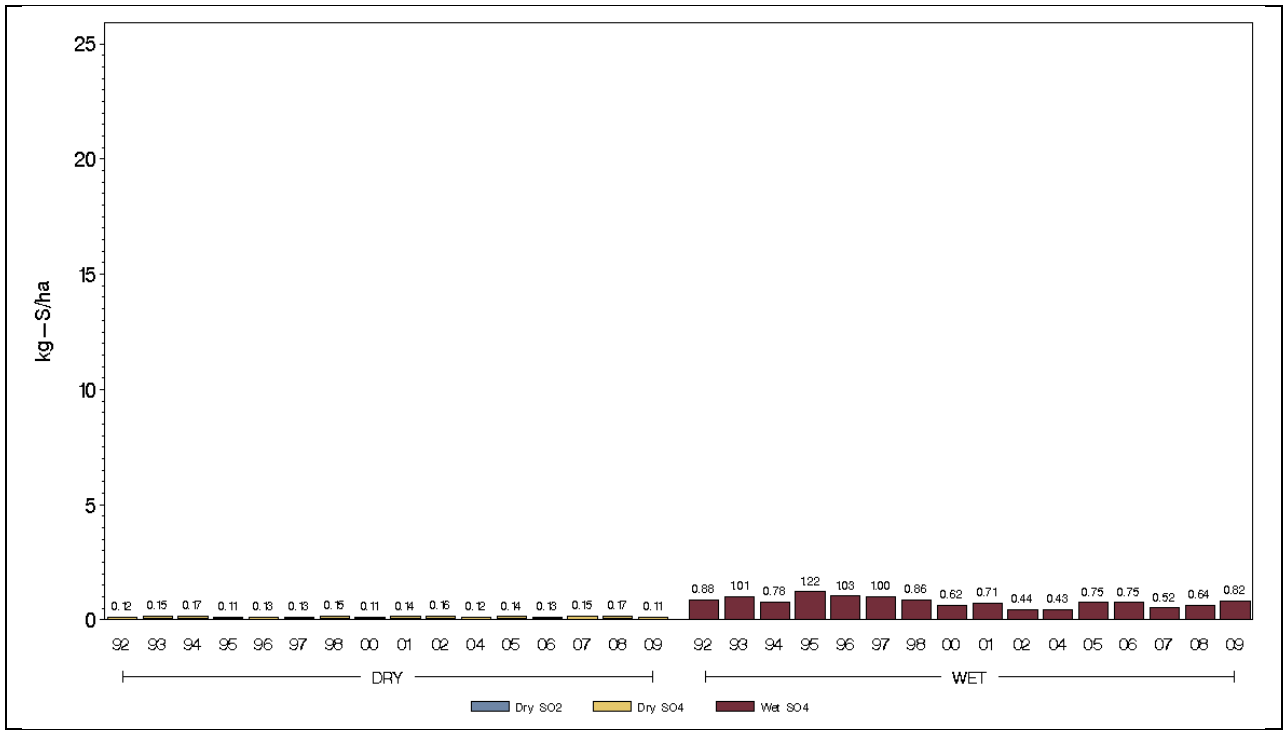
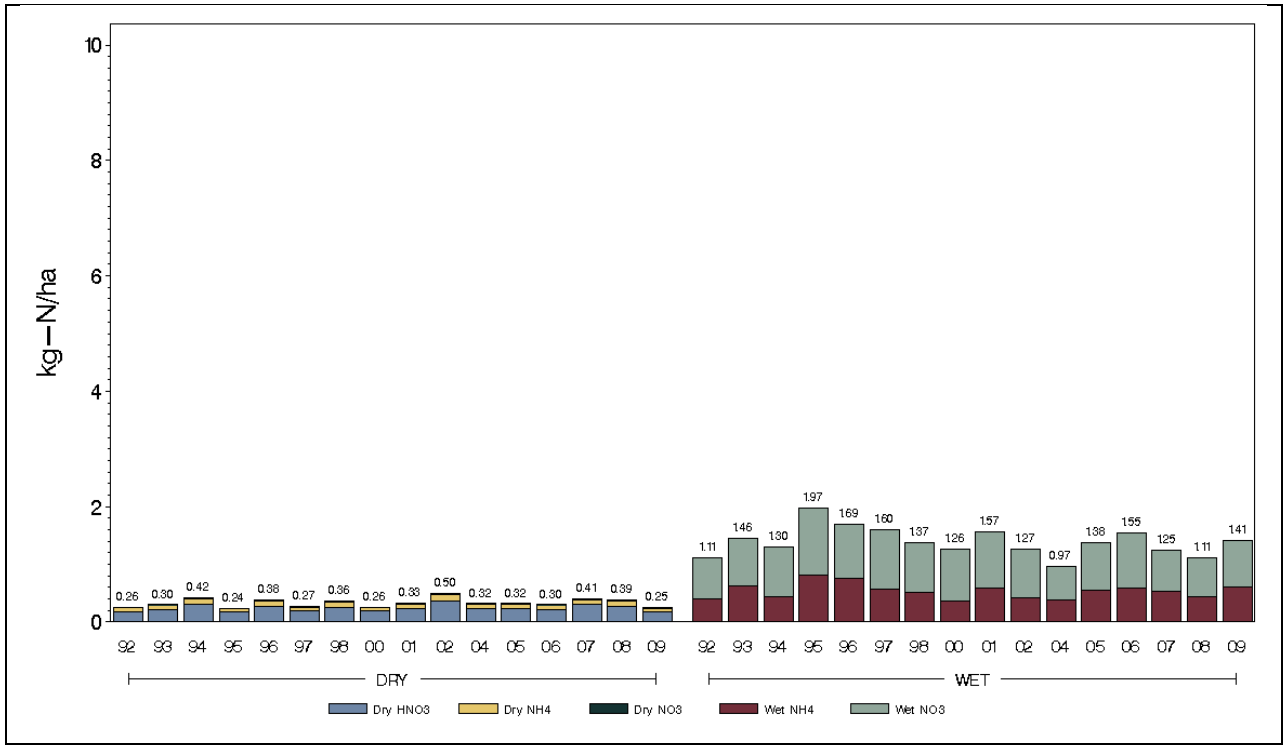


Diagram 3-6
Total Annual Wet and Dry Nitrogen Deposition (kilograms per hectare per year) at the Gothic CASTNET Site



total annual nitrogen deposition at the Gothic CASTNET Site for the period 2000 through 2009 (EPA 2012). There are no discernible trends in these measurements over this period.

Summary of Air Quality Trends

Available air quality data for monitored criteria pollutants were examined to determine potential trends over the various periods of record. For ozone, the fourth highest 8-hour average concentrations do not indicate a trend, although design values for the two to three years available for Palisade and Colorado National Monument, respectively, show a slight downward trend. Ozone monitors outside of the planning area have shown elevated levels of ozone concentrations during the winter months. Monitored PM_{10} concentrations at both Grand Junction South Avenue monitor and the Clifton site show a steady decrease in the last three to four years. Concentrations of $PM_{2.5}$ at the South Avenue site show an increase through year 2010, with 2011 24-hour 98th percentile values considerably lower. Visibility data collected at the White River National Forest site show very good to excellent visibility, even for the 20 percent haziest days. Visibility shows a trend of improvement over the period of record. Wet and dry nitrogen and sulfur deposition data from the Gothic site show no distinct trend in atmospheric deposition over the ten-year period of record (2000 through 2009) examined in this analysis.

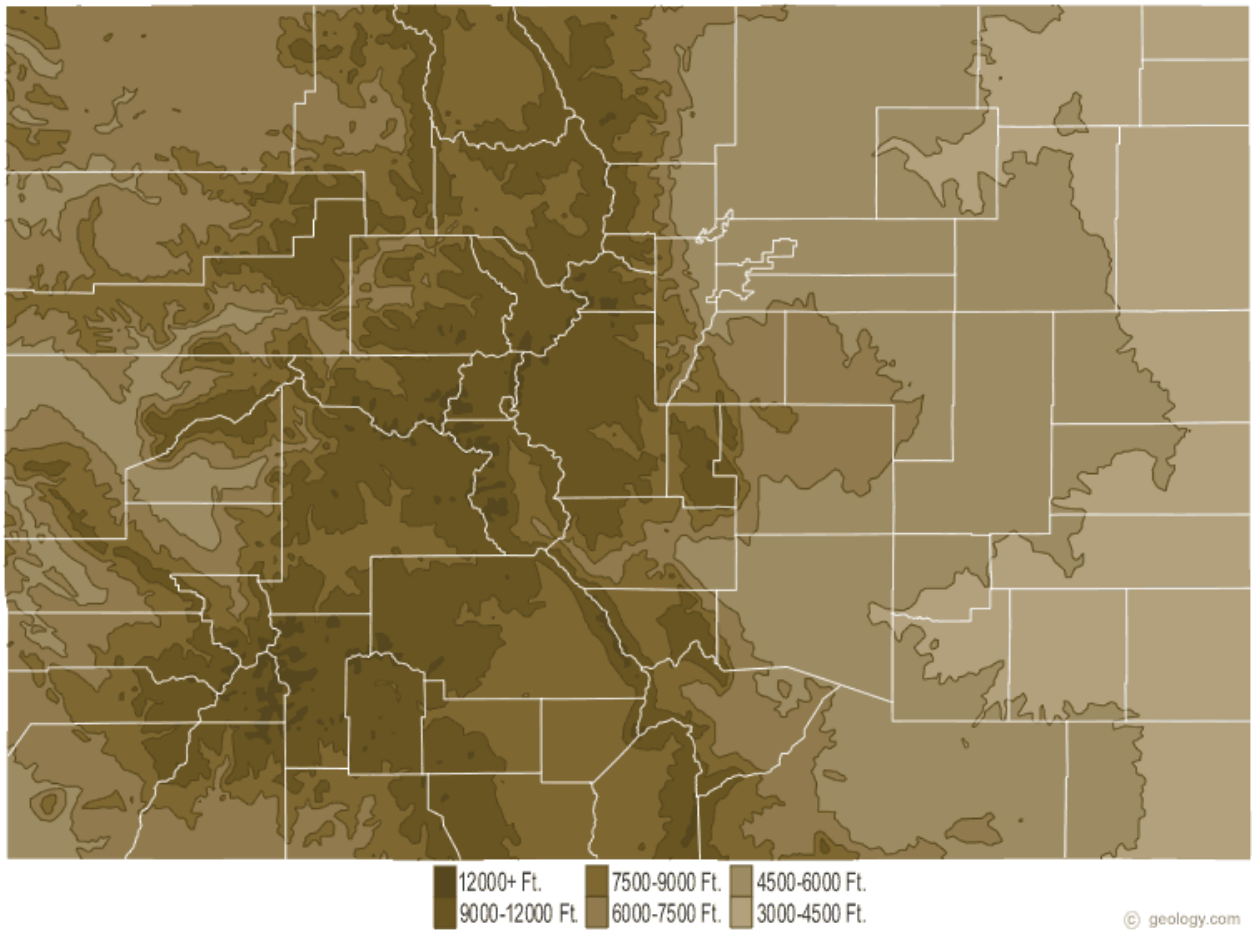
Management Challenges for Air Quality

Monitoring data available from the sites in the planning area and data collected at monitors in nearby areas reflect good to excellent air quality and visibility. The estimated ozone design concentration at Palisade is 67 ppb, which is below the current level of the standard (75 ppb). However, the EPA is currently evaluating the level of the standard and may reduce the standard to between 60 and 70 ppb. If the 8-hour ozone NAAQS is reduced within this range, nonattainment designation could be possible in the future. Continued maintenance of the applicable federal and state air quality standards for $PM_{2.5}$ is also an issue, considering historical monitoring data from 2009 and 2010. As additional resource development scenarios are considered for the planning area, it would be important to evaluate the impacts that emissions from development sources will have on criteria pollutants such as ozone and $PM_{2.5}$, as well as impacts on visibility and atmospheric deposition. The BLM expects to work cooperatively with CDPHE-APCD, the EPA, and other local, state, federal, and tribal agencies to address these issues. Developing effective management actions and strategies aimed to maintain compliance with ambient standards and other air quality goals will enable air quality improvement in the planning area.

3.2.2 Climate

The topography in Colorado is very complex with mountain ranges over 9,000 feet running mostly in the north-south direction in the middle of the state with peaks exceeding 14,000 feet. The planning area is west of the Continental Divide, with the Uncompahgre Plateau running in a northwest to southeast direction to the south and numerous mesas to the northeast. Both have elevations exceeding 9,000 feet. In between are the Colorado River drainage area and the Grand Valley, which includes the cities of Grand Junction, Fruita, and Palisade, where the elevation of these cities is around 4,500 to 5,000 feet. A topography map for the state of Colorado is shown in **Diagram 3-7**, Topographic Map of the State of Colorado. The Grand Valley that lies in the center of the planning area is adjacent to Utah, with a north-northwest to south-southeast orientation at the north-south mid-point of the state.

Diagram 3-7
Topographic Map of the State of Colorado



Due to the shape of the valley floor, the dominant wind direction at Grand Junction is channeled by the topography; during most months of the year, the dominant wind direction is easterly or east-southeasterly with speeds averaging 5 miles per hour in the winter and 10 miles per hour in the summer (WRCC 2012). **Diagram 3-8,** Grand Junction, Colorado - Meteorological Data Wind Rose**,** displays a wind rose of surface wind speed and direction at Grand Junction for the five year period, 1991-1995. The Grand Junction wind rose illustrates the channeling of the winds along the east-southeast to north-northwest orientation of the Grand Valley. Outside of the Grand Valley, wind distributions within the RMPPA may be slightly different given the complex terrain in the region. This is illustrated in annual wind roses for Nucla and Pine Ridge that are sites within the southern portion of the RMPPA in Montrose County shown in **Diagram 3-9**, Pine Ridge, Colorado - Meteorological Data Wind Rose, and **Diagram 3-10**, Nucla, Colorado - Meteorological Data Wind Rose. Over the higher elevations, the prevailing wind direction is from the west.

Diagram 3-8
Grand Junction, Colorado - Meteorological Data Wind Rose

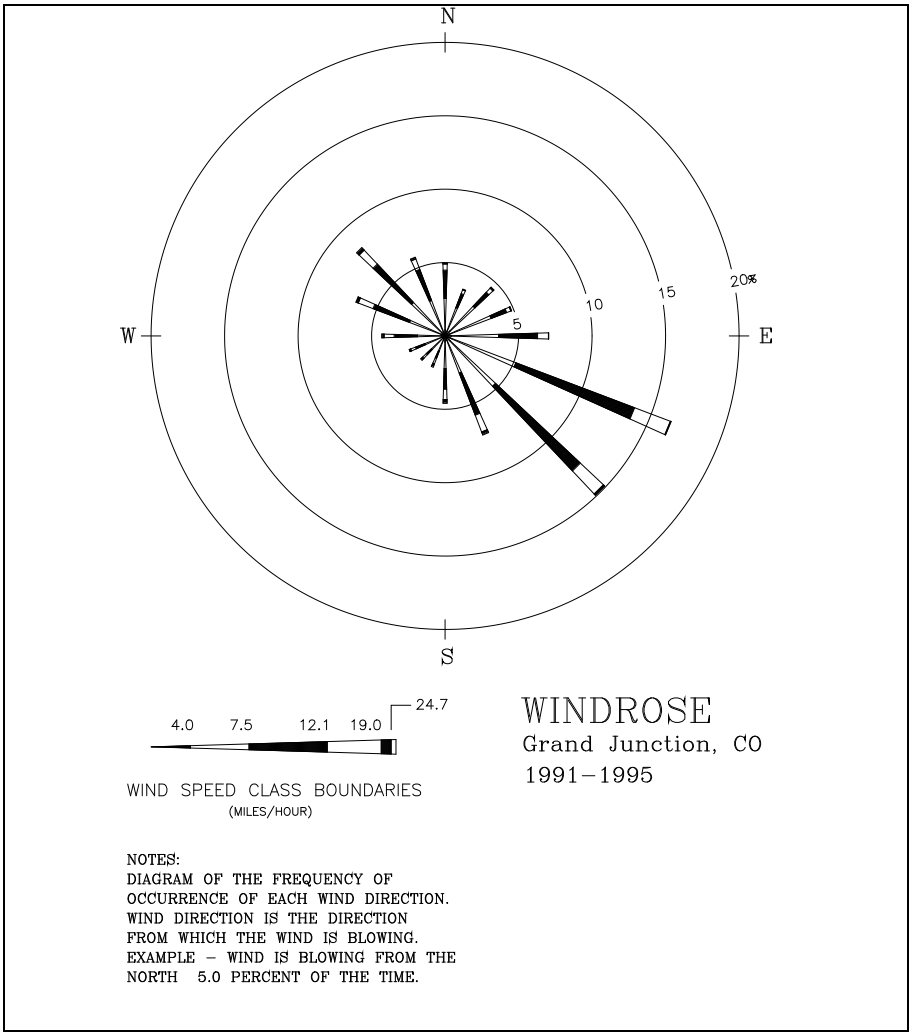


Diagram 3-9
Pine Ridge, Colorado - Meteorological Data Wind Rose

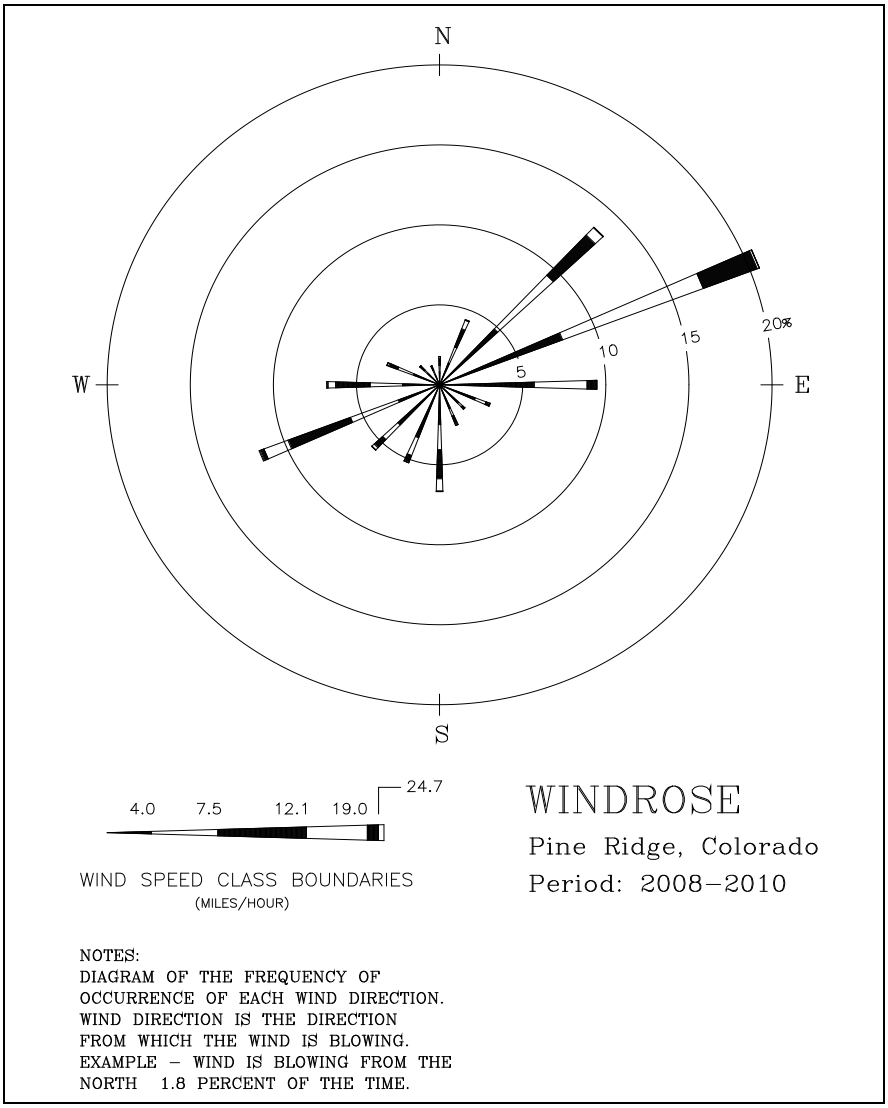
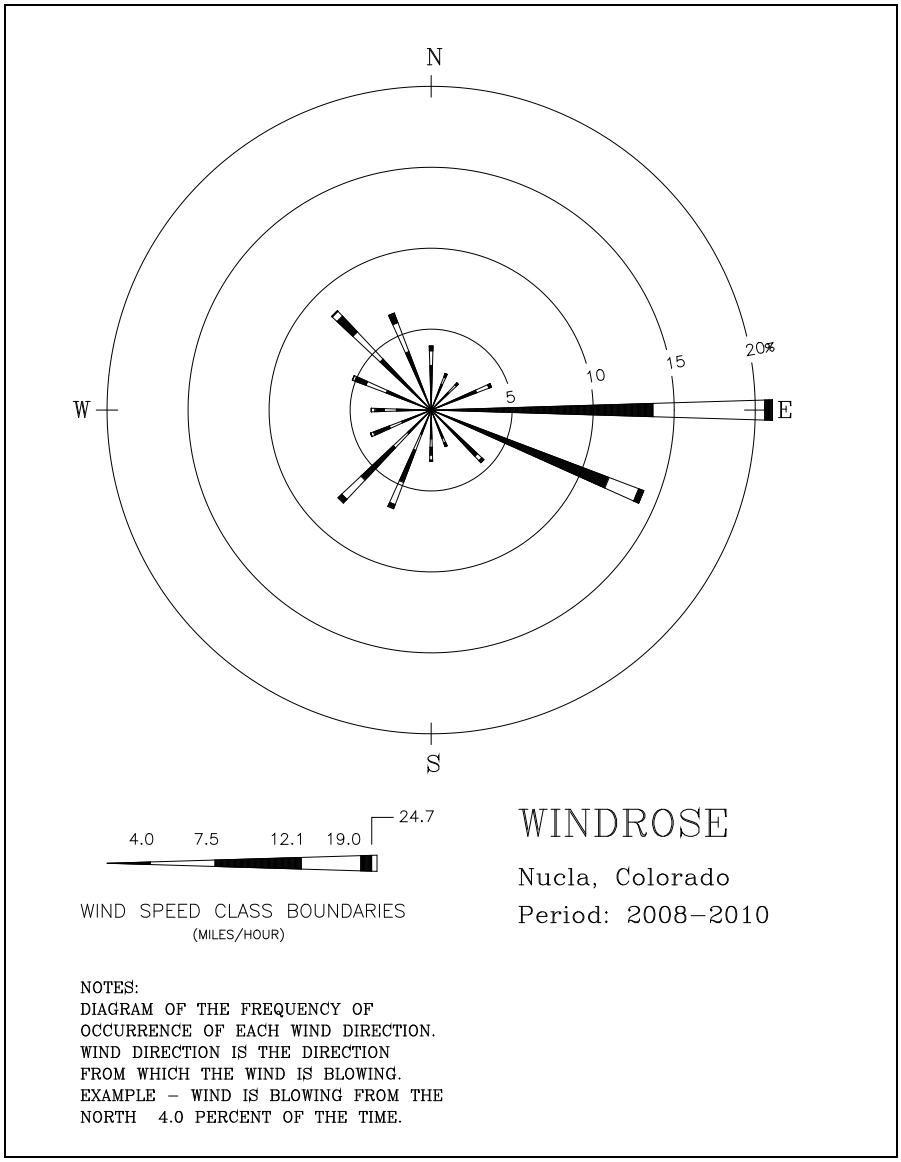


Diagram 3-10
Nucla, Colorado - Meteorological Data Wind Rose

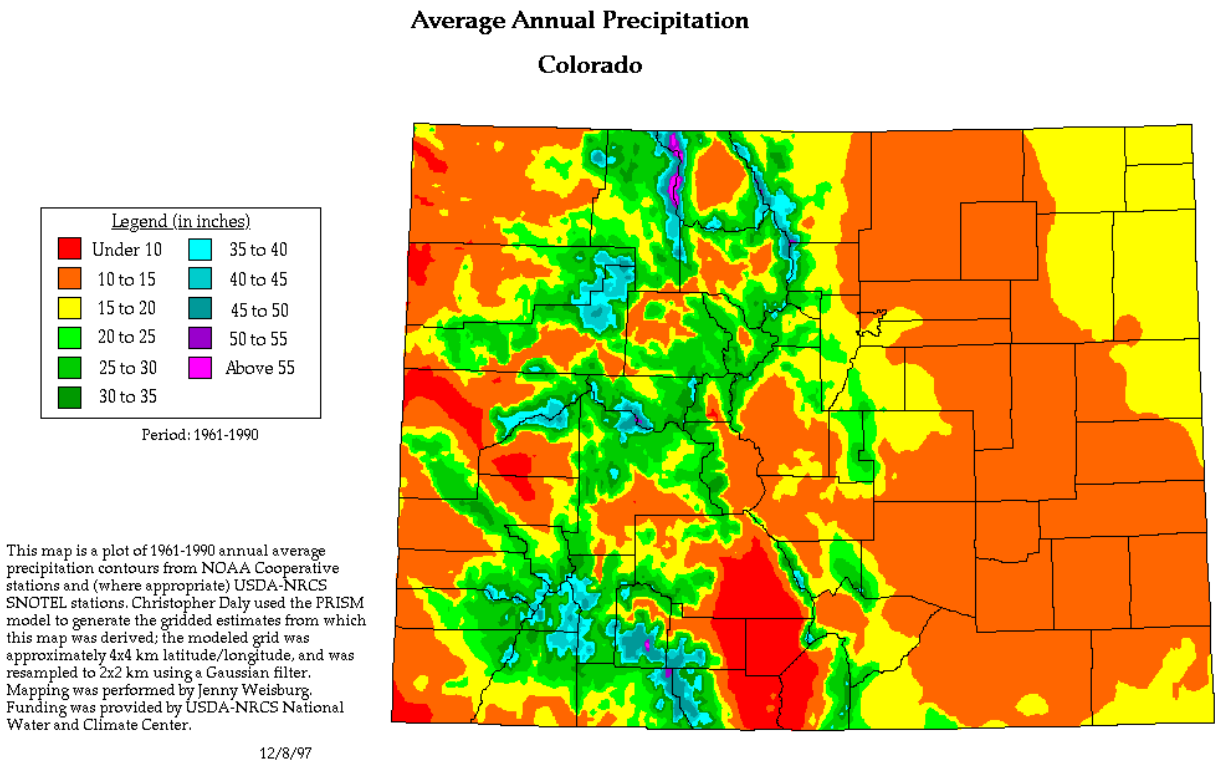


Average daytime high temperatures in the summer can vary from the lower 90s (°F) near the valley floor to the 60s at the higher elevations; in the winter, the average high temperatures near the valley floor are in the mid-30s to lower 40s, with temperatures in the 20s at higher elevations. Nighttime temperatures in the Grand Valley are typically in the 50s to lower 60s in the summer and in the teens in the winter, with cooler temperatures at the higher elevations. Monthly average temperatures drop below freezing in most valley floor locations from November to March. Grand Junction averages 8 days of fog per year.

Storms from the Pacific Ocean generally lose most of their moisture by the time they reach Colorado, resulting in very little precipitation in the valley. Grand Junction, Fruita, and Palisade each receive on average 9 to 10 inches of

precipitation per year. Monthly precipitation totals are fairly uniform in this area, but June tends to have the fewest number of days of precipitation and the lowest totals at most meteorological monitoring sites. More precipitation falls at the higher elevations, as shown in the 30-year climatological average annual precipitation map in **Diagram 3-11**, Average Annual Precipitation Map of Colorado, obtained from the Western Regional Climate Center (WRCC 2012).

Diagram 3-11
Average Annual Precipitation Map of Colorado



3.2.3 Geology

The geologic history of the GJFO planning area involves tectonics, sedimentation, igneous activity, and erosion extending from the Precambrian Era to the present, with the current landscape resulting from uplift and erosion during the past 5 million years. This text is derived from the *Mineral Potential Report for the Grand Junction Resource Area* (BLM 2010d). The reader is directed to this document for a fully referenced discussion of the geology of the GJFO.

Current Conditions

Stratigraphy

Rocks in the GJFO planning area range in age from Precambrian to Quaternary, with some significant gaps (see **Figure 2-65**, Alternatives A, B, C, and D: Surface Geology). Precambrian rocks form the basement to the planning area, appearing in canyon bottoms in several places. Pennsylvanian-age Hermosa Group rocks are the oldest in the southwest part of the GJFO planning area, having formed in the Paradox Basin (which includes Paradox and Sinbad Valleys) prior to the uplift of the ancestral Rocky Mountains. The restricted circulation in the basin saw deposition of evaporites that have moved upward as diapiric structures with deposits of salt and potash.

The uplift in the Pennsylvanian and Permian Periods shed sediments to the west into the Paradox basin, depositing the Cutler Formation, consisting of coarse clastic sediments. To the north and east, the strata overlying exposed Precambrian rocks are Triassic, representing a hiatus of some 400 million years, indicating a period of either erosion or non-deposition in those geographical areas. Intrusive activity emplaced veins and dikes through the Precambrian strata that host small deposits of copper, gold, and silver, along with other minerals.

From the time the Chinle Formation was deposited in the Triassic Period, the GJFO planning area experienced a period of fluvial deposition, with river systems forming broad flood plains and deltas. The climate was arid for long periods of time, with deposition of eolian sands in a very dry environment occurring across the area. The development of a large inland sea (the Cretaceous Inland Seaway) introduced a period of deposition from floodplain to deep water, as sea level fluctuated back and forth across the area. Numerous volcanic eruptions to the west of the area deposited felsic tuffs, especially during the Jurassic. These tuffs are believed to be the source of uranium that was subsequently mobilized and redeposited in the sandstone stream channels of the underlying fluvial sediments in the Morrison Formation. The Cretaceous environment saw development of significant coal deposits in the fluvial, deltaic, and estuarine environments bordering the Cretaceous Interior Seaway.

Toward the end of the Mesozoic Era, Laramide deformation raised uplifts and downwarped basins, leading to the maturation of the natural gas deposits found in the Piceance Basin of the GJFO planning area. The seaway disappeared by the

Tertiary Period, replaced by large lake systems. These lakes received clastic sediments from the surrounding uplands and were also the site for the quiet-water, varve-like deposition of the oil shale of the Green River Formation. Since that time, the lakes disappeared and the arid climate has taken over, with movement and deposition of sediments shed off the higher features dominating the landscape.

Precambrian. Precambrian rocks occur in the southwest portion of the GJFO planning area where they have been exposed by erosion beneath Paleozoic strata. No specific studies have been conducted on the geology of the Precambrian rocks within the GJFO planning area. Descriptions of the rocks and additional information are available from the Gunnison River area just to the east.

Precambrian crystalline rocks have been observed in the northeast corner of the Gateway quadrangle (BLM 2010d). Most of the exposed rock is a gray, medium-grained granite containing masses of partially-assimilated schist and gneiss. The gray granite is intruded by pink, coarse-grained granite, dikes of pegmatite and aplite, and dark hornblende-rich dikes.

Mapping of the Black Canyon area has divided the Precambrian rocks into metamorphic and igneous suites. Metamorphic rocks included quartz-mica gneiss, mica schists, sillimanite schist, amphibolites, and migmatites. The igneous rocks are the Pitts Meadow Granodiorite, the Vernal Mesa and Curecanti Quartz Monzonites, and smaller volumes of rocks intruded into those older plutonic bodies, including aplites, pegmatites, lamprophyres, and diabases (BLM 2010d).

Radiometric dating of the rocks of the Black Canyon indicates that the Pitts Meadow Granodiorite is the oldest of the intrusive rocks at 1,730 million years before present (Ma) +/- 190 Ma. The quartz monzonites date at 1,480 Ma (Vernal Mesa) and 1,420 Ma (Curecanti), and the lamprophyres also at 1,420 Ma. The youngest rocks are the diabases that intrude the other units, dated at 510 Ma, which is Paleozoic rather than Proterozoic (BLM 2010d).

Supracrustal rocks (metavolcanics and metasediments) have been assigned an age of 1.8 to 1.7 billion years before preset. The appearance of these rocks coincides with plutonic events elsewhere in Colorado. The Pitts Meadow Granodiorite is the same age as the Routt Plutonic suite, and the Curecanti event in the Black Canyon area is roughly the same age as the Berthoud Plutonic Suite (BLM 2010d).

The Precambrian crystalline rocks of the GJFO planning area in the Dominguez Canyon Wilderness Study Area comprise four separate units interpreted to be supracrustal in origin (BLM 2010d):

- Pink and grey gneissic biotite schists;

- Gray and pink medium-grained mica schist with felsic xenoliths;
- Pink, yellow, gray medium-grained gneiss with a well-defined schistosity; and
- Black to dark blue and gray to black medium-grained amphibolites.

Intrusive units include the following:

- Pink and white foliated granular granite;
- Pink and gray medium-grained biotite-hornblende granite;
- White to gray coarse-grained biotite granodiorite;
- Green coarse-grained biotite hornblendite (completely chloritized); and
- Pegmatites.

All the units are cut by metamorphosed diabase dikes of hornblende-biotite-garnet, striking northwest with low dips. Pegmatites crosscut the diabases in Big Dominguez Creek area vertically, with a northeast-southwest strike.

Cambrian, Ordovician, Silurian, Devonian, Mississippian. No strata of early Paleozoic age occur within the GJFO planning area and Mississippian rocks, while present in the subsurface, are not represented at the surface and thus do not appear on geologic maps.

Pennsylvanian. Hermosa Group: Hermosa Group rocks appear in the Sinbad Valley in the far southwest corner of the GJFO planning area. Salt and gypsum beds of the Paradox Formation of the Hermosa Group have pierced the overlying strata and appear as contorted beds of salt diapirs associated with a limestone unit, possibly the Honaker Trail Formation, the unit which overlies the Paradox stratigraphically (BLM 2010d). The thickness of the Hermosa Formation has yet to be determined, but a well drilled in the Paradox Valley, immediately south of the GJFO planning area, penetrated 2,300 feet of limestone believed to be the Honaker Trail Formation before encountering anhydrite beds of the Paradox Formation (BLM 2010d).

The Paradox Formation is a cyclical sequence of evaporites and shales, bounded on the top and bottom by black shales (BLM 2010d). No conclusion has been reached as to whether the cause of the cyclicity is eustatic or tectonic. The adjacent Uncompahgre highlands were uplifted from Pennsylvanian through Permian time and could well have influenced the sedimentation in the Paradox depositional basin.

The Paradox Valley, adjacent to the Sinbad Valley in the GJFO planning area, contains well-known potash deposits, including a Known Potash Leasing Area (KPLA) (BLM 2010d). The same potash-bearing geology occurs in the Sinbad

Valley and is classified by the US Geological Survey as a resource area for potash (BLM 2010d).

Permian. Rico Formation: The Rico Formation is composed of conglomeratic sandstone and arkose with some interbedded shale and limestone. The BLM *Mineral Potential Report for the Grand Junction Resource Area* recognizes the Rico as a transitional facies between marine strata of the Hermosa below and the continental sequence represented by the Cutler Group above (BLM 2010d).

Within the GJFO planning area, the Rico Formation has been mapped only in a small area of the Juanita Arch quadrangle, but may appear in other locations in the Sinbad Valley.

Cutler Group: The Cutler Formation of Permian age consists of maroon, purple, red and mottled light-red, arkosic conglomerate and some sandy mudstone. In the Davis Mesa quadrangle just to the south of the GJFO planning area, the Cutler Formation consists of a basal limestone, alternating with the arkosic sandstones upward in the section (BLM 2010d). The conglomeratic units contain clasts of granite, gneiss, schist, and quartzite, in addition to mineral grains.

The Cutler Formation is exposed along the Dolores River below Gateway and along West Creek (BLM 2010d). Ranging up to 3,500 feet in thickness, the unit thins and pinches out against the rocks of the Uncompahgre Uplift (BLM 2010d). The Cutler Formation is considered the proximal section of alluvial fan sediments shed by the ancestral Rocky Mountains of the Uncompahgre Plateau (BLM 2010d). The sediments detail seven different facies of the formation, including debris-flow facies, water-laid deposits, laterally continuous streamflood facies, braided stream facies and sheetflood facies.

No mineral resources are known in the Permian rocks.

Triassic. Moenkopi Formation: The Moenkopi Formation is a sequence of mostly coarse-grained terrestrial sediments. Three members have been observed in the adjacent Roc Creek, Juanita Arch, and Davis Mesa quadrangles respectively: (1) a lower red sandy mudstone and silty sandstone with thin beds of gypsum; (2) a middle member of arkosic conglomerate and conglomeratic sandstone with interlayered thin shales; and (3) an upper micaceous brown sandstone and shale sequence (BLM 2010d). Numerous names have been proposed and adopted for the Moenkopi members across the Colorado Plateau, but these have not yet been applied to the sequence in the GJFO planning area.

The members have represent terrain that began with shallow standing-water deposition, moving to a fluvial regime in the middle member, and returning to the shallow standing-water environment in the upper member. The Moenkopi has generally been considered to represent a shoreline environment across the Plateau. The unit is approximately 500 feet thick in the southwest corner of the GJFO planning area.

Chinle Formation: The Chinle Formation, of Upper Triassic age, also appears in the southwest corner of the GJFO planning area. The unit is a red siltstone with interbedded fine-grained siltstones. The siltstones are interbedded with conglomeratic units which are considered to be equivalent to the Shinarump Member that occurs in greater abundance to the south and west. Some cross-bedding and ripple marks can be found.

The Chinle Formation is interpreted as a braided stream facies. The lenses and channels of the Shinarump Member represent stream channels and other coarse debris that probably filled the lower valleys (BLM 2010d).

In the GJFO planning area, Chinle Formation outcrops are commonly obscured by talus from overlying sandstones. In many places, the Chinle Formation lies directly on Precambrian rocks, representing a profound unconformity, with no strata present between the Precambrian and the Triassic periods, a hiatus of at least 400 million years. The unit thickens south from 100 feet thick at Grand Junction to nearly 300 feet at Gateway (BLM 2010d).

Jurassic. The Glen Canyon Group is the collective term for three distinctive units of terrestrial sediments that provide the character of the Colorado Plateau's spectacular scenery. The Glen Canyon Group has been divided into three units – Wingate Sandstone, the Kayenta Formation, and Navajo Sandstone.

Wingate Sandstone: The Wingate Sandstone is a massive, fine-grained, red-gray to tan eolian sandstone that lies unconformably on the Chinle Formation. The unit displays cross-bedding characteristic of dune sands. Bedding ranges in thickness from several inches to several feet and weathers in a block- to slab-like fashion (BLM 2010d).

The unit consists of sands that were supplied by streams from the east, deposited by ephemeral streams and subsequently windblown across the terrain (BLM 2010d).

The Wingate Sandstone ranges in thickness from 275 to 400 feet where exposed in the GJFO planning area. The unit is a distinctive cliff-former, enhanced by prominent vertical jointing. Exposures are especially notable in the Colorado National Monument where it is the predominant rock type.

Kayenta Formation: Conformable with the Wingate Sandstone is the Kayenta Formation, a varicolored sandstone containing thin-bedded shale and red siltstone layers. Most of the sandstone is thin-bedded and flaggy. Conglomerate and mudstone occur in the upper half of the unit (BLM 2010d).

The Kayenta Formation was formed as braided alluvial streams prograded over the desert terrain during Wingate time.

As a result of the interbedded shales and lensoidal sandstones, the Kayenta Formation forms benches and ledges above the cliffs of Wingate Sandstone. The unit is harder and more tightly-cemented near the bottom, shielding the underlying Wingate Formation from erosion and preserving the cliff faces. Thickness typically varies from 90 to 220 feet; however, it may change abruptly over short distances (BLM 2010d).

Navajo Sandstone: The Navajo Sandstone is a fine-grained, gray to buff, cross-bedded sandstone of eolian origin. It represents a return to the desert environment that dominated before the deposition of the Kayenta Sandstone. The prominent cross-bedding is characteristic of this unit.

The unit thickens to the east, ranging from thin exposures in Maverick Canyon to a thickness of 260 feet in the far southwest corner of the GJFO planning area. The unit forms rounded hills caused by disintegration of the sandstone.

Entrada Sandstone/Carmel Formation: The Carmel, Entrada and Summerville Formations together comprise the San Rafael Group.

The Carmel Formation is composed of tan and red sandstones, siltstones, and mudstones grading upward from the underlying coarser-grained Navajo Sandstone. The Carmel Formation sediments have been interpreted as being deposited on an irregular Navajo Formation terrain, accounting for variations in the thickness. In many places, the Carmel Formation consists of reworked Navajo Sandstone, representing what was a complex suite of deposition along a fluctuating shoreline (BLM 2010d).

The Entrada Sandstone is a picturesque unit of orange, red, and white eolian sandstone overlying the Carmel Formation consisting of two parts. The prominent Slick Rock Member forms characteristic bulging, massive cliffs of sandstone with pits formed by differential weathering that occur up to a foot across. Above that is a section referred to as the "board beds," characterized by interbedded resistant sandstone and mudstone that form outcrops resembling a stack of boards (BLM 2010d). The Entrada Sandstone was formed as dunes once again encroached over the area. The "board beds" are interpreted as a flat interdune wet sand environment, also known as a sabkha environment (BLM 2010d). The total thickness of the Carmel-Entrada sequence ranges from 10 to more than 100 feet.

Summerville Formation/Wanakah Formation: The Summerville Formation has a type section in Utah and was originally mapped in the GJFO planning area of the Colorado Plateau (BLM 2010d). The sequence is described as silty shales, sand, and thin-bedded mudstones exhibiting even, thin horizontal bedding. A thin dark gray freshwater limestone has been observed in the upper part of the section (BLM 2010d). The interpreted gradational contact between the Summerville and the overlying Morrison Formation made distinguishing the two quite difficult.

The Summerville Formation is comprised of debris-littered slopes beneath the more resistant sandstones of the Morrison Formation (BLM 2010d).

Recently, geologists working to the north and east of the Uravan Mining District have stopped using the term Summerville Formation and have referred to the top of the San Rafael Group in Colorado as the Wanakah Formation. The Summerville Formation and the Wanakah Formation have been dated as roughly time-equivalent in Utah and Colorado respectively (BLM 2010d). The Summerville and Wanakah Formations are both truncated by a regional unconformity which is, in turn, overlain by the basal Morrison Formation, the Summerville to the west, and the Wanakah to the east. The Summerville Formation is younger than the Wanakah Formation, and shows no correlation to the Wanakah Formation or any of the other western San Rafael Group units, although the Wanakah terminology was used in the 1987 study of the Dominguez Canyon Wilderness Study Area (BLM 2010d).

The Wanakah in the Colorado National Monument consists of interstratified mudstone with 5 to 15 percent sandstone and silty sandstone, and up to 5 percent impure limestone. Traces of volcanic ash and gypsum also occur. The unit throughout the GJFO planning area is thin, probably not exceeding 100 feet in thickness (BLM 2010d).

It is not known if the unit mapped as Summerville in the Uravan Mining District is equivalent to the Wanakah Formation.

Morrison Formation: The Morrison Formation is a varied assemblage of siltstones, sandstones, and mudstones, ranging in thickness from 800 to 900 feet in the southwest to 500 to 600 feet near the city of Grand Junction. The braided streams, lakes, and deltas of the Morrison Formation create a depositional environment that is rich in paleontological resources (BLM 2010d). Four member units are recognized in the Colorado Plateau region, but only three occur within the GJFO planning area – the Tidwell, the Salt Wash, and the Brushy Basin Members.

Tidwell Member: Mudstone characterizes the Tidwell Member, with minor beds of sandstone and limestone. The mudstone is grayish-red to graying-yellow-green, with sandy siltstone, silty claystone, and siltstone, generally quite thin. Sandstone is light gray to greenish gray, rather fine-grained and well-sorted, with local bioturbation. Limestone beds present in the upper section represent the only limestone in the Colorado National Monument area. The unit is 125 feet thick in the National Monument. The Tidwell Member probably represents deposition in freshwater to brackish environments (BLM 2010d).

Salt Wash Member: Much of the Salt Wash Member consists of alternating beds of siltstone or mudstone with lenticular sandstone. Near the base, persistent limestone beds are not uncommon (BLM 2010d). Sandstone predominates in the Uravan Mining District of the GJFO planning area. The sandstone facies have

been described in the Gateway quadrangle as traceable as ledges in outcrop for long distances, but individual beds within a stratum are lenticular and discontinuous, wedging out laterally where others wedge in, forming interfingering lenses in a mudstone matrix. This configuration is indicative of the depositional environment of meandering and anastamosing stream channels. It is these channels that host the abundant uranium deposits of the area.

The Salt Wash Member decreases in thickness from 600 feet in Utah to 200-300 feet in the Grand Junction area. Approaching Grand Junction, the nature of the rocks changes from a sandstone-mudstone facies to claystone containing lenticular sandstones. To the east and north of Grand Junction, the Salt Wash Member ceases to be a recognizable unit. The Salt Wash units form cliffs and steep slopes above the less resistant units of the Summerville and Wanakah Formations beneath.

The environment of deposition was probably a series of flat floodplains and marshy areas, rich in vegetation. Rivers meandered across the terrain, contributing abundant organic material to the sedimentary pile and providing habitat for the fauna whose fossils remain.

Brushy Basin Member: The Brushy Basin Member is predominantly mudstone and siltstone, but it contains some beds of sandstone, limestone and bentonitic mudstone. The sequence is characteristically colored, with red, purple, and green units. In the Uravan Mining District, beds are distinguished by their turquoise blue-green color.

Deposition in a fluvial to lacustrine environment is indicated for the Brushy Basin Member. The Brushy Basin Member is thought to be the world's largest and oldest known playa lake complex (BLM 2010d). Notable in the southern portion of the area is the contribution of volcanic tuffs. Alteration of these tuffs to bentonite and other secondary minerals have created the colors characteristic of Brushy Basin units. Furthermore, it is believed that these silicic tuffs are the source for uranium and vanadium that has been deposited in the sandstone channels of the underlying Salt Wash Member. The unit varies in thickness from around 95 feet in the Colorado National Monument area to over 400 feet to the south in the Roc Creek quadrangle.

Cretaceous. Burro Canyon Formation: In the GJFO planning area, the Burro Canyon Formation comprises a sequence of sandstones, siltstones, and green and red shales with a basal conglomerate, very much like the Salt Wash Member of the Morrison Formation. The sequence represents a change from the predominantly silty beds of the Brushy Basin Member to the conglomerate and then more sandy units up through the stratigraphic section.

The Burro Canyon Formation caps gently sloping mesas in the area around the city of Grand Junction at about 100 feet in thickness. The unit also occurs on mesa tops in the Gateway quadrangle, as the youngest unit present in that area.

The environment of deposition was similar to that of the Salt Wash Member – an area of broad floodplains and slow, meandering rivers.

Dakota Sandstone: The Dakota Sandstone is a widespread unit that appears in the GJFO planning area mainly as a pale orange to gray, fine-grained sandstone. A basal conglomerate rests unconformably on the Burro Canyon Formation in the Grand Junction area, but to the south, the contact between the two units becomes gradational (BLM 2010d). It grades laterally from fluvial sandstone to conglomerate, carbonaceous mudstones and shale with thin coals, to marine sandstone. The carbonaceous units contain numerous plant fossils while the sandstones show cross-bedding, bioturbation and channel fills. The Dakota Sandstone contains coal beds that are mined to the south in the Nucla area.

The Dakota Sandstone has been described as forming prominent ledges and ridges with steep slopes on the interbedded mudstones. The Dakota Sandstone is about 200 feet thick through much of the area, thinning somewhat to the south (BLM 2010d).

The Dakota Sandstone was formed as the Cretaceous Interior Seaway encroached from the east, leading to the formation of delta, bar, swamp, and shoreline facies. The Dakota represents a stack of strata comprising four separate sequences, reflecting tectonic and eustatic sea level fluctuations along the western edge of the interior sea (BLM 2010d). The Dakota Sandstone in many locations forms a very hard, resistant quartzite.

Mancos Shale: The Mancos Shale is a sequence dominated by rocks formed offshore of the Cretaceous Interior Seaway. The total unit is 3,450 to 4,150 feet thick in the Piceance Basin and grades upward and intertongues with the overlying Mesaverde Group (BLM 2010d). The Mancos Shale is generally a gray to brown fissile shale with interbedded calcareous and silty zones and limestones.

Topographically, the Mancos Shale forms gentle slopes containing occasional white bentonite layers, broken by calcareous sandstones. The complex unit is interpreted as deposition in changing offshore environments, from distal turbidites to near-shore muds, silts and sandstones (BLM 2010d).

Mesaverde Group: The Mesaverde Group overlies the Mancos Shale throughout the GJFO planning area, comprising a thick sequence of rocks deposited shoreward of the Mancos Shale as the seaway regressed across the area toward the East. Because of the direction of the shoreward migration, the underlying Mancos Shale persists later in time to the east; rocks of the Mesaverde Group enter the section later in Colorado than in Utah. The stratigraphy has been studied carefully because of the presence of the economic coal deposits formed in the near-shore swamp and lagunal environments (BLM 2010d).

The lowermost unit of the Mesaverde Group is the Castlegate Sandstone. Not a major unit in Colorado, the Castlegate Sandstone does occur in the GJFO planning area, pinching to a thin tongue in the Piceance Basin (BLM 2010d).

The Sego Sandstone is defined in the Sego Canyon of Utah. It is separated from the Castlegate Sandstone by the Buck Tongue of the Mancos Shale and is divided higher up the section into two parts by another tongue of the Mancos Shale – the Anchor Mine Tongue. The Sego Sandstone is a fine- to medium-grained sandstone interpreted to be delta-front and delta plain sediments. The Anchor Mine Tongue is 100 feet thick at the Colorado-Utah state line, thickening and merging with the main body of Mancos Shale at East Salt Creek. The Sego Sandstone was being deposited in the western part of the area while the Mancos Shale was still being deposited in the offshore areas to the east (BLM 2010d).

Atop the Sego Sandstone in the Book Cliffs area is the *Mount Garfield Formation*, consisting of a sequence of brown to gray sandstone, siltstone, shale, and coal. The Mount Garfield is a shoreline and coastal plain facies characterized by three well-defined cliff-forming sandstones – the Corcoran Sandstone, the Cozzette Sandstone, and the Rollins Sandstone, all three considered members of the Mount Garfield Formation separated by tongues of Mancos Shale. These units are described below as they are also members of the Iles Formation to the east (BLM 2010d).

The Iles Formation is the next unit in the sequence in the east. In general, the Iles Formation is a fine to medium-grained sandstone, siltstone, mudstone, carbonaceous shale, and coal, formed along a coastal plan and lower alluvial plain under tidal influence. The Iles Formation is composed of three members – the Corcoran, the Cozzette, and the Rollins (BLM 2010d).

The Corcoran Member is very fine-grained sandstone, siltstone, shale, and coal, lying unconformably on the Sego Sandstone. The Corcoran forms 40 feet of delta plain deposits including carbonaceous shale, coal, and minor sandstone at Big Salt Creek. This represents the Palisade Coal Zone. The Corcoran Member is considered a tight gas sand and has been an exploration target (BLM 2010d).

The Cozzette Member is as thick as 230 feet with the same description as the Corcoran Member. It contains the Chesterfield and Carbonera coal zones, the former defined in and restricted to Utah, while the Carbonera zone has been traced into Colorado to East Salt Creek. The Cozzette Member is also a tight gas sand target.

At the top of the Iles Formation sequence is the Rollins Sandstone Member. Varying in thickness from 200 feet in the east to zero, it pinches out near Layton Wash north of Grand Junction. The Rollins Sandstone is a coarse-grained cliff-forming sandstone formed in a near-shore marine environment. Near the top of

the Rollins is the Cameo coal zone, the uppermost coal zone of the Book Cliffs coal field.

The Williams Fork Formation includes all the Cretaceous strata above the Rollins Sandstone east of the Utah border. This is a thick sequence, grading from 1,200 feet thick at the Utah state line to nearly 5,155 feet thick at the Grand Hogback. Included in the Williams Fork Formation are coal zones in two of the members. The description of the Williams Fork Formation is much the same as the Iles Formation – fluvial and coastal plain strata of sandstones, siltstones, carbonaceous shales and some major coals (BLM 2010d).

Included in the Williams Fork Formation are the Paonia and Bowie Shale Members and the Cameo-Fairfield, South Canyon and Coal Ridge coal zones. The Bowie Shale Member is nearly 1,000 feet thick, consisting of two coal-bearing coastal plain units overlain by marine shale and marginal sandstone. The Paonia Shale Member – up to 560 feet thick – also consists of coal-bearing coastal plain sediments but does not extend as far west as the GJFO planning area. An upper undifferentiated member is fluvial sandstone, conglomerate, siltstone, and shale. The top of the undifferentiated member consists of a kaolinitic sandstone that is correlated with the Ohio Creek Member of the Hunter Canyon Formation.

The Cameo-Wheeler coal zone occurs within the Williams Fork Member, intertonguing with the Rollins Sandstone and pinching out toward the south and west. The South Canyon and Coal Ridge coal zones both overlie and interfinger with the Bowie Shale but do not extend as far west as the GJFO planning area.

Tertiary. The Tertiary rocks in the GJFO planning area consist of Paleocene and Eocene formations described in the following sections.

Paleocene. Wasatch Formation: The main body of the Wasatch Formation varies from 1000 to nearly 6000 feet in thickness, consisting primarily of varicolored sandstones and mudstones representing floodplain, coastal plain and lacustrine facies. Detailed mapping at 1:24,000 scale in the GJFO planning area has identified three members of the Wasatch Formation – the Atwell Gulch of Late Paleocene age, the Molina of Paleocene-Eocene age, and the younger Shire Member. The Molina and Shire Members will be discussed in the Eocene section (BLM 2010d).

The Atwell Gulch Member is described as comprising three discernible portions. The lower section is 80 to 1,150 feet of black and gray claystone, mudstone with some coals. Sandstones are mapped toward the south in the Mesa quadrangle, while in DeBeque quadrangle, the Member is conglomeratic at the base and sits unconformably on the underlying Mesaverde Group. The unit disappears to the east, as it is not mapped in the Housetop Mountain or Hawxhurst quadrangles (BLM 2010d).

Eocene. Wasatch Formation (continued): Overlying the Atwell Gulch Member is the Molina Member of the Wasatch Formation. This unit is characterized by conspicuous gray to brown massive ledge-forming sandstones, up to 50 feet thick and persistent laterally, interlayered with grey to greenish to lavender non-laminated mudstones.

The top member of the Wasatch Formation is the Shire Member. It is comprised of mudstones and claystones with a few lenticular sandstones. The Shire Member thickens to the northeast, from as thin as 90 feet in the west to 1,700 feet in the Hawxhurst Mountain quadrangle in the northeast, where it is the only member of the Wasatch identified (BLM 2010d).

The Wasatch Formation was formed at a time when Piceance and Uinta Basins were beginning to take form as they appear today. In the GJFO planning area, an onlap of coastal plain sediments was followed by wetland and lacustrine environments. In the Eocene, the system of lakes was expanding in the basin with clastics sporadically introduced (the Molina Member).

Green River Formation (Garden Gulch, Douglas Creek, and Parachute Creek Members): The Green River Formation is found in the northeast corner of the GJFO planning area. The formation is divided into three members – the basal Anvil Points Member, the middle Garden Gulch Member, and the upper Parachute Creek Member. Earlier mapping in the Wagon Track Ridge quadrangle and in the Mesa quadrangle identified the Douglas Creek Member, but this appears to be at least equivalent to the Garden Gulch Member (BLM 2010d).

The Anvil Points Member is primarily a massive, cliff-forming sandstone that thickens to the northeast, toward the axis of the Tertiary basin where it reaches 1,200 feet in thickness in the Hawxhurst Mountain quadrangle.

Above the Anvil Points, the Garden Gulch Member is mainly a carbonate unit, composed of light gray marlstone, light-gray oolitic limestone with ostracodal and algal limestone, some paper-thin shale and thin sandstones. Thickness reaches 1,000 to 1,200 feet in the northeast of the GJFO planning area.

The youngest unit – the Parachute Creek Member – is composed of a gray-weathering marlstone that is a local cliff-former, containing minor beds of oil shale. The rich oil shale zone, the Mahogany Bed, occurs near the base of the Parachute Creek Member and reaches 120 feet of thickness within the GJFO planning area.

The Green River Formation reflects a large area with internal drainage. A large lake, with fluctuating shorelines, may have reached its maximum size at the time of the deposition of the oil-shale rich Mahogany Bed. By Late Eocene time, the lakes receded and, by Oligocene, were gone (BLM 2010d).

Uinta Formation: The Uinta Formation occurs in the far northeast corner of the GJFO planning area, capping the Tertiary strata with 900 feet of light-colored fine-grained sandstone with lesser marlstone and siltstone. The Uinta Formation is generally fossiliferous and represents clastic deposition along the margins of the retreating Eocene lake system.

Quaternary. Numerous unconsolidated Quaternary deposits occur within the GJFO planning area including glacial deposits (map unit Qd), older gravels (Qgo), colluvium (Qc) and alluvial and eolian deposits (Qae). Sand and gravel deposits occur in the larger river channels and their associated higher-level terrace deposits.

Structural Geology and Tectonics

The GJFO planning area covers a portion of the northeast corner of the Colorado Plateau geographic and structural province. Physiographic characteristics of this province reflect structural characteristics of the region that contrast with more complex terrain surrounding it. As a structural province, the Colorado Plateau acts as a high-standing block of relatively undeformed rocks framed by the deformed rocks of the Middle and Southern Rocky Mountains provinces, which wrap around from north to east, and the Basin and Range Province to the south and west. It is characterized by large regions of nearly flat lying Paleozoic and younger sedimentary formations occasionally broken up into broad uplifts bounded by monoclines and high-angle faults. This style typifies structural elements within the GJFO planning area wherein Mesozoic and younger sedimentary rocks are relatively undeformed with the exception of a few very prominent structural features related to the geologic evolution of the northwest trending Uncompahgre Plateau and the adjoining Piceance Basin.

Structural elements within the GJFO planning area can be best described by those primary periods of deformation during which they were active. For purposes of this discussion, the primary periods include early evolution of the North American craton during the Proterozoic followed by the late Paleozoic uplift of the Ancestral Rocky Mountains and the subsequent compressional Laramide Orogeny during the late Mesozoic and early Cenozoic. Finally, a recent period of extensional deformation began in the mid Cenozoic and continues today. A fifth category is described that covers deformation caused by flowage of buried evaporite deposits that began shortly after burial in the Late Paleozoic and has continued off and on since.

Proterozoic Structural Elements

The relatively undeformed nature of the Mesozoic and younger sedimentary formations at the surface within the GJFO planning area mask greater structural complexity at depth in the older rocks, particularly in the crystalline Proterozoic basement rocks. Exposure of Proterozoic rocks within the GJFO planning area is limited to a few narrow canyons on the Uncompahgre Plateau, such as

Unaweep Canyon, and nearby canyons along the northeast edge of the Uncompahgre Plateau. Little direct information about the buried Proterozoic rocks can be obtained from within the GJFO planning area with such limited exposure; however, enough can be understood from regional exposures to have a basic understanding of the hidden terrain beneath the surface.

The Proterozoic rocks in this region formed at the margin of the North American Craton in an island arc and back arc basin setting as a series of sedimentary and volcanic rocks that underwent metamorphism between approximately 1.8 and 1.7 billion years ago followed by intrusive events up to approximately 1.4 billion years ago. The regional structural grain of these rocks trends northeast and the predominant deformational style is ductile associated with regional metamorphism. Subsequent brittle deformation is evidenced by the emplacement of mafic dikes and pegmatites with northeast trends in the Colorado National Monument area and northwest trends in the Dominguez canyon area (BLM 2010d).

For the next nearly 1 billion years the area underwent erosion with the next period of deposition starting approximately 520 Ma in the early Paleozoic. Development of the west to northwest trending Garmesa and Uncompahgre fault zones may have occurred during this period of non-deposition in late Precambrian time. These fault zones were later reactivated as primary structures during development of the ancestral Uncompahgre highland as described below. Early to middle Paleozoic time was marked by repeated transgression and regression of shallow continental seas across the entire region. Tectonic activity was apparently limited; however, uplift along high angle faults resulted in erosion in central Colorado during the Early Ordovician epoch. There is very little preserved of this period of time in the GJFO planning area due to tectonic uplift and erosion during the late Paleozoic (BLM 2010d).

Late Paleozoic Structural Elements

During the Pennsylvanian and Permian Periods of the Late Paleozoic, around 300 to 250 Ma, the region underwent tectonism that resulted in the uplift and erosion of the Ancestral Rocky Mountains (BLM 2010d). Fault-bound uplifted highlands trending generally northwest to southeast rose providing abundant sediments to adjacent basins. In Colorado these ancient mountain ranges included the Front Range and Apishapa highlands in the central part of the state and the Uncompahgre highland in southwest part of the state. Basins adjacent to these highlands included the Central Colorado Trough, also known as the Eagle Basin in the northwest part of the state, and the Paradox Basin that extended southwest of the Uncompahgre highland across much of the Four Corners region.

The ancestral Uncompahgre highland extended across most of the area now encompassed by the GJFO planning area and includes the modern day Uncompahgre Plateau. This uplift was bounded on the southwest by the

Uncompahgre fault zone where there may have been as much as 20,000 feet of vertical displacement. This fault zone includes the Gateway Fault. The edge of the uplift has been placed along the Garmesa Fault Zone where there may have been up to at least 2,000 feet of vertical separation (BLM 2010d). This edge of the ancestral highland is now concealed beneath Late Cretaceous and Tertiary sediments of the Piceance Basin.

Development of the highlands and basins continued into the Permian Period; however, tectonic activity was apparently most robust during the Pennsylvanian. By Middle Triassic, uplift of the highlands had pretty much ceased with the Chinle Formation being the first formation to completely blanket the region (BLM 2010d).

Late Mesozoic and Early Cenozoic Structural Elements

Following a period of relative tectonic quiescence from the Middle Triassic through Early Cretaceous, around 240 Ma to 100 Ma, the region underwent a period of compressional tectonic deformation that developed many of the major structural and topographic features present today. This period of deformation began with regional subsidence along a north south trending foreland basin east of the Sevier orogenic belt of west-central Utah (BLM 2010d). This broad foreland basin was flooded by the Cretaceous Interior Seaway. Eastward progression of the Sevier thrust front pushed the axis of deposition in the seaway to the east and eventually the seaway retreated. Tectonic deformation subsequently advanced into the Rocky Mountain region during Late Cretaceous and into the Eocene, from around 70 to 50 Ma, as manifested by the Laramide Orogeny. During this phase of deformation, Precambrian basement-cored uplifts were accompanied by subsidence of intervening basins. In many places this event reactivated faults developed during the earlier Proterozoic period and Late Paleozoic events.

Although the main Laramide mountain building activity occurred in the Central and Southern Rocky Mountains north and east of the Colorado Plateau, the area encompassed by the GJFO planning area was affected by this tectonic event. Laramide deformation within the relatively stable Colorado Plateau occurred primarily as broad uplifts bounded by monoclines and high-angle faults (BLM 2010d). Northwest-trending monoclines cored by high-angle reverse faults bound the modern Uncompahgre Plateau, a prominent topographic high extending across the southwestern portion of the GJFO planning area. Most notable of these structural features is the Redlands fault and monocline that form the dramatic southwest edge of the Grand Valley and pass through the Colorado National Monument. This feature offsets Mesozoic strata downward to the northeast approximately 1,800 feet. On the southwest side of the Uncompahgre Plateau Laramide deformation resulted in as much as 1,300 feet of vertical displacement along the Uncompahgre fault zone (BLM 2010d).

The GJFO planning area also spans the southwest flank of the Piceance Basin, an asymmetric Laramide structural basin with its northwest-trending axis situated just west of the Grand Hogback. On this flank strata dip gently to the northeast toward the axis. Subtle Laramide folds trending generally northwest sub-parallel to the basin axis deform the flank in a number of locations (BLM 2010d).

The Douglas Creek Arch is a broad north-south trending anticline that forms the west edge of the Piceance Basin in the northwest part of the GJFO planning area. This structural feature developed during the Laramide Orogeny contemporaneously with subsidence of the Piceance Basin and the Uintah basin to the west and exerted a strong influence on deposition patterns of the Green River Formation. Late Cretaceous strata deposited in the foreland basin at the edge of the Cretaceous Interior Seaway are partially truncated by the arch while the Paleocene and Eocene Wasatch and lower Green River formations thin dramatically over the arch. Upper members of the Green River Formation, including the oil shale bearing Parachute Creek Member display less thinning over the arch than the older members. These relationships combined with distribution of clastic facies within the Green River Formation suggest that at times the feature formed a sub-areal lowland separating the greater Eocene Lake Uinta into two lakes, one within the Piceance basin and the second in Uinta Basin. By the time the Parachute Creek Member was deposited the lakes had transgressed over the arch forming one large lake (BLM 2010d).

Cenozoic Structural Elements

By the end of the Eocene, Laramide style deformation in the region had waned. To the east in the Southern Rocky Mountain region this was followed by a period of voluminous volcanic activity, but little direct evidence of tectonic activity was preserved within the GJFO planning area. The next period of major tectonic activity affecting the region has been extensional deformation that began approximately 25 Ma in late Oligocene and has continued through the Quaternary. While the most notable structural features developed during this phase are associated with the Rio Grande Rift to the east, there is evidence of deformation within the GJFO planning area. Regional uplift has led to broad erosion and deep incision of modern stream systems. Other evidence includes Pliocene arching of the Uncompahgre Plateau and northeast-trending normal faults developed on the Douglas Creek Arch that are likely post-Laramide in age. Possible Quaternary movement has been identified for several faults within the Uncompahgre Plateau (BLM 2010d).

Evaporite Flow Structures

The southwest corner of the GJFO planning area extends into the Paradox Basin and enters a structural region known as the Paradox fold and fault belt where unique structures have developed in response to flowage of Pennsylvanian evaporite deposits. Within the GJFO planning area, the Sinbad Valley is one of these unique structures (BLM 2010d).

During basin subsidence in the Pennsylvanian and Permian periods, up to 20,000 feet of clastic sediments and evaporite deposits accumulated in the Paradox Basin; evaporite deposits, primarily salt, may have reached a thickness of up to 8,000 feet of this wedge of sediments. These evaporite deposits began to flow and form elongate salt anticlines as they were buried beneath rapidly accumulating clastic sediments. Pre-existing northwest-trending basement faults that may have originated in Late Precambrian along with the main boundary faults of the ancestral Uncompahgre highland probably controlled alignment of the salt anticlines. Stratigraphic evidence suggests that upward salt flowage was rapid from Pennsylvanian through early Permian and continued into the Jurassic (BLM 2010d). Flowage generally ceased as the source salt beds were depleted until uplift and erosion began to expose the salt anticlines to meteoric groundwater flow. Modern groundwater flow and surface dissolution have led to collapse of the anticline crests to form grabens within the anticlines.

Characterization

Geologic resources are closely related to soils, water, minerals, and paleontological resources. Each of these resources is discussed in detail in other sections. Specific unique geologic features are discussed as part of visual resources.

Trends

The current trend for geologic resources is to manage any geologic resources or features as part of the management of soils, water, minerals, or paleontological resources.

3.2.4 Soil Resources

Many resources and resources uses, including livestock grazing, wildlife habitat, riparian habitat, special status species, fisheries, recreation, water quality, and forestry, depend on suitable soils. Therefore, soil attributes and conditions are important to RMP management decisions (BLM 2009d).

Current Conditions

Many different soil types occur in the GJFO planning area because of the varying climatic, vegetative, topographic, and geologic conditions. In the planning area, impacts on soil resources have resulted from energy development, grazing, recreation, natural processes, and other activities (BLM 2009d). Soil resources support range and forest plant communities that stabilize the soil surface and protect watershed function and condition. The potential for maintaining or restoring these communities and conserving the soil resource depends on the specific soil types and how the resource is managed.

Soil Types

The soil types in the project area occur from 4,400 feet above mean sea level on the valley floor to 8,600 feet above mean sea level in the higher elevations. The average annual precipitation and temperature in the project area vary greatly by elevation and aspect (Western Region Climate Center 2009). Many of

the soils have developed from alluvium that was deposited over time as the Colorado, Dolores, and Gunnison Rivers and their tributaries eroded through the surrounding mountain ranges. Soils also vary with vegetative cover, including range and forest plant communities.

When making land management decisions based on soil-related hazards or limitations, the GJFO evaluates soil surveys available from the NRCS. Soils are mapped according to the boundaries of major land resource areas, which are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (NRCS 2009a). Each soil survey describes the specific properties of soils in the area surveyed and shows the location of each kind of soil on detailed maps. BLM evaluates soil map units to make management decisions that would likely affect soils. Each soil survey applicable to the GJFO describes soil map units by the individual soil or soils that make up the unit. These descriptions indicate the limitations and hazards inherent in each unit. Descriptions include soil depth, range of elevation, origin, climate, physical properties, runoff capabilities, erosion hazard, associated native vegetation, wildlife habitat use, and capability for community development and other uses.

Third-order soil surveys, provided by the NRCS, cover most of the GJFO. The NRCS maps over 250 soil map units in the GJFO, making summarization complex. Lands within the planning area are primarily within the Mesa County Area survey (908,649 acres in Mesa County) and Douglas-Plateau Area survey (858,188 acres in parts of Garfield and Mesa Counties), Uncompahgre National Forest Area (119,890 acres), Grand Mesa Area (253,141 acres), San Miguel Area (18,087 acres), and smaller acreages in the Paonia, Grand Mesa, Rio Blanco County, and Rifle Areas (NRCS 2009b).

Generally, soils in the planning area are loams, clays, and rock outcrop complexes. The depth of all soils range from 0 to 60 inches, depending on slope and aspect. Some soils have a very high runoff potential and erosion hazard rating. Prime farmlands are located on private land between Grand Junction and Mack and east to Palisade, as well as on private lands near Collbran and DeBeque and in Montrose County. No public lands are believed to have prime farmlands. Complete descriptions of the affected soil units are available from the NRCS (NRCS 2009b).

Biological Crusts

Biological (or cryptobiotic) soil crusts are composed of highly specialized communities of cyanobacteria, mosses, and lichens. These biological crusts cover open spaces between vascular plants on relatively barren soils. Biological crusts generally occur where vascular plant cover is sparse. Crust cover is generally greatest at lower elevation sites in semiarid areas (Belnap et al. 2001). The vertical and horizontal vascular plant structure of many semi-arid vegetation communities optimizes growth of biological soil crusts. Vascular plants create

windbreaks and shade, influencing how much moisture and light reach the soil surface. They also trap leaf litter, keeping the interspaces free of substantial or persistent litter cover. Biological crusts in many regions are best developed in interspaces between shrubs. Invasive exotic plants generally decrease the biological crust cover in most ecosystems (Belnap et al. 2001). Stable or embedded rocks at or near the soil surface can increase soil crust cover by perching water and armoring the surface from physical disturbances.

Biological soil crusts have not been mapped in the planning area. In general, more stable, fine-textured soils (such as silty loams) support greater crustal cover than less stable, coarse-textured soils (Belnap et al. 2001). North and east slopes generally favor crustal development.

Soil Erosion

Erosion is a continuing natural process that can be accelerated by human disturbances. Factors that influence soil erosion include soil texture, structure, length and percent of slope, vegetative cover, and rainfall or wind intensity. Soils most susceptible to erosion by wind or water are typified by bare or sparse vegetative cover, non-cohesive soil particles with low infiltration rates, and moderate to steep slopes. Wind erosion processes are less affected by slope angles but are highly influenced by wind intensity.

The potential for soil erosion increases with increasing slope. Approximately 347,800 acres exceed 40-percent slope within the planning area. Steep slopes are concentrated adjacent to stream courses, particularly in the northern portion of the planning area and around the edge of the Grand Mesa in the southern portion of the planning area (**Figure 3-1**, Steep Slopes).

NRCS soil map unit descriptions rate soils in the planning area according to their susceptibility to water and wind erosion. Wind erosion is particularly a hazard when surface litter and vegetation are removed by fire or other disturbances. Soils in the planning area were screened based on several relevant characteristics that indicate potentially fragile soils or high erosion hazards (Dieterich 2009). These characteristics include:

- Soils rated as highly or severely erodible by wind or water, as described in NRCS soil survey reports;
- Landslide Areas, as identified in NRCS soil survey reports; and
- Soils on slopes greater than 35 percent, particularly with the following attributes:
  - Surface texture of sand, loamy sand, very fine sandy loam, fine sandy loam, silty clay, or clay;
  - Depth to bedrock less than 20 inches;
  - Erosion hazard rating of high or very high; and

– K (soil erodibility potential) factor greater than 0.32.

Within the planning area, 481,600 acres were mapped as fragile soils (**Figure 3-2**, Fragile and Slumping Soils). These soils include 54,500 acres of slumping soils. Most fragile and slumping soils occur in the northern portion of the planning area, along the rise up to the Roan Plateau to the north. Slumping soils also occur in the Plateau Valley and Grand Mesa slopes areas.

One geologic formation in the planning area that experiences substantial instability is the Mancos Shale. The Mancos Shale is susceptible to hydration and flow. A thin, water-resistant lens of montmorillonite clay keeps water from moving to the bottom of this unit, restricting mass wasting to the upper Mancos Shale (Sinnock 1978). Approximately 171,900 acres of potentially unstable Mancos Shale areas were mapped throughout the planning area (**Figure 2-74**, Alternatives A, B, C, and D: Surface Geology). Outcrops of geologically unstable Mancos Shale occur predominately in the northern portion of the planning area.

Soil Salinity

Salinity is the presence of elevated levels of soluble salts (i.e., sodium chloride, magnesium and calcium sulfates, and bicarbonates) in soils or waters. As described in **Section 3.2.5**, Water Resources, salinity is one of the greatest water quality concerns within the Colorado River Basin. Plant species have a difficult time adapting in saline soils, and revegetation is challenging after soils are disturbed and lose vegetative cover (BLM 2009d).

As described in **Section 3.2.5**, Water Resources, many stream segments in lower elevation areas have elevated salinity, sediment, and/or selenium levels. The threshold for salinity is defined as 8 milliohms per centimeter. Salinity and selenium typically are associated with eroded sediment. Elevated pollutant levels commonly originate from eroding saline soils developed from the Mancos, Morrison, Wasatch, and Green River Formations (BLM 2009d). Approximately 308,000 acres of saline soils are mapped in the planning area, particularly in the Grand Valley north of the Colorado River, in lower portions of Roan Creek, east of the Gunnison River below the Grand Mesa, and in other localized areas (**Figure 3-3**, Saline Soils).

Studies conducted by the USGS and the National Irrigation Water Quality Program indicated primary source areas for selenium in the Colorado River near the Colorado/Utah State line to be the eastern side of the Uncompahgre Valley and the western one-half of the Grand Valley, where extensive irrigation is located on Mancos Shales (National Irrigation Water Quality Program 1993).

Soil Compaction

Soil compaction is the process by which soil pore air space is reduced in size because of physical pressure exerted on the soil surface. Compaction results in soil conditions that reduce infiltration, permeability, and gaseous and nutrient exchange rates of the soil. Physical resistance to root growth can occur with

high soil bulk densities. Soil compaction changes the soil structure by reducing the porosity and increasing the bearing strength of the soil. As a result, the ability to receive water is reduced, leading to an overall reduction in the moisture-holding capacity of the soil. The degree of compaction depends on the moisture content at the time of compaction and on soil texture. Compaction decreases infiltration and increases runoff and the hazard of water erosion.

Fine-textured soils with poor internal drainage are the most susceptible to compaction. Sandy loam, loam, and sandy clay loam soils compact more easily than silt, silt loam, silty clay loam, silty clay, or clay soils (NRCS 1996).

Within the planning area, the combination of inherent soil characteristics and past grazing and surface-disturbing activities have resulting in soil compaction in some areas.

Characterization

Characterization of soil resources includes the trends or changes in soil conditions over time.

Trends

The BLM began a review process in 1991 to determine ways to improve rangeland management in response to public concern about livestock grazing management on western public lands. Since that time, the BLM has implemented the management tools, methods, strategies, and BMPs described in the Colorado Standards for Public Land Health to maintain or achieve healthy public lands. Based on GJFO Landscape Health Assessment Reports prepared from 2003 to 2006, all but a few localized areas within the four evaluated landscapes meet Standard 1. The reports identify localized areas of soil erosion and localized areas lacking vegetative cover. These conditions are attributed to past grazing and surface-disturbing activities and to inherently erodible soil types.

In addition, the GJFO has experienced increased requests to develop pipelines, well pads, roads, recreation trails, and other infrastructure on steep, unstable, or unsuitable soils (BLM 2009d). Implementation of NSO and other stipulations has limited the effects on soils from these activities.

3.2.5 Water Resources

Fresh water is scarce and therefore extremely valuable in semi-arid western Colorado. Surface water is the primary source of fresh water, with groundwater only accounting for approximately five percent of water uses in the planning area. Surface water and surface water quality are also intertwined with other natural resources and GJFO management actions and are the main focus of this section.

Surface water on public lands is regulated by the Clean Water Act, Colorado River Salinity Control Act, Public Land Health Standards, Colorado Water Quality Standards, and other laws, regulations, and policy guidance at the

federal, state, and local levels. The GJFO strives to manage for and sustain good water quality and adequate flows in area streams for the benefit of people and aquatic, riparian, and upland animals and plants on a watershed scale.

Current Conditions

Surface Water

The GJFO lies within the Upper Colorado River Basin in western Colorado, near its headwaters in the Rocky Mountains. As the river flows from its source to the Gulf of California, it provides livelihood to Colorado, six other states, and Mexico. Within the planning area, the Colorado River includes four major sub-basins. From east to west, these include Roan Creek, Plateau Creek, Gunnison River, and Dolores River. Of the 2.2 million acres within the GJFO planning area, the BLM manages nearly 1.1 million acres of public lands, or 60 percent of the land surface. Public land within the GJFO contributes 57 percent of the runoff from the total area. Peak flows on the major tributaries of the Colorado River typically occur in May and June, resulting from snowmelt. Base flows occur in late fall and winter from groundwater when surface runoff is minimal. Intense summer thunderstorms are often responsible for peak flows on the smaller tributaries that can cause severe flooding in localized areas.

While there are many perennial rivers and streams within the planning area, the majority of streams are intermittent or ephemeral, flowing seasonally or from storm events, respectively. According to the National Hydrography Dataset, 68 percent of all streams in Colorado are ephemeral or intermittent (Levick et al. 2008). Because west-central Colorado is an arid region within the state, and because the BLM manages primarily lower-elevation areas in contrast to the US Forest Service, the percentage of ephemeral and intermittent streams within the planning area is higher than the state average, at 90 percent of the total stream miles. Levick concludes that ephemeral and intermittent streams should be examined in a watershed context, which would highlight their importance in maintaining water quality, overall watershed function, or health, and in providing for the essential human and biological needs for clean water (Levick et al. 2008). Among other functions, healthy ephemeral and intermittent streams move water, nutrients, and sediment through the watershed, provide landscape hydrologic connections, dissipate stream energy during high flows to reduce erosion and improve water quality, provide groundwater recharge and discharge, maintain floodplains, and store and cycle nutrients. In addition, they provide wildlife habitat and migration corridors and support vegetation communities to help stabilize stream banks.

Surface Water Quality

The headwater stream segments within the GJFO generally have good water quality, meeting or exceeding water quality standards established by the State of Colorado for the beneficial uses on the streams. Many stream segments in lower-elevation areas have water quality concerns, with the primary pollutants

being salinity, sediment, and selenium. Salinity and selenium are typically associated with sediment, as the ions tend to be bound to soil particles. Elevated pollutant levels commonly originate from eroding saline soils developed from the Mancos, Morrison, Wasatch, and Green River Formations. While erosion rates are naturally high in many areas, erosion tends to be accelerated by land uses. These saline soils exist in the Grand Valley north of the Colorado River, in the lower portions of Roan Creek, in areas east of the Gunnison River below the Grand Mesa, and in other localized areas (**Figure 3-4**, Local Geologic Formations Affecting Water Quality).

Salinity is the presence of elevated levels of soluble salts in soils or waters. These salts are sodium chloride, magnesium and calcium sulfates, and bicarbonates. Salinity is one of the greatest water quality concerns within the Colorado River Basin and is subject to the Colorado River Basin Salinity Control Act (Public Law 98-569). Section 203(b)(3) of this act directs the Secretary of the Interior to "…develop a comprehensive program for minimizing salt contributions to the Colorado River from lands administered by the Bureau of Land Management…" High salinity levels threaten the multitude of uses, including municipal, agricultural, and industrial, supported by Colorado River water. The highest sediment loads occur during periods of high flow, spring snowmelt on the larger streams, and intense summer storms on the smaller tributaries. In general, high flows tend to dilute pollutant concentrations but increase pollutant loading within a stream. Low or base flows occur in late fall and winter, correlating with high dissolved salt concentrations.

Selenium is another pollutant of concern in the planning area. Studies conducted by the USGS and the National Irrigation Water Quality Program indicated primary source areas for selenium in the Colorado River near the Colorado/Utah state line to be the eastern side of the Uncompahgre Valley and the western one-half of the Grand Valley, where extensive irrigation is located on Mancos Shales (National Irrigation Water Quality Program 1993). Elevated selenium in surface waters is due in large part to above-average erosion rates and deep percolation from irrigated agriculture and irrigation return flow on soils derived from Mancos Shale or other formations with marine depositional origins.

Surface water quality varies greatly depending on natural and anthropogenic factors, including geology, precipitation, vegetation cover, and land use. The bedrock geology within a watershed is a key determinant of its surface water quality. In areas with sandstone, basalt, or granite bedrock, the surface water tends to be of good quality. Where the Morrison, Mancos, Wasatch, and Green River Formations are exposed within the GJFO, water quality tends to be poorer, with high total dissolved solids and/or selenium concentrations. Precipitation pattern also influences water quality. Average precipitation within the GJFO ranges from eight inches in the Grand Valley desert to eighteen inches or more in the higher elevation Book Cliffs and Uncompahgre Plateau. Most

rainfall occurs in the form of isolated, short-duration, and intense summer thunderstorms, creating localized flood flows that have the power to erode, mobilize, and transport sediment downstream. This sediment is then transported to streams and can increase salinity and selenium concentrations in surface water.

Precipitation also affects water quality by influencing vegetation. A diverse and abundant vegetation cover provides for a healthy watershed. A vegetation community with diverse spatial structure, both vertical and horizontal, is better able to stabilize the soil, minimizing soil erosion, sediment transport, and deposition in nearby streams. Vegetation reduces soil loss by minimizing raindrop impact, slowing runoff velocities, and allowing more percolation of rainwater, saturating the soil to further enhance vegetative growth in a positive feedback cycle.

Land use is another factor influencing water quality. Increased recreational demands placed on BLM-administered lands adjacent to urban expansion areas, conversion of currently nonirrigated public land to irrigated agriculture, energy development such as coal, oil, natural gas, and uranium, and surface-disturbing activities such as pipelines and roads can increase point and nonpoint source pollution in water bodies. Land use disturbances of marine-derived geologic formations enhance the introduction of dissolved materials into the river systems.

Coal mining can be associated with land subsidence which can change recharge rates, runoff and sediment production. Mining can also change groundwater flow gradients potentially leading to dewatering of surface water in perennial and intermittent streams and springs. Where coal or carbonaceous shales are present, increased infiltration may result in increased runoff of poor quality water and erosion from spoil piles; recharge of poor quality water to shallow groundwater aquifers; or poor quality water flow to nearby streams. This may contaminate both groundwater and nearby streams for long periods. Lakes formed in abandoned mining operations are more likely to be acidic if there is coal or carbonaceous shale present in spoil piles, especially if these materials are near the surface and contain pyrites.

Flood events can increase the risk to water resources from land use changes. Facilities associated with energy development such as roads, crushing and washing plants, storage piles, settling basins and surface water diversion structures can be damaged and release sediment and poor quality water many miles downstream from a mine site.

Recreational uses, particularly on user-created roads and trails, negatively impacts water quality through stream crossings, riparian and upland vegetation damage, and soil compaction. Flow paths and runoff timing, volume, and velocities can all be affected by unsustainable roads and trails, affecting a stream's hydrology.

All surface waters within Colorado are organized by basin and labeled by stream segment. For each stream segment, the state has set water quality standards for physical, chemical, and biological parameters based on the existing or potential beneficial uses for water supply, aquatic life, recreation, and agriculture. Colorado's List of Water-Quality-Limited Segments Requiring Total Maximum Daily Loads (TMDL) fulfills Section 303(d) of the Clean Water Act, which requires that states submit to the US EPA a list of those waters for which technology-based effluent limitations and other required controls are not stringent enough to implement water quality standards. For these impaired water bodies, TMDL calculations would have to be completed to determine the loadings from anthropogenic and natural sources and to determine the loading allocations for the different polluting sources (Title 5 Colorado Code of Regulations [CCR] 1002-93). Colorado's Monitoring and Evaluation List identifies water bodies where there is reason to suspect water quality problems, but where there is also uncertainty regarding one or more factors such as the representative nature of the data. Water bodies that are impaired, but it is unclear whether the cause of impairment is attributable to pollutants as opposed to pollution, are also placed on the Monitoring and Evaluation List (Title 5 CCR 1002-93). Sediment and selenium are the primary water quality impairments within the GJFO planning area (**Table 3-8**, Water Bodies on Colorado's 2010 Section 303(d) List of Water-Quality-limited Segments Requiring Total Maximum Daily Loads or the Monitoring and Evaluation List within the Planning Area).

Colorado's water quality standards and regulations are codified in Regulation No. 31 of Title 5 CCR 1002-31 (Basic Standards and Methodologies for Surface Water). Colorado's regulations set forth provisions regarding the adoption of water quality-based designations for certain surface waters and establish an antidegradation review process applicable to certain activities impacting the quality of surface waters. Regulation No. 37 of Title 5 CCR 1002-37 for the Lower Colorado River Basin and Regulation No. 35 of Title 5 CCR 1002-35 for the Gunnison and Lower Dolores River Basins define the state-identified water quality standards for the planning area. Colorado does not have streamflow criterion to protect streamflow necessary to support existing uses. The state also does not have biological criteria or guidance.

One of two water quality-based designations may be adopted. An "outstanding waters" designation may be applied to certain high-quality waters that constitute an outstanding natural resource. No degradation of outstanding waters by regulated activities is allowed. A "use-protected waters" designation may be applied to waters with existing quality that is not better than necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water. The quality of these waters may be altered so long as applicable use-based water quality classification and standards are met. Colorado's designated uses for the planning area waters requiring TMDLs or monitoring and evaluation are included in Table 3-8.

Table 3-8
Water Bodies on Colorado's 2010 Section 303(d) List of Water-Quality-limited Segments Requiring Total Maximum Daily Loads or the Monitoring and Evaluation List within the Planning Area

Water Body ID	Watershed	Segment Description	State Designated Uses[1]	Portion	Impairment	Priority for TMDL Development	List[2]
COLCLC02a	Colorado	Colorado River, Rifle Creek to Rapid Creek	Aquatic Life Warm Water Class 1, Recreation E, Water Supply, Agriculture	All	sediment	NA	M&E
COLCLC02b	Colorado	Colorado River, Rapid Creek to Gunnison River	Aquatic Life Warm Water Class 1, Recreation E, Water Supply, Agriculture	Humphrey Backwater Area	selenium	medium	303(d)
				All	sediment selenium	NA	M&E
COLCLC03	Colorado	Colorado River, Gunnison River to State Line	Aquatic Life Warm Water Class 1, Recreation E, Agriculture	All	selenium	medium	303(d)
COLCLC13b	Colorado	Tributaries to Colorado River from Government Highline Canal Diversion to Salt Creek	Aquatic Life Warm Water Class 2, Recreation E, Agriculture	Salt Creek	sediment	low	303(d)

Table 3-8
Water Bodies on Colorado's 2010 Section 303(d) List of Water-Quality-limited Segments Requiring Total Maximum Daily Loads or the Monitoring and Evaluation List within the Planning Area

Water Body ID	Watershed	Segment Description	State Designated Uses[1]	Portion	Impairment	Priority for TMDL Development	List[2]
COLCLC13b	Colorado	Tributaries to Colorado River from Government Highline Canal Diversion to Salt Creek except specific segments	Aquatic Life Warm Water Class 2, Recreation E, Agriculture	All	selenium	medium	303(d)
				Adobe	e. coli iron	high	303(d)
				Indian Wash	iron	NA	M&E
COLCLC13c	Colorado	Walker Wildlife Area Ponds	Aquatic Life Warm Water Class 1, Recreation E, Agriculture	All	selenium	medium	303(d)
COLCLC14b	Colorado	Clear Creek from Tom Creek to Roan Creek including tributaries from Clear Creek to Kimball Creek	Aquatic Life Cold Water Class 1, Recreation P, Water Supply, Agriculture	All	e. coli iron	NA	M&E
COLCLC14c	Colorado	Roan Creek including all tributaries from Kimball Creek to the Colorado River	Aquatic Life Warm Water Class 1, Recreation P, Water Supply, Agriculture	Dry Fork (Roan Creek)	selenium	low	303(d)
COLCLC15	Colorado	Plateau Creek, including tributaries from source to Hwy 330 Bridge	Aquatic Life Cold Water Class 1, Recreation E, Water Supply, Agriculture	All	Iron selenium	NA	M&E

Table 3-8
Water Bodies on Colorado's 2010 Section 303(d) List of Water-Quality-limited Segments Requiring Total Maximum Daily Loads or the Monitoring and Evaluation List within the Planning Area

Water Body ID	Watershed	Segment Description	State Designated Uses[1]	Portion	Impairment	Priority for TMDL Development	List[2]
COLCLC19	Colorado	Lakes and reservoirs tributary to the Colorado River, Parachute Creek to the Colorado/Utah border	Aquatic Life Warm Water Class 1, Recreation E, Agriculture	West Pond Orchard Mesa Wildlife Area	selenium	high	303(d)
COGULG02	Gunnison	Gunnison River, Uncompahgre River to Colorado River	Aquatic Life Warm Water Class 1, Recreation E, Water Supply, Agriculture	All	selenium	high	303(d)
					sediment	NA	M&E
COGULG04a	Gunnison	Tributaries to Gunnison River, Crystal Reservoir to Colorado River	Aquatic Life Warm Water Class 2, Recreation N, Water Supply, Agriculture	All	selenium	high	303(d)
COGULG04b	Gunnison	All lakes and reservoirs tributary to the Gunnison River and not on national forest lands from the outlet of Crystal Reservoir to the Colorado River	Aquatic Life Warm Water Class 2, Recreation N, Water Supply, Agriculture	Juniata Reservoir	mercury aquatic life use - food consumption advisory	high	303(d)

Table 3-8
Water Bodies on Colorado's 2010 Section 303(d) List of Water-Quality-limited Segments Requiring Total Maximum Daily Loads or the Monitoring and Evaluation List within the Planning Area

Water Body ID	Watershed	Segment Description	State Designated Uses[1]	Portion	Impairment	Priority for TMDL Development	List[2]
COGULG08	Gunnison	Tributaries to Gunnison River, Kannah Creek	Aquatic Life Cold Water Class 1, Recreation E, Water Supply, Agriculture	Kannah Creek below USGS gage station 09152000	selenium	high	303(d)
COGULD02	Dolores	Dolores River from the Little Gypsum Valley Bridge at the San Miguel/ Montrose County line, to the Colorado/Utah border	Aquatic Life Warm Water Class 1, Recreation E, Agriculture	All	iron	high	303(d)

Source: Title 5 CCR 1002-35 (CDPHE 2012a), Title 5 CCR 1002-37 (CDPHE 2012b), Title 5 CCR 1002-93 (CDPHE 2010a), and CDPHE 2010b
[1]For a detailed discussion of state-designated uses, refer to Title 5 CCR 1002-35 (CDPHE 2012a) and Title 5 CCR 1002-37 (CDPHE 2012b)
[2]M&E: Monitoring and Evaluation

As part of the Colorado Public Land Health Standards passed in 1997 (BLM 1997a), water quality is one of the five standards for land health that must be assessed:

> Standard 5: The water quality of all water bodies, including groundwater where applicable, located on or influenced by BLM lands will achieve or exceed the water quality standards established by the State of Colorado. Water quality standards for surface and groundwater include the designated beneficial uses, numeric criteria, narrative criteria, and anti-degradation requirements set forth under state law (5 CCR 1002-8), as required by Section 303(c) of the Clean Water Act.
>
> **Indicators:**
> - Appropriate populations of macroinvertebrates, vertebrates, and algae are present.
> - Surface and groundwater only contain substances (e.g., sediment, scum, floating debris, odor, heavy metal precipitates on channel substrate) attributable to humans within the amounts, concentrations, or combinations as directed by the Water Quality Standards established by the State of Colorado (5 CCR 1002-8).

In several situations where stream segments on BLM-administered lands are not meeting water quality standards, it is due to land uses on private land beyond the management control of the BLM. As one example, the main stem of the Gunnison River from the Uncompahgre River to the Colorado River is currently listed for selenium on the 303(d) list of impaired water bodies. However, the primary cause of the elevated selenium through the segment is deep percolation of irrigation water through croplands on Mancos Shale in the Uncompahgre Valley. Likewise, many tributaries on the north side of the Colorado River within the Grand Valley are listed for selenium on the 303(d) list. While the lower Book Cliffs and north desert on public lands may contribute selenium to streams from natural erosion and surface-disturbing activities, the scale of the pollution contribution is much less than that of irrigated agriculture in the Grand Valley.

Water quality in the planning area is generally meeting Standard 5, but there are localized areas that are functioning at risk (FAR) or not functioning (NF) for riparian areas, which if not improved could lead to water quality degradation.

Proper Functioning Condition (PFC) assessments have been conducted as part of Land Health Assessments on various landscapes within the GJFO (See **Section 3.2.6**, Vegetation). PFC is one tool used to help diagnose potential water quality problems. Other indicators relevant to water quality include assessments of Land Health Standard 1 for soils and Standard 3 for vegetation, as well as macroinvertebrate sampling and commitment to long term water

quality monitoring at established sites. A complete list of water quality data for these sites is available upon request at the GJFO.

Activities that occur in and in areas adjacent to rivers, streams, or waterbodies may also affect water quality. Riparian areas have been defined for the purpose of this management plan to aid in the classification of localized areas and to protect water quality. 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. These areas exhibit vegetation or physical characteristics reflective of permanent surface or subsurface water influence. Riparian areas can be defined for lotic ecosystems with standing water such as lakes and ponds and lentic ecosystems with flowing water such as rivers and streams. Assessment of riparian areas is further discussed in **Section 3.2.6**, Vegetation.

In addition, activities adjacent to definable streambeds can impact water quality. For the purpose of this plan, definable streams include those with evidence of scour or deposition (Johnson and Buffler 2008).

Morphology and channel stability can be specifically monitored along streams that could be impacted by major land use actions or to assess concerns identified through land health assessments or inventories to determine appropriate management action. For the purposes of this plan, dysfunctional streams will be defined as those streams with a Pfankuch channel stability rating of "Poor" based on Rosgen channel type (Rosgen 1996) and/or streams in which riparian habitat is rated non-functional through BLM interdisciplinary team PFC evaluations.

Groundwater and Groundwater Quality

The GJFO lies within the larger Colorado Plateau and Wyoming Basin Groundwater Region. This region covers an area of 160,000 square miles throughout Colorado, Utah, Wyoming, Arizona, and New Mexico. A broad plateau averaging 8,200 to 11,500 feet dominates this region and is underlain primarily by horizontal to gently dipping layers of consolidated sedimentary rocks predominantly composed of Paleozoic to Cenozoic sandstone, shale, and limestone. Mountain ranges border this area on the north, west, and east (Heath 1984).

Surface water is the principal water resource in the GJFO with groundwater used for less than five percent of the water needs. The primary sources of groundwater in the planning area are the alluvial aquifer systems associated with the Colorado, Gunnison and the Dolores Rivers. Bedrock aquifers of the Piceance Basin account for a very small proportion of water use (Topper et al. 2003).

Alluvial groundwater occurs in unconsolidated deposits formed along drainage courses. The alluvial aquifer is capable of yielding sufficient water for domestic

and stock water uses, and as irrigation water in some locations. Groundwater in the alluvial drainages occurs primarily under unconfined conditions. Localized confined conditions may occur where clay layers are laterally extensive. The direction of groundwater flow in the alluvium is generally parallel or sub-parallel with the axis of the drainage.

The Plateau Valley consists of quaternary alluvial deposits as well as glacial till deposits. These sediments serve as an important source of domestic and municipal water in the Plateau Valley. The Mesa and Powderhorn Source Water Protection Areas contain a significant amount of these types of deposits and also have a high density of water wells.

Alluvial groundwater is recharged by stream flow in the upper reaches of the drainages where there is more likely to be a separation between the channel bottom and the underlying alluvial water table. Recharge of the groundwater is greatest during precipitation events or snow melt runoff when the stage of the creeks increases and more water is able to infiltrate. A lesser amount of recharge may occur from bedrock formations and from irrigation return flows.

The valley fill deposits or alluvium in the Colorado River basin consists generally of unconsolidated boulders, cobbles, gravel, sand, silt, and clay. The thickness of the alluvium can be extremely variable depending on location. Alluvium in the upper reaches of the basin tends to be thin due to increased slopes and higher flow velocities. Thicker deposits tend to accumulate in the lower reaches. Alluvium is very limited or nonexistent in the canyon sections of the Colorado River where bedrock is exposed. Alluvial groundwater resources are used for public water supply and agricultural irrigation, and represent an important resource in rural areas for domestic supplies. The principal agricultural area is the Grand Valley from Palisade to Fruita; other agricultural areas include Plateau Creek in the Collbran area (Topper et al. 2003).

The Gunnison River flows northwest through portions of the GJFO at Whitewater and joins the Colorado River at Grand Junction. Groundwater is used for irrigation, public and domestic water supply, and livestock. The alluvium of the Gunnison River basin consists of clay, silt, sand, gravel, and cobbles. Alluvial deposits are very thin or nonexistent in the canyon areas of the main stem of the Gunnison River and tributaries (Topper et al. 2003).

The Dolores River Basin passes through the southern part of the GJFO. Alluvium within the Dolores River basin is comprised of typical Quaternary alluvial valley fill. These deposits consist of gravel, sand, silts, clay, and various mixtures. The alluvial extent is limited to areas near the rivers and their tributaries and disappears entirely in areas where active canyon downcutting occurs. Mapped alluvial deposits are localized around the town of Gateway and in West Creek in Unaweep Canyon. Although restricted in extent, the alluvium is an important aquifer to those people who utilize it for domestic, livestock, and minor irrigation use (Topper et al. 2003).

Much of the northern part of the GJFO is in the Piceance Basin, an elongated structural depression trending northwest to southeast. The basin is more than 100 miles long and has an average width of over 60 miles. The principal bedrock aquifers in the northern portion of the Piceance Basin are the saturated, porous members of the Uinta Formation and Parachute Creek Member of the Green River Formation (both of Tertiary age). Bedrock aquifers in the Piceance Basin are typically under confined conditions, except along outcrops at the basin edge. The potentiometric surface indicates that the pressure head is at or very near the surface within the drainage valleys. This suggests that groundwater is moving from the aquifers to the creek alluvium (Topper et al. 2003).

The thickness of Tertiary-age rocks in the Piceance Basin varies from 2,000 to approximately 12,000 feet. South of the Colorado River, the upper Tertiary-age aquifers have largely been eroded off, exposing a thick basal confining unit of the lower Green River and Wasatch Formations (Topper et al. 2003).

In the planning area, the Entrada sandstone provides most of the artesian fresh water, and the Wingate sandstone is the source of the deepest artesian fresh water supply. The sandstone layers of the Salt Wash member of the Morrison Formation also provide artesian fresh water, but at lesser amounts. The Burro Canyon and Dakota sandstones often provide artesian water too, but typically the water is saline (Lohman 1965). In many areas groundwater wells must be drilled to depths of roughly 1,000 feet, or more depending on the location within the basin, to tap the fresh waters of the most permeable sandstones and limestones. The shales and siltstones usually contain salty waters, or water containing more than 1,000 milligrams per liter of dissolved solids (Heath 1984). As such, most water supply wells in the southern portion of the Piceance Basin are completed in the alluvial aquifers associated with the Colorado and Gunnison River tributaries (Topper et al. 2003).

Colorado's water quality criteria are set by the CDPHE, Water Quality Control Division. For groundwater, specified areas are designated to delineate a special activity or use. Site-specific uses and standards are then promulgated for the specified area. Where there is no specified area, and therefore no site-specific standards, a general standard applies.

There is one small underground coal mine in the Book Cliffs north of Loma that uses groundwater inflows for mining processes, and one small underground uranium mine on the Uncompahgre Plateau that is idle and no longer pumping, treating and discharging groundwater inflows to the surface. Another larger underground coal mine (11,000 acres) has been proposed in the Book Cliffs north of Loma and is being analyzed in a separate EIS, and a new mine on existing leases was proposed to the Division of Reclamation Mining and Safety but later withdrawn. Industry is also utilizing tributary groundwater for dust suppression, drilling operations, and domestic purposes.

Water Use

The GJFO manages lands that support municipal, residential, agricultural, livestock watering, and industrial mining uses. Municipal watersheds and source water protection areas have been identified in the planning area (**Figure 3-5**, Municipal Watersheds and Source Water Protection Areas). Source water protection areas providing drinking water to local towns and communities were delineated by the State of Colorado as required by the Safe Drinking Water Act Amendments of 1996. To date, source water assessments have been completed for Grand Junction, Palisade, Collbran, DeBeque, and Clifton. Assessments have also been completed for smaller municipalities, resorts, homeowner associations, and ski areas. Notable municipal water supply areas and storage reservoirs that have been mapped in the planning area include the following:

- Grand Junction municipal watershed;
- Palisade municipal watershed;
- Jerry Gulch watershed;
- Collbran source water protection area;
- Mesa/Powderhorn source water protection area;
- Cabin Reservoir; and
- Jerry Creek Reservoir.

Smaller systems and private potable water sources are tapped throughout the planning area (CDPHE 2000, 2009). Irrigated agriculture remains an important water use, although much farmland has been converted to residential developments, especially in the Grand Valley. Fruit crops, wine, and corn production are strong agricultural products dependent on irrigation in the planning area. Livestock watering is an important use on public lands. If water for livestock is not otherwise available, it is developed by various means on grazing ranges. The mining industry is also a major user. Recreation and fish and wildlife uses are also important but do not consume appreciable quantities of water and are generally incidental to other uses.

The State of Colorado has authority for allocating limited water supplies to various uses. However, the BLM implements multiple responsibilities and authorities that are complementary to the state's authority for water allocation. First, any water diversion facility on BLM lands requires explicit land use authorization from BLM. In these land use authorizations, BLM's role is to fulfill mandates expressed in federal laws for resource maintenance and protection. This responsibility is fulfilled by imposing terms and conditions on the land use authorization or by denial of land use applications if terms, conditions, and mitigation aren't sufficient to address resource management requirements. Second, the BLM applies to the state of Colorado for water rights that support BLM land management objectives in areas such as wildlife management, livestock management, recreation, and fire suppression. Third, BLM makes

recommendations to the Colorado Water Conservation Board for protection of instream flows in streams that support fishery, riparian, wetland, and wildlife values.

Trends

The key trends that impact water supply and quality within the planning area are energy development, recreation, grazing, and urban development and sprawl. Energy development, primarily in the form of natural gas, uranium, and coal, has and will continue to impact surface and groundwater quality and quantity. The rate or extent of extraction or mining tends to be cyclical, with boom and bust periods. The Roan Creek and Plateau Creek watersheds have experienced rapidly expanding natural gas development in the past few years, creating a short- and long-term infrastructure of roads, pipelines, well pads, compression stations, and supporting industrial facilities.

Increased natural gas development may impact water quality by increasing erosion and sediment production from surface disturbance and from spills of fuel and chemicals used in drilling and production activities. Additional impacts could be anticipated from produced water disposal and the introduction of noxious and invasive plant species ineffective at stabilizing soils, causing accelerated erosion and resultant water quality impacts. Stream crossings, in particular low-water crossings, are numerous and are large sediment contributors to streams.

Natural gas and oil development requires the use of freshwater during the drilling process and the completion process. Freshwater is also used for dust abatement at the gas and oil site development sites and on associated roads. The sources of freshwater for use in these activities can be in close proximity to the activity, thereby affecting local freshwater supplies.

Uranium mining has a large legacy footprint throughout the Gateway area, which is part of the Lower Dolores River basin. Emergent activity over the past couple of years was flourishing but is now responding to depressed uranium prices and market conditions. One active mine, Whirlwind Mine, has recently gone idle. However, a new uranium mill is in the permitting stage on private land outside of Naturita and may cause an increase in uranium production if construction is completed.

An existing coal mine in the Book Cliffs north of Fruita is currently idle, though mining is anticipated to resume in the future. A proposal for a coal lease of approximately 11,000 acres is currently undergoing analysis in an EIS. As described previously, coal mining can be associated with land subsidence, changes in recharge rates, runoff of poor quality water, sediment production, changes in groundwater flow gradients, potential dewatering of surface water and springs and contamination of surface water and groundwater sources.

The GJFO is experiencing growth in recreation on public lands due to local population growth, as well as the area's reputation as a national and international recreation destination. All forms of recreational activities can increase potential for erosion, sedimentation, gully creation, biologic soil crust damage, and riparian and upland vegetation damage. Recreation activities may also directly and indirectly impact water quality due to erosion and sediment production potential. However, the significance of such impacts varies with the nature and degree of disturbance as well as site specific environmental conditions. Typically larger disturbances in sensitive areas represent greater potential to damage soils and vegetation, degrade water quality, and impair overall watershed function and condition than smaller disturbances in less sensitive areas.

Colorado's Grand Valley is recognized as the largest non-point source of salinity in the Upper Colorado River Basin. Much of the lands currently open to all modes of travel are situated in areas mapped to be highly erodible (fragile) or saline. The cumulative erosion in these areas resulting from a dispersed, expanding, unmaintained, and in many cases poorly designed route system would be considered a nonpoint source of pollution.

Livestock grazing activities have affected the water quality of surface water sources in the planning area. In some areas, grazing activities have caused vegetation loss, soil compaction, reduced runoff retention, riparian function loss, direct soil disturbance, and runoff concentrated into animal trails, with consequent enhanced erosion. Grazing animals create waste that can introduce nutrients and pathogens to streams directly or in runoff. Excessive nutrient loading can lead to algal growth, depleted dissolved oxygen needed to support aquatic fauna, reduced water clarity, increased water temperature, and other effects that reduce riparian function.

Increasing populations and increasing participation in recreational activities can increase impacts to source water protection areas that provide drinking water to local towns and communities. There is increasing interest in multiple uses in municipal watersheds and source water protection areas, while there is increased need to protect those areas to ensure water quality.

Grand Junction is expanding, and the Grand Valley is increasing in population; both will add increasing development and recreation pressure. The urban development in these areas is pushing against BLM lands in the desert. Sprawled development is anticipated to have long-term negative impacts on surface water quality and flow. Rain in urban developed areas picks up and transports pollutants like sediment, oil and grease, nutrients (lawn fertilizers), and metals into streams. This polluted runoff is called stormwater and is regulated by the US EPA and by the state. Increased development also adds impermeable surfaces from roads, parking lots, and rooftops and would permanently alter the natural hydrograph of local streams, creating flashier systems. Rain on

impermeable surfaces is conveyed more rapidly to local drainages without soil infiltration, causing rapidly swelling streams with greater power to flood and erode stream banks, potentially impacting human and environmental resources.

Population growth outside of the GJFO may also be a key component to water resource issues in the future. For example, development along the Dolores River near Gateway will utilize groundwater wells drawing water from the Dolores River alluvium. Since the Dolores River is regulated by an upstream dam, recharge to alluvium is also regulated. Groundwater development in this area may result in capture of surface water, reducing downstream water availability needed to sustain already limited riparian communities. Future development, especially in river corridors, may have similar effects on water supplies and quality.

Predicted climate change impacts on Colorado may include earlier melting of snowpack, lower river flows in summer months, water shortages for irrigated agriculture, slower recharge of groundwater aquifers, effects on water availability for recreation and wildlife use, and migration of plant and animal species to higher elevations.

3.2.6 Vegetation

Vegetation serves multiple purposes in the landscape and provides many ecosystem services. Vegetation stabilizes soils, prevents erosion, uses carbon dioxide, releases oxygen, increases species diversity, and provides habitat and food for animals and products for human use. Many of the BLM's land management policies are directed toward maintenance of healthy vegetation communities. Vegetation can be characterized generally by ecological provinces and more specifically by plant communities. The ecological provinces and plant communities discussed below are those that provide the most important land cover across the GJFO planning area.

Ecological Provinces

Bailey's (1995) description of North American ecoregions places the GJFO planning area in three different ecological provinces, including the Nevada-Utah Mountains Semi-Desert-Coniferous Forest-Alpine Meadow Province (M341), Intermountain Semi-Desert Province (341), and Southern Rocky Mountain Steppe-Open Woodland-Coniferous Forest-Alpine Meadow Province (M331). Each ecological province covers approximately one-third of the GJFO planning area, including all land jurisdictions. The Nevada-Utah Mountains Semi-Desert-Coniferous Forest-Alpine Meadow Province is located in the northern portion of the planning area extending from the Utah State line to DeBeque. The Intermountain Semi-Desert Province extends through the central portion of the planning area and includes the Dolores River drainage. The Southern Rocky Mountain Steppe-Open Woodland-Coniferous Forest-Alpine Meadow Province covers the upper elevation lands in the southern and eastern sections of the

planning area (Uncompahgre Plateau and Grand Mesa). These ecoregions are depicted on **Figure 3-6**, Ecoregions.

Within a specific area, the type and amount of vegetation are largely determined by precipitation, elevation, topography, aspect, soil types, and human actions. The Nevada-Utah Mountain Semi-Desert-Coniferous Forbs-Alpine Meadow Province (M341) consists of hills, mesas, and lower mountains and occupies the highest elevations of the Colorado Plateau and the Great Basin of Colorado, Utah, and eastern Nevada. The lower elevations are dominated by shrubs and bunchgrasses. Where soils are saline, salt-tolerant species such as greasewood *(Sarcobatus vermiculatus)* dominate. Woodland areas consist of pinyon pine *(Pinus edulis)* and juniper *(Juniperus* spp.*)*, which give way to aspen *(Populus tremuloides)*, willow *(Salix* spp.*)*, and cottonwood in wetter areas (Bailey 1995; Cronquist et al. 1972). The valleys and basins are generally higher than 5,000 feet, and the upper peaks can be as high as 12,000 feet. Precipitation ranges from 5 to 8 inches per year in the lowest and driest basins to over 25 inches per year in the mountainous areas. Climate change may result in modified hydrographs which could result in earlier than normal peak flow conditions. Likewise climate change could result in water depletions associated with longer growing seasons (increased transpiration). These areas provide ideal year-round habitat for many species of wildlife.

The Intermountain Semi-Desert and Desert Province (341) is contained within the intermountain basins of Colorado and Utah. The chief vegetation type, sagebrush steppe, is made up of sagebrush, saltbush, and a mixture of grasses and forbs. The Intermountain Semi-Desert Province is sometimes considered a cold desert, as the summers are hot and the winters can be extremely cold. The growing season is short, and the annual precipitation is between 5 and 12 inches. Winter snow accumulation and runoff provide available moisture for spring plant growth. Snow distribution patterns caused by wind, topography, and existing vegetation develop pockets of highly productive sites within the drier, less productive surrounding areas. This area lies at elevations below 8,000 feet.

The Southern Rocky Mountain Steppe-Open Woodland-Coniferous Forest Province (M331) is a transition from grass- and shrub-dominated areas to shrub- and tree-dominated areas. Juniper, shrub, and grass communities dominate at elevations between 8,000 and 9,000 feet, with pine and spruce forest occurring between 8,500 and 12,000 feet. Riparian vegetation varies according to elevation as well; however, willows and water-tolerant grasses, sedges, and rushes often dominate from the foothills to the alpine (Bailey 1995). The climate of these areas is variable and dynamic due to factors such as elevation, aspect, slope, and topographical change. Eastern and southern slopes are generally drier and warmer than western and northern slopes. As the elevation rises, the mean temperature decreases and the growing season shortens.

Current Conditions

Plant Communities

There are three main physiognomic groups in the GJFO planning area: rangelands, forests and woodlands, and riparian areas and wetlands. Barren land, also a physiognomic group, comprises less than one percent of the planning area. Physiognomic groups can be further divided into plant communities. There are 14 general vegetation plant communities in the GJFO planning area. 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. Distinct plant communities within the GJFO planning area are influenced by characteristics such as soil depth, texture, and salinity; climate variables, particularly temperature, total and seasonal distribution of precipitation, and wind; and topographic features, most importantly elevation, aspect, and slope. The following discussion of plant communities that occur within the GJFO planning area shows the diverse and complex nature of vegetation resources in the area. **Table 3-9**, Mapped Vegetation in the GJFO Planning Area, lists the plant communities and provides acreages for BLM-administered lands. **Figure 3-7**, Major Vegetation Groups, shows the location of plant communities in the planning area.

Table 3-9
Mapped Vegetation in the GJFO Planning Area

Mapped Vegetation	Specific Plant Community	BLM Acreage	Percent of GJFO
Aspen	Quaking aspen-dominated stands	7,800	less than 1
Barren land	Barren talus slopes, badlands, rock outcrops, soil	100	less than 1
Blackbrush	Blackbrush, with lesser amounts of needle-and-thread grass, sand dropseed, Indian ricegrass, and winterfat	7,000	less than 1
Douglas-fir and mixed conifer	Douglas-fir, subalpine fir	33,800	3
Greasewood	Greasewood, halogeton, seepweed, cheatgrass	25,500	2
Mountain shrub	Gamble oak, serviceberry, snowberry, squaw apple, antelope bitter brush	160,700	15
Pinyon-juniper	Pinyon pine, Utah juniper, Rocky Mountain juniper, common juniper, shrubs, bare ground	539,900	53
Ponderosa pine	Ponderosa pine interspersed with Gambel oak	6,700	less than 1
Riparian	Cottonwood, willow, tamarisk, sedge, and rush	9,800	less than 1
Sagebrush	Wyoming big sagebrush, mountain big sagebrush, and black sagebrush; limited amounts of silver sagebrush, basin big sagebrush, and bud sage	83,900	8
Salt desert shrub	Shadscale, Gardner's saltbush, mat saltbush, spiny hopsage, greasewood, winterfat, broom snakeweed, and bud sage; limited native grasses and forbs	174,700	16

Source: BLM 2010a

Barren/talus/rock outcrops. This community, representing less than one percent of the planning area, includes areas of barren soil, cliffs and talus slopes that support little or no vegetation, and rock outcrops. Barren areas, talus slopes, and rock outcrops are too steep and too sparsely vegetated to be beneficial to livestock or big game animals for forage. Barren areas are usually caused by soil conditions that preclude the growth of vegetation. Although vegetation in these areas is quite sparse, microbiotic crusts are abundant and diverse and are key to holding these soils intact. Other barren areas are found as small inclusions on Wasatch soils that are too steep or lack the proper soil characteristics to support vegetative growth.

Talus slopes form below cliffs of the Green River Formation as the cliffs begin to weather and crumble. These talus slopes consist of shale shards of various sizes and often have very little soil development or are too steep and unstable to support most forms of vegetation. However, many endemic rare plant species in the GJFO planning area occur on these talus slopes. Most of these species have biological characteristics that enable them to grow in extreme conditions.

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

Rangelands. Rangelands can be subdivided into grasslands and shrub communities. These vegetation types and the roles they play in the GJFO planning area are described below.

Grasslands. No true grasslands (where grass is dominant over shrubs) occur within the GJFO planning area; however, grass plays an important ecological role. In the lower elevations with sandier soils, needle-and-thread *(Hesperostipa comata)*, sand dropseed *(Sporobolus cryptandrus)*, galleta *(Hillaria jamesii)*, Indian ricegrass *(Achnatherum hymenoides)*, and blue gramma *(Bouteloua gracilis)* are common. In the more mesic settings, grass communities shift to junegrass *(Koeleria macrantha)*, wheat grasses *(Agropyron* spp.*)*, and bluegrasses *(Poa* spp.*)*. In general, the only pure stands of grass within the GJFO planning area occur as a result of some type of disturbance. Chainings and seedings in the 1960s have resulted in crested wheat grasslands on the Uncompahgre Plateau and Glade Park (crested wheat is an introduced but naturalized grass) (Weber 2001). In the lower desert (valley floor) and in areas of DeBeque, cheatgrass (*Bromus tectorum*) dominates the more degraded areas. Degradation into cheatgrass-dominated areas is most commonly associated with historic overgrazing, drought, and/or fire. Cheatgrass-degraded sites tend to also contain other weedy species, including annual wheatgrass *(Eremopyrum triticeum)*, filaree *(Erodium cicutarium)*, halogeton *(Halogeton glomeratus)*, Russian thistle *(Salsola iberica)*, annual mustards, and in some areas, jointed goat grass *(Aegilops cylindrica)*. Increasing stands of non-native bulbous bluegrass *(Poa bulbosa)* have also been noticed across the GJFO planning area at all elevations.

<u>Shrub Communities.</u> Approximately 41 percent of the BLM-administered lands in the GJFO planning area are considered shrublands (salt desert shrub, mountain shrub, sagebrush, greasewood, and blackbrush *[Coleogyne ramosissima]*) (BLM 2010a). These communities are very diverse in plant composition, size, location, habitats, and forage they provide to wildlife and livestock. Therefore, this section discusses several shrub community types: salt desert shrub, mountain shrub, sagebrush (three dominant sagebrush species discussed within this type), greasewood, and blackbrush.

Salt Desert Shrub. Salt desert shrublands are characterized by drought-tolerant shrubs, with few grasses and forbs in the understory (BLM 2009d). The soils of these areas are shallow saline clays and loams. Typical shrubs in this vegetation type are shadscale *(Atriplex confertifolia)*, Gardner's saltbush *(A. gardneri)*, mat saltbush *(A. corrugata)*, four-wing saltbush *(A. canescens)*, spiny hopsage *(Grayia spinosa)*, greasewood, winterfat *(Krascheninnikovia lanata)*, broom snakeweed *(Gutierrezia sarothrae)*, and bud sagebrush *(Picrothamnus desertorum)*. Big sagebrush *(Artemisia tridentata)* and rabbitbrush *(Chrysothamnus* spp.*)* occur in looser and rockier soils and are much less abundant than in the other desert shrub types. Juniper *(Juniperus osteosperma)* is occasionally found on the lee side of rocky hills and ridges. Understory vegetation includes globemallow *(Sphaeralcea* spp.*)*, wild parsley *(Lomatium* spp. and *Cymopterus* spp.*),* prickly pear cactus *(Opuntia* spp.*)*, galleta *(Hilaria jamesii)*, needle-and-thread, and Indian ricegrass. These areas are often important winter ranges for wildlife and livestock, as they provide forage that is not buried in snow, and the shrubs and rough topography provide cover from wind and predators. The forage of these areas is excellent in the winter, as these shrubs maintain relatively high levels of protein and carbohydrates. In addition to winter forage, this shrub community is an important soil stabilizer in areas too salty or xeric for other plants to survive in. The salt desert shrub community occurs on 16 percent of the lands managed by BLM and is located in the lower elevations, from 5,000 to 7,000 feet (BLM 2009d).

In a degraded condition, these communities are dominated by invasive annuals; degradation often results from fire, historic grazing, or recreational activities. This vegetative community does not respond well to disturbance and is typified by extremely slow recovery. Examples of the fragility of this community are areas north of the Grand Junction Regional Airport where heavy recreational use has led to desertification, and in the north desert where salinity-control contouring was done in the 1960s (where native shrubs have yet to recover and cheatgrass dominates), and areas north of Interstate 70 along the Utah border where fire has removed all woody species and invasive annual grasses are the primary species.

Mountain Shrub. Mountain shrub communities include Gamble oak *(Quercus gambelii)*, service berry *(Amelanchier* spp.*)*, snowberry *(Symphoricarpos rotundifolius)*, squaw apple *(Peraphyllum ramosissimum)*, antelope bitterbrush

(Purshia tridentata), and various other shrubs (BLM 2009d). These shrubs may reach 10 to 15 feet in height, occurring in dense stands or in scattered patches, often adjacent to aspen or willow. These areas are important wildlife summer and transition ranges, as well as spring, fall, and summer livestock ranges. This community provides hiding and thermal cover for deer, elk, and other wildlife species. The mountain shrub community comprises 15 percent of the land managed by BLM and generally occurs in all mid- to upper-elevation ranges (6,500 to 9,500 feet) across the GJFO planning area (occurring between the lower pinyon-juniper woodlands and upper-elevation aspen and conifer stands). Since this community typically occurs in areas of relatively abundant moisture, understory species are abundant, and density of the understory is determined by canopy cover. Common understory species are Letterman's and Columbia needlegrass *(Achnatherum lettermanii* and *A. nelsonii*, respectively*)*, junegrass, penstemon *(Penstemon* spp.*)*, Indian paintbrush *(Castilleja* spp.*)*, and aster (family Asteraceae). The mountain shrub community tends to respond favorably to fire due to its resprouting capabilities (BLM 2009d).

Sagebrush. Sagebrush communities in the GJFO planning area are dominated by Wyoming big sagebrush *(Artemisia tridentata* ssp. *wyomingensis)*, mountain big sagebrush *(A. t.* ssp. *vaseyana)* and black sagebrush *(A. nova)* (BLM 2009d). Less frequent species are silver sagebrush *(A. cana* ssp. *bolanderi)*, basin big sagebrush *(A. tridentata* ssp. *tridentata)*, bud sage *(A. spinescens)*, and an unidentifiable hybrid on the Uncompahgre Plateau. Collectively, sagebrush communities make up eight percent of the GJFO public lands. Sagebrush communities are especially rich in wildlife species that live only or predominately in this vegetation type, or as with mule deer *(Odocoileus hemionus)*, species that would be far less numerous if sagebrush were absent. Fire is an important component of all sagebrush-dominated plant communities. Degraded Wyoming big sagebrush and mountain big sagebrush communities are susceptible to cheatgrass invasion, and at extremes may have understories devoid of all perennials, populated solely by cheatgrass. The three dominant species are described below.

Wyoming Big Sagebrush. The Wyoming big sagebrush is the most tolerant big sagebrush species in arid locations, existing in areas with precipitation of 7 to 11 inches. Wyoming big sagebrush tends to grow at mid elevations in well-drained soils but can exist at elevations reaching 8,000 feet (Winward 2004). This species is important winter forage for big game species and sage-grouse. This species is the most diminutive of the big sagebrush group, with typical heights of 24 to 36 inches. Some mature plants may surpass four feet. Canopy cover is not as extensive as for either basin or mountain big sagebrush, usually topping out between 30 and 40 percent. Wyoming big sagebrush often appears as the dominant plant in mosaic communities intermixed with other shrubs and open grasslands. In shallow, rocky to gravelly soils, Wyoming big sagebrush may be co-dominant with black sagebrush, viscid rabbitbrush *(Chrysothamnus viscidiflorus)*, and sometimes winterfat. Grass and forb species vary depending on soil texture, aspect, and slope. Common grass species include Sandberg

bluegrass *(Poa secunda)*, Indian ricegrass, needle-and thread, western wheatgrass *(Pascopyrum smithii)*, and bottlebrush squirreltail *(Elymus elymoides)*. Common forbs include phlox *(Phlox* spp.*)*, buckwheat *(Eriogonum* spp.*)*, penstemon, Indian paintbrush, globemallow, and prickly pear cactus. It is also one of the dominant species found on antelope and mule deer crucial winter ranges.

Mountain Big Sagebrush/Grassland. Common to pinyon-juniper woodlands, Mountain big sagebrush grows in moderately deep, well-drained soils at elevations ranging from 6,500 to 8,500 feet. Most sites supporting this sagebrush are very productive and diverse. The fire return interval in mesic Mountain big sagebrush sites with abundant grass and forb cover is more frequent than other sagebrush sites, roughly 25 to 30 years. Mountain big sagebrush can increase in canopy cover without periodic fire, disease, or other disturbance. Canopy cover on areas that have not had disturbance for several decades can reach between 40 and 50 percent (Winward 2004). This sagebrush type is an important component of sage-grouse brood-rearing habitat, so any sagebrush reduction projects must be designed to consider sage-grouse habitat requirements (Winward 2004).

Black Sagebrush. Of the three dominant sagebrush species in the GJFO planning area, black sagebrush is the smallest (4 to 12 inches). Black sagebrush is found in shallow argillic or clay pan soils, with an elevation range of 4,000 to 8,500 feet. In order to survive, it must endure saturated soils in the spring and extremely dry soils in the summer (Winward 2004). In low-elevation winter ranges (during snow-free periods), black sagebrush is extremely important to pronghorn *(Antilocapra americana)* and mule deer. This species is particularly nutrient-rich winter forage and is highly palatable to domestic sheep.

Greasewood. Greasewood communities make up approximately two percent of the GJFO planning area, occurring in uplands and washes (lower desert) (BLM 2009d, 2010a). Areas populated by greasewood tend to have extremely saline soils, with limited plant associations. Plants most likely occurring within greasewood communities are greasewood, seep weed *(Suaeda* spp.*)*, cheatgrass, and halogeton, and, in less saline sites, sagebrush and shadscale. In general, greasewood-dominated communities are the most resistant vegetative community to treat and to revegetate as a more desirable community. While domestic livestock will graze greasewood, animals not adapted to it can suffer from oxalate poisoning, causing kidney failure. Greasewood provides important cover for upland game birds, big game animals, and other wildlife species.

Blackbrush. Blackbrush *(Coleogyne ramosissima)* is found in less than one percent of the GJFO planning area. Blackbrush is a drought-tolerant, low- to mid-level shrub (11 to 48 inches), with an elevation range of 2,500 to 6,000 feet. Blackbrush can be found on the north side of the Dolores River near the town of Gateway, and on a lower bench overlooking Unaweep Canyon near Casto Draw. Monitoring studies are established in both locations. While deer may

utilize blackbrush in the winter, monitoring has determined that this species receives very little use. The blackbrush community near Gateway contains very little understory and is characterized by large bare-ground interspaces, while the Casto Draw location has a slightly more robust understory consisting of needle-and-thread grass, sand dropseed, Indian ricegrass, and winterfat.

Forests and Woodlands. Forest and woodland vegetation is primarily composed of pinyon-juniper woodlands, Douglas-fir, aspen, and ponderosa pine and collectively account for 55 percent of the GJFO planning area (BLM 2009d, 2010a). Pinyon-juniper woodlands make up the majority of this vegetation community. The forested areas within the GJFO planning area are found mainly within the mountainous areas of the Uncompahgre Plateau, Grand Mesa, areas accessed by Douglas Pass, and the extreme northern areas of the Book Cliffs (north of DeBeque). Pinyon-juniper is much more widespread, accounting for nearly all mid-elevation areas. Forested lands and woodlands managed by the BLM within the GJFO planning area total 588,200 acres.

Pinyon-Juniper Woodlands. Consisting of approximately 539,900 acres and accounting for 53 percent of the GJFO planning area, pinyon-juniper woodlands are the most dominant vegetative community in the GJFO planning area (BLM 2009d, 2010a). At lower elevations, many of the woodlands exhibit a greater dominance of juniper than pinyon, with many communities entirely dominated by juniper. Due to a lower xylem pressure, juniper is more drought tolerant than pinyon (BLM 2010e). The denser woodlands are found mainly at the intermediate elevations (4,900 to 8,000 feet) where precipitation averages 12 to 14 inches per year. As pinyon-juniper stands age, understory is drastically reduced. At extremes, older stands can be devoid of perennial grasses, containing only sparse forbs. Moss mats are also commonly found around the trunks of juniper within the drip lines of trees. While it has been thought that the allelopathic properties[1] of the Utah juniper were to blame for the lack of understory, research has not supported this theory. In studies done by Horman and Anderson (1998), Utah Juniper leachate was applied to seeds, and germination rates were found to be positively linked to the application instead of suppressed as would be expected of allelopathic effects. Understory amounts are more likely influenced by canopy cover, with older woodlands having a greater canopy and a sparser understory.

Cheatgrass invasion following fire is an increasing problem in the pinyon-juniper woodlands. Across the west, pinyon stands have been decimated by the Pinyon ips beetle. Mild winters, plentiful stands of drought-stressed pinyon, and large numbers of ips beetle have teamed together to create the optimal conditions for beetle infestations. Ips beetle-related mortality can be found in Bangs Canyon and Glade Park. The GJFO planning area has not experienced the same

[1] Allelopathy is a characteristic of some plants, algae, bacteria, coral, and fungi by which they produce certain biochemicals that influence the growth and development of other organisms.

level of mortality that southern Colorado and other areas of the Southwest have, where entire stands have been lost. No estimates are available for the number of acres affected by ips beetle within the GJFO planning area.

Old-growth pinyon-juniper woodland has been identified within the GJFO planning area. Old-growth forests and woodlands encompass the later stages of stand development that typically differ from earlier stages in a variety of characteristics, such as tree size, accumulations of large dead woody material, number of canopy layers, species composition, and ecosystem function. Old-growth pinyon-juniper woodlands are composed not only of pinyon pine and juniper species, but also may include bristlecone pine *(Pinus longaeva)* and limber pine *(P. flexilis)*. Typically, these woodlands are structurally more complex than younger woodlands, adding biological diversity at the community and landscape levels, and providing habitat for many species (US Forest Service 1999). Structural attributes used to identify old-growth pinyon-juniper stands are provided in **Table 3-10,** Minimum Structural Attributes to Identify Old-Growth Pinyon-Juniper Stands.

Table 3-10
Minimum Structural Attributes to Identify Old-Growth Pinyon-Juniper Stands

Attribute	Description
Live Trees	
Trees per acre	30
Diameter at root collar	12 inches, with variation in diameter
Age	200 years
Decadence present	Yes, dead, broken, or deformed tops and/or bole or root rot
Number of tree canopies	Single story
Other	Upper canopy trees are slow growing Variation in tree diameter Basal area of 23 square feet/acre
Dead Trees	
Standing	
Number per acre	1
Diameter at root collar	10 inches
Down	
Pieces	2 per acre (10-foot-long segments)
Diameter	10 inches
Canopy Closure	
Total canopy cover	35 percent

Source: US Forest Service 1999

Douglas-fir and Mixed Conifer. Douglas-fir *(Pseudotsuga menziesii)* stands are generally found on northern and eastern aspects of the Book Cliffs and the Roan Plateau. There are very few grasses or forbs in the understory. This forest type represents approximately three percent of the GJFO planning area.

Aspen. The aspen forest type accounts for 7,800 acres, equaling less than 1 percent of the GJFO planning area (BLM 2010a). Aspen is typically relegated to areas above 8,000 feet on northern and eastern slopes. Within the GJFO planning area, aspen can be found on Douglas Pass, Mud Springs, and the Uncompahgre Plateau. Understories are highly variable. Across Colorado, aspen stands have been in a state of decline. Recent research has indicated that aspen stands are drought stressed, making them more susceptible to disease and insect infestation.

Ponderosa Pine. Ponderosa pine *(Pinus ponderosa)* occurs on the higher mesas and mountains of the planning area at about 8,000 feet, including the Uncompahgre Plateau, Douglas Pass, and other scattered areas. Ponderosa pine represent less than one percent of the planning area (BLM 2010a). Ponderosa pine stands tend to be small, with a mountain shrub understory. While Ponderosa pine is a fire adapted species, records indicate infrequent fires in the northern portion of the Uncompahgre Plateau.

Riparian Areas and Wetlands. Riparian areas are ecosystems that occur along rivers, streams, or waterbodies (NRCS 2007). These areas exhibit vegetation or physical characteristics reflective of permanent surface or subsurface water influence. Typical riparian areas are lands along, adjacent to, or contiguous with perennially and intermittently flowing rivers, streams, glacial potholes, and shores of lakes and reservoirs with stable water levels. Excluded are such sites as ephemeral streams or washes that do not exhibit vegetation dependent on free water in the soil (BLM 2006a). Wetlands are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and which, under normal circumstances, do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include marshes, shallows, swamps, lakeshores, bogs, muskegs, wet meadows, estuaries, and riparian areas (BLM 2006a). Even though riparian and wetlands areas occupy only a small percentage of GJFO planning area land (less than one percent), these areas provide a wide range of functions critical to many different wildlife species, improve water quality, provide scenery, and provide recreational opportunities. A variety of physiognomic groups (Carsey et al. 2003) of riparian zones and wetlands occur within the GJFO, including evergreen riparian forests and woodlands, mixed coniferous and deciduous forests and woodlands, deciduous-dominated forests and woodlands, tall willow shrublands, short willow shrublands, non-willow shrublands, and herbaceous vegetation. These groups can be further divided into a variety of plant community types; however, insufficient data exist to provide a comprehensive listing of plant association types in the GJFO planning area.

Information on the condition of riparian areas and wetlands is available from PFC assessments that have been conducted from 1993 to the present. Many of these assessments have been conducted as part of Land Health Assessments on various landscapes within the GJFO. Based on hydrology, vegetation, and

erosion/deposition (soils) attributes and processes (BLM 1998a), the PFC assessments place the riparian area in one of three ratings: PFC, FAR, and NF. A trend is also identified for the FAR ratings, which may be upward, not apparent, or downward. 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 rating with an upward trend generally means that several indicators have not been met but that significant progress is being made toward achieving Standard 2. A FAR rating with a downward or no apparent trend means several indicators have not been met and generally Standard 2 will not have been achieved. Likewise, an NF rating means that critical indicators have not been met and Standard 2 has not been achieved.

For lotic systems (riparian-wetland areas adjacent to flowing water such as rivers, streams, and springs), a riparian-wetland area is considered to be in PFC when adequate vegetation or landform (or large woody debris in Pacific Northwest systems) is present to accomplish the following:

- Dissipate stream energy associated with high water flow, thereby reducing erosion and improving water quality;
- Filter sediment, capture bed load, and aid floodplain development;
- Improve floodwater retention and groundwater recharge;
- Develop root masses that stabilize streambanks against cutting action;
- Restrict water percolation;
- 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 (BLM 1998a).

For lentic systems (riparian-wetlands areas with standing water, such as lakes, ponds, seeps, bogs, and meadows), 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 (BLM 1998a).

Each riparian-wetland area has to be judged against its capability and potential (BLM 1998a).

Table 3-11, GJFO Lotic Proper Functioning Condition Assessment (miles), shows the most current results of PFC assessments on lotic systems within the GJFO. The measurement used for riparian areas is in miles. Areas determined to be non-riparian systems are not shown on the table. As displayed in the table, 76 percent of the total miles inventoried are meeting PFC. The causal factors for FAR and NF are shown on **Table 3-12**, Causal Factors for Functioning at Risk and Not Functioning Ratings. The lotic tables show only those riparian-wetland areas that have had a PFC assessment. The lotic table represents most riparian areas that occur along streams and rivers within the GJFO. PFC has been assessed on a few riparian areas at springs and seeps, but these data are incomplete and therefore not included.

Table 3-11
GJFO Lotic Proper Functioning Condition Assessment (miles)

Riparian Area Name	Year Assessed	Total Miles Inventoried	PFC	FAR	NF
Bangs Canyon	2003	1.77	1.77		
Barrel Spring Creek	1993/2006	3.76	3.76		
Barrel Spring Creek Left Fork	1993/2006	2.76	2.76		
Barrel Spring Creek Right Fork	1993	3.15	3.15		
	2006	4.26	4.26		
Beiser Creek	1993	1.90	1.90		
Big Salt Wash	1993	16.42	6.45	9.97	
	2006	7.53	7.53		
Blue Branch	1993	0.89	0.89		
Blue Creek	1993	10.41	10.41		
	2010	10.25	9.29	0.85	0.11
Blue Creek Tributary	2010	0.63	0.63		
Brandon Ditch	1993	2.28	2.28		
Briar Creek	1993	1.83	1.83		
Brush Creek	1993	0.44		0.44	
	2004	0.44	0.44		
Bull Creek	1993/2005	0.26	0.26		
Burro Creek	2010	0.20	0.20		

Table 3-11
GJFO Lotic Proper Functioning Condition Assessment (miles)

Riparian Area Name	Year Assessed	Total Miles Inventoried	PFC	FAR	NF
Calamity Creek	1993	7.97	7.97		
Calf Canyon Creek	1993	3.41		3.41	
	2006	3.41	3.41		
Carr Creek	1993	4.37	0.70	3.67	
	2004	3.41	3.41		
Carr Creek Left Fork	2004	3.23	3.23		
Clear Creek	1993	0.23		0.23	
	2004	0.50	0.50		
Coal Gulch Creek	1993	9.49		9.49	
Coal Gulch Creek Branch	1993	4.18		4.18	
Collier Creek	1993/2005	0.95	0.95		
Colorado River	1993	9.54	9.54		
	2004	8.76	8.76		
Conn Creek	1993	0.72	0.48		0.24
	2004	0.68	0.68		
Corral Canyon Creek	1993	4.64	4.64		
	2006	2.79	2.79		
Cottonwood Creek	1993	4.58	4.58		
	2005	4.96	4.96		
Cottonwood Creek (Collbran)	1993	0.07	0.07		
Cougar Creek	2010	1.99	1.99		
Cougar Creek Tributary	2010	0.08	0.08		
Dark Canyon	1993	1.62	1.62		
	2010	1.80	1.80		
Deer Creek	1993	4.90	1.08	3.82	
	2010	4.74	0.11	0.10	4.53
Dolores River	1993	18.65	14.66	3.99	
	2010	9.46	8.35	1.11	
Dry Fork	1993	1.27		1.27	
	2004	1.26	0.93	0.33	
Dry Fork Creek - Middle Fork	1993	0.91	0.91		
Dry Fork Creek - North Fork	1993	2.99	0.73	2.00	0.26
	2004	0.49	0.49		
Dry Fork Creek - South Fork	1993	1.66		1.66	
East Creek	1993	8.69	8.69		
	2003	7.48	7.48		
East Creek - North Fork	1993	7.33	7.33		
East Hawxhurst Creek	1993	1.21	1.21		
East Salt Creek (Collbran)	2005	0.34	0.34		
East Salt Creek	1993	21.80	6.90	14.90	
	2006	11.40	10.41	0.99	
Edd Canyon Creek	1993/2006	1.29	1.29		
Fish Creek	2002	1.28	1.28		
Gill Creek	1993	0.29	0.29		

Table 3-11
GJFO Lotic Proper Functioning Condition Assessment (miles)

Riparian Area Name	Year Assessed	Total Miles Inventoried	PFC	FAR	NF
Granite Creek	1993	5.51	5.51		
	2010	5.70	5.70		
Gunnison River	1993	3.97	3.97		
Hawxhurst Creek East Branch	2005	1.23	1.23		
Hawxhurst Creek West Branch	2005	1.60	1.60		
Hay Canyon Creek	1993	2.61	0.10	2.51	
	2006	2.61	2.61		
Hells Hole Tributary	2006	0.58	0.58		
Hill Creek	1993	3.24	3.24		
John Brown	1993	6.32	6.32		
Kannah Creek	1993/2005	0.21	0.21		
Kannah Creek - North Fork	1993	1.49	1.49		
	2003	1.49	1.49		
Kimball Creek	1993	4.07		4.07	
Kimball Creek Tributary	2005	0.47	0.47		
King Gulch	1993/2005	1.41	1.41		
Kings Canyon Creek	1993	5.51	5.51		
Ladder Creek	1993	1.72	1.72		
Lane Gulch Creek	1993	3.04	3.04		
Leon Creek	1993/2005	0.27	0.27		
Little Dolores River	1993	6.49	3.78	2.71	
Little Salt Wash	1993	5.28	5.28		
Little Salt Wash - Middle Fork	1993	4.21	4.21		
Lobe Creek - North Fork	1993/2002	1.48	1.48		
Lost Horse	2010	0.62	0.62		
Main Canyon	1993	7.77	7.77		
Maverick Canyon	1993	11.23	11.23		
	2010	0.64	0.64		
Mesa Creek - North Fork	1993	1.81	1.81		
Mckenzie Canyon Creek	1993	2.51	2.51		
Mule Creek	2010	0.52	0.52		
Oak Creek	1993	0.39	0.39		
Payne Canyon	1993	0.88		0.88	
Pine Gulch Creek	1993	4.64	4.64		
Plateau Creek	1993	2.99	2.99		
	2005	4.43	4.43		
Prairie Canyon Creek	1993	13.63	13.63		
	2005	6.13	6.13		
Rapid Creek	1993/2005	2.60	2.60		
Rapid Creek Tributary	1993/2005	1.29	1.29		
Roan Creek	1993	8.22	5.72	2.17	0.33
	2004	7.09	5.48	1.06	0.55
Rough Canyon	1993	9.80	9.80		
	2003	9.71	9.71		

Table 3-11
GJFO Lotic Proper Functioning Condition Assessment (miles)

Riparian Area Name	Year Assessed	Total Miles Inventoried	PFC	FAR	NF
Salt Creek	1993	5.16		5.16	
Salt Creek - Middle Fork	1993	0.72	0.72		
Salt Creek - North Fork	1993	4.01		4.01	
Smalley Gulch	1993	0.80	0.80		
Snyder Creek	1993	1.55	1.55		
Spring Creek	1993/2005	1.63	1.63		
Trail Canyon Creek	1993	6.90		6.90	
	2006	7.29	7.29		
Turner Gulch Creek	1993	1.99	1.99		
Ute Creek	1993/2002	4.15	4.15		
West Creek	1993/2002	4.70	4.70		
West Creek East Branch	2002	2.25	2.25		
West Creek Branch	2002	0.85	0.85		
West Creek - North Fork	1993/2002	3.24	3.24		
West Hawxhurst	1993/2005	1.60	1.60		
West Salt Creek	1993	21.70		21.70	
	2006	7.33	5.77	1.56	
West Salt Creek - East Branch	2002	0.62	0.62		
West Salt Creek - West Branch	1993	2.36	0.15	2.21	
	2006	2.36	2.36		
Whitewater Creek	1993	3.20	3.20		
	2006	4.63	4.63		
Willow Creek - East Fork	2008	0.32			0.32
Total		*516.77*	*393.08*	*117.35*	*6.34*

Source: BLM 2010f.

Table 3-12
Causal Factors for Functioning at Risk and Not Functioning Ratings

Riparian Area Name	Causal Factor
Dry Fork	Insufficient woody vegetation resulting from heavy livestock use.
East Creek	Insufficient bank vegetation and streambed disturbance related to recreational use along the banks and OHV use.
East Salt Creek	Insufficient stream bank vegetation resulting from livestock grazing over season-long use.
Gibbler Gulch Creek	Insufficient stream bank vegetation resulting from OHV and livestock use.
Roan Creek	Insufficient stream bank vegetation resulting from heavy livestock use. Road encroachment and crossings are keeping banks unstable. Current beaver ponds are unstable because of the lack of large-diameter materials.

Table 3-12
Causal Factors for Functioning at Risk and Not Functioning Ratings

Riparian Area Name	Causal Factor
West Branch of West Salt Creek	Insufficient stream bank vegetation resulting from diversions of flow, landslides into the stream, saline seeps inhibiting vegetation growth and establishment, and livestock use along the stream bank.
West Salt Creek	Insufficient stream bank vegetation resulting from grazing use along the stream and a pipeline and road crossing that are creating bank instability.

Stream reaches determined to be not functioning or functioning-at-risk are managed by BLM to meet or exceed Standard 2. If livestock are determined to be a causal factor for not meeting Standard 2, the BLM must implement management changes to improve the stream reach within one year. When other factors such as recreational use or wildlife are compromising PFC, more collaborative approaches must be used. Management of vegetation resources, including riparian and wetland areas, is designed to enhance and maintain sustainable ecological condition within plant communities.

Most management practices for riparian areas and wetlands have been focused on improving grazing management and mitigating impacts from industry development. Methods used include reducing grazing use to the carrying capacity of the area; completing new and modifying existing grazing management systems to provide rest or deferment of upland and riparian areas to improve forage composition and productivity; improving distribution by encouraging herding and development of off-riparian area water sources and upland salting; and improving springs and seeps by modifying current spring projects to enhance riparian function and water quality. Riparian exclosures and pastures have been used to control grazing in specific areas, but these treatments are expensive to construct and to maintain. Development by industry is mitigated through avoidance of riparian areas. Where avoidance is not practical, site-specific conditions of approval and best management practices are developed specifically to mitigate impacts to riparian impacts.

Significant Plant Communities

Significant plant communities are those that are globally rare, rare within the state, or ancient, exemplary, in that they have not been substantially altered by human activity. The first category includes vegetation communities in which the individual species may not be rare but the unique assemblage is rare or uncommon. The second category of significant plant communities involves plant community types that are significant not because of their rarity, but because they represent relatively pristine plant communities with few nonnative species.

Significant plant communities on BLM lands are important for many of the same reasons that special status plants are important. Urbanization, agriculture, and

other human activities have greatly modified many of the natural plant communities on private lands. BLM lands are therefore critical to maintaining the diversity of natural plant communities and biological diversity (BLM 1992c). Significant plant communities constitute relict areas and may serve as comparison areas to assess public land health and analyze the impacts of human activities. These areas may also prove to be important to future studies and research.

In the GJFO planning area, 50 occurrences of 28 significant plant communities have been identified (see **Table 3-13**, Significant Plant Communities). The list is neither complete nor conclusive as changes are expected over the life time of the RMP, and new significant plant communities are expected to be located and recorded over time.

Table 3-13
Significant Plant Communities

Scientific Name	Common Name	Global Rank	State Rank	Location	Number of Sites
Achnetherum hymenoides Shale Barren Herbaceous Vegetation	Western Slope Grasslands	G2	S2	Northeast of 6&50 Reservoir, near old rail road grade	1
Aquilegia micrantha / Mimulus eastwoodiae Herbaceous Vegetation	Hanging Gardens	G2G3	S2S3	Hwy 141, base of Sewemup Mesa, near Montrose County line. Partially within the Sewemup Mesa WSA and the proposed Dolores River Riparian ACEC.	1
Arctostaphylos patula / Ceanothus velutinus / Ceanothus prostratus Shrubland	Montane Shrublands	G3	S2	Glade Park, North of Pinon Mesa, Briar Canyon	1
Atriplex confertifolia / Achnatherum hymenoides Shrubland	Cold Desert Shrublands	G3	S2	Near 2 Rd, in desert bottom	1
Atriplex confertifolia / Pleuraphis jamesii Shrubland	Cold Desert Shrublands	G3G5	S2	Delta County line, east of Hwy 50	1
Atriplex corrugata Dwarf-shrubland	Alkali Mat Saltbush Shrublands	G5	S2?	South of Badger Wash along 4 Rd, east of Highline State Park	3
Atriplex gardneri / Leymus salinus Dwarf-shrubland	Gardner's Mat Saltbush Shrublands	G2?	S2?	Along Hwy 6&50, 2 Rd, Hwy 139, southern portion of Badger Wash ACEC (approximately ½ of the known location are within the Badger Wash ACEC)	8

Table 3-13
Significant Plant Communities

Scientific Name	Common Name	Global Rank	State Rank	Location	Number of Sites
Atriplex gardneri / Pleuraphis jamesii Dwarf-shrublands	Gardner's Mat Saltbush Shrublands	G3G5	S1?	East of Highline State Park, Hwy 6&50, 25 Rd	3
Betula occidentalis / Cornus sericea Shrubland	Lower Montane Riparian Shrublands	G3	S1S2	Glade Park: Ryan Park, McKenzie Canyon, Middle Canyon (of the 3 known locations, only 1 is fully on BLM, Ryan Park)	3
Betula occidentalis / Maianthemum stellatum Shrubland	Foothills Riparian Shrubland	G4?	S2	Briar Canyon, Calf Canyon (on private and BLM land)	2
Eleocharis rostellata Herbaceous Vegetation	Emergent Wetland	G3	S2	Unaweep Seep ACEC, Calf Canyon, and the proposed Dolores River Riparian ACEC	3
Forestiera pubescens Shrubland	Foothills Riparian Shrubland	G1G2	S1	Palisade ACEC & the proposed Dolores River Riparian ACEC (all known locations fall within the 2 ACECs)	5
Fraxinus anomala Woodland	West Slope Riparian Woodland	GUQ	S1	Hunter Canyon	1
Hesperostipa comata Great Basin Herbaceous Vegetation	Western Slope Grasslands	G2G4	S2	North of NCA boundary along old 6&50 Hwy	1
Juniperus scopulorum / Cornus sericea Woodland	Riparian Woodland	G4	S2	Glade Park, north of Payne Mesa, above the Little Dolores	1
Picea pungens / Cornus sericea Woodland	Montane Riparian Forest	G4	S2	McKenzie Canyon (North Pinon Mesa)	1
Pinus edulis / Juniperus monosperma / Juniperus osteosperma / Hesperostipa comata Woodland	Xeric Western Slope Pinyon-Juniper Woodland	G2?	S2	Unaweep Canyon, within the Sewemup Mesa WSA	1
Pinus edulis / Juniperus osteoperma / Colegyne ramosissima Woodland	West Slope Pinon Woodland	G3	S2	Rough Canyon ACEC, Gateway near Lumsden Canyon	2
Pleuraphis jamesii Herbaceous Vegetation	Western Slope Grasslands	G2G4	S1	Coon Hollow, within the proposed South Shale Ridge ACEC	1

Table 3-13
Significant Plant Communities

Scientific Name	Common Name	Global Rank	State Rank	Location	Number of Sites
Populus balsamifera Woodland	Montane Riparian Woodland	GU	S2	Corral Canyon, near Long Canyon	1
Populus deltoides (ssp. *wislizeni* and ssp. *monilifera*) / *Salix exigua* Woodland	Fremonts Cottonwood Riparian Forests	G3	S1S2	Little Dolores River, on private and BLM	1
Pseudotsuga menziesii/ Acer glabrum Forest	Lower Montane Forests	G4?	S1	West of Douglas Pass	2
Rhus trilobata Rocky Mountain Shrub Herbaceous Vegetation	Skunkbrush Riparian Shrubland	G2	S2	Coal Gulch	1
Sarcobatus vermiculatus / *Distichlis spicata* Shrubland	Saline Bottomland Shrublands	G4	S2	Whitewater, Radio Towers area along Hwy 50	1
Sarcobatus vermiculatus / *Sueda moquinii* Shrubland	Saline Bottomland Shrublands	GUQ	S2S3	Badger Wash ACEC	1
Schoenoplectus acutus/ Typha latifolia/ Schoenoplectus tabernaemontani Herbaceous Vegetation	Great Plains Marsh	G4	S2S3	Unaweep Seep ACEC	1
Schoenoplectus maritimus Herbaceous Vegetation	Emergent Wetland (Marsh)	G4	S2	Sewemup Mesa WSA	1
Sullivantia hapemanii / *Aquilegia barnebyi* Herbaceous Vegetation	Sullivantia Hanging Gardens	G2	S2	Henderson Ridge	1

Source: CNHP 2011.

Invasive Species/Noxious Weeds

BLM policy requires the application of Integrated Pest Management (IPM) methods. The GJFO's treatment of noxious weeds is guided by the BLM's Final Programmatic Environmental Impact Statement on Vegetation Treatment and Fuels Reduction (BLM 2007), the Environmental Assessment for Integrated Weed Management for the Grand Junction Field Office (BLM 2004c), and the

Colorado Noxious Weed Act (Colorado Weed Management Association 2009a).

In 2004, Colorado amended the Noxious Weed Act to list species in three categories: A, B, and C (Colorado Weed Management Association 2009b). List A weeds are rare to the state and are subject to eradication wherever detected statewide in order to protect neighboring lands and the state as a whole. List B weeds have discreet statewide distributions that are subject to eradication, containment, or suppression in portions of the state designated by the commissioner in order to stop the spread of these species. List C noxious weeds are already widespread and well established for which control is recommended, but not required, by the state, although local governing bodies may require management. The GJFO planning area has species from all categories. **Table 3-14**, Colorado Noxious Weed Species, and **Figure 3-8**, Noxious Weeds: All Species Surveyed Since 2000, describes the species of weeds within each category.

Table 3-14
Colorado Noxious Weed Species

List A species are species that are designated by the Commissioner[1] for eradication.	
African rue *(Peganum harmala)*	Medusahead *(Taeniatherum caput-medusae)*
Camelthorn *(Alhagi pseudalhagi)*	Myrtle spurge *(Euphorbia myrsinites)*
Common crupina *(Crupina vulgaris)*	Orange hawkweed *(Hieracium aurantiacum)*
Cypress spurge *(Euphorbia cyparissias)*	Purple loosestrife *(Lythrum salicaria)*
Dyer's woad (*Isatis tinctoria)*	Rush skeletonweed *(Chondrilla juncea)*
Giant salvinia *(Salvinia molesta)*	Sericea lespedeza *(Lespedeza cuneata)*
Hydrilla *(Hydrilla verticillata)*	Squarrose knapweed *(Centaurea virgata)*
Meadow knapweed *(Centaurea pratensis)*	Tansy ragwort *(Senecio jacobaea)*
Mediterranean sage *(Salvia aethiopis)*	Yellow starthistle *(Centaurea solstitialis)*
List B weed species are species for which the Commissioner[1] (in consultation with the state noxious weed advisory committee, local governments, and other interested parties) develops and implements state noxious weed management plans designed to stop the continued spread of these species.	
Absinth wormwood *(Artemisia absinthium)*	Moth mullein *(Verbascum blattaria)*
Black henbane *(Hyoscyamus niger)*	Musk thistle *(Carduus nutans)*
Bouncingbet *(Saponaria officinalis)*	Oxeye daisy *(Chrysanthemum leucanthemum)*
Bull thistle *(Cirsium vulgare)*	Perennial pepperweed *(Lepidium latifolium)*
Canada thistle *(Cirsium arvense)*	Plumeless thistle *(Carduus acanthoides)*
Chinese clematis *(Clematis orientalis)*	Quackgrass *(Elytrigia repens)*
Common tansy *(Tanacetum vulgare)*	Redstem filaree *(Erodium cicutarium)*
Common teasel *(Dipsacus fullonum)*	Russian knapweed *(Acroptilon repens)*
Corn chamomile *(Anthemis arvensis)*	Russian-olive *(Elaeagnus angustifolia)*
Cutleaf teasel *(Dipsacus laciniatus)*	Scentless chamomile *(Matricaria perforata)*
Dalmatian toadflax, broad-leaved *(Linaria dalmatica)*	Scotch thistle *(Onopordum acanthium)*
Dalmatian toadflax, narrow-leaved *(Linaria genistifolia)*	Spotted knapweed *(Centaurea maculosa)*
Dame's rocket *(Hesperis matronalis)*	Spurred anoda *(Anoda cristata)*
Diffuse knapweed *(Centaurea diffusa)*	Sulfur cinquefoil *(Potentilla recta)*
Eurasian watermilfoil *(Myriophyllum spicatum)*	Venice mallow *(Hibiscus trionum)*
Hoary cress *(Cardaria draba)*	Wild caraway *(Carum carvi)*

Table 3-14
Colorado Noxious Weed Species

Houndstongue *(Cynoglossum officinale)*	Yellow nutsedge *(Cyperus esculentus)*
Jointed goatgrass *(Aegilops cylindrical)*	Yellow toadflax *(Linaria vulgaris)*
Leafy spurge *(Euphorbia esula)*	Saltcedar *(Tamarix chinensis, T. parviflora*, and *T. ramosissima)*
Mayweed chamomile *(Anthemis cotula)*	
List C weed species are species for which the Commissioner[1] (in consultation with the state noxious weed advisory committee, local governments, and other interested parties) will develop and implement state noxious weed management plans designed to support the efforts of local governing bodies to facilitate more effective integrated weed management on private and public lands. The goal of such plans will not be to stop the continued spread of these species but to provide additional education, research, and biological control resources to jurisdictions that choose to require management of List C species.	
Chicory *(Cichorium intybus)*	Johnsongrass *(Sorghum halepensei)*
Common burdock *(Arctium minus)*	Perennial sowthistle *(Sonchus arvensis)*
Common mullein *(Verbascum thapsus)*	Poison hemlock *(Conium maculatum)*
Common St. Johnswort *(Hypericum perforatum)*	Puncturevine *(Tribulus terrestris)*
Downy brome *(Bromus tectorum)*	Velvetleaf *(Abutilon theophrasti)*
Field bindweed *(Convolvulus arvensis)*	Wild proso millet *(Panicum miliaceum)*
Halogeton *(Halogeton glomeratus)*	

Source: Colorado Weed Management Association 2009a
[1]Colorado Department of Agriculture Commissioner

The GJFO strictly adheres to state direction for the management of List A weeds; however, some of the state's List B weeds are actually GJFO List A weeds. For example, spotted knapweed *(Centaurea maculosa)* is rare in the GJFO, and the BLM considers this one of its highest priorities. Repeat surveys are a vital part of a weed program, and the GJFO is planning to continue that process.

Current Status of Key Species

In 2000, the GJFO began a comprehensive inventory for noxious weeds within its jurisdiction. At the end of the 2004 field season this process was nearly completed, with the exception of the Gunnison and Dolores River floodplains. BLM weed staff conducted the surveys with the help of a contract horseback survey of the eastern half of Black Ridge Wilderness. Crews prepared GIS field maps ahead of time on aerial photos and searched all known disturbed sites and most perennial riparian areas. The results of the survey revealed about 20 species of noxious weeds (see **Figure 3-8**) in approximately 8,000 locations scattered throughout the field office and the Dominguez-Escalante and McInnis Canyons NCAs. The survey did not include cheatgrass, annual wheatgrass, Russian thistle, or other nuisance annuals. With the exception of the river floodplains, the planning area contains numerous small infestations of many species. GJFO lands are ideal for the implementation of Early Detection Rapid Response (USDA 2009), a key strategy for successful weed management.

As of 2008, BLM crews and cooperators have treated nearly 15,000 sites with noxious weeds. This figure is higher than the original survey results (+/- 8,000) because crews always find more weeds when they begin to thoroughly treat an

area. The program includes large-scale spot treatments or small-scale broadcast treatments. There is very little collateral damage to non-target vegetation, since the majority of treatments are with a hand gun.

Weed infestations can be considered a slow-moving biological wildfire, and the strategy and tactics for treating them are exactly the same as fire suppression. Work begins on the perimeter and moves toward the center. For widespread weeds such as hoary cress (whitetop) in the Book Cliffs, the center of the "fire" is Highway 139 and Trail Canyon. The BLM has spent years treating adjacent canyons as the perimeter, slowly moving toward Hwy 139. Rapid and Cottonwood Creeks above Palisade are treated as a "spot fire," and aggressive action is in place to completely contain that area. Houndstongue is abundant in the higher elevations of the Book Cliffs, but very rare on the Uncompahgre Plateau and Glade Park. Those areas are treated as "spot fires" with aggressive action. In the rest of the Book Cliffs, the BLM treats the southern edge and around certain improvements.

Russian knapweed is scattered throughout the field office, with the river corridors as the centers. The BLM plans to treat every infestation in the uplands, and move toward the rivers, where the infestation is worst.

Weeds that are rare in the GJFO planning area receive a majority of the BLM's treatment work. Rare species include spotted and diffuse knapweed, purple loosestrife, yellow starthistle, black henbane, dalmatian toadflax, and perennial pepperweed. Other species treated frequently include saltcedar (tamarisk), bull thistle, and houndstongue.

Trends

Trends in the percentage of desirable species present in the GJFO planning area rangeland communities are mixed, with many areas having a relatively constant amount of desirable species, some areas with increases in desirable species, and other areas with decreases in desirable species and increases in undesirable species. Within the GJFO planning area, especially in the last ten years, there has been an increase in noxious and invasive weeds, including cheatgrass, saltcedar (*tamarisk*), halogeton, Russian thistle, and Canada thistle. These problems are most evident in the desert grazing allotments, oil and gas production fields, and other locations where native vegetation has been disturbed.

Trends in rangeland health are managed by adjusting livestock numbers and wild horse use, by implementing vegetation treatments and weed control techniques, and by various other measures used to control public land use. These actions manipulate plant composition with the goal of maintaining desirable plant species and communities that, on average, represent mid to upper seral stages of development.

The condition or health of forest stands varies by location. In the forest types, predominately Douglas-fir, the stands are past mature and the incidence of

mortality is increasing as a result of mistletoe and bark beetles. In pinyon-juniper woodlands, there have been several large-scale stand-replacing fires over the past twenty years. Conifers are encroaching on aspen stands, limiting aspen regeneration. The disease known as bleeding rust is currently killing the older mature aspen clones.

Riparian and wetland condition in many areas of the Grand Junction planning area has been improved through adjustment and implementation of grazing systems. Monitoring data such as utilization, photo-points, and general observations, along with Land Health Assessments, indicate that riparian and wetland conditions in many areas are improving, and progress is being made in meeting land health standards. However, in some riparian-wetland areas, some issues remain.

Because plant communities respond to other environmental influences such as wildlife and livestock foraging, drought, disease, wildfire, and prescribed burns, it is difficult to forecast their health. Where the BLM has primary authority to manage livestock grazing, and grazing is the primary activity potentially diminishing vegetation health, the BLM will continue to act to restore the health of plant communities by managing for desired plant communities and/or adjusting the number and seasonal distribution of AUMs. Where other agencies or private landowners share or have primary authority over factors causing the decline of vegetation health, collaborative efforts will be pursued; however, the situation does become more complex. At best, resolution of landscape health issues is likely to progress slowly over the planning period.

3.2.7 Fish and Wildlife

This section describes the existing conditions of fish and wildlife resources within the GJFO planning area, including aquatic and terrestrial animal species and their habitats. Although the CPW and USFWS are directly responsible for the management of fish and wildlife species, the BLM is responsible for land management. Therefore, on BLM-administered lands in the decision area, the BLM is directly responsible for the management of habitat for fish and wildlife species and indirectly responsible for the health of fish and wildlife populations that are supported by these habitats. In addition, BLM is mandated by the Endangered Species Act of 1973 (ESA) and the BLM Land Use Planning Handbook (BLM 2005a) to ensure that special status species are protected. This mandate is reinforced through a Memorandum of Agreement with USFWS, US Forest Service, and National Marine Fisheries Service (BLM et. al 2000).

The fish and wildlife habitats that occur in the decision area are primarily characterized in the soil, water, and vegetation existing conditions discussions in **Sections 3.2.4**, **3.2.5**, and **3.2.6**, respectively. The discussions of aquatic and terrestrial habitat in this section identify attributes of these resources that are particularly important to their role in providing fish and wildlife habitat.

Table 3-15 displays Fish and Wildlife Species of Primary Interest in BLM's Environmental Planning; special status species are described in **Section 3.2.8**, Special Status Species, and also listed in **Table 3-16**, BLM Sensitive Plant Species.

Table 3-15
Fish and Wildlife Species of Primary Interest in BLM's Environmental Planning

	Rationale for Inclusion in Primary Interest Species										
					Special Status Species						
Species	**Recreational Value**	**Economic Value**	**High Public Interest[7]**	**CO Partners in Flight Priority**	**Species of Concern (State)**	**Threatened (State)**	**Endangered (State)**	**Sensitive (BLM)**	**Candidate (Federal)**	**Threatened (Federal)**	**Endangered (Federal)**
Fish											
Bluehead sucker *(Catostomus discobolus)*								X			
Bonytail chub *(Gila elegans)*			X				X				X
Colorado pikeminnow *(Ptychocheilus lucius)*			X			X					X
Cutthroat trout *(Oncorhynchus clarkii)*	X	X	X		X	X		X		X	
Flannelmouth sucker *(Catostomus latipinnis)*								X			
Humpback chub *(Gila cypha)*			X			X					X
Razorback sucker *(Xyrauchen texanus)*			X				X				X
Roundtail chub *(Gila robusta)*					X			X			
Cold water gamefish (brook, brown, rainbow trout)	X	X	X								
Warm water gamefish (bass, sunfish, pike, catfish)	X	X	X								
Amphibians											
Boreal toad *(Bufo boreas boreas)*							X		X		
Canyon treefrog *(Hyla arenicolor)*								X			
Great Basin spadefoot *(Spea intermontana)*								X			
Northern leopard frog *(Rana pipiens)*					X			X			
Reptiles											
Long-nosed leopard lizard *(Gambelia wislizenii)*					X			X			
Midget faded rattlesnake *(Crotalus oreganus concolor)*					X			X			
Milk snake *(Lampropeltis triangulum taylori)*								X			

Table 3-15
Fish and Wildlife Species of Primary Interest in BLM's Environmental Planning

	Rationale for Inclusion in Primary Interest Species										
					Special Status Species						
Species	**Recreational Value**	**Economic Value**	**High Public Interest[7]**	**CO Partners in Flight Priority**	**Species of Concern (State)**	**Threatened (State)**	**Endangered (State)**	**Sensitive (BLM)**	**Candidate (Federal)**	**Threatened (Federal)**	**Endangered (Federal)**
Birds											
American peregrine falcon *(Falco peregrinus)*[3,5]			X	X	X			X			
American white pelican *(Pelecanus erythrorhynchos)* [1]								X			
Bald eagle *(Haliaeetus leucocephalus)*[2,3,5]			X			X		X			
Brewer's sparrow *(Spizella breweri)*								X			
Burrowing owl *(Athene cunicularia)*			X	X		X		X			
Cooper's hawk *(Accipiter cooperii)*[5]			X								
Ferruginous hawk *(Buteo regalis)*[5]					X			X			
Golden eagle[2,5] *(Aquila chrysaetos)*			X								
Gray vireo *(Vireo vicinior)*				X							
Greater sage-grouse *(Centrocercus urophasianus)*			X	X	X			X	X		
Greater sandhill crane[1] *(Grus canadensis)*			X		X						
Gunnison sage-grouse[4] *(Centrocercus minimus)*			X	X	X			X	X		
Lewis' woodpecker *(Melanerpes lewis)*				X							
Long-billed curlew *(Numenius americanus)*					X			X			
Mexican spotted owl *(Strix occidentalis lucida)*[5]			X			X		X		X	
Migratory birds	X	X	X	X	X	X	X	X	X	X	X
Mountain plover *(Charadrius montanus)*					X			X			
Northern goshawk *(Accipiter gentilis)*[5]			X					X			
Raptors					X	X		X		X	
Scott's Oriole *(Icterus parisorum)*	X		X	X							
Shorebirds					X			X			
Southwestern willow flycatcher *(Empidonax traillii extimus)*			X				X				X
Swainson's hawk *(Buteo swainsoni)*[5]			X								
Turkey *(Meleagris gallopavo)*	X	X	X								

Table 3-15
Fish and Wildlife Species of Primary Interest in BLM's Environmental Planning

	Rationale for Inclusion in Primary Interest Species										
					Special Status Species						
Species	**Recreational Value**	**Economic Value**	**High Public Interest[7]**	**CO Partners in Flight Priority**	**Species of Concern (State)**	**Threatened (State)**	**Endangered (State)**	**Sensitive (BLM)**	**Candidate (Federal)**	**Threatened (Federal)**	**Endangered (Federal)**
Waterfowl	X	X	X								
Western snowy plover *(Charadrius alexandrinus nivosus)*					X			X			
Western yellow-billed cuckoo *(Coccyzus americanus occidentalis)*					X			X	X		
White-faced ibis *(Plegadis chihi)*								X			
Mammals											
Big free-tailed bat *(Nyctinomops macrotis)*								X			
Desert bighorn sheep *(Ovis canadensis nelsoni)*	X	X	X					X			
Rocky Mountain bighorn sheep *(Ovis canadensis canadensis)*	X	X	X								
Black bear *(Ursus americanus)*	X	X	X								
Canada lynx *(Lynx canadensis)*[5]			X				X			X	
Elk *(Cervus canadensis)*	X	X	X								
Fringed myotis *(Myotis thysanodes)*								X			
Kit fox *(Vulpes macrotis)*							X	X			
Moose *(Alces alces)*	X	X	X								
Mountain lion *(Felis concolor)*[5]	X	X	X								
Mule deer *(Odocoileus hemionus)*	X	X	X								
Pronghorn *(Antilocapra americana)*	X	X	X								
River otter *(Lontra canadensis)*			X			X					
Spotted bat *(Euderma maculatum)*								X			
Townsend's big-eared bat *(Corynorhinus townsendii)*					X			X			
White-tailed prairie dog *(Cynomys leucurus)*[6]	X		X					X			

Table 3-15
Fish and Wildlife Species of Primary Interest in BLM's Environmental Planning

	Rationale for Inclusion in Primary Interest Species										
					Special Status Species						
Species	**Recreational Value**	**Economic Value**	**High Public Interest[7]**	**CO Partners in Flight Priority**	**Species of Concern (State)**	**Threatened (State)**	**Endangered (State)**	**Sensitive (BLM)**	**Candidate (Federal)**	**Threatened (Federal)**	**Endangered (Federal)**
Invertebrates											
Great Basin silverspot *(Speyeria nokomis nokomis)*								X			

Source: BLM 2009e; CPW 2007; Colorado Partners in Flight 2000; USFWS 2009a
Notes: [1]Uses concentrated nesting and foraging areas; [2]Bald and Golden Eagle Protection Act; [3]Delisted from federal threatened and endangered species list; [4]USFWS 12-month status review due September of 2010; [5]Top of food chain species; [6]Keystone species; [7]This category includes all federal threatened and endangered species, all game animals, and other species that are well known to the public; it is not a regulatory category.

Current Conditions

Within the planning area, the GJFO directly manages nearly 1.1 million acres of fish and wildlife habitat. The presence and interspersion of many habitat types support a large number of wildlife species. The discussion of fish and wildlife populations and habitat addresses the entire GJFO planning area, not just the lands managed by BLM (decision area), because fish and wildlife are mobile and may readily cross these boundaries. Elk *(Cervus canadensis)*, mule deer, pronghorn, bighorn sheep *(Ovis canadensis canadensis, Ovis canadensis nelsoni, and Ovis canadensis mexicana)*, mountain lion *(Felis concolor)*, raptors, and many nongame species, including migratory birds, are among the species that use habitat in the GJFO planning area. The diversity and populations of fish and wildlife throughout the planning area provide considerable recreational opportunity and economic benefit. A minimum of 84 species of mammals, 215 species of birds, 30 species of amphibians and reptiles, and 30 species of fish occur in the planning area. Most of the discussion that follows is based on BLM GIS data, CPW GIS data, BLM Land Health Assessments, and relevant agency literature review. A more thorough discussion of these species, their habitats, and recommended management actions can be found in Colorado's Comprehensive Wildlife Conservation Strategy (CPW 2006).

A group of species that are of primary interest to the BLM for environmental planning within the planning area are presented in **Table 3-15**, Fish and Wildlife

Species of Primary Interest in BLM's Environmental Planning. These species are of management concern to one or more agencies, such as BLM, CPW, and USFWS because they are game species, rare, or keystone species. Therefore, they require consideration in management activities and may affect land management decisions. A keystone species is one whose presence and role within an ecosystem has a disproportionate effect on other organisms within the system.

Fish and Aquatic Wildlife

Aquatic habitats in the GJFO planning area include both lentic (riparian-wetlands areas with standing water, such as lakes, ponds, seeps, bogs, and meadows) and lotic (riparian wetland areas adjacent to flowing water such as rivers, streams, and springs) resources. While the CPW and USFWS are directly responsible for managing fish and amphibian species, the BLM is directly responsible for aquatic habitat management on the lands under its jurisdiction.

The diverse abundance of fish throughout the planning area provides considerable recreational opportunity and economic benefit.

Cold Water Sport and Native Fish. Higher-elevation waters located generally above 5,200 feet support cold water fishes, consisting largely of non-native sport fish including brook trout *(Salvelinus fontinalis)*, rainbow trout *(Oncorhynchus mykiss)*, and brown trout *(Salmo trutta)*, as well as the native cutthroat trout *(Oncorhynchus clarkii* spp.*)*. Higher elevation non-game species include mottled sculpin *(Cottus bairdii)* and speckled dace *(Rhinichthys osculus)*. Cutthroat trout *(Oncorhynchus clarki)* is a special status species and is discussed further in **Section 3.2.8**, Special Status Species.

Waters generally below 6,500 feet support primarily cool water and warm water fishes, including the native bluehead sucker *(Catostomus discobolus)*, roundtail chub *(Gila robusta)*, flannelmouth sucker *(Catostomus latipinnis)*, razorback sucker *(Xyrauchen texanus)*, Colorado pikeminnow *(Ptychocheilus lucius)*, bonytail chub *(Gila elegans),* and humpback chub *(Gila cypha)*. These fish are special status species and are discussed further in **Section 3.2.8**, Special Status Species.

Invasive/Nonnative/Competitive Fish. Fish species that occur but are not native to the GJFO planning area include, but are not limited to, several warm water sport fish, such as largemouth bass *(Micropterus salmoides)*, smallmouth bass *(Micropterus dolomieu)*, crappie *(Pomoxis* spp.*)*, bluegill *(Lepomis macrochirus)*, northern pike *(Esox lucius)*, and channel catfish *(Ictalurus punctatus)*. All of these species compete with native species. Several species of nonnative nongame species occur within the planning area, the most notable being common carp *(Cyprinus carpio)* and white sucker *(Catostomus commersonii)*.

Amphibians. Six species of frogs, three toads, and one salamander are known to occur in or near aquatic and riparian habitats within the planning area. CPW and

BLM surveys have documented the presence of tiger salamander *(Ambystoma tigrinum)*, bullfrog *(Rana catesbeiana)*, northern leopard frog *(Rana pipiens)*, red spotted toad *(Bufo punctatus)*, and woodhouse toad *(Bufo woodhousii)* across portions of the planning area (BLM 2008g, 2009f). Boreal toad habitat is located in the highest elevation areas within the planning area, generally in areas above 8,500 feet that contain suitable aquatic habitat. Lower-elevation amphibians include the Great Basin spade-foot toad *(Spea intermontana)*. The Northern leopard frog and tiger salamander use various aquatic habitats and are found at varying elevations throughout the GJFO planning area. All of the amphibian species of primary interest (**Table 3-15**, Fish and Wildlife Species of Primary Interest in BLM's Environmental Planning) are special status species, which are discussed further in **Section 3.2.8**, Special Status Species.

Wildlife

A variety of terrestrial wildlife species use the vegetation types discussed in **Section 3.2.6**, Vegetation. The key terrestrial wildlife species within the GJFO planning area are primarily herpetiles (reptile and amphibians), birds, and mammals. However, many terrestrial invertebrate species also occur and adequate populations of terrestrial invertebrates are assumed when populations of the vertebrate groups that prey on invertebrates are healthy. Information regarding terrestrial wildlife distribution within the GJFO planning area is informed by both the Land Health Assessments and GIS data maintained by CPW. In addition, CPW maintains statistics on big game harvests, hunter use days, and population trends.

Reptiles. Species of reptiles that have been historically documented within the planning area include 9 lizards and 11 snakes. Population numbers are not known. The majority of reptiles occur in lower elevations and in dryer habitats such as sagebrush, greasewood, and pinyon-juniper.

The reptiles of primary concern are BLM sensitive species and are discussed in **Section 3.2.8**, Special Status Species. Other reptiles that occur in the GJFO planning area include collared lizard *(Crotaphytus collaris)*, sagebrush lizard *(Sceloporus graciosus)*, tree lizard *(Urosaurus ornatus)*, side blotched lizard *(Uta stansburiana)*, prairie/plateau lizard *(Sceloporus undulates)*, short-horned lizard *(Phrynosoma hernandesi)*, plateau striped whiptail *(Cnemidophorus velox)*, western whiptail *(Cnemidophorus tigri)*, desert striped whipsnake *(Masticophis taeniatus)*, smooth green snake *(Liochlorophis vernalis)*, bull/gopher snake *(Pituophis catenifer)*, western terrestrial garter snake *(Thamnophis elegans)*, western blackneck garter snake *(Thamnophis cyrtopsis)*, wandering garter snake *(Thamnophis elegans vagrans)*, western yellow-belly racer *(Coluber constrictor)*, corn snake *(Elaphe guttata)*, Mesa Verde night snake *(Hypsiglena torquata loreala)*, and Utah blackhead snake *(Tantilla planiceps)*.

Ants. The University of Houston is conducting a long-term study of the population biology of the western harvester ant (*Pogonomyrmex occidentalis*

Cresson). Research has been ongoing in a portion of the field office adjacent to 16 Road since 1992, and is expected to continue in the future. Researchers have permanently marked and mapped 1,000 – 1,400 colonies of P. occidentalis which they monitor on an annual basis. Researchers collect data on survival/mortality, recruitment (new colonies), and the size of all living colonies (University of Houston 2012). The long-standing date collection at this site allows researchers to relate changes in temperature and rainfall patterns to changes in population growth, population size, and population age/size structure. Harvester ants are important agents of seed dispersal for annual plants. For example, soil in the vicinity of ant mounds is better aerated, has a higher nitrogen content, and often a higher water content than surrounding areas. Thus, ant abundance is an indicator of landscape health (Cole 2012).

Waterfowl and Shorebirds. The key water bird species include great blue heron *(Ardea herodias)*, several species of ducks and geese, and sandhill cranes *(Grus canadensis)*. Great blue heron foraging and breeding areas are primarily along the Colorado and Gunnison Rivers, though individual herons visit small streams and ponds throughout the planning area.

Canada geese *(Branta canadensis)* and other waterfowl species winter along the Colorado and Gunnison Rivers. Important foraging areas occur on private lands in agricultural areas and within the river corridors. Important production areas extend along much of the Colorado and Gunnison Rivers, with brood (group of young birds from the same mother) concentration areas reflecting the location of the important foraging areas. Sandhill cranes use areas within the GJFO planning area as a migratory stopover in the fall and spring. The majority of the areas used occur on private agricultural lands; however, ponds and reservoirs managed by BLM, such as 6 and 50 Reservoir, provide a migratory stopover for this species. Long-billed curlew *(Numenius americanus)* occasionally nest in the desert areas near the Utah border.

Upland Game Birds. The dusky grouse *(Dendragapus obscurus)*, wild turkey *(Meleagris gallopavo),* and the Gunnison sage-grouse *(Centrocercus minimus)* and greater sage-grouse *(Centrocercus urophasianus)* (discussed in **Section 3.2.8**, Special Status Species) occur in the GJFO planning area. High-elevation forested zones in the upper elevations of the planning area provide habitat for nesting blue grouse. Turkeys occur throughout the planning area, primarily in higher elevations. Chukar *(Alectoris chukar)*, an introduced game bird, occur throughout the planning area, including lower Roan and Plateau Creeks, the Book Cliffs, and along the Gunnison and Colorado Rivers.

Raptors. Raptors include eagles, falcons, hawks, and owls. Because they are at the top of food chains and therefore occur in fewer numbers than their prey, they serve as important indicators of overall ecosystem health. The CPW maintains data on observations of most raptor species, and several species are tracked individually. The BLM has particular management interest in

concentrations of raptors (particularly bald eagles *(Haliaeetus leucocephalus)* and peregrine falcons *(Falco peregrinus)* along the Colorado, Dolores, and Gunnison Rivers.

Cavity-Nesting Birds. Of the primary interest species, only the Lewis's woodpecker *(Melanerpes lewis)* is a cavity nester. This fly-catching woodpecker inhabits open habitats such as open pine forests, burn areas, cottonwoods in riparian areas, and pinyon-juniper forests (Johnsgard 1986).

Other Migratory Birds. Numerous species of migratory birds summer, winter, and/or migrate through the planning area. The habitat diversity provided by the broad expanses of pinyon-juniper, sagebrush, and saltbush vegetation zones support many species of birds. Common species include mourning doves *(Zenaida macroura)*, horned lark *(Eremophila alpestris)*, gray vireo *(Vireo vicinior)*, pinyon jay *(Gymnorhinus cyanocephalus)*, and sage sparrow *(Amphispiza belli)*.

Birds of Conservation Concern (USFWS 2008b) that occur in the GJFO include bald eagle, Brewer's sparrow *(Spizella breweri)*, burrowing owl *(Athene cunicularia),* Cassin's finch *(Carpodacus cassinii)*, ferruginous hawk *(Buteo regalis)*, flammulated owl *(Otus flammeolus)*, golden eagle *(Aquila chrysaetos)*, Grace's warbler *(Dendroica graciae)*, gray vireo, Gunnison sage-grouse, juniper titmouse *(Baeolophus ridgwayi)*, Lewis's woodpecker, long billed curlew *(Numenius americanus)*, peregrine falcon, pinyon jay *(Gymnorhinus cyanocephalus),* and prairie falcon *(Falco mexicanus).*

Owls. Long-term owl research in the field office began in 2002 by the Rocky Mountain Bird Observatory with the intent to capture and mark migrating Northern Saw-whet Owls during fall migration. The owl banding station in the Sunnyside area was selected after experimenting with several other locations and determining that owl capture rates seemed to be highest at this location. Owls were captured and banded between sunset and 10pm every Tuesday evening from September until Thanksgiving. A total of 41 Northern Saw-whet Owls (*Aegolius acadicus*), 1 Long-eared Owl (*Asio otus*), and 1 Western Screech Owl (*Megascops kennicottii*) over were banded over 5 years. The same bird has never been captured twice, suggesting that these are indeed migrating owls and not just residents (Potter 2008). Through this research it appears Saw-whet Owl migration in this area begins in early October, peaks around Halloween, and usually ends by Thanksgiving.

Big Game Species. The overall range of elk occupies the majority of the GJFO planning area except for the lower semi-desert shrub valleys of the Colorado, Gunnison, and Dolores Rivers (**Figure 3-9,** Elk Range). Summer range is found at the top of the Book Cliffs, on the Grand Mesa, along the Uncompahgre Plateau, and in Glade Park. Production occurs in concentrated areas in summer in the upper Book Cliffs, in the Uncompahgre National Forest, and in the upper elevations of Glade Park. Winter range includes the majority of the Book Cliffs, the Roan Creek drainage, the Grand Mesa Slopes and Collbran areas, the lower-

elevation slopes around the Uncompahgre Plateau, and Glade Park. No major migration corridors have been identified within the planning area except for a small corridor on private lands in Glade Park.

Severe winter range is defined as that part of the winter range where 90 percent of the individuals are located when annual snowpack is at its maximum and/or temperatures are at a minimum in the two worst winters out of ten (BLM 2010a). Critical winter range is defined as the winter habitat which is used during the most extreme portion of the winter (BLM 2010a).

Mule deer *(Odocoileus hemionus)* range includes the entire GJFO planning area, except for areas of high human concentration like downtown Grand Junction (**Figure 3-10**, Mule Deer Range). Summer range is found at the top of the Book Cliffs, on the Grand Mesa, along the Uncompahgre Plateau, and in Glade Park. Production occurs in concentrated areas within the summer range of the upper Book Cliffs, and on the Uncompahgre Plateau, on the Grand Mesa, and on the upper elevations in Glade Park. Winter range includes the majority of the Book Cliffs, the Roan Creek drainage, the Grand Mesa Slopes and Collbran areas, the lower-elevation slopes around the Uncompahgre Plateau, and the Dolores River drainage and the north end of Glade Park to the Colorado River. Two major migration corridors have been identified within the planning area; both are near the town of Mesa. In addition to the migration corridors, many migration pattern areas have also been identified in the GJFO.

The GJFO planning area contains both desert bighorn sheep *(Ovis canadensis nelsoni and mexicana)* (south of the Colorado River and west of the Gunnison River) and Rocky Mountain bighorn sheep *(O. canadensis canadensis)* (east of the Gunnison River and north of the Colorado River). The desert bighorn is a BLM sensitive species and is discussed in **Section 3.2.8**, Special Status Species. The planning area also contains two Rocky Mountain bighorn sheep populations. The Battlement Mesa herd (S-24) is found northwest of the town of Mesa, Colorado and ranges across both BLM and US Forest Service lands. It is one of 34 native, indigenous herds in the state of Colorado and is one of the few low-elevation herds still persisting in native habitat. The Battlement Mesa population numbers approximately 50 individuals (Duckett 2012). The Main Canyon herd (S-75) was extirpated from its range in the DeBeque Canyon/Roan Creek areas in the mid-1900's (Duckett 2006). This herd was re-established through translocations in 2003 and 2004. The primary factor currently influencing, and that will continue to influence, the growth and establishment of this herd is the ongoing impacts of respiratory disease that has affected adult survival and long-term lamb recruitment. It is likely that the respiratory disease is a result of a highly virulent strain of Pasturella (a bacteria), that was brought in with the translocation in 2004 of bighorn sheep from Almont, Colorado as part of the reintroduction effort. There are currently approximately 40 individuals in the Main Canyon herd (Duckett 2012).

Pronghorn antelope occur across the GJFO planning area in the lower elevation desert areas in the Colorado and Gunnison River valleys.

Other Priority Mammal Species. White-tailed prairie dogs (*Cynomys leucurus*) and the many species that are associated with this keystone species are present in the lower elevations of the GJFO planning area. This sensitive species is described further in **Section 3.2.8**, Special Status Species.

Numerous bats use the abandoned mines and natural caves in the GJFO planning area. The Townsend's big-eared bat (*Corynorhinus townsendii)* is known to occur in the planning area. There are two known maternity roosts in the planning area, one of which, the Pup Tent mine site, was withdrawn in 2008 from settlement, sale, location, or entry under the general land laws, including the mining laws, subject to valid existing rights. The second location is within a leased coal area. A study was conducted in 2006 to determine which bat species were using the areas around the Book Cliffs. The most common species observed was the silver-haired bat (Lasionycteris noctivagans), followed by the big brown bat *(Eptesicus fuscus)*, hoary bat *(Lasiurus cinereus),* and long-legged bat *(Macrophyllum macrophyllum)* (Chung-MacCoubrey 2008).

The CPW has reintroduced moose on US Forest Service lands at the top of the Grand Mesa. Moose are likely to disperse to lower elevations on adjacent BLM lands at least seasonally as numbers increase.

Additional species of management concern are black bear and mountain lion, both of which occur throughout the GJFO planning area in appropriate habitat. The GJFO planning area provides habitat for a number of other mammals of management and conservation concern. Special status mammals are discussed in **Section 3.2.8**, Special Status Species.

Trends

For most fish and wildlife species, habitat loss and fragmentation have been and remain the primary cause for declines. Some of these species have also suffered from historic efforts to extirpate them, and some suffer competition or predation from species that have expanded their range or that have been introduced. Management efforts by the BLM, USFWS, CPW, and others have reversed the downward trend for a number of these populations, but few populations are near their historic levels.

The GJFO does not have monitoring data for most species. However, the CPW maintains monitoring data for some species and a few local and national trends have been documented by the BLM and others including:

- The CPW designates and surveys big game Data Analysis Units, which are intended to encompass one herd's range throughout the year. Several Data Analysis Units overlap the GJFO planning area. Based on the most recent CPW elk population estimates in

overlapping Data Analysis Units and the percentage of these Data Analysis Units within the GJFO, there are an estimated 93,000 elk in the GJFO planning area (CPW 2010a). This estimate is 13 times the 1987 RMP goal of providing habitat for 2,950 elk in winter.

- The number of mule deer appears to be relatively stable in the long term. There are an estimated 37,500 mule deer in the GJFO planning area (CPW 2010a), which exceeds the 1987 RMP goal of providing habitat for 34,400 mule deer in winter.
- Recent CPW surveys suggest pronghorn numbers are declining in the herd south of Whitewater, Colorado, and that the herd west of Grand Junction is stable to declining.
- Nationally, 76 percent of bird species that only breed in arid lands have declined since 1976 (North American Bird Conservation Initiative, US Committee 2009).

Although well below historic levels, wetland breeding birds have shown steady increases in numbers nationally since the late 1970s when policies shifted from draining to protecting wetlands (North American Bird Conservation Initiative, US Committee 2009).

3.2.8 Special Status Species

Special status species and the ecosystems upon which they depend require special management consideration to promote their conservation on BLM-administered lands. Species may need to be designated as special status species for variety of reasons: because they are species that are naturally occurring rare species, or due to consequences of habitat loss or modification, competition, disease, predation, overharvest. Such species may or may not be legally protected by federal or state agencies. BLM land management practices are intended to sustain and promote species that are legally protected by the Endangered Species Act or similar state laws and prevent species that are not yet legally protected from needing such protection.

Current Conditions

Species discussed in this section have been listed by the USFWS (USFWS 2009a), listed by the CPW (CPW 2007), or placed on the Colorado BLM State Director's Sensitive Species List (BLM 2009e). **Table 3-15**, Fish and Wildlife Species of Primary Interest in BLM's Environmental Planning, in **Section 3.2.7**, Fish and Wildlife, lists fish and wildlife species of primary interest to the BLM in the GJFO planning area, including all special status species that could occur. Federal threatened and endangered species and designated critical habitat crucial to species viability are managed by the USFWS in cooperation with other federal agencies to support recovery. Species identified by the State of Colorado and Colorado BLM are treated similarly in terms of protection measures. BLM, USFWS, and the State of Colorado have developed formal and informal agreements to provide guidance on the management of species within

the GJFO planning area. Consultation with USFWS is required on any action proposed by the BLM or by another federal agency that may affect a listed species or that could jeopardize the continued existence of a species or modify designated critical habitat under Section 7 of the ESA.

Species considered for designation on the Colorado BLM sensitive species list (BLM 2009e) were reviewed against the following criteria:

- Species occurs on BLM Colorado public lands;
- Native species;
- Species has a documented or predicted downward trend such that the species is at risk across all or a significant portion of its range;
- Species inhabits ecological refugia or unique/specialized habitats;
- Actions on BLM lands may influence habitats or species populations to a degree that the species is at risk across all or a significant portion of its range;
- BLM has the capability to significantly affect the conservation status of the species through management;
- Species occur in small or widely dispersed populations; and
- Species is under status review by USFWS or is being managed under a Species Conservation Management Plan.

There are seven federally listed species and four candidate species for federal listing that have been documented or have critical habitat in the GJFO planning area, including four species that are candidates for federal listing (UFSWS 2009a). Many of these federally listed species are also listed by the State of Colorado (CPW 2007). Other species that are only on the BLM sensitive species list (BLM 2009e) or that are listed by the State of Colorado (CPW 2007) are also discussed below. Information on the distribution of special status species in the GJFO planning area is derived from project-related biological surveys, Colorado Natural Heritage Program (CNHP) data, Land Health Assessment comments, CPW GIS data, and other sources. Inventories have been completed across portions of the field office for some of the listed and candidate plant, fish, and wildlife species. Specific management direction to influence habitat components, leading to species recovery, is integrated into BLM management plans. Designated critical habitat for four fish species exists within the GJFO planning area (USFWS 2009a).

Plants

The spineless hedgehog cactus *(Echinorcereus triglochidiatus* var. *inermis)* was included as a federally endangered species in the 1987 RMP (BLM 1987). This species has been delisted and is no longer included as a listed species in the planning area.

The spineless hedgehog cactus was listed as federally endangered on November 7, 1979 (USFWS 1979). The GJFO 1987 RMP designated 51,452 acres as sites protected from surface disturbance to protect the spineless hedgehog cactus. The spineless hedgehog cactus was delisted on September 22, 1993 (USFWS 1993) under the ESA species status code DO (delisted taxon, erroneous commercial data). The spineless hedgehog cactus was found to be a spineless variety of the red-flowered hedgehog cactus *(E t.* var. *melanacanthus)*, which is widespread in Utah, Colorado, and Mexico. The spineless hedgehog cactus is no longer a BLM sensitive species (BLM 2009e).

Federally Listed Species. The following three plants within the GJFO planning area are identified as federal listed species:

- Colorado hookless cactus *(Sclerocactus glaucus)*–Threatened;
- DeBeque phacelia *(Phacelia submutica)*–Threatened; and
- Parachute penstemon *(Penstemon debilis)*–Threatened.

Colorado Hookless Cactus. The Colorado hookless cactus (*Sclerocactus glaucus*, formerly Uinta Basin hookless cactus, see the following paragraph) occurs mainly in the DeBeque area (north and south of Interstate 70) and in the Whitewater area within the planning area. The GJFO 1987 RMP designated 131,503 acres as sites protected from surface disturbance to protect the Uinta Basin hookless cactus. The cactus typically occurs on gravelly or rocky surfaces on river terrace deposits and lower mesa slopes and in desert shrub communities (CNHP 1999) dominated by shadscale, galleta grass *(Pleuraphis jamesii)*, sagebrush, and Indian ricegrass *(Oryzopsis hymenoides)*. It occasionally occurs in pinyon-juniper or greasewood and cheatgrass communities. The Colorado hookless cactus flowers between April and May and may be visible only when flowering (CNHP 1999). The Colorado hookless cactus is found in the Pyramid Rock ACEC (Colorado Natural Areas Program [CNAP] 2009). The Colorado hookless cactus is being monitored by the BLM; however, existing data are insufficient to determine present population trends. Ongoing monitoring is expected to fill in data gaps during the life of the RMP.

The taxonomy of the Colorado hookless cactus (*Sclerocactus glaucus* complex) has changed since the 1987 RMP was prepared. The USFWS now recognizes the Uinta Basin cactus as three separate species: the Colorado hookless cactus *(S. glaucus)*, the Uinta Basin cactus *(S. wetlandicus)*, and the Pariette cactus *(S. brevispinus)*. The Uinta Basin and Pariette cacti only occur in Utah, which is outside of GJFO planning area.

DeBeque Phacelia. The DeBeque phacelia *(Phacelia submutica)* is a federally listed threatened species (USFWS 2011a). The DeBeque phacelia is endemic to exposures of chocolate to purplish brown and dark charcoal gray alkaline clay soils of the Atwell Gulch and Shire Members of the Wasatch Formation, including Pyramid Rock ACEC. The soils are characterized by large cracks due

to the shrink-swell potential of the clays. Within the planning area, the DeBeque phacelia is primarily dependent on BLM-administered lands for survival (CNAP 2009).

A total of 24,987 acres of critical habitat has been designated for DeBeque phacelia within nine critical habitat units (CHUs): Sulphur Gulch, Pyramid Rock, Roan Creek, DeBeque, Mount Logan, Ashmead Draw, Baugh Reservoir, Horsethief Mountain, and Anderson Gulch. BLM-administered lands within the GJFO planning area cover 21,558 acres of these CHUs (USFWS 2011b).

Parachute Penstemon. The Parachute penstemon *(Penstemon debilis)* is a federally listed threatened species (USFWS 2011a). The species is endemic to oil shale outcrops on the southern escarpment of the Roan Plateau in Garfield County. Parachute penstemon grows on steep slopes of white shale talus at 8,000 to 9,000 feet elevation and occurs within the GJFO planning area and Colorado River Valley Field Office. The species is found only on the Parachute Creek Member of the Green River Formation. There are seven known occurrences of the Parachute penstemon, two of which are wholly or partially on BLM-administered lands within the GJFO planning area.

Within the GJFO planning area, Parachute penstemon is found on Mount Logan, where there are estimated to be less than 550 plants. The Mount Logan Mine population extends along and is fragmented by an old OXY mining road (OXY USA WTP LP, a subsidiary of Occidental Petroleum). Although OXY is no longer using this road, state-required storm water management of the site and access road is ongoing. This management is anticipated to impact individual Parachute penstemon plants located within and along the access road. The Mount Logan Mine population is being monitored by the BLM in cooperation with Colorado State Parks, CNAP, CNHP, and USFWS.

Scattered plants were also found within the Colorado River Valley Field Office in Smith Gulch, an outwash far below the expected elevation for this species. This may mean that there are more populations in the GJFO planning area at lower elevations, however none are known at this time.

Four CHUs have been designated for Parachute penstemon: Brush Mountain, Cow Ridge, Mount Callahan, and Anvil Points. The Brush Mountain and Cow Ridge CHUs cover a total of 6,256 acres, all on BLM-administered lands. Eleven percent (868 acres) of the Mount Callahan CHU is on BLM-administered lands within the planning area. The Anvil Points CHU is not within the planning area (USFWS 2011b).The Parachute penstemon is also found on Mount Callahan, approximately three miles east of the planning area within the Colorado River Valley Field Office. The private land is owned by OXY. OXY entered into a voluntary conservation effort with CNAP. To conserve the Parachute penstemon, CNAP and OXY designated Mount Callahan State Natural Area (CNAP 1987) and recently designated Mount Callahan Saddle State Natural Area, an additional 360 acres (CNAP 2008). OXY also agreed to best

management practices for drilling near the Parachute penstemon, including buffer zones, weed control, and addressing storm water impacts (Colorado Rare Plant Conservation Initiative 2009).

BLM Sensitive Species. Twenty-five plant species that are on the Colorado BLM State Director's Sensitive Species List are known to occur within the GJFO planning area (BLM 2009e). As shown on **Table 3-16**, BLM Special Status Plant Species, 11 of the 25 species have a CNHP rank of State 1, critically imperiled. The definitive distribution of these species within the GJFO planning area is not known. Species locations that occur outside the GJFO planning area (such as private land, Colorado National Monument, and Rabbit Valley) are shown in Table 3-16 because they may provide information about the potential locations of nearby unknown populations of special status plant species within the GJFO planning area.

Table 3-16
BLM Special Status Plant Species

Common Name	Scientific Name	Federal Listing	CNHP Global/ State Ranking (G_/S_)[1]	Ecological Description	Known Locations within the GJFO Planning Area
Narrow-stem gilia	*Aliciella stenothyrsa (Gilia stenothyrsa)*	Not listed	**G3/S1**	Clay hills	Coal Canyon
Jones' bluestar	*Amsonia jonesii*	Not listed	**G4/S1**	Powder-blue flowers bloom in May. Runoff-fed draws on sandstone, desert steppe	Rabbit Valley
DeBeque milkvetch	*Astragalus debequaeus*	Not listed	G2/S2	Purple flowers bloom from late April to May. Varicolored, fine textured, seleniferous, saline soils of the Wasatch Formation-Atwell Gulch Member. Barren outcrops of dark clay interspersed with lenses of sandstone. Elevation ranges from 5,100 to 6,400 feet. Endemic to Colorado, in the Colorado River Valley near DeBeque	Pyramid Rock, Atwell Gulch, DeBeque to Mesa
Horseshoe milkvetch	*Astragalus equisolenis*	Not listed	**G5T1/S1**	Flowers from early May to June. Typical habitat consists of sagebrush, shadscale, horsebrush, and other mixed desert shrub communities	Gateway

Table 3-16
BLM Sensitive Plant Species

Common Name	Scientific Name	Federal Listing	CNHP Global/ State Ranking (G_/S_)[1]	Ecological Description	Known Locations within the GJFO Planning Area
Grand Junction milkvetch	*Astragalus linifolius*	Not listed	G3Q/S3	Flowers from early May to June, has grass-like leaves. Grows on the Chinle and Morrison Formations, with pinyon-juniper and sagebrush on canyon sides. Elev. 4,800 to 6,200 feet. Endemic to Colorado	Rough Canyon
Ferron milkvetch	*Astragalus musiniensis*	Not listed	**G3/S1**	Flowers from late April to early June. Gullied bluffs, knolls, benches and open hillsides; in pinyon-juniper woodlands or desert shrub (sagebrush) communities, mostly on shale, sandstone, or alluvium derived from them. Elev. 4,700 to 7,000 feet. Endemic to Colorado (Mesa and Garfield Counties) and Utah	Badger Wash
Naturita milkvetch	*Astragalus naturitensis*	Not listed	G2G3/S2S3	Flowers from April to June. Sandstone mesas, ledges, crevices and slopes in pinyon-juniper woodlands. Elev. 5,000 to 7,000 feet. Found in Mesa, Montrose, and Montezuma Counties	Pyramid Rock, DeBeque
Fisher Tower's milkvetch (named for Fisher Towers, Utah)	*Astragalus piscator*	Not listed	**G1?/S1**	Pale lilac flowers bloom from late April to early June. Sandy, sometimes gypsiferous soils of valley benches and gullied foothills. Elev. 4,300 to 5,600 feet. Endemic to Colorado and Utah, Dolores River Valley	Dolores River
San Rafael milkvetch	*Astragalus rafaelensis*	Not listed	**G3Q/S1**	White or pale purple flowers bloom from late April to early June. Gullied hills, washes, and talus under cliffs; in seleniferous clayey, silty, or sandy soils. Elev. 4,400 to 6,500 feet. Endemic to Colorado and Utah, Dolores Canyon bottom	Gateway
Grand Junction suncup	*Camissonia eastwoodiae*	Not listed	G2/S1	Flowers in early spring. Adobe hills in the lower valleys.	North Desert
Gypsum Valley cateye	*Cryptantha gypsophila*	Not listed	G1G2/S1S2	Gypsum outcrops	Gateway

Table 3-16
BLM Sensitive Plant Species

Common Name	Scientific Name	Federal Listing	CNHP Global/ State Ranking (G_/S_)[1]	Ecological Description	Known Locations within the GJFO Planning Area
Osterhout cryptanth	*Cryptantha osterhoutii* (*Oreocarya osterhoutii*)	Not listed	**G3/S1S2**	Small sized plant. Flowers from April to early June. Dry, barren sites, in reddish-purple decomposed sandstone. Elev. 4,500 to 6,100 feet	Colorado National Monument, Rabbit Valley, Gateway
Kachina daisy, Kachina fleabane (named for Kachina Natural Bridge, Utah)	*Erigeron kachinensis*	Not listed	**G2/S1**	Flowers from May to July. Saline soils in alcoves and seeps in sandstone canyon walls. Elev. 4,800 to 5,600 feet. Endemic to Colorado and Utah	Dolores River
Grand buckwheat	*Eriogonum contortum*	Not listed	G3/S2	Flowers from May to August. Mancos Shale badlands, with shadscale and other salt desert shrub communities. Elev. 4,500 to 5,100 feet. Endemic to Colorado and Utah, Colorado River Valley	Badger Wash, North Fruita Desert
Tufted green gentian	*Frasera paniculata*	Not listed	**G4/S1**	Endemic to Colorado, Mesa County	Gateway
Piceance bladderpod	*Lesquerella parviflora*	Not listed	G2/S2	Flowers from June to early July. Shale outcrops of the Green River Formation, on ledges and slopes of canyons in open areas. Elev. 6,200 to 8,600 feet. Endemic to Colorado, in Garfield, Mesa, and Rio Blanco Counties	Green River Formation, Book Cliffs north of DeBeque
Canyonlands biscuitroot, Wideleaf biscuitroot	*Lomatium latilobum (Aletes latilobus)*	Not listed	**G1/S1**	Flowering from April/May to early June. Pinyon-juniper and desert shrub communities; sandstone ledges and canyons in sandy soils derived from the Entrada Formation or the contact point of the Wingate and Chinle Formations. Elev. 5,000 to 7,000 feet. Endemic to Colorado and Utah	Pyramid Rock, DeBeque
Dolores River skeleton plant	*Lygodesmia doloresensis*	Not listed	**G1G2/S1**	Endemic on the benches of the Dolores River Valley	Gateway, Rabbit Valley

Table 3-16
BLM Sensitive Plant Species

Common Name	Scientific Name	Federal Listing	CNHP Global/ State Ranking (G_/S_)[1]	Ecological Description	Known Locations within the GJFO Planning Area
Roan cliffs blazingstar, Southwest stickleaf	*Mentzelia rhizomata (M. argillosa, Nutallia argillosa)*	Not listed	G2/S2	Flowers from late June to July/August. Steep eroding talus slopes of shale, Green River Formation. Elev. 5,800 to 9,000 feet. Endemic to Colorado and Utah, Parachute Creek drainage	Mount Callahan (private), Book Cliffs north of DeBeque
Eastwood's monkeyflower	*Mimulus eastwoodiae*	Not listed	G3G4/S1	Flowers from late July to early September. Shallow caves and seeps on steep canyon walls. Elev. 4,700 to 5,800 feet	Dolores River
Aromatic Indian breadroot	*Pediomelum aromaticum*	Not listed	G3/S2	Mixed pinyon-juniper	Pyramid Rock, DeBeque
Sun-loving meadowrue	*Thalictrum heliophilum*	Not Listed	G2/S2	Flowers June-July/July-August. Found in open sunny sites on sparsely vegetated, steep shale slopes of the Green River Formation. Elev. 6,300 to 8,800 feet. Endemic to Colorado, Garfield, Mesa, and Rio Blanco Counties	Book Cliffs north of DeBeque
Parachute Penstemon, Parachute beardtongue	*Penstemon debilis*	T	**G1/S1**	Flowers mid-June to mid-July. Sparsely vegetated, south facing, steep, white shale talus of the Parachute Creek Member of the Green River Formation. Soils are a mixture of thin shale fragments and clay. Typical elev. 8,000 to 9,000 feet, but can occur down slope. Endemic to Colorado, Garfield County	Mount Callahan (private), Logan Wash Mine

Table 3-16
BLM Sensitive Plant Species

Common Name	Scientific Name	Federal Listing	CNHP Global/ State Ranking (G_/S_)[1]	Ecological Description	Known Locations within the GJFO Planning Area
DeBeque Phacelia	*Phacelia submutica*	T	G4T2/S2	An annual plant with small cream flowers that bloom late April-June/May-June. Late in the summer, submutica shrivels up and may be washed or blown away. Sparsely vegetated, steep slopes; chocolate-brown or gray clay; Atwell Gulch and Shire Members of the Wasatch Formation. Soils often have large cracks because of the high shrink-swell potential of the clays. Elev. 4,700 to 6,200 feet. Endemic to Colorado, Garfield and Mesa Counties	Pyramid Rock, DeBeque, Sunnyside Road
Colorado hookless cactus	*Sclerocactus glaucus*	T	Not assigned yet after taxonomy change	Flowers April to May. Plants are usually only visible when flowering. Rocky hills, mesa slopes, and alluvial benches; in desert shrub communities. Elev. 4,500 to 6,000 feet. Endemic to Colorado	Pyramid Rock, Atwell Gulch, South Shale Ridge, DeBeque, Whitewater

Source: CNHP 1999; Weber and Wittmann 2001
[1]CNHP ranking system is as follows:
1 = Critically Imperiled (Example: G1 = Globally Ranked Critically Imperiled; critically imperiled species are shown in bold font)
2 = Imperiled (Example: N2 = Nationally Ranked Imperiled)
3 = Vulnerable to Extirpation (Example: S3 = State Ranked Vulnerable to Extirpation)
4 = Apparently Secure
5 = Demonstrably Widespread, Abundant, and Secure
T = Gives the rank of a separate taxon (i.e., the rank of a subspecies or a variety)
? = Inexact or Uncertain rank. See CNHP's Rare Plant Field Guide for a full description of ranks (CNHP 2009)

Fish

Five federally listed fish species and four BLM sensitive species occur or have habitat within the GJFO planning area (USFWS 2009a, BLM 2009e). Several of these species also have state designations (CPW 2007) (see **Table 3-15**, Fish and Wildlife Species of Primary Interest in BLM's Environmental Planning, in **Section 3.2.7**, Fish and Wildlife). These species are discussed below.

Native Cutthroat Trout Species. The cutthroat trout is the most diverse trout species in North America, and its historical distribution covers the broadest

range of any stream dwelling trout in the Western Hemisphere. The rugged topography of their range has led to isolation, which in turn has given rise to fourteen recognized subspecies. Four of these evolved in Colorado: the Colorado River cutthroat trout *(Oncorhynchus clarkii plueriticus)* in drainages west of the Continental Divide, Greenback cutthroat trout *(Oncorhynchus clarkii stomias)* in the South Platte and Arkansas River drainages, the Rio Grande cutthroat trout *(O. c. virginalis)* in streams that drain into the San Luis Valley, and the extinct yellowfin cutthroat trout *(O. c. macdonaldi)* that was historically found in Twin Lakes at the headwaters of the Arkansas drainage.

The three remaining subspecies in Colorado have seen dramatic reductions in their range, precipitated primarily by the introduction of nonnative salmonids. Rainbow trout hybridize with native cutthroat trout and brook and brown trout tend to outcompete them in streams and rivers. In an effort to preserve the legacy of these fish, multi-agency conservation teams have been established for each subspecies. These teams have been working on conservation actions and measures to improve conditions and status of all three subspecies. All three Colorado subspecies look very similar and all three are special status species (Greenback cutthroat are federally listed as threatened, Rio Grande cutthroat are candidates for listing under ESA, and Colorado River cutthroat are BLM sensitive species and have been petitioned for listing – found to be Not Warranted by USFWS on June 13, 2007).

As these three cutthroat subspecies could not be reliably identified visually or with traditional genetic techniques, their historic range had been used to distinguish them. Colorado River cutthroat trout were considered to inhabit streams located on the west slope of the Continental Divide and Greenback cutthroat trout to inhabit the east slope of the Continental Divide. Recent advances in genetic techniques have allowed biologists to confidently identify the three subspecies. However, the new genetic findings are challenging the current paradigm on the heritage of cutthroat trout in the state. The studies confirm the existence of three genetically distinct subspecies in Colorado, but they also suggest that some key Greenback cutthroat trout populations in eastern Colorado may actually be descendants of Colorado River cutthroat trout, possibly stocked east of the Continental Divide in the late 1800's. Conversely, several conservation populations of Colorado River cutthroat trout on the west side of the Divide appear to be more closely related to Greenback cutthroat trout.

Deoxyribonucleic acid isolated from museum specimens collected from 1860-1890 is currently being evaluated in hopes of accurately delineating historic ranges of the Colorado subspecies of cutthroat trout. Comprehensive genetic assessments of current populations in Colorado are also underway to relate current distributions to historic ranges to possibly infer the influence of historic undocumented stocking on present distribution.

Until additional information clarifies the relationship between the two subspecies, biologists are recognizing two distinct lineages of cutthroat trout within the range of Colorado River and Greenback cutthroat trout. These lineages have been tentatively called Lineage CR (for Colorado River cutthroat trout) and Lineage GB (for Greenback cutthroat trout). To date, 53 populations of Lineage GB fish have been identified west of the Continental Divide. Given the uncertainty of the genetic status of the two lineages within the GJFO planning area, the term "cutthroat trout" will be used in this planning effort to refer to both Colorado River and Greenback cutthroat trout lineages.

Within the GJFO planning area, cutthroat trout have been documented in Whitewater Creek, Payne Canyon, Brush Creek (of the Buzzard Creek drainage), Brush Creek (of the Roan Creek drainage), Cabin Reservoir, Collier Creek, Little Dolores River, Left Fork Carr Creek, East Fork Big Creek, the upper reaches of Roan and the main stem of Carr Creeks and Hawxhurst and Coon Creek drainages.

Big River Fish Species. Seven big river fish species or their critical habitat are found in the GJFO planning area, including roundtail chub, bluehead sucker, flannelmouth sucker, Colorado pikeminnow, razorback sucker, bonytail, and humpback chub.

The following three species are collectively known as the "Three Species." All three have seen significant reductions in their occupied range and all three are BLM sensitive species. These fish are addressed in the document: "Range-Wide Conservation Agreement and Strategy for Roundtail Chub, Bluehead Sucker, and Flannelmouth Sucker (Colorado River Fish and Wildlife Council 2006)." BLM Colorado is one of several signatories to this agreement that include the states of Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming, the BLM in New Mexico, Utah, and Wyoming, and the Park Service's Intermountain Region, as well as the Jicarilla Apache Nation. As a signatory, BLM Colorado has made commitment to implement identified strategies to improve habitat conditions, minimize negative effects, and improve populations. These efforts are intended to preclude the need to list them as threatened or endangered under the ESA.

Roundtail Chub. This species inhabits pools and rapids of moderate to large rivers and large reservoirs and selects cobble-rubble, sand-cobble, or sand-gravel substrate in association with undercut banks, fallen logs, or other overhead cover (Rees et al. 2005a). Within the GJFO planning area, roundtail chub have been observed in the Dolores, Gunnison, and Colorado Rivers and their major tributaries, including but not limited to Plateau Creek and East Salt Wash.

Bluehead Sucker. This species inhabits a variety of habitats from headwater streams to large rivers, in moderate to fast-flowing water above a rubble-rock substrate (Ptacek et al. 2005). Young fish prefer quiet, shallow areas near the shoreline. In the GJFO planning area, bluehead suckers have been observed in

the Dolores, Gunnison, and Colorado Rivers and their major tributaries, including, but not limited to, Blue Creek, West Creek, Bieser Creek, East Salt Creek, Carr Creek, and Plateau Creek.

Flannelmouth Sucker. This species is found in a wide variety of habitats, ranging from riffles to backwater areas to large pools, in larger rivers and streams (Rees et al. 2005b). Within the GJFO planning area, these fish are found primarily in the Dolores, Colorado, and Gunnison Rivers and portions of the major tributaries to these rivers where no barriers preclude movement between the river and the streams. Some tributary streams may be used seasonally for spawning. Threats to flannelmouth sucker, bluehead sucker, and roundtail chub include impairment of water quality, disease, introductions of nonnative fish, predation, hybridization, reductions in flow, and physical changes and loss of important habitats. Plateau Creek provides habitat for all three species and is believed to be used year-round by these species.

BLM Colorado is a signatory to the Range-Wide Conservation Agreement and Strategy for Roundtail Chub, Bluehead Sucker, and Flannelmouth Sucker (Colorado River Fish and Wildlife Council 2006), which was developed to expedite implementation of conservation measures for these three species across their range as a collaborative and cooperative effort among resource agencies.

Colorado Pikeminnow, Razorback Sucker, Bonytail, and Humpback Chub. All four of these native fish are federally listed as endangered under the ESA. Ongoing efforts to recover these fish in Colorado are being led by the Upper Colorado River Endangered Fish Recovery Program, a partnership of local, state, and federal agencies, water and power interests, and environmental groups. Initiated in 1988, primary work includes restoring and managing stream flows and habitat, boosting wild populations with hatchery-raised endangered fish, and reducing negative interactions with certain nonnative fish species.

Within the GJFO planning area, the 100-year floodplain of the Colorado River from the eastern boundary of the GJFO to the Utah state line and beyond, as well as the 100-year floodplain of the Gunnison River from the southern GJFO boundary to the confluence with the Colorado River, is designated critical habitat for the Colorado pikeminnow (squawfish) and razorback sucker (USFWS 1994). Designated critical habitat for bonytail and humpback chub is located along the Colorado River from the Interstate 70 Exit 90 bridge to the Utah state line and beyond to Lake Powell, Utah (USFWS 1994). All four species require a diversity of habitats at varying life stages. Colorado pikeminnow generally prefer swift-flowing turbid rivers with quiet, warm backwaters and adequate spawning substrates (USFWS 1994). The humpback chub prefers deep turbid pool habitats often found in canyon-bound portions of the Upper Colorado River system (USFWS 1994). This species is found in the Black Rocks area near the Colorado-Utah border and in Westwater Canyon west into Utah

along the Colorado River (USFWS 1994). The razorback sucker is most often found in quiet, muddy backwaters along the Colorado River but uses main channel habitats as well (USFWS 1994). The bonytail chub is extremely rare in Colorado, and no self-sustaining populations exist throughout the Colorado River Basin (USFWS 1994). This species prefers swift turbid reaches of the Colorado River basin but is now found only in portions of the Green River and Lake Mohave (USFWS 1994). The alteration of habitats due to construction and operation of large dams that capture sediment, reduce water temperatures, change river morphology below the dams, and cut off migration corridors is one of the major factors that have contributed to the decline of these species (USFWS 1994). Other factors that have contributed to their decline include reductions in water flow caused by water diversions and other water-depleting activities, and introductions of nonnative predatory game fish species such as smallmouth bass, northern pike, and channel catfish. A recovery program managed by USFWS has been underway for several years. Threats to these fish include impairment of water quality, disease, introduction of nonnative fishes, hybridization, reductions in flow, and physical changes and loss of important habitats.

Amphibians

Four BLM sensitive amphibian species occur in the GJFO planning area (BLM 2009e) (see **Table 3-15**, Fish and Wildlife Species of Primary Interest in BLM's Environmental Planning, in **Section 3.2.7**, Fish and Wildlife). Two of these species also have state designations.

Federally Listed or Candidate Species. No amphibians listed as threatened or endangered under the ESA are known to exist in the GJFO planning area (USFWS 2009a).

BLM Sensitive Species. Four BLM sensitive species of amphibians are known to occur in the GJFO planning area (BLM 2009e) (see **Table 3-15**, Fish and Wildlife Species of Primary Interest in BLM's Environmental Planning, in **Section 3.2.7**, Fish and Wildlife).

Boreal Toad (Bufo boreas boreas). This toad species inhabits a variety of wet habitats, including marshes, wet meadows, streams, beaver ponds, glacial kettle ponds, and lakes interspersed in subalpine forest at altitudes primarily between 8,000 and 11,500 feet (USFWS 2009c). There has been one observation of this species within the GJFO, just south of Collbran in 1991. There are numerous observations of the species on the Grand Mesa on National Forest lands (Lampert 2006). BLM lands within the GJFO are generally lower that what the species typically inhabits. Additional information on the species and recovery efforts can be found in the 2001 Conservation plan and agreement for the management of the southern rocky mountain population of the boreal toad.

Canyon Treefrog (Hyla arenicolor). This frog is largely restricted to riparian areas in rocky canyons. It is typically found along streams among medium to large

boulders from desert to desert grassland and into oak-pine forests (Stebbins 1985). Within the GJFO planning area, it is found in rocky canyons south of the Colorado River and west of the Gunnison River.

Great Basin Spadefoot (Spea intermontana). This toad occurs mainly in sagebrush flats, semi-desert shrublands, and pinyon-juniper woodland. This species digs its own burrow in loose soil or uses those of small mammals, and it breeds in temporary or permanent water, including rain pools, pools in intermittent streams, and flooded areas along streams (NatureServe 2009). Within the GJFO, it occurs from the Book Cliffs to Glade Park.

Northern Leopard Frog (Rana pipiens). This frog generally inhabits permanent water with rooted aquatic vegetation (NatureServe 2009). Northern leopard frog was observed in all corners of the GJFO during surveys conducted in 2008 (BLM 2008g).

Reptiles

Federally Listed or Candidate Species. No ESA-protected reptile species are known to occur in any of the counties in the GJFO planning area (USFWS 2009a).

BLM Sensitive Species. Three BLM sensitive species have been documented in the planning area (BLM 2009e).

Long-Nosed Leopard Lizard (Gambelia wislizenii). Habitat for this lizard includes desert and semidesert areas with scattered shrubs or other low plants such as creosotebush and sagebrush, especially areas with abundant rodent burrows (Stebbins 1985).

Midget Faded Rattlesnake (Crotalus oreganus concolor). Habitat for this snake is high, cold desert dominated by sagebrush with an abundance of rock outcrops and exposed canyon walls. Greasewood, juniper, and other woody plants may occur in some areas (Travsky and Beauvais 2004).

Milk Snake (Lampropeltis triangulum). Habitat for this BLM sensitive subspecies of milk snake is not well documented.

Birds

Eighteen special status bird species occur or have the potential to occur in the GJFO planning area (USFWS 2009a, CPW 2007, BLM 2009e) (see **Table 3-15**, Fish and Wildlife Species of Primary Interest in BLM's Environmental Planning, in **Section 3.2.7**, Fish and Wildlife).

Federally Listed or Candidate Species. The Mexican spotted owl *(Strix occidentalis lucida)* and southwestern willow flycatcher *(Empidonax traillii extimus)* are two species listed under the ESA that have never been documented on

BLM-administered lands within the GJFO planning area but that have some potential to occur. The western yellow-billed cuckoo and greater sage-grouse are candidate species that occur in the planning area.

Mexican Spotted Owl. The Mexican spotted owl can be found in the forested mountains and canyons of central and western Colorado and southern Utah south through Arizona and New Mexico into Central Mexico. The owl's distribution in this range is not contiguous but occurs in patches of suitable habitat. Mexican spotted owl uses mixed-conifer forests throughout most of their range (USFWS 1995). The Mexican spotted owl occurs in southwestern Colorado but has never been recorded on BLM-administered lands within the GJFO planning area. While potential habitat for the species does occur in the GFJO planning area, the closest designated critical habitat for the species occurs approximately 30 miles southwest of the field office boundary in San Juan County, Utah (USFWS 2004).

Southwestern Willow Flycatcher. This songbird requires extensive riparian habitat with dense patches of trees or shrubs with slow to still water available at or near nesting habitat (USFWS 2002). The GJFO planning area is on the edge of the range of the southwestern willow flycatcher. This subspecies has never been recorded in the GJFO, and the USFWS no longer lists the species as potentially occurring in Mesa County (USFWS 2009a).

Western Yellow-Billed Cuckoo (Coccyzus americanus). This subspecies' habitat includes old-growth riparian woodlands with dense understories (Carter 1998). Potential habitat for the cuckoo exists along the Colorado, Gunnison, and Dolores Rivers within the GJFO planning area. During surveys conducted in 1998, one presumed pair was located at Corn Lake State Park, along the Colorado River within the planning area.

Greater Sage-grouse. In March 2010, the USFWS announced a 12-month finding that listing the greater sage-grouse (rangewide) is warranted, but precluded by higher priority listing actions (USFWS 2010). The species was placed on the candidate list range-wide. The Parachute-Piceance-Roan (PPR) population of the greater sage-grouse occurs on the northeastern side of the GJFO planning area (**Figure 3-11**, Sage-grouse Habitat), and Colorado has identified 5,600 acres of Preliminary Priority Habitat (PPH) and 8,900 acres of Preliminary General Habitat (PGH). The Colorado Greater Sage-grouse Conservation Plan (Colorado Greater Sage-grouse Steering Committee 2008) shows a larger portion of the GJFO planning area as potential pre-settlement habitat based on historic sagebrush distribution, encompassing everything above the Book Cliffs and portions of the Grand Mesa slopes (though the plan identifies this as an area where the species of sage-grouse is uncertain). Sixteen active and inactive greater sage-grouse leks occur within the GJFO planning area; three occur on BLM-administered lands, and thirteen occur on private lands. Of these sixteen leks, seven are considered active; two of the active leks occur on BLM-

administered lands. In the winter of 2008, sage-grouse droppings were found within the GJFO just north of the town of Mesa, in an area between occupied Gunnison sage-grouse habitat and greater sage-grouse habitat. A follow-up study was conducted in the winter of 2009 by the Rocky Mountain Bird Observatory where numerous droppings and cecal casts were discovered, suggesting the area is an important wintering area. Genetic information could not be collected from the droppings and cecal casts, therefore the species of sage-grouse (Gunnison or greater) is still unknown (Beason 2009), but is believed to be greater sage-grouse. More detailed information on this population can be found in the PPR Conservation Plan (PPR Greater Sage-grouse Work Group 2008), the Colorado Greater Sage-Grouse Conservation Plan (Colorado Greater Sage-grouse Steering Committee 2008), and the Western Association of Fish and Wildlife Agencies' Greater Sage-grouse Comprehensive Conservation Strategy (Stiver et al. 2006).

Gunnison Sage-grouse. In September 2010, the USFWS announced a 12-month finding that listing the Gunnison sage-grouse is warranted, but precluded by higher priority listing actions, and the species was placed on the candidate list (75 *Federal Register* 187 [28 September 2010], pp. 59804-59863). The Piñon Mesa population of Gunnison sage-grouse occurs entirely within the GJFO planning area in the Glade Park area (**Figure 3-11**, Sage-grouse Habitat). Historically, leks occurred on BLM-administered lands; however, currently the birds primarily use private land in the southwest corner of Glade Park, and all active leks are on private property. The number of males attending leks has been decreasing in this area from a high of 34 in 2005 to 13 in 2011. The CPW began augmenting this population in 2010, however immediate results of increased males in lek counts were not observed as males at leks dropped from 15 in 2010 to 13 in 2011. A conservation plan for this population was completed in 2000 (Piñon Mesa Gunnison Sage-grouse Partnership 2000), and a rangewide conservation plan for the species was completed in 2005 (Gunnison Sage-grouse Rangewide Steering Committee 2005). The BLM has been actively managing public lands in the Glade Park area to improve Gunnison sage-grouse habitat through mechanical treatments and prescribed fire. Recent data on greater and Gunnison sage-grouse populations within the GJFO planning area are provided in **Table 3-17**, Estimated Sage-grouse Populations.

BLM Sensitive Species. Fifteen BLM sensitive bird species have potential to occur in the GJFO planning area (BLM 2009e) (see **Table 3-15**, Fish and Wildlife Species of Primary Interest in BLM's Environmental Planning, in **Section 3.2.7**, Fish and Wildlife).

American Peregrine Falcon. Peregrine falcons use cliff and canyon habitats for breeding. Foraging areas include riparian zones and nearshore environments where waterfowl and riparian birds may be found. The species was removed from the Endangered Species List in 1999 (USFWS 1999). This falcon has been

Table 3-17
Estimated Sage-grouse Populations

Year	High Count Males on Lek
Greater Sage-grouse (PPR Population)[1]	
1975*	234
2005*	119
2006	175
2007	125
Gunnison Sage-grouse (Piñon Mesa Population)[2]	
1995	16
1996	24
1997	23
1998	26
1999	29
2000	33
2001	31
2002	27
2003	25
2004	29
2005	34
2006	33
2007	26
2008	22
2009	16
2010	15
2011	13

[1]Source: Parachute-Piceance-Roan (PPR) Greater Sage-grouse Work Group 2008
[2]Source: CPW 2011
*Data collected between 1975 and 2005 for greater sage-grouse are considered unreliable because of varied effort and difficulty in collecting accurate lek counts in the area.

known to nest on within the GJFO since the late 1970's and there are at least 17 documented current or former nests on BLM-administered lands within the GJFO, and there are likely many more than that. Nesting sites are concentrated in DeBeque, Dolores, Ruby, and Unaweep canyons; Black Ridge; and the Book Cliffs in the eastern end of the Grand Valley.

American White Pelican (Pelecanus erythrorhynchos). This species generally breeds in colonies on islands in large bodies of water and forages up to 30 miles away in marshes, rivers, and lakes (Potter 1998). Pelicans were seen at Cheney Reservoir in 2011 and are known to forage there.

Bald and Golden Eagles. Bald eagles generally nest in large trees near rivers and lakes with abundant fish. In winter they are more transient and occur where food, including fish, waterfowl, and carrion, is available. The bald eagle was removed from the endangered species list in 2007 (USFWS 2007). Bald and golden eagles are both protected by the Bald and Golden Eagle Protection Act. Bald eagles nest on the Colorado River and winter along the Colorado, Gunnison, and Dolores Rivers and along Plateau Creek in the GJFO planning area. Golden eagles generally nest on cliffs and forage on small- to medium-sized mammals, such as rodents and rabbits, in open habitats.

Brewer's Sparrow (Spizella breweri). This sparrow occurs primarily in sagebrush habitats, particularly big sagebrush, and arrives on breeding grounds in April (Lambeth 1998). Occurrence records are across the GJFO but species trends are unknown.

Burrowing Owl. This owl occurs in sparsely vegetated grasslands, shrublands, and deserts and nests primarily in rodent burrows. In western Colorado, they use burrows of prairie dogs and ground squirrels (Jones 1998). Based on recent surveys conducted by the Rocky Mountain Bird Observatory, Burrowing owls seem to be increasing in numbers in the GJFO since an apparent drop off in numbers during the drought of 2002 (Beason 2008).

Ferruginous Hawk. This hawk inhabits ungrazed or lightly grazed grasslands and shrublands with varied topography. They tend to nest on hilltops in trees or other structure when available but also nest on the ground (Preston 1998). This species is believed to be declining in the GJFO as active nests have not been documented since the late 1990s. Monitoring of this species has not occurred since the late 1990's, however informal surveys conducted in spring 2011 indicate that areas utilized for nesting 20 years ago still show signs of possible nesting activity.

Long-billed Curlew. This large shorebird occurs primarily in shortgrass prairie with nearby standing water for feeding and drinking (Nelson 1998a). In Colorado it primarily occurs on the eastern plains but is believed to exist in Mesa County (Nelson 1998a).

Mountain Plover (*Charadrius montanus*). Mountain plovers typically breed in sparsely vegetated upland areas. The species is primarily found in upland areas and is often associated with prairie dog colonies, as prairie dogs keep the vegetation cover sparse. It has not been documented on BLM-administered lands in the GJFO planning area (BLM 2009e).

Northern Goshawk (Accipiter gentilis).This raptor requires large blocks of forest for nesting and foraging and tends to be intolerant of human disturbance around nests. Most nests occur in coniferous forests. However, details of habitat types used vary considerably (Barrett 1998).

Western Snowy Plover (Charadrius alexandrinus nivosus). Inland populations of this shorebird occur on ephemeral alkali playas, reservoir shores, and man-made habitats such as evaporation ponds (Nelson 1998b).

White-faced Ibis (Plegadis chihi). This species nests primarily in marshes with tall emergent vegetation such as cattails and rushes. They feed in marshes, other shallow water bodies, and flooded agricultural lands (Ryder 1998).

Mammals

Twelve special status mammal species occur or have some potential to occur in the GJFO planning area (USFWS 2009a; CPW 2007; BLM 2009e) (see **Table-3-8**, Fish and Wildlife Species of Primary Interest in BLM's Environmental Planning, in **Section 3.2.7**, Fish and Wildlife).

Federally Listed or Candidate Species. The GJFO planning area contains suitable habitat for two federally listed mammal species, black-footed ferret and Canada lynx. In addition, there is some potential for future occurrence of gray wolf.

Black-footed Ferret (Mustela nigripes). The black-footed ferret does not currently occur within the GJFO planning area and is unlikely to become established without reintroduction effort. This species' habitat is shortgrass and midgrass prairie to semidesert shrublands and is associated with large prairie dog colonies (USFWS 1988). Populations have been established in the White River Field Office north of Grand Junction through introductions, but these animals are unlikely to move into the GJFO planning area on their own.

Canada Lynx (Lynx canadensis). Lynx occurrence is highly correlated with the habitat of their primary prey, snowshoe hare. They occur in uneven-aged coniferous stands with relatively open canopies and well-developed understories (Fitzgerald et al. 1994). The CPW began reintroducing lynx to Colorado in 1999 (CPW 2009b). Canada Lynx has been recorded on US Forest Service-administered lands adjacent to the GJFO planning area. Several lynx analysis units have been designated in the vicinity of Collbran and provide habitat for the lynx. Primary habitat for the species occurs only in small pockets on high-elevation BLM lands. As the species' range in Colorado continues to expand, BLM lands are more likely to be used for dispersal and foraging.

Gray Wolf (Canis lupus). Historically, gray wolves were spread across North America, including Colorado and the GJFO planning area, in areas where prey density (primarily hoofed mammals) was sufficient, regardless of habitat type (Fitzgerald et al. 1994). Gray wolves reintroduced into Yellowstone National Park provide the closest source of dispersing individuals. Individuals from the Yellowstone population have been documented in Colorado in recent years. Therefore, there is some potential for wolves to occur in the GJFO planning area during the lifespan of this RMP.

BLM Sensitive Species and State-listed Species. Nine BLM sensitive species and state-designated mammals could occur in the GJFO planning area (CPW 2007, BLM 2009e).

Big Free-tailed Bat (Nyctinomops macrotis). The largest bats in Colorado occur at lower elevations, in pinyon-juniper woodlands, arid grasslands, and semidesert shrublands. They roost in crevices on cliff faces or in buildings. Its habitat requirements are not well known (Fitzgerald et al. 1994).

Desert Bighorn Sheep. Bighorn sheep prefer steep areas with good visibility, grass cover, and low shrubs (Fitzgerald et al. 1994). This subspecies of bighorn occurs south of the Colorado River and west of the Gunnison River. There are three populations of desert bighorn sheep in the GJFO planning area. These include the Black Ridge wilderness population, the Uncompahgre or Dominguez population, and the Middle Dolores River population. The Black Ridge wilderness population primarily inhabits the McInnis Canyons NCA. This herd was established by four translocations since 1979; the population is believed to be stable and estimated at 230 individuals as of 2009 (CPW 2010b). The Black Ridge and Uncompahgre populations use portions of the GJFO planning area; however, their core habitat areas are within the NCAs not included in this RMP revision. Only a very small portion of the Middle Dolores River population occurs within the GJFO planning area.

Kit Fox (Vulpes macrotis). This state endangered species occurs in semidesert shrubland and margins of pinyon-juniper woodlands, including mixed juniper-sagebrush communities and rimrock (Fitzgerald et al. 1994). Kit fox historically occurred in the GJFO planning area. The last known den site was just north of the Grand Junction Regional Airport, observed in the early 1990s. From 2008 to 2011 surveys were conducted for Kit Fox north and west of the town of Grand Junction. One probable kit fox track was found near Badger Wash, in addition CPW biologists reported seeing a kit fox just north of Badger Wash, and surveyors reported finding one probable kit fox den near Horse Mountain, just south of the Town of Palisade, in 2010. Kit fox are known to occur and active dens exist in Utah, just a few miles west of the Colorado border.

River Otter (Lontra canadensis). This state threatened species inhabits riparian areas along rivers and streams. Otters require water year-round and feed on fish and crustaceans (Fitzgerald et al. 1994). River otters were extirpated in Colorado until 1976, when the CPW began reintroducing them into major waterways. River otter occur on the Colorado and Gunnison Rivers in the GJFO planning area.

Spotted Bat (Euderma maculatum). This bat has been documented in ponderosa pine, pinyon-juniper woodlands, and open semidesert shrublands. They roost in crevices in cliffs (Fitzgerald et al. 1994). A mummified specimen of a lactating female was collected in the summer of 2011 from the Loma area providing

evidence for this species in the Grand Valley. In addition, the species has been captured in Sinbad Valley on two different occasions.

Townsend's Big-Eared Bat. This bat occurs in semidesert shrublands, pinyon-juniper woodlands, and open montane forests. It roosts in caves, mines, abandoned buildings, and cliffs (Fitzgerald et al. 1994). The Townsend's big-eared bat is known to occur in the planning area. There are two known maternity roosts in the planning area, one of which, the Pup Tent mine site, was withdrawn in 2008 from settlement, sale, location, or entry under the general land laws, including the mining laws, subject to valid existing rights. The second location is within a leased coal area.

White-tailed Prairie Dog. This colonial rodent occurs primarily in semidesert shrublands in Colorado (Fitzgerald et al. 1994). Their colonies provide habitat for numerous other species. White-tailed prairie dogs and the many species that are associated with this keystone species are present in the lower elevations of the GJFO planning area. The prairie dog populations north of the Colorado River seem to have recovered from a large plague event in the Grand Valley in the early 1990s, while the prairie dog towns south of the Colorado River are still sparsely occupied. The field office currently permits transplanting of white-tailed prairie dogs from development occurring north of the Colorado River to BLM lands on the same side of the Colorado River.

Invertebrates

BLM Sensitive Species. One special status invertebrate is known to occur in the GJFO planning area.

Great Basin Silverspot (Speyeria nokomis nokomis). This butterfly occurs in permanent spring-fed meadows, seeps, marshes, and boggy streamside meadows associated with flowing water in arid country (Selby 2007). The Unaweep Seep ACEC (**Figure 2-65**, Alternative A: Areas of Critical Environmental Concern) was established in part to protect this sensitive butterfly species.

Trends

For most of the special status species, habitat loss and fragmentation have been and remain the primary cause of their imperiled status. Some of these species have also suffered from historic efforts to extirpate them, and some suffer competition or predation from species that have expanded their range or that have been introduced. Management efforts by the BLM, USFWS, CPW, and others have reversed the downward trend for a number of these populations, but none of the populations are near their historic levels, and most remain at levels that are biologically insecure, regardless of their legal status. In addition to continued threats from habitat loss and fragmentation, variability in habitat condition is an ongoing factor in the distribution and density of these special status species. For example, population viability for special status plant, fish, and

amphibian species varies with hydrologic conditions. Soil conditions further influence the populations of plants.

The GJFO does not have monitoring data for most special status species. However, the CPW maintains monitoring data for some species and a few local and national trends have been documented by the BLM and others including::

- Declines in the distribution of Colorado River cutthroat trout have been documented in a number of sources (Behnke and Zarn 1976; Binns 1977; Martinez 1988; Young 1995).
- Peregrine falcon and bald eagle have been delisted in recent years because they met the goals set for recovery of each species.
- The number of males attending leks has been decreasing in the planning area, from a high of 34 in 2005 to 13 in 2011. The CPW began augmenting the population in 2010, but immediate results of increased males in lek counts were not observed as males at leks dropped from 15 in 2010 to 13 in 2011.
- CPW reintroduced Canada lynx to Colorado starting in 1999 and the population appears to be expanding (CPW 2009b).

3.2.9 Wild Horses

Wild horse management on BLM-administered lands of the GJFO follows the Wild Free-Roaming Horse and Burro Act of 1971 (Public Law 92-195) and 43 CFR 4700 – Protection, Management and Control of Wild and Free-Roaming Horses and Burros. There is one herd of horses within the GJFO planning area. These horses are found within the Little Book Cliffs Wild Horse Range (LBCWHR). The LBCWHR Management Plan was signed on September 24, 1979, and was updated in 1984, 1990, and 1992. On November 7, 1980, the area was dedicated as the third National Wild Horse Range in the country. In June 2002, the LBCWHR Population Management Plan was written, which amended the original plan (BLM 2002). Wild horses within the range are managed to maintain or improve rangeland conditions and remain compliant with the Colorado Standards and Guidelines that became effective in 1997.

Current Conditions

The LBCWHR is part of the larger Little Book Cliffs Herd Area (approximately 52,600 acres), which was established after passage of the 1971 Wild and Free-Roaming Horses and Burros Act. The LBCWHR is 10 miles northeast of Grand Junction and 20 miles west of DeBeque, Colorado, atop the Book Cliffs escarpment. It is 13 miles long and encompasses 36,014 acres, of which 35,189 are public and 925 are private. The Little Book Cliffs WSA makes up about two-thirds of the range (**Figure 2-4**, Alternatives A, B, C, and D: Little Book Cliffs Wild Horse Range). As reflected in the Population Management Plan, the appropriate management level changed in 2002 from a range of 65 to 125 horses, to a range of 90 to 150 horses. The boundary of the range is composed

of natural barriers, along with some fencing to prevent wild horses from leaving the range. There are no fences within the range, allowing horses to roam freely within the confines of the defined boundary. There is no authorized livestock grazing within the range.

The LBCWHR is characterized by numerous deep canyons interspersed with rugged mesas, ridges, and small drainages. Elevation varies from 7,412 feet in the far northwestern corner to 5,000 feet in Main Canyon at the southwestern boundary. The area receives 8 to 16 inches of annual precipitation, and the climate is typical of the Rocky Mountain Region, with warm summers and cold winters. Vegetation types within the LBCWHR include sagebrush/bunchgrass, saltbush, mountain shrub, and pinyon-juniper woodlands.

Several vegetation treatments have occurred at the upper elevations to improve forage for wild horses and to reduce fuel loading, particularly in the pinyon-juniper and sagebrush vegetation types. Treatments included chaining, prescribed burning, hydro-axing, and rollerchopping. Seeding the area was included in most of these treatments. Until the 1,700-acre Cosgrove Fire in 2011, wildfire had not played a major role within the range.

Besides the vegetation treatments to improve forage for wild horses, 17 springs have been developed to improve water availability. Maintenance on these springs and on fences occurs annually with the help of volunteers.

Monitoring within the LBCWHR includes exclosures, vegetation trend studies, and vegetative utilization estimates that measure grazing use by the wild horses in various areas of the range. These studies are used along with census data to determine when population reductions through gathers are needed.

The estimated population in 2008 was 121 head, which included 16 new foals. The current wild horse population is estimated to be within the current management range. The mare/stud ratio is maintained at approximately 50/50, which enables the horses to sustain smaller bands of 3 to 8 head.

Trends

To maintain populations at a sustainable level, the herd has been gathered 12 times between 1975 and 2007. Frequency of gathers has been two to four years, depending on range conditions. It is the GJFO's intent to reduce the frequency of gathers by continuing the implementation of fertility control measures. Selective removal and the introduction of wild horses from other management areas have increased the genetic diversity of the herd as well as increased the diversity of color and overall conformation.

In 2002, a fertility control research program in the LBCWHR was initiated in coordination with the Biological Research Division of the USGS. The goal of this program was to reduce the growth rate of the population. The fertility program has reduced the population growth for the herd but still allows for some

reproduction to improve or maintain genetic diversity. The use of contraceptives has long been recognized as a humane means of limiting the growth of wild horse herds while providing less disruption to the herd gene pool. Individual contracepted mares have their genetic contributions delayed but not removed. Thus far the use of fertility control has increased the timeframe between gathers, with associated cost benefits and reduction of resource impacts.

A continuation of the fertility control program should provide for a viable horse population, while reducing the number of horses removed from the range over time as a result of fewer gathers. Fewer gathers is based on a decrease in the annual population growth.

3.2.10 Wildland Fire Management

Fire, as the main disturbance agent within ecosystems of the GJFO planning area, plays a critical role in shaping vegetative characteristics. Fire suppression practices of the twentieth century have pushed some ecosystems outside their historic range of variability due to increased fuel accumulations, higher densities of trees and shrubs, and increased ladder fuels. As a result, these areas of the planning area are prone to higher-intensity wildfires than historically experienced.

Current fire management direction encourages use of planned fire, unplanned fire, and nonfire fuel reduction treatments to restore natural fire regimes and to promote the overall ecological health of public lands. Fire management decisions reflect the protection of human life as the single, overriding priority. BLM's management actions include suppression of natural and human-caused wildfires, vegetation treatments to control fire in appropriate areas (e.g., the Wildland-Urban Interface [WUI]), and the use of both planned and unplanned fire events to manage plant succession, restore ecosystem characteristics, and improve wildlife habitat.

The occurrence of wildland fire varies from year-to-year depending on weather, climatic, and other conditions. Fire occurrence and size can depend on a range of factors, including elevation, vegetative community, fuel moisture, precipitation or lack of precipitation, the ability of fire to carry in specific types of vegetation, and other climatic dynamics such as dry summer weather following a wet spring or extended periods of drought.

Current Conditions

Fire History

From 1980 to 2008, the GJFO averaged 67 fires a year covering 2,863 acres annually. The weather and fuel structure provide an opportunity for ignitions from frequent summer storms, and lightning fires have traditionally been an integral factor in the formation and arrangement of vegetation types across the GJFO planning area. Lightning accounts for 85 percent of all starts and

approximately 50 percent of the acres burned. Historically, the area has displayed a moderate to high frequency of fires (BLM 2009d).

More recently, the combination of wildfire suppression and changing land use patterns has altered the natural cycle and role of fire. Suppression actions have resulted in large, unnatural fuel loads across the landscape, while invasive species such as cheatgrass and saltcedar are fire-adapted and tend to become monoculture after a fire occurs on lower elevations (below 7,500 feet). Wildland fires will burn with greater intensities and spread more rapidly, consuming more acres than in the past under these altered landscape conditions.

The fire season for the GJFO planning area normally extends from late April to early November. The most critical fire conditions are often present from mid-June until late summer, when monsoonal moisture pushes into the area, and again from late August through October, before season-ending winter weather arrives.

Fires are categorized on the basis of period of occurrence, size class, regime, and condition class. Size class classifications range from A (one-fourth acre or less) to G (5,000 acres or more). From 1980 to 2008, 94.1 percent of the wildfires that occurred within the GJFO planning area were less than 100 acres in size, or Class A to Class C incidents. **Table 3-18**, Fire Occurrence 1980 to 2008, displays the size and number of fires by size class in the GJFO planning area for that timeframe.

Table 3-18
Fire Occurrence 1980 to 2008

Size Class[1]	A	B	C	D	E	F	G
Number of fires	1,301	369	175	41	32	21	2
Number of acres	158	982	5,375	8,788	16,849	39,965	10,917

Source: BLM 2010a
[1]Size classes are as follows: A: 0.1- 0.25 acres; B: 0.26- 9.9 acres; C: 10-99.9 acres; D: 100-299.9 acres; E: 300- 999.9 acres; F: 1,000- 4,999.9 acres; G: ≥5,000 acres

Fire Regimes

Fire regimes are used as part of the fire regime condition class (FRCC) discussion to describe fire frequency (average number of years between fires) and fire severity (effect of the fire on the dominant overstory vegetation—low, mixed, or stand replacement). These regimes represent fire intervals prior to Euro-American settlement and are calculated and classified by analyzing natural vegetation, known fire cycles, and fire history data. **Table 3-19**, Fire Regimes in the GJFO Decision Area, categorizes BLM land within the planning area into the five historical FRCCs. Much of the BLM lands within the planning area are grouped in Classes III through V. Many of those areas have sparse fuels and

Table 3-19
Fire Regimes in the GJFO Decision Area

Fire Regime	Acres	Percent of Area
I (0-35 year frequency and low to mixed severity-surface fires most common)	42,346	4
II (0-35 year frequency and high severity-stand replacement fires)	18,800	2
III (35-100+ year frequency and mixed severity)	539,158	51
IV (35-100+ year frequency and high severity-stand replacement fires)	190,180	18
V (200+ year frequency and high severity-stand replacement fires)	194,734	18
Unclassified (water, barren, and alpine/tundra)	77,496	7

Source: BLM 2008b, 2010a

other natural barriers that limit fire spread; most are dry sites where the age-class distribution is moderate to old.

Fire Regime Condition Class

FRCC is a classification system that describes the amount of departure an area or landscape has experienced from its historic regime to the present condition. It is used to classify existing ecosystems by looking at conditions of ecosystem components. Departures from the historic fire regimes are caused by fire exclusion, timber harvesting, grazing, introduction and establishment of exotic plant species, insects and disease, and other management activities. Wildland fire and fuels management works towards restoring ecosystem components to their historic range (FRCC 1). As displayed in **Table 3-20**, Condition Class Definitions and Acreages, a majority of the decision area falls within FRCC 2, meaning fire regimes have been moderately altered from their historic range.

Fuel Conditions

In many parts of the GJFO planning area, fuel conditions have changed from historic conditions due to management practices and the spread of nonnative species.

Fire exclusion, in the form of fire suppression, has greatly affected fuel conditions. This management practice results in increased fuel loadings because fires are more infrequent than historic fire-return intervals. Fire suppression is allowing mountain shrub (oak brush) communities to become more mature, dense, and less productive (i.e., large dead component), and, to a lesser extent, pinyon-juniper to invade sagebrush sites and conifers to advance into aspen stands. Higher-elevation fuel types and pinyon-juniper ecosystems are least affected by fire exclusion due to their long fire-return intervals. Cheatgrass occurrence has increased from scattered pockets to a dominant fine-fuel component intermixed with sagebrush and pinyon-juniper stands. Its presence is increasing the intensity and size of fires by providing the fine fuels that fire needs to spread into areas where vegetation was previously too sparse for fire to spread (BLM 2008b). Lower-elevation (below 6,500 feet) sites that are dominated by sagebrush, pinyon-juniper, and salt desert shrub have shown the

Table 3-20
Condition Class Definitions and Acreages

Condition Class	Fire Regime Example Management Options
Condition Class 1 Acres: 252,177 24 percent of decision area	Fire regimes are within a historical range, and the risk of losing key ecosystem components is low. Vegetation attributes (species composition and structure) are intact and functioning within a historical range. Where appropriate, these areas can be maintained within the historical fire regime by treatments such as managing fire for resource benefit.
Condition Class 2 Acres: 710,788 67 percent of decision area	Fire regimes have been moderately altered from their historical range. The risk of losing key ecosystem components is moderate. Fire frequencies have departed from historical frequencies by one or more return intervals (either increased or decreased). This results in moderate changes to one or more of the following: fire size, intensity and severity, and landscape patterns. Vegetation attributes have been moderately altered from their historical range. Where appropriate, these areas may need moderate levels of restoration treatments, such as fire use and hand or mechanical treatments, to be restored to the historical fire regime.
Condition Class 3 Acres: 67,519 6 percent of decision area	Fire regimes have been significantly altered from their historical range. The risk of losing key ecosystem components is high. Fire frequencies have departed from historical frequencies by multiple return intervals. This results in dramatic changes to one or more of the following: fire size, intensity, severity, and landscape patterns. Vegetation attributes have been significantly altered from their historical range. Where appropriate, these areas may need high levels of restoration treatments, such as hand or mechanical treatments, before fire can be used to restore the historical fire regime.
Other Acres: 30,740 3 percent of decision area	Developed, barren, water-covered areas.

Source: BLM 2008b, 2010a

greatest change in fuels conditions due to the increase of cheatgrass. Most other vegetation types in the GJFO planning area have altered fuel conditions due to an influx of cheatgrass but to a lesser degree than these low-elevation sites.

Along riparian areas within the GJFO planning area, nonnative saltcedar has significantly increased fuel loading. These higher fuel loads have resulted in high-intensity fires that cause mortality of associated cottonwood galleries.

Wildland Fire Management

The Fire Management Plan for the Colorado National Monument and BLM Grand Junction Field Office (BLM 2008b) provides guidance for management of wildland fires, prescribed fire, vegetation treatments, emergency stabilization and rehabilitation, community assistance, fire preparedness, fire prevention, fire danger, and other fire management activities. The Fire Management Plan is reviewed annually and updated as needed to reflect changes in policy, current issues, conditions, procedures, and resource management. During multiple

wildfire events or when resources are limited, priorities are derived from the Fire Management Plan in conjunction with local, state, and national guidance (BLM 2008b).

The Fire Management Plan also identifies areas where unplanned wildfire can be managed for resource benefit. Response to fire in these areas is determined on a case-by-case basis using ecological and resource constraints along with human health and safety. The decision to manage fire for resource benefit is made by the field office manager with input from fire staff, resource advisors, and resource staff (BLM 2008b).

Since 1995, the GJFO fire management program has been part of the Upper Colorado River Interagency Fire Management Unit, a consortium that provides a full range of fire management services to participating federal, state, and local jurisdictions in western Colorado. The Upper Colorado River Interagency Fire Management Unit consists of the GJFO, Colorado River Valley Field Office, White River National Forest, Grand Valley District of the Grand Mesa, Uncompahgre, and Gunnison National Forests, and the Colorado National Monument. This partnership has increased the capability, efficiency, and coordination of the fire management program for the GJFO. The Upper Colorado River Interagency Fire Management Unit fuels program works with local stakeholders to identify and treat fuels in WUI settings to reduce the potential for wildfire.

The GJFO fire and fuels management program also collaborates with the Colorado State Forest Service, Mesa and Garfield Counties, and local Fire Protection Districts to identify fuels treatments and fire management activities.

Vegetation treatments are used to reduce hazardous fuels, improve wildlife habitat, restore ecosystems, and reduce wildfire threat to the WUI. These vegetation treatments may include prescribed fire, mechanical treatments, manual treatments, chemical and biological treatments, and seeding.

Most fuel treatments were historically limited to prescribed fire projects used to meet range and wildlife objectives. In the 1980s and 1990s, prescribed fire projects occurred in the canyon bottoms in the Book Cliffs, Corcoran Wash, Maverick Canyon, and the LBCWHR. With the 2001 review and update of the 1995 Federal Wildland Fire Management Policy, fuels treatment targets have increased, and more fuels treatments are occurring on BLM-administered lands within the GJFO planning area, especially along the WUI. Prescribed fire projects normally emphasize the reduction of hazardous fuel conditions and maintaining and restoring vegetation to FRCC 1.

Fire and fuels management strategies across the major vegetation types in the GJFO planning area currently include:

- Aspen – Fire (planned and unplanned) and other fuel treatments can be used to manage disease, age class diversity, and ecosystem health.
- Black brush – Use of planned and unplanned fire should be avoided in this vegetation type. Other treatments may be used to manage plant succession and ecosystem health
- Douglas fir and mixed conifer – Fire (planned and unplanned) and other fuel treatments can be used to manage disease, age class diversity, and ecosystem health.
- Greasewood – Use of planned and unplanned fire should be avoided in this vegetation type. Other treatments may be used to manage plant succession and ecosystem health
- Mountain shrub – Fire (planned and unplanned) and other fuel treatments can be used to manage disease, age class diversity, wildlife habitat, and ecosystem health.
- Pinyon-juniper – Fire (planned and unplanned) and other fuel treatments can be used to manage disease, age class diversity, wildlife habitat, and ecosystem health.
- Ponderosa pine – Fire (planned and unplanned) and other fuel treatments can be used to manage disease, age class diversity, wildlife habitat, and ecosystem health.
- Riparian – Use of planned and unplanned fire should be avoided in this vegetation type. Other treatments may be used to manage plant succession and ecosystem health.
- Sagebrush (below 7,500 feet) – Avoid use of planned and unplanned fire that results in converting sagebrush shrublands into invasive species. Other treatments may be used to manage plant succession, age class diversity, wildlife habitat, and ecosystem health.
- Sagebrush (above 7,500 feet) – Fire (planned and unplanned) and other fuel treatments can be used to manage disease, age class diversity, wildlife habitat, and ecosystem health.
- Salt desert shrub – Use of planned and unplanned fire should be avoided in this vegetation type. Other treatments may be used to manage plant succession and ecosystem health.

Wildland-Urban Interface

The GJFO planning area contains a large amount of WUI. The intermixed landscape of public and private lands means wildland fires have a heightened potential to spread onto private property, destroying homes and valued landscapes. The BLM coordinates with other federal, state, county, and local agencies and participates in proactive community projects to reduce wildfire risks and damages. Where public lands are adjacent to WUI areas, federal

funding is available to plan and implement fuel treatments to mitigate risk, for education and prevention efforts, and to complete plans, inventories, and assessments.

The BLM works with other fire departments and local and state government to identify communities and other WUI values at risk from wildfire and to set priorities for the mitigation of those threats. Within the GJFO planning area, the WUI includes areas in Glade Park, Unaweep Canyon, Plateau Valley, and near Whitewater, Mesa, DeBeque, and Gateway.

Effective fire prevention is critical because of the values at risk. Fuels treatments in these areas are designed to reduce the potential of fires moving into the WUI. Treatments in the WUI are often mechanical and are sometimes followed with pile burning for fuels reduction.

Trends

The trend in FRCC is likely to continue as vegetation types move further outside their historic fire regime due to fire suppression and an increase in nonnative species. Fires in areas infested with cheatgrass have and will continue to become more frequent, with potential to burn once every few years. The WUI will continue to expand, bringing urban development to these vegetative communities. In response, suppression and fire exclusion activities will increase in an effort to protect economic values. The expansion of energy exploration and recreation creates higher potential for human-caused fires in the GJFO planning area. Costs to protect associated infrastructure from wildland fires will also increase.

3.2.11 Cultural Resources

Cultural resources are past and present expressions of human culture and history in the physical environment. The term "cultural resource" can refer to archaeological and architectural sites, structures, or places with important public and scientific uses, and includes locations (i.e., sites, natural features, or places) of traditional cultural or religious importance to specified social and/or cultural groups. Cultural resources as defined by the BLM 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 Section 8110, Identifying and Evaluating Cultural Resources). 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. Historic properties are defined by the National Historic Preservation Act (NHPA) as cultural resources that meet specific eligibility criteria found at 36 CFR 60.4 for nomination for listing on the National Register of Historic Places (NRHP). Used in this context the words "Historic Properties" have no connotation of age or cultural affiliation, only their status in consideration for NRHP eligibility.

For the purposes of this document, cultural resources have been organized into prehistoric resources, historic resources, and ethnographic resources. Prehistoric resources refer to any material remains, structures, and items used or modified by people before Euro-Americans established a presence in the planning area. Historic resources include material remains and the landscape alterations that have occurred since the arrival of Euro-Americans, including those associated with Native Americans. Ethnographic resources are places associated with the cultural practices or beliefs of living communities. These sites are rooted in the community's history and are important in maintaining cultural identity. These sites are typically thought of as primarily related to Native American use, but can also refer to other groups. These categories often overlap at a single location.

Cultural resources are fragile, irreplaceable resources subject not only to natural forces of change but also to the effect of increasing demands placed on them for public, educational, and recreational purposes or for scientific and experimental uses, as well as their unique traditional cultural or religious importance.

However, the constraints of a traditional cultural resources definition do not fully express the meaning of these resources for the Indigenous peoples of the project area, the Northern Ute, Ute Mountain Ute, and Southern Ute Tribes (see Section 3.6.1, Native American Tribal Uses). The tribes and many other stakeholders "are pushing for inclusions of more permeable perspectives regarding landscape-scale cultural and heritage resources" (Ott 2010). There are often intangible cultural values that not readily captured as part of a cultural resources discussion, but are part of the cultural and heritage landscapes for the tribes. Ongoing, meaningful consultation with the noted tribes will integrate the Ute understanding and perspective of the cultural landscape into this cultural resource discussion.

Current Conditions

Federal agency responsibilities with regard to cultural resource management are addressed by a number of laws, regulations, executive orders, programmatic agreements, and other requirements. The principal federal law addressing cultural resources is the National Historic Preservation Act of 1966, as amended (16 USC Section 470), and its implementing regulations (36 CFR 800). The NHPA describes the process for identifying and evaluating historic properties, for assessing the effects of specific federal actions on historic properties, and for consulting with not only the State Historic Preservation Officer but with the Public and the Tribes to avoid, reduce, or minimize adverse effects. The NHPA also requires federal agencies to fully integrate the management of cultural resources in ongoing programs and to proactively identify, evaluate, nominate, and protect historic properties. Agencies are not required to preserve all historic properties, but agencies must follow a process to ensure that their decisions concerning the treatment of these places result

from meaningful consideration of cultural and historic values and the options available to protect the properties.

In 2012, the BLM entered into a national programmatic agreement with the Advisory Council on Historic Preservation and the National Conference of State Historic Preservation Officers on planning for and managing historic properties under the BLM's jurisdiction or control (BLM et. al 2012). This programmatic agreement replaces one signed in 1997 (BLM 1997e). In each state that was a party to the programmatic agreement, the BLM is updating protocol agreements with the State Historic Preservation Officer (SHPO). The national programmatic agreement and the current Colorado Protocol (BLM 1998b) provide alternative procedures for implementing 36 CFR 800 and substitutes for Sections 106, 110, 111(a), and 112(a) of the NHPA. These procedures allow the BLM to identify and evaluate those cultural resources that meet criteria listed in 36 CFR Part 60.4 for NRHP eligibility and determine effects according to 36 CFR 800.9 without consulting with the SHPO for each routine undertaking. The protocol outlines how the BLM and SHPO would continue to interact, cooperate, and share information to ensure that the alternate procedures are consistent with the goals of the NHPA.

BLM management objectives encourage responsible use of cultural resources, ensuring that they will be available for appropriate uses by present and future generations. This is accomplished by continuing to identify and evaluate cultural resources and by setting priorities for protecting and preserving significant cultural resources and administering them accordingly on public lands in accordance with existing laws, regulations, and guidelines. BLM will continue to identify all historic properties and sacred sites on all lands that are within the APE of a BLM undertaking and ensure that the identification of cultural resources is conducted in accordance with professional standards detailed in the Secretary of the Interior's Standards and Guidelines. The 1987 GJFO RMP was completed prior to passage of a number of laws, most notably the Native American Graves Protection and Repatriation Act, and there have been additions and changes in BLM program policy. The 1987 RMP does not have specific resource management goals and actions that address these and other directives.

Methods used to identify the presence of cultural resources vary among the resource types and the scale of the action. Identifying archaeological resources, for example, typically requires a systematic pedestrian survey. Identifying historic buildings and historic transportation or water systems would more appropriately start with archival research, followed by fieldwork to document the current buildings or structures. Identifying any traditional cultural properties or religious sites requires direct consultation with Native American and other potentially affected communities.

Following identification, significance is determined by evaluating the resource against the criteria for listing on the NRHP. For this, a site, district, building, structure, or object must meet at least one of four criteria, in that they:

- Are associated with events that have made a significant contribution to the broad patterns of history;
- Are associated with the lives of persons significant in the past;
- Embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; possess high artistic value; or represent a significant and distinguishable entity whose components may lack individual distinction; and
- Have yielded, or may be likely to yield, information important in prehistory or history.

In addition to meeting these criteria, the historic properties must have integrity of "location, design, setting, materials, workmanship, feeling, and association" to convey its significance (36 CFR, Part 60).

Since 1974, Class II (statistical-based sample) and Class III (systematic intensive pedestrian) cultural resource inventories for compliance for ground-disturbing projects, and infrequently for research purposes, have been completed on public and private lands in the planning area. This work has been completed by BLM archaeologists or by cultural resource consultants who are permitted to conduct cultural inventory surveys for BLM projects. During these surveys, cultural sites have been recorded and field evaluated for NRHP eligibility. In accordance with the NHPA and more recently by the national programmatic agreement and with Colorado Protocol, BLM submits its NRHP determinations to the SHPO for concurrence. Archaeologists also record isolated features and artifacts that do not meet the criteria to be classified as sites, but are nonetheless indicative of cultural activity and use. Surveys conducted for extractive resource exploration and development, land exchanges, ROWs, recreational developments, grazing projects, and research have resulted in an ever-increasing database of inventory reports and cultural resource records.

Concurrent with the development of this RMP, a Class I overview of the planning area was written (Grand River Institute 2011). A Class I overview is a compilation and analysis of all available cultural resource data and literature, and it provides a management-focused interpretive and narrative overview and synthesis of the data. The last Class I inventory of the planning area was completed by O'Neil in 1993 and was entitled *The Archaeology of the Grand Junction Resource Area: Crossroads to the Colorado Plateau and the Southern Rocky Mountains* (O'Neil 1993). The data for the Class I inventory prepared in 1993 were based upon records current through June 30, 1989, and included lands now within NCAs.

The Class I overview under preparation is using an updated Geographic Information System (GIS) database with cultural resource information meeting current BLM and Colorado Office of Archaeology and Historic Preservation standards current to Spring of 2009. The Class I overview is a confidential document for BLM internal use that will include a cultural resource narrative of the prehistory, history, and ethnology of the planning area; a discussion of the past environmental factors that have influenced cultural resources; a discussion of present research emphasis and the management actions needed to address data gaps; a site classification system derived from the data synthesis and applied to practical management by site allocation; and sensitivity maps based on resource significance and complexity. Preliminary information from this study and the previous Class I inventory are incorporated in the goals, objectives, and actions of this RMP and the description of the affected environment.

Many of the early Class III inventories were not conducted or reported to current standards. There was great variability in the reports and the site forms used, and this is clearly reflected in the type and quality of the information collected. In many cases records are the result of a single visit several decades ago, and there is no updated information. The quality of records is variable in terminology, detail, site boundary definition, and functional interpretations and in the researchers' familiarity with the local cultural and natural resources. In most cases the current condition is not known and the existence of the resource as reported is not verifiable.

The quality of survey and site recording, as well as data management, has improved with standards established by both the Colorado Office of Archaeology and Historic Preservation and the BLM. Today over 1,920 cultural resources and 2,933 isolated finds have been recorded, and approximately 15 percent of the planning area as a whole has been surveyed. Inventories cover approximately 149,342 acres of the planning area. These numbers do not include lands within the Dominguez-Escalante and McInnis Canyons NCAs, other federally administered lands, and private land (Grand River Institute 2009).

The 1993 Class I overview suggested that 99 percent of the reports and site records had been generated by Section 106 compliance work involving natural resource and energy development for coal, water, oil and gas, and locatable minerals. The current data are still geographically biased towards surveys conducted in areas of energy development. Adding some geographical balance to the data set, and a major contributor to the survey and site database, are the results from large block surveys conducted since 2000 for hazardous fuels reduction projects as a result of implementing the National Fire Plan.

Native American Religious Concerns

The 1987 RMP does not contain any specific decision guidance related to Native American issues or concerns. There was no documented Native American

consultation for the 1987 RMP. Consultation with the tribes between 1987 and 2000 was not documented. Native American consultation on both a programmatic and project-specific basis began in a systematic manner in 2001 to identify any traditional cultural properties, sacred/religious sites, and special use areas through letters, phone calls, and on-site visits. Field site visits were conducted to share the results of compliance projects where sites that were affiliated to the Ute Tribes are recorded. The Ute Ethnobotany Project was started in 2006 in partnership with the Ute Indian Tribe and the US Forest Service to bring Ute students and elders to their traditional lands, work with botanists to identify plants that were traditionally used, and seek possible connections between plant communities and Ute sites. The Ute Ethnohistory Project began in 2007 as a long-term partnership and research project with the Ute Tribes. "The broad goals of the project are to identify areas and sites of cultural and religious importance to the Ute people, to preserve and protect Ute cultural heritage values that are embedded in public lands, and to encourage and support the Utes' traditional use of those lands…A primary goal of this project was to integrate Ute perspectives into the land management planning activities of the three BLM field offices comprising the study area [Grand Junction, Uncompahgre, and Glenwood Springs], insofar as they relate to cultural resources management (CRM) and Ute heritage needs" (Ott 2010).

Monitoring

Both BLM cultural program staff and volunteers periodically monitor and document at-risk and potentially at-risk cultural sites for evidence of degradation from natural processes (erosion and fire) and from erosion impacts exacerbated by human activities, including, but not limited to, construction, maintenance, livestock grazing, recreation, wildlife impacts, fluid and locatable mineral exploration and development, mineral material disposal, and habitat restoration/fuel reduction. Since any BLM-initiated or authorized action recognizes and mitigates the effect of authorized actions on cultural resources by virtue of standard operating procedures, the other human activity that may damage these resources is unplanned public use. These activities include unauthorized recreational vehicle use, deliberate theft by illegal collection or excavation, vandalism, or the use of cultural sites that results in damage (fires, occupation of historic structures, new age ceremonial features, etc.). The location of these activities is impossible to predict and may occur in spite of measures designed to eliminate or limit them. A more formal monitoring program is directed at the several cultural areas, including Calamity Camp and Bangs Canyon SRMA, and sites that have significant values. Sites with physical barriers and signs are also monitored annually for maintenance and repair of these facilities.

Partnerships/Collaboration Practices

The GJFO has an active partnership program and over the last 20 years has worked with the Colorado Archaeological Society, Colorado State University Lab of Public Archaeology, Dominguez Archaeological Research Group, and

Colorado Historical Society to conduct research projects. Tribal partnership projects include the Ute Ethnobotany Project with the Ute Indian Tribe (Northern Ute), US Forest Service, Colorado Mesa University, Colorado State University Agricultural Extension Service, and Museum of Western Colorado. Historic partnership projects include the Mesa County Oral History Project and the Calamity Camp restoration/interpretation project with the Museum of Western Colorado, Gateway Canyons Resort/Hendricks Foundation, and Heritage Preservation Resources. The Heritage Adventures Project brings hands-on archaeology and programs to the public through the Museum of Western Colorado and Dominguez Archaeological Research Group. Through partnership with the Dominguez Archaeological Research Group, the GJFO also supports the Colorado Wickiup Project to inventory and document "at-risk" sites.

Interpretation

The GJFO cultural program has provided interpretation at several trailheads and, working with funding support from Colorado Historical Society grants, has other projects in various stages of interpretive development.

Characterization

The planning area has been occupied with varying levels of intensity for almost 10,000 years. The complexity of the cultural resources of the planning area is influenced by its geographic location between the Canyon Lands and Uinta Basin of the Colorado Plateau, the Southern Rocky Mountains, the Wyoming Basin, and the Middle Rocky Mountain Physiographic Provinces. It includes multiple hydrological basins that have provided many resources through time. Cultural influences from the Southwest, Great Basin, Great Plains, and Mountain cultural traditions are present in the archaeological record.

Cultural resources recorded in the planning area include prehistoric and historic archaeological and architectural resources, as well as Native American traditional cultural and religious properties. Prehistoric properties include lithic scatters, quarries, temporary camps for seasonal hunting and gathering, extended camps, rock shelters, hunting/kill/butchering sites, game processing areas, tree scaffolds, eagle traps, vision quest sites, rock shelters and caves, rock art panels, trails, and isolated finds. Sites that date to the transition between the prehistoric and historic period include all of the prehistoric site types as well as wickiup villages, tree platforms, brush corrals and fences, and trails. Historic properties include homesteads, trails and roads, railroads, irrigation ditches, reservoirs, mining sites, corrals, line camps, cabins, trash scatters and dumps, aspen art carvings, and isolated finds. Native American traditional cultural and religious properties include plant gathering locations, trails, landscape features, burials, and group ceremonial sites.

Through scientific study of cultural resources, the story of adaptation and technological change can be told. Archaeologists simplify the description of

prehistory and history by naming time periods that roughly correspond to cultural attributes or traditions manifested as artifact assemblages and features.

Five broad time periods are used to record human behavior in the area. These periods make generalizations about both behavior and technology. These periods, along with their significance and research potential, include the following:

- Paleoindian (Before 6400 BC). Archaeologists refer to the earliest hunters and gatherers as Paleoindians. Paleoindian sites are rare and evidence of occupation in the GJFO planning area prior to 7,600 BC is limited to isolated Folsom and Clovis points and surfaces that are postulated to date to this period and have the potential to hold these sites. Scientific excavation of Paleoindian sites in the GJFO planning area is nonexistent. After approximately 7,600 BC, there are indications of occupation or use and some radiocarbon dates from this period are included in the archaeological record. These sites have significant scientific value for environmental information and their potential for studying subsistence strategies in the planning area. Information on physical site development and mapping areas where intact soils remain from this period is important for identifying and preserving these sites. Another research consideration is that sites may not be excavated to a depth that would produce cultural materials from this time period. Excavating sites past levels that are often misinterpreted as sterile could produce new information.
- Archaic (6400 BC to AD 0). The beginning of this period coincides with the last extinctions of megafauna at a time when vegetation communities were radically changing in response to climate changes. It is seen as a transition from a mobile hunting subsistence style to a semi-sedentary hunting and gathering lifeway. Four periods have been described by some archaeologists to subdivide the Archaic era. More Archaic era sites need to be excavated and more complex excavations need to be conducted, not only to collect dates and subsistence information, but to identify habitation structures and settlement patterns. Like the Paleoindian period sites, excavation at Archaic sites needs to be based on an understanding of the local deposition. Sites may be deeply buried. The cultural transition to the next era is poorly understood and the effectiveness of the hunting and gathering lifestyle, given the abundant resources of the planning area, makes this an important research subject.
- Formative (AD 0 to AD 1350). The Formative period in most areas of the Southwest represents the introduction of horticulture and a more sedentary subsistence pattern. Evidence of the cultivation of corn has been found in the GJFO planning area, however, strong

evidence of site types indicating a more sedentary subsistence pattern are lacking. More study is needed of the cultural dynamics that led to variations in the archaeological record during this period. The complexities of the Formative period in the GJFO planning area are in part due to the geographic influences, both socio-cultural as well as the physical environment. It is proposed that the pattern of summer monsoons may not have been consistent in the planning area as in the Southwest and thus agriculture played less of a dominant role. Some groups continued a hunting and gathering lifestyle throughout the late Formative. The late Formative coincides with a period of intense drought and the arrival of Numic speakers from the Southwest and Great Basin, which is another area that needs to be explored.

- Aboriginal Protohistoric/Historic (AD 1350 to AD 1900). This period marks the transition from late prehistoric times through initial contact and subsequent forced removal from the GJFO planning area by Euro-Americans. These sites are important for their research potential but perhaps more important for developing management considerations to protect their potential to provide important heritage connection to the planning area for the Ute who traditionally occupied the area.
- Historic (After circa 1860). Euro-American historic sites have the potential to provide additional insight and often provide a new perspective on the development of the modern community and the diversity of the people who contributed to it as we experience it today.

A large number of Native American sites have not been assigned to a particular time period or time periods. The majority of the sites have either not been recorded with enough detail to estimate a time period, or have had unauthorized surface collection, which has removed the information that could estimate a date. Many of these sites have dateable features and with limited testing could contribute significant information on the distribution of prehistoric sites. Conversely, with current chronometric technology, no determination for some sites can be made as to what temporal period or group is responsible for a cultural manifestation. Often these include cairns or rock alignments or enigmatic features with no associated artifacts.

Table 3-21, Summary of Cultural Resources by Resource Management Units, displays the frequency of sites across management units, which indirectly suggests density. Because a site is counted as one unit regardless of the acreage of the site (relative to the acreage of the unit), it is not considered a true representation of density. In addition, site numbers can vary based on a previous recorder's tendency to lump or split out cultural loci. The Class I inventory is

Table 3-21
Summary of Cultural Resources by Resource Management Units

Resource Type	Bangs Canyon	Book Cliffs	Gateway	Glade Park	Grand Mesa Slopes	Grand Valley	Plateau Valley	Roan Creek
Prehistoric Sites	299	46	226	264	191	83	257	140
Historic Sites	36	28	31	13	33	83	26	53
Multi-component Sites	11	3	17	10	18	15	6	8
Unknown Sites	3	0	0	1	0	2	5	12
Total Sites	349	77	274	288	242	183	294	213
Isolated Finds	354	45	412	553	592	189	522	267
Total Recorded Cultural Resources	703	122	686	841	834	372	816	480
Acres Surveyed	8,187	22,665	13,202	15,709	14,782	31,085	17,230	21,413
Ratio of Resources to Acres	1:12	1:19	1:19	1:19	1:18	1:84	1:21	1:55

Source: Grand River Institute 2009

further refining the management tools available to BLM by correlating the results from surveys within each management area with other indicators to define sensitivity zones for archaeological sites. These indicators include elevation, vegetation zone, topography, hydrology, shelter, lithic (stone) material sources, and other environmental factors. Data on early land patents were also plotted as an indicator of sensitivity for historic sites.

As noted previously, much of the information on cultural resources in the planning area was developed from compliance projects for energy and mineral development. Therefore, the samples used to project sensitivity are not randomly distributed across the landscape. In addition, many sites, especially older sites, are buried and do not have any surface manifestations. Some cultural resources such as locations important to tribes or those consisting of ephemeral or perishable materials may not have been recognized or recorded in the past. In recent years there have been ongoing efforts to address these issues.

The condition of cultural resources in the planning area varies considerably as a result of the diversity of terrain, geomorphology, access, visibility, and past and current land use patterns. Adherence to Section 106 of the NHPA provides for the continued identification of cultural resources, and the BLM policy of avoiding cultural resources is the preferred mitigation for cultural resource sites threatened by projects. The cultural resources program primarily supports the other BLM renewable and nonrenewable resource programs by completing cultural inventories in areas of proposed ground disturbance, and taking into account both the direct and indirect effects of the proposed projects. Most of the field inventory work is contracted to meet the timeframes of the applicants. Cultural sites discovered during inventory are evaluated for eligibility for listing on the National Register of Historic Places (NRHP) and protected through site

avoidance, where possible. If avoidance is not possible, testing for NRHP site eligibility and mitigation of impacts through data recovery may be necessary. Consultation with the SHPO is completed through the Section 106 process. Avoidance of direct impact is not preservation, and many sites continue to degrade through negligence. The proactive component of the cultural resource program pursuant to Section 110 of the NHPA includes providing interpretation and education programs to the public and the identification, treatment, and protection of significant sites and areas.

Trends

Ongoing trends and management actions within the planning area that have the potential to impact cultural resources include oil and gas development, wildfire, prescribed fire, vegetation treatments, grazing, recreation, land exchanges, road and utility rights-of-ways and leases, and the designation of roads and trails through travel management. As described above, most cultural program work is completed from a compliance-driven reactive process that accounts for direct impacts from identified projects. This approach fails to address the impacts on sites from natural disturbances such as wind and water erosion, intrusion by animals, development and maintenance activities, and human intrusion, including theft and vandalism. Limited site patrol and stabilization completed by the GJFO cultural staff and volunteers protect and preserve only a few well-known cultural sites.

The last large-scale, research-based inventory in the GJFO planning area was conducted in 1983 (Kvamme 1983). The dearth of research-based inventories has led to an understanding of the cultural resources of the planning area based only on where disturbance has previously occurred, rather than on where sites are likely to occur. Because recorded sites are manifested by discovery of exposed artifacts, features, and 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.

As part of Chapter 2 in the RMP, the BLM is allocating all cultural resources known and projected to occur in the planning area to appropriate use categories. These use categories, which include scientific use, conservation for future use, traditional use, public use, and experimental use, are defined in BLM Manual Guidance 8110, Identifying and Evaluating Cultural Resources (BLM 2004d). These allocations pertain to cultural resources, not to areas of land. These are recommendations of suitable uses for each cultural property or class of properties, and the recommendations consider the properties' characteristics, condition, setting, location, and accessibility, and especially their perceived values and potential uses. A cultural property may be allocated to more than one use category, or it may pass from one category to another when appropriate.

Categorizing cultural resources according to their potential uses broadly establishes what resources need to be protected, and when or how use should be authorized. All cultural resources have uses, but not all of these resources should be managed or used in the same way. Safeguards against incompatible land and resource uses may be imposed through withdrawals, stipulations on leases and permits, design requirements, and similar measures to meet the desired outcome. The implementation of the use categories should assist planners and applicants in proactively reducing potential conflicts that arise between specific cultural resources and other land uses. It does not replace the requirements of the NHPA.

Another trend is the increased recognition that a more comprehensive approach is needed for the inventory of cultural resources in order to identify and evaluate buried sites, to recognize resources consisting of ephemeral or perishable materials, and to identify traditional cultural properties.

Consultation with the Ute tribes and evaluation of the archaeological and historic record reiterate that the planning area is part of the Ute tribes' ancestral homeland. There is potential for traditional cultural properties and sacred sites to be present. Many Ute tribal members have never been on the public lands in the GJFO and are only familiar with the general area as they travel through. At present, no locations within the GJFO planning area have been identified as sacred or religious sites by the Ute tribes, as defined by the current laws and executive orders. However, through consultation the Ute have emphasized that they have a generalized concept of spiritual significance that is not easily transferred to Western models or definitions. As such the BLM recognizes that the Ute have identified sites that are of concern because of their association with Ute occupation of the area as part of their traditional lands. Other known cultural resources that are affiliated to the Ute such as rock art, wickiup camps, trails, eagle traps, and battle locations are known to be of interest to the Ute. It is anticipated that the understanding of cultural resources as heritage sites important to the Ute will change as programs continue to be developed to work with students, adults, and elders to reconnect them to their traditional lands and resources. Cultural sites attributed to the Navajo have been recorded in the planning area, and consultation with that nation has just begun. Based on current research, additional consultation with other tribes will be conducted by the GJFO in the future.

3.2.12 Paleontological Resources

Paleontology is the study of fossils and related remains. A fossil is defined as any trace of a past life form. The term "paleontological resources" includes any fossilized remains, traces, or imprints of organisms that are preserved in or on the earth's crust, are of paleontological interest, and provide information about the history of life on earth. Paleontological resources constitute a fragile and nonrenewable scientific record of the history of life on earth. BLM policy is to manage paleontological resources for scientific, educational, and recreational

values and to protect or mitigate these resources from adverse impacts. To accomplish this goal, paleontological resources must be professionally identified and evaluated, and paleontological data should be considered as early as possible in the decision-making process. Paleontological resources are managed according to the BLM Manual Section 8270, Paleontological Resource Management, BLM Handbook H-8270-1, General Procedural Guidance for Paleontological Resource Management, and applicable BLM instructional memoranda and bulletins. Additional preservation measures have been enacted under the Paleontological Resources Preservation Act, as part of the Omnibus Public Lands Act 1 of 2009. The BLM is currently developing regulations to implement the requirements of this law.

Recent BLM guidance (BLM Instruction Memorandum 2008-009, Potential Fossil Yield Classification (PFYC) System for Paleontological Resources on Public Lands) defines a new classification system for the classification of paleontological resources. This system is intended to provide a more uniform tool to assess potential occurrences of paleontological resources and evaluate potential impacts. It is intended to be applied in broad approach for planning efforts and as an intermediate step in evaluating specific projects. This is part of a larger effort to update BLM Handbook H-8270-1.

Occurrences of paleontological resources are closely tied to the geologic units (i.e., formations, members, or beds) that contain them. The probability for finding paleontological resources can be broadly predicted from the geologic units present at or near the surface. Therefore, geologic mapping can be used for assessing the occurrence potential of paleontological resources.

Using the PFYC system, geologic units are classified based on the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts. A higher class number indicates a higher potential. This classification is applied to the geologic formation, member, or other distinguishable unit, preferably at the most detailed mappable level. It is not intended to be applied to specific paleontological localities or small areas within units. Although significant localities may occasionally occur in a geologic unit, a few widely scattered important fossils or localities do not necessarily indicate a higher class; instead, the relative abundance of significant localities is intended to be the major determinant for the class assignment. Five classes were developed: Class 1 has very low potential for containing fossils, and Class 5 has very high potential.

Current Conditions

In the GJFO planning area, fossil-bearing sedimentary rocks range in age from Pennsylvanian to Quaternary and include parts of the three eras (great periods of earth history) during the last 540 million years: the Paleozoic Era (245 million to 540 million years ago); the Mesozoic Era (65 million to 245 million years ago); and the Cenozoic Era (present to 65 million years ago). Roughly 20 percent

(270,000 acres) of the GJFO has either Morrison or Wasatch Formation on the surface, and these formations have produced many scientifically significant fossils. These areas often have mining or oil and gas activities proposed on them.

Since the 1987 RMP, numerous paleontological fossil sites have been discovered and continue to be surveyed and recorded. There are several quarry sites in the GJFO for educational purposes, and the public has become increasingly more aware of paleontological resources. Some paleontological resource sites within the GJFO, like the Douglas Pass area along Highway 139, have been impacted by heavy public use.

Three formations in the GJFO are rated as PFYC 4-5 and often require paleontology surveys prior to any surface disturbance. These are the Wasatch, Morrison, and Chinle Formations.

The geology of the GJFO spans a time of roughly 1.8 billion years. From youngest to oldest, **Table 3-22,** Paleontological Resources by Geologic Rock Unit, contains a list of major rock units, their PFYC, and some of the fossils that have been found in each unit.

Table 3-22
Paleontological Resources by Geologic Rock Unit

Rock Unit Map Symbol/Description	Potential Fossil Yield Classification	Paleontological Finds
(Q) Quaternary	3	Pleistocene finds include mammoth teeth, musk ox, extinct and modern bison, and other vertebrates, invertebrates, and plants
(Qa) Modern alluvium	2	Modern bison (buffalo)
(Qg) Gravels and alluviums (Pinedale and Bull Lake Age)	3	Mammoth teeth
(Qgo) Older gravels and alluviums, Pre-Bull Lake Age	3	None known
(QTa) Ancient alluvium	3	Musk ox, invertebrates, and plants
(Qe) Eolian deposits	3	None known
(Qd) Glacial drift of Pinedale and Bull Lake glaciations	3	None known
(Ql) Landslide deposits	3	None known
(Tbb) Basalt flows and associated tuff, breccia, and conglomerate of late-volcanic bimodal suite, age 3.5 to 26 million years	1	None known
(Tu) Uinta	3	None known at present immediately in the GJFO planning area

Table 3-22
Paleontological Resources by Geologic Rock Unit

Rock Unit Map Symbol/Description	Potential Fossil Yield Classification	Paleontological Finds
(Tg) Green River	3	Primate and other mammals, crocodilians, gar and other fish, amphibians, turtles, birds, over 300 species of insects, fossil wood, and plant fragments (including leaves from numerous species of trees and bushes)
(Tgp) Green River Formation, Parachute Creek member	3	Primate and other mammals, crocodilians, gar and other fish, amphibians, turtles, birds, over 300 species of insects, fossil wood, and plant fragments (including leaves from numerous species of trees and bushes)
(Tgl) Green River Formation, lower part	3	"Algal" layers, ostracodes, gastropods (snails), pelecypods (clams), fish, turtles, crocodiles, and plants
(Tw) (Two) Wasatch Formation (DeBeque)	4-5	Archaic mammals, including horses, primates, artiodactyls (deer-like, even-toed), other perissodactyls (odd-toed), pantodonts, creodonts, carnivores, marsupials, multituberculates, insectivores, rodents, condylarths, and others; gar and other fish; lizards; turtles; crocodilians; birds; freshwater clams, gastropods (snails), and other invertebrates; petrified wood, leaves, and other plant fragments; algal heads (stromatolites)
(Two) Ohio Creek Formation	3	Mammals
(Kmv, Kmvu, Kmvl, Kh, Kmgh) Mesaverde Group: Hunter Canyon, Mount Garfield, Sego sandstone, etc.	3	Dinosaur tracks, eggs, and bones; turtles, crocodilians, fish, petrified wood, and other plant and invertebrate material
(Kmv) Mesaverde, undivided	3	Same as for Mesaverde Group
(Km) Mancos shale	3	Dinosaurs (two duck-billed dinosaurs), marine reptiles (plesiosaurs and mosasaurs), fish, sharks, clams, oysters, ammonites, scaphites, baculites, mollusks, plants, crinoids, and others
(Kd) Dakota sandstone	3	Dinosaur tracks, plant fragments
(Kdb, KJd, KJdw) Burro Canyon sandstone	3	Dinosaurs, including a meat-eating theropod; petrified wood, cycads, Tempskya (fern) wood, and plant impressions that include leaves and flowers
(Jm, Jmw, Jme, Jmse, Jmwe) Morrison	4-5	Dinosaurs, including the large plant-eating sauropods: Apatosaurus (Brontosaurus), Barosaurus, Brachiosaurus, Camasaurus, Diplodocus, Supersaurus, and Ultrasaurus; the meat-eating theropods: Allosaurus, Ceratosaurus, Torvosaurus, and others; and the bird-hipped

Table 3-22
Paleontological Resources by Geologic Rock Unit

Rock Unit Map Symbol/Description	Potential Fossil Yield Classification	Paleontological Finds
		ornithopods: Dryosaurus, Camptosaurus, iguanodontid, Stegosaurus, Mymoorapelta, and others; fish (Coccolepis, and one other), lizards, turtles, crocodilians (including Fruitachampsa and Goniopholis), a pterosaur and five families of small primitive mammals (including docodonts, triconodonts (including Priacodon fruitaensis), multituberculates, symmetrodonts, dryolestid eupantotheres, and possibly monotremes, and a new form named *Fruitafossor windscheffeli*; various invertebrates, including fresh water clams, gastropods (snails), ostracods, conchostrachans, and others; and plants, including conifer trees, seed fern trees, horse tails, cycads, and others
(Jmse) Summerville	3	Gastropods (snails)
(Jme, Jmse, Jmwe) Entrada	3	Tracks of small meat-eating dinosaurs
(JTRgc) Navajo	3	No fossils known
(TRkc) Kayenta	3	Possible tracks of small meat-eating dinosaurs
(TRkc, TRwc) Wingate	3	Tracks of small meat-eating dinosaurs
(JTRgc) Glen Canyon group	3	See Navajo, Kayenta, and Wingate
(JTRsc, JTRmc, TRkc, TRwc, TRcc, TRc) Chinle	4-5	Metoposaurs (giant amphibians), phytosaurs (large "armored crocodiles"), tracks of various amphibians and reptiles, lungfish burrows, insect tracks, and worm and other invertebrate burrowings
(TRm) Moenkopi	3	Tracks of various insects, amphibians, and reptiles
(Pc) Cutler	3	This formation is fossiliferous in other areas, but there are no known fossils in the GJFO
(Pennh) Hermosa	2	No fossils
(Xb) Biotitic Gneiss, Schist, Migmatite	1	No fossils
(Yg) Granitic rocks of 1,400 million years	1	No fossils
(Xg) Granitic rocks of 1,700 million years	1	No fossils
(YXg) Granitic rocks of 1,400 and 1,700 million years	1	No fossils

Source: Armstrong and Kihm 1980

Characterization

Paleontological resources are indicated by both the presence of and potential for these resources. Paleontological resources are typically discovered through

exposure by erosion or by excavation often associated with other resource uses. The current trend of paleontological resource use permits and scientific activity would likely continue or increase slightly in the future. Clearances and monitoring of surface-disturbing activities are anticipated to be the primary means of identifying paleontological localities. The discovery and mapping of resources would potentially allow future research and interpretive uses and protective measures.

The current management direction and forecast for paleontological resources is to implement the new PFYC throughout the planning area and to identify and record new findings. This RMP revision addresses opportunities to designate areas with significant paleontological resources for special management. One such area under consideration for special management designation is the Dolores River corridor near Gateway, Colorado. There are hundreds of dinosaur and ancient mammal tracks and track ways found in slabs of Wingate Formation sandstone along the Dolores River near Gateway.

Areas like Douglas Pass along Highway 139 have been experiencing high use, which is expected to continue. Special management strategies may be required to minimize impacts to paleontological and environmental resources for such high-use areas within the planning area. New monitoring strategies for these sites may also be developed.

Paleontological resources need to be surveyed, recorded, and monitored as recreational and mineral development activity continue to increase in the general area. Area population will likely increase over the next 20 years, so special management designation may be required to better protect the paleontological resources. Preservation measures for paleontological resources enacted under the Paleontological Resources Preservation Act, as part of the Omnibus Public Lands Act of 2009 will be implemented by the GJFO when regulations are finalized.

3.2.13 Visual Resources

Visual resources refer to the visible physical features on a landscape (e.g., land, water, vegetation, animals, structures, and other features). These features contribute to the scenic or visual quality and appeal of the landscape. Visual impact is the creation of an intrusion or perceptible contrast that affects the scenic quality of a landscape. A visual impact can be perceived by an individual or group as either positive or negative, depending on a variety of factors or conditions (e.g., personal experience, time of day, and weather or seasonal conditions).

Visual Resource Management System

The BLM's VRM system is a way to identify and evaluate scenic values to determine the appropriate levels of management. VRM is a tool to identify and map essential landscape settings to meet public preferences and recreational experiences today and into the future. The BLM's VRM system helps to ensure

that actions taken on public lands will benefit the visual qualities associated with the described landscape.

The BLM's VRM system consists of two stages, inventory and analysis (visual resource contrast rating). Visual resource inventory involves identifying the visual resources of an area and assigning them to inventory classes using the BLM's visual resource inventory process. The process involves rating the visual appeal of a tract of land, measuring public concern for scenic quality, and determining whether the tract of land is visible from travel routes or observation points. This process is described in detail in BLM Handbook H-8410-1, Visual Resource Inventory (BLM 1986a).

The results of the VRI become an important component of the RMP for the area. The RMP establishes how BLM-managed lands will be used and allocated for different purposes, and it is developed through public participation and collaboration. Visual values are considered throughout the RMP process, and the area's visual resources are then designated to the management classes with established objectives. The objectives for the four VRM classes are described in **Table 3-23**, BLM Visual Resource Management Class Descriptions.

Table 3-23
BLM Visual Resource Management Class Descriptions

VRM Class	Class Objective
I	Preserve landscape character. This class provides for natural ecological changes but does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
II	Retain existing landscape character. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract a casual observer's attention. Any changes must repeat the basic elements of line, form, color, and texture found in the predominant natural features of the characteristic landscape.
III	Partially retain existing landscape character. The level of change to the characteristic landscape should be moderate. Management activities may attract attention, but should not dominate a casual observer's view. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
IV	Provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. 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 repetition of the basic landscape elements.
Rehabilitation Areas	Areas in need of rehabilitation should be flagged during the inventory process. The level of rehabilitation is determined through the RMP process by assigning the VRM approved for that particular area.

Source: BLM 1984

The analysis stage involves determining whether the potential visual impacts from proposed resource uses and management activities would meet the objectives of the VRM classes established for the area. The objectives can be met through land use planning or design adjustments. A visual contrast rating process is used for this analysis, which involves comparing the project features with the existing landscape features using basic elements of form, line, color, and texture. This process is described in BLM Handbook H-8431-1, Visual Resource Contrast Rating (BLM 1986b). The analysis is used to determine conformance to the RMP's VRM Class decisions and used as a guide for resolving visual impacts. Once every attempt is made to reduce visual impacts, BLM managers can decide whether to accept those projects found to be in conformance with the RMP, deny proposals not in conformance, or amend the land use plan VRM Class designations to a different VRM objective. Managers also have the option of attaching additional mitigation stipulations to bring the proposal into conformance. Examples of management resource uses and activities include energy development, ROW corridors, road construction, recreational activities, wildland fires, mining, vegetation treatments, and increased urban infrastructure needs and associated development on BLM- managed lands (e.g., roads, power lines, water tanks, and communication towers).

Current Conditions

The landscape of the GJFO planning area is visually diverse in both topography and vegetation. The topography of the area consists of foothills, mountains, plateaus, mesas, deep canyons, and broad and narrow river valleys. The area contains only limited areas of open, gently rolling hills with predominantly sagebrush and grassland vegetation. It also encompasses sizeable pinyon-juniper woodlands, scrub oak, and aspen and spruce in the higher elevations (Otak 2009). Some of the streams and rivers flowing through and adjacent to BLM-managed land in the planning area include the Colorado, Dolores, and Gunnison Rivers and the Blue, Rough Canyon, East, and West Creeks. Prominent features in the landscape include Mount Garfield, the cliffs of the Sinbad Valley, the Palisade, Douglas Pass, the Book Cliffs, and multiple canyons known for their scenic values.

Visual variety contributes to the distinctive character of the GJFO. Colorful landforms with reds and grays are intermingled with shades of brown and beige, all of which contrast with the deep greens, grays, and vibrant greens of the vegetation (Otak 2009). The visual character of the area also varies throughout the seasons due to changing light conditions. Sunsets in the Book Cliffs can be spectacular (Otak 2009).

While portions of the GJFO planning area are still largely undeveloped, range improvements, linear disturbances (e.g., pipelines and roads), and energy developments have altered the landscape over the past 20 years, especially in areas with high oil and gas development and areas with densely populated

routes. Sources of artificial light, including from residential housing, signage on commercial buildings, and oil and gas drill rigs, have also increased.

Visual quality is a concern to most residents in the GJFO planning area. The location of BLM-managed lands and their proximity to communities and key transportation corridors, the combined effects of scenic quality, the high degree of sensitivity, and visual accessibility have resulted in 13 percent of BLM-administered lands in the planning area being managed as VRM Class I, 18 percent being managed as VRM Class II, and 27 percent being managed as VRM Class III. The remaining 42 percent of BLM-administered lands in the planning area are undesignated. The current VRM classes were chosen to emphasize scenic quality of WSAs, highly visible landscape features, the Unaweep-Tabeguache Scenic and Historic Byway, the Book Cliffs, and other prominent features.

Table 3-24, Visual Resource Management Classes in the GJFO Decision Area, identifies the VRM classes for the GJFO decision area. The locations of these VRM classes are shown in **Figure 2-5**, Alternative A: Visual Resource Management. The visual resource classes were prescribed in the 1987 GJFO RMP (BLM 1987).

Table 3-24
Visual Resource Management Classes in the GJFO Decision Area

Visual Resource Management Classes	Acres
Class I	27,100
Class II	132,100
Class III	206,100
Undesignated	696,100

Source: BLM 2010a

Characterization

In 2009, a VRI was completed for the GJFO, excluding the McInnis Canyon and Dominguez-Escalante NCAs, the Colorado National Monument, and units of the State Park System. The Scenic Quality, Sensitivity, and VRI class distribution for the GJFO is presented in **Table 3-25**, Visual Resource Inventory Component Distribution. The entire field office was found to be within the foreground/middle ground distance zone. There are also no areas within the decision area that qualify for VRI Class I.

Trends

Management of multiple resources on BLM-managed lands can alter visual resources. With an increased amount of urban development throughout the planning area on adjacent private land, increased management activities are also occurring on BLM-managed lands. Growing pressure is being placed on the

Table 3-25
Visual Resource Inventory Component Distribution

Visual Resource Inventory Component	Acres	Percent of Decision Area
Scenic Quality		
A	9,200	1%
B	776,900	73%
C	275,100	26%
Sensitivity		
High	321,600	30%
Medium	484,900	46%
Low	254,600	24%
VRI Class		
Class I	0	0%
Class II	376,100	35%
Class III	382,300	36%
Class IV	302,700	29%

Source: BLM 2010a

visual resources from activities such as oil and gas extraction, fire management, ROW corridors, roads and trails, communication sites, pipelines, livestock grazing, and water tanks. Public concern over preservation of visual and scenic quality is also increasing for open space and scenic backgrounds in residential areas and for recreational uses. Most gas development has taken place in the northeastern portion of the planning area, which has modified the landscape into a more industrialized setting.

In response to increasing concerns from local communities, the condition of visual resources is being assessed for the major transportation corridors, population centers, and other scenic viewsheds to determine how BLM should manage these sensitive viewsheds and corridors. Tourism also plays a major role in the economy of western Colorado, and much of the GJFO planning area is viewed en route to or from major tourist destination areas. As the state's population grows, more visitors will be attracted to public lands for recreation in natural landscapes. In addition, a high demand is being placed on scenic resources near population centers.

3.2.14 Lands with Wilderness Characteristics Outside Existing Wilderness Study Areas

The BLM's authority to conduct wilderness reviews, including the establishment of new WSAs, expired on October 21, 1993, pursuant to Section 603 of the FLPMA. However, the BLM has retained authority under Section 201 of the FLPMA to inventory public lands for wilderness characteristics and to consider such information during land use planning. Through this planning process, the BLM has discretion to determine which portions of BLM lands with wilderness characteristics would be managed for those characteristics. However, the BLM

cannot manage these areas under the nonimpairment standard described in the BLM's Interim Management Policy for Lands under Wilderness Review (BLM Handbook H-8550-1 [BLM 1995a]), which applies only to WSAs.

The 1987 GJFO RMP did not address wilderness characteristics outside of WSAs. As such, during this current RMP revision process, the BLM completed a review of BLM-administered public lands within the GJFO to determine whether or not they possess one or more wilderness characteristics. The BLM reviewed both internal and external nominations, as well as areas identified through inventory and monitoring, and adjacent designations of other federal and state agencies. This review includes only BLM public lands and does not include portions of wilderness proposals on National Forest lands, within McInnis Canyons or Dominguez-Escalante NCAs, or within existing WSAs. Proposals involving lands exclusively within existing WSAs were not analyzed; however, any additions to the WSAs (lands outside or adjacent to) were analyzed. All wilderness characteristic proposal areas that occur within the existing designated WSAs will be managed in order to protect those wilderness characteristics under BLM's interim management policy until Congress either designates them as wilderness or releases them for other uses (see **Section 3.4.1**, Wilderness Study Areas). Wilderness characteristics include naturalness and outstanding opportunities for solitude and primitive and unconfined recreation. The results of the wilderness characteristics assessment are in **Appendix F**, Draft Wilderness Characteristics Assessment.

The process entails the identification of wilderness inventory units, an inventory of roads and wilderness characteristics, and a determination of whether or not the area meets the overall criteria for wilderness character. Units found to possess such character are evaluated during the land use planning process to address future management. The following factors are documented:

A. Size: Must be a roadless area with over 5,000 acres of contiguous BLM land or contiguous with designated wilderness or WSAs (or the equivalent. A roadless area of less than 5,000 acres may be considered if it is demonstrated that the area is of sufficient size to make practicable its preservation and use in an unimpaired condition.

B. Naturalness: Lands and resources exhibit a high degree of naturalness when affected primarily by the forces of nature and where the imprint of human activity is substantially unnoticeable. An area's naturalness may be influenced by the presence or absence of roads and trails, fences or other developments; the nature and extent of landscape modifications; the presence of native vegetation communities; and the connectivity of habitats.

C. Outstanding Opportunities for Solitude and Primitive and Unconfined Types of Recreation: Visitors may have outstanding

opportunities for solitude, or primitive and unconfined types of recreation when the sights, sounds, and evidence of other people are rare or infrequent; where visitors can be isolated, alone or secluded from others; where the use of an area is through non-motorized, non-mechanical means; and where no or minimal recreation facilities are encountered.

D. Supplemental Values: The area may contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Current Conditions

The 1987 GJFO RMP did not provide special management for areas outside of WSAs with wilderness characteristics. In 1999, a wilderness character inventory was conducted for the Bangs Canyon and South Shale Ridge areas near Grand Junction following a detailed roadless review of the two areas and BLM's consideration of nearly 3,000 public comments. The wilderness character inventory was conducted by an interdisciplinary BLM team from three states and an ad-hoc group of citizen-observers who represented a wide range of interests. Criteria for determining wilderness character were the same as those used in BLM's original 1980 national inventory. Details of inventory findings are included below.

Numerous external groups have varying interests and have advocated wilderness designations through legislation and participation in the land use planning processes. Proposal areas and acreage figures have changed over time. In 1994, Colorado conservationists presented to BLM the *Conservationists' Wilderness Proposal for BLM Lands* that compiled numerous citizen wilderness inventories and area-by-area justification for the statewide citizens' wilderness proposal. In 2001 and 2007, citizens' groups again presented BLM with a compilation of numerous citizen wilderness inventories and area-by-area justifications for citizens' wilderness proposals for BLM lands. The recent submission that will be analyzed carries forward a modified version of this original proposal. Currently, the proposal includes 13 areas within the GJFO project area: Bangs Canyon, Cow Ridge, Demaree Canyon, Granite Creek, Hunter Canyon, Kings Canyon, Little Book Cliffs, Maverick Canyon, Prairie Canyon, Sagebrush Pillows, Sewemup Mesa, South Shale Ridge, and West Creek (the Palisade).

In addition to external proposals, the BLM also internally identified additional areas to inventory for wilderness characteristics in accordance with the BLM "Policy on Conducting Wilderness Characteristics Inventory on BLM Lands" under Section 201 of the FLPMA. A total of 31 units were inventoried. **Table 3-26**, Units Inventoried for Wilderness Characteristics outside Existing Wilderness Study Areas, identifies the areas that were assessed for wilderness characteristics as part of the RMP revision process. Summaries are included below for inventory units that will be evaluated for management in at least one

Table 3-26
Units Inventoried for Wilderness Characteristics outside Existing Wilderness Study Areas

Inventory Unit	Acres Inventoried	Acreage with Wilderness Characteristics	Acres not Having Wilderness Characteristics
Bang's Canyon	20,434	20,434	0
Bang's West	6,878	0	6,878
Barrel Spring	10,169	0	10,169
The Blowout	5,105	0	5,105
Brush Mountain	5,310	0	5,310
Buck Canyon	5,009	0	5,009
Buttermilk Canyon	14,087	0	14,087
County Line	7,308	0	7,308
Cow Ridge	15,721	0	15,721
East Demaree	4,796	4,796	0
East Salt Creek	18,952	16,982	1,970
Granite Creek	14,048	0	14,048
Horse Mountain	10,303	0	10,303
Hunter Canyon	32,709	32,125	584
Kings Canyon	9,606	9,606	0
Lipan Wash	15,375	0	15,375
Little Book Cliffs WSA Expansion	1,580	0	1,580
Little Horsethief Creek	5,732	0	5,732
Lumsden Canyon	13,764	10,072	3,692
Main Canyon	12,613	0	12,613
Maverick	20,401	20,401	0
Munger Creek	23,804	0	23,804
Payne Wash	8,154	0	8,154
Prairie Canyon	17,569	0	17,569
Sagebrush Pillows	5,127	0	5,127
Sewemup Mesa[1]	23,551	0	23,551
South Shale Ridge	27,540	27,540	0
Spink Canyon	13,081	13,081	0
Spring Canyon	14,009	9,384	4,625
Unaweep[2]	7,154	7,154	0
West Creek (adjacent)	111	111	0
Total	**390,000**	**171,686**	**218,314**

[1]Acreage reflects BLM land in Colorado managed by the GJFO. The citizen-proposed wilderness unit of 70,084 acres includes lands managed by the US Forest Service, lands in Utah, and lands managed by the BLM Uncompahgre Field Office. These lands were not included in this assessment.
[2]Acreage reflects BLM land only. The citizen-proposed wilderness unit of 39,392 acres includes lands managed by the US Forest Service, as well as lands managed by the BLM that are cut off from the majority of the unit by a private road and lands. These lands were not included in this assessment.

alternative in the EIS (see **Chapter 2**, Alternatives, and **Chapter 4**, Environmental Consequences). These areas are also depicted on **Figure 2-10**, Alternative C: Lands Managed for Wilderness Characteristics Outside Existing WSAs. More information on the evaluation of proposed wilderness units, including methodology for analysis, as well as detailed information on all inventoried units, can be found in **Appendix F**, Draft Wilderness Characteristics Assessment.

Under the authority of 43 USC 1712 (Sec. 202 of the FLPMA), the BLM has discretion to manage lands to protect and maintain wilderness characteristics and character. While the BLM is in the RMP planning process, the BLM will manage public lands so as not to forgo management options in the event that new information is presented, weighed (evaluated), and incorporated into the planning process as part of one or more alternatives.

The following sections provide descriptions of those units found to have wilderness characteristics.

Bangs Canyon

The Bangs Canyon unit was not included in the original 1980 inventory and was inventoried in a newly filed re-inventory by the BLM in 1999. This unit is also proposed in the citizens' wilderness inventory. The Bangs Canyon unit contains 20,434 acres of federal land. All of the area was determined to have wilderness character. This large area retains its natural appearance and provides outstanding opportunities for both solitude and primitive and unconfined recreation in many locations. It includes 35 miles of rugged, steep-walled canyon country in Bangs Canyon, West Bangs Canyon, the canyon of North East Creek, and several of their tributary side canyons. Four specific areas within the inventory units (totaling 530 acres) do not appear natural in the landscape and lack wilderness characteristics. Livestock developments, continuously used roads, historically used camping areas adjacent to State Highway 141, and a utility line along State Highway 141 all contribute to the "unnatural in character" condition of these four areas. Three roads have been cherry-stemmed out of the inventory unit.

East Demaree

The East Demaree citizen-proposed wilderness area is exclusively BLM public lands and contains 13,830 acres. The proposal includes several additions to BLM's existing Demaree Canyon WSA boundaries. The entire inventoried area was determined to have wilderness character. This area retains its natural appearance and provides outstanding opportunities for solitude and primitive and unconfined recreation. The area contains steep granite cliffs and canyons, pinyon-juniper woodlands, and aspen-spruce forests.

East Salt Creek

The 16,879-acre East Salt Creek unit is located in Garfield County and is comprised entirely of BLM-administered lands. The entire unit was determined to have wilderness character.

The southern portion of the unit begins near the end of 16 Road, approximately 27 miles north of Fruita, Colorado. The unit is located within the Book Cliffs Range with elevations ranging from approximately 8,800 feet in the northern portion of the unit to 6,200 feet in the East Salt Creek drainage.

The combination of topography, vegetation, and size allow for outstanding opportunities for solitude. Canyons and creeks throughout the unit offer ample opportunity for concealed exploration, while the large stands of Douglas fir not only make the unit stand out in a regional context but also provide excellent screening from others within the unit.

Hunter Canyon

The Hunter Canyon citizen-proposed wilderness area encompasses 32,125 acres of BLM public lands. In the 1980 BLM intensive inventory findings, the Hunter Canyon unit described below was split into two units – the Garvey Canyon unit and the Hunter Canyon unit. The BLM now combines and analyzes these units as one. The Hunter canyon inventory unit was determined to have wilderness character. This area retains its natural appearance and provides outstanding opportunities for solitude. The unit ranges in elevation from approximately 6,200 to 8,200 feet and contains rugged canyons and cliffs of the Green River Formation. The unit also contains colorful and interestingly shaped hoodoos which are considered to be a supplemental value as they have been given special VRM consideration in the current GJFO RMP (BLM 1987). The BLM cherry-stemmed an existing route in the bottom of Kimball Creek that contains the gas wells that are still maintained.

Kings Canyon

This citizen-proposed unit was not inventoried during the intensive wilderness inventory in 1980 because the BLM described too many affronts to naturalness due to chaining and livestock water developments. It has a contiguous boundary with the Westwater WSA managed by the BLM Moab Field Office in Utah. All 9,398 acres of the unit were found to have wilderness character. The area has returned to a natural state and includes outstanding opportunities for primitive and unconfined recreation. The unit contains varied topographic features, including canyons such as Toms and Kings with numerous smaller side canyons and interesting rock formations.

Lumsden Canyon

The 10,072-acre Lumsden Canyon unit is located in southern Mesa County, just west of the town of Gateway and Highway 141. The unit is comprised entirely of BLM-administered lands and encompasses a system of canyons which rise

above the Dolores River. All lands inventoried were found to have wilderness character.

Elevation in the Lumsden Canyon unit ranges from approximately 7,000 feet where the canyons reach the mesa to 4,600 feet in the eastern portion of the unit near the Dolores River. John Brown, Lumsden, and Gateway Canyons offer impressive Entrada Sandstone formations. The scenery within the canyons and scenic views of the Palisade supplement the qualities of the unit.

Maverick Canyon

The Maverick Canyon citizen-proposed wilderness area encompasses 20,451 acres of BLM public lands within Colorado. The unit was not inventoried during the intensive wilderness inventory in 1980. All lands inventoried were found to have wilderness character. This area retains its natural appearance and provides outstanding opportunities for solitude and primitive and unconfined recreation. The Maverick Canyon unit consists of several towering red-rock canyons, including Maverick Canyon, Larson Canyon, and Blue Creek, which all cut deeply into the Uncompahgre Plateau to the east. The unit also contains Juanita Arch, one of the only natural bridges of its kind in Colorado.

South Shale Ridge

The South Shale Ridge unit was not included in the original 1980 inventory and was inventoried in a new field assessment by the BLM in 1999. The unit contains 32,393 acres of federal land. Most of the area (27,631 acres) has wilderness character. This large area retains its natural appearance and provides outstanding opportunities for both solitude and primitive and unconfined recreation in many locations. Four specific areas within the inventory unit (totaling 4,762 acres) lack wilderness characteristics. Absence of natural appearance in the landscape, gas wells, livestock developments, and continuously used roads all contribute to the "unnatural in character" condition of these four areas. Twelve roads have been cherry-stemmed out of the inventory unit.

Spink Canyon

The 13,118-acre Spink Canyon Unit is located in Garfield County, approximately 25 miles north of Loma, Colorado. The unit is adjacent to the Demaree Wilderness Study Area, which bounds a portion of the unit to the south. The entire unit is comprised of public lands administered by the BLM. All acres inventoried were found to have wilderness character. Within the unit, there are very few human imprints, and the combination of topography, vegetation, and size allow for outstanding opportunities for solitude. Due to the remote nature of the unit, wildlife is abundant, offering outstanding hunting opportunities. High ridges in the canyon provide high visibility, which is ideal for scouting.

Spring Canyon

The 9,386-acre Spring Canyon unit is located in Garfield County, 25 miles north of Mack, Colorado, between South Canyon Road and Baxter Pass Road. The

unit is part of the Book Cliffs Range and is comprised entirely of BLM-administered lands.

Elevations range from approximately 8,100 feet in the northern portion of the unit to 5,900 feet in the southeastern portion of the unit along South Canyon. Talus slopes and rock outcroppings are prevalent in the unit due to the steep topography. As the elevation increases in the northern section of the Spring Canyon unit, Douglas fir becomes present. The unit offers high ridges providing scenic views for scouting, and multiple canyons, side canyons, and other drainages that provide outstanding hiking opportunities.

Unaweep
The Unaweep citizens' proposal contains 39,392 acres, of which the 7,335 acres on BLM lands were inventoried for the GJFO RMP revision process. All acres inventoried were found to have wilderness character. This area retains its natural appearance and provides outstanding opportunities for solitude and primitive and unconfined recreation, particularly on Ute Creek canyon.

West Creek (adjacent)
The West Creek citizens' proposal includes 350 acres adjacent to the Palisade WSA. The proposed unit would close two small cherry-stemmed dirt tracks on the area's western boundary. This unit was determined to have wilderness character. The area retains its natural appearance and provides outstanding opportunities for solitude and primitive and unconfined recreation, and has similar characteristics to the adjacent WSA.

3.3 RESOURCE USE CONDITIONS

This section contains a description of the human uses of resources in the GJFO planning area and follows the order of topics addressed in Chapter 2:

- Forestry
- Livestock Grazing
- Energy and Minerals
- Recreation and Visitor Services
- Comprehensive Travel and Transportation Management
- Lands and Realty

3.3.1 Forestry

BLM manages three million acres of forest and woodland lands in Colorado, including over half a million acres in the GJFO decision area. Tree species used commercially such as Douglas-fir and ponderosa pine make up only a small percentage of this acreage. The majority of woodland forests are dominated by tree species that are not traditionally used in commercial markets, such as pinyon-juniper and gambel oak *(Quercus gambelii)*. Wood products harvested from BLM lands include sawtimber, firewood, Christmas trees, post and poles,

wildings (live trees), and biomass. BLM management emphasizes forest health restoration and reducing the risk of catastrophic wildfire rather than production of commercial timber.

Current Conditions

Woodland and Forest Plant Communities

The GJFO decision area includes 586,000 acres of forest and woodland vegetation, covering approximately 55 percent of the decision area. Pinyon-juniper woodlands account for the majority of this area, covering approximately 539,900 acres or 51 percent of the decision area. Woodland and forest vegetation types are described below and in **Section 3.2.6**, Vegetation.

Woodland. The pinyon-juniper type is found at elevations of 4,800 to 7,500 feet. Stands at lower elevations tend to be primarily juniper, while stands at higher elevations tend to be primarily pinyon pine. The pinyon-juniper type usually gives way to the mountain shrub type at elevations above 7,500 feet. Pinyon-juniper woodlands have varying degrees of stand health. Woodlands have been altered by historic livestock grazing, vegetation treatments, roads, and fire suppression. Disease has increased, likely due to mild winters and drought-stressed pinyon. Understory herbaceous species composition has also been altered, with an increase in introduced nonnative plant species and invasive plant species such as cheatgrass.

Commercial Forest. Forested areas with potential commercial species are located within the mountainous areas of the Uncompahgre Plateau, Grand Mesa, areas accessed by Douglas Pass, and the extreme northern areas of the Book Cliffs. These areas cover approximately 46,200 acres, or four percent of the decision area. The majority of commercial forest land is in isolated stands on slopes greater than 60 percent and with limited access. The main plant community types within this category are Douglas fir, aspen, and ponderosa pine, described below.

Douglas fir is generally found on the northern and eastern aspects of the Book Cliffs and the Roan Plateau and occupies around 31,800 acres, or approximately three percent of the decision area. This species is found on steep slopes at elevations between 7,000 and 9,000 feet. Timber sales have been proposed in Douglas-fir stands; however, due to the stands' remoteness and steep slopes, the sales were not economically feasible. The predominance of mid- to late-seral-stage stands of Douglass fir in the region increase the susceptibility to insect outbreak and stand-replacing wildfire (US Forest Service 2007).

The aspen forest type accounts for 7,800 acres, or less than one percent of the decision area. Aspen occurs in areas above 8,000 feet on northern and eastern slopes with high moisture content. Within the decision area, aspen can be found on Douglas Pass, Mud Springs, and Uncompahgre Plateau. Aspen forests across Colorado have experienced widespread severe and rapid dieback and mortality,

termed Sudden Aspen Decline. One cause of Sudden Aspen Decline is drought stress, which makes trees more susceptible to disease and insect infestation. The majority of aspen in the region are in later seral stages, between 80 and 120 years old, and an increasing amount of mortality due to fungal pathogens is expected in the future (US Forest Service 2007). Conifer species will become the dominant tree species in a significant portion of the current aspen cover type if succession continues.

Ponderosa pine occurs on the higher mesas and mountains of the decision area at about 8,000 feet. The ponderosa pine forest type accounts for 6,700 acres, or less than one percent of the decision area. These stands are found on Uncompahgre Plateau, Douglas Pass, and other scattered areas, and occupied areas tend to be small. Frequent (less than 30-year interval), usually low-intensity wildland fires have burned through many ponderosa pine stands, removing competing understory vegetation and downed material. Core samples taken from the ponderosa pine stands on the Uncompahgre Plateau detected no fire history in the present stand.

Current Management and Use

Table 3-27, Woodland and Forest Acreage by Dominant Species, shows acreage for woodland and forest lands, regardless of suitability for harvest. Productive woodland or forestland is defined as an area capable of bearing vegetative products of commercial character and economically available now or prospectively for commercial use and not otherwise withdrawn from use. Woodland and commercial forest acreage is classified as either productive and suitable for management and harvesting on a 180-year rotation or unsuitable for management.

Table 3-27
Woodland and Forest Acreage by Dominant Species

Vegetation Type	Species	BLM Acreage	Percent of Decision Area
Woodland	Pinyon-Juniper	539,900	51
Commercial Forest	Douglas Fir	31,800	3
	Aspen	7,800	less than 1
	Ponderosa Pine	6,700	less than 1

Source: BLM 2010a

Pinyon-juniper woodlands are classified as unsuitable for management if they have the following site conditions or occur in the following locations:

- Steep slopes;
- Fragile soils;
- WSAs;
- Recreation sites;

- Wildlife areas;
- Areas containing sensitive species; and
- Areas of high cultural sensitivity.

Commercial forest lands are classified as unsuitable for management if they occur in the following locations:

- Municipal watersheds;
- WSAs;
- Recreation areas;
- Wildlife areas;
- Special status species habitat; and
- Areas of high cultural sensitivity.

An estimated 1,300 acres of commercial forest and 111,200 acres of woodland were classified as land productive and suitable for management in the 1987 RMP. Approximately 37,800 acres of commercial forest and 424,900 of woodland were classified as nonproductive and unsuitable for management.

The BLM has developed management zones for areas likely to have forestry product harvesting, and future site-specific management actions will be organized by management zone. Areas with defined management zones include the following:

- Bangs Canyon: 59,100 acres;
- Book Cliffs: 214,300 acres;
- Gateway: 194,300 acres;
- Glade Park: 67,100 acres;
- Grand Mesa Slopes: 60,700 acres;
- Grand Valley: 155,600 acres;
- Plateau Valley: 66,800 acres; and
- Roan Creek: 243,300 acres.

Current forestry uses in the project area include personal and commercial harvest of fuel wood, poles and posts for fence building, wildings (live trees), and Christmas trees. Pinyon pine has historically been the preferred species for fuelwood harvest, though juniper and other species are also collected. Poles and posts are generally collected from pinyon-juniper woodlands, and Christmas trees and wildlings are harvested throughout the project area. The GJFO authorizes approximately 1,100 personal use permits per year, the majority of which are for Christmas trees. Based on permits issued over the past four

years, current demand for Christmas trees is approximately 515 trees per year, demand for personal use firewood is 600 cords per year, and demand for juniper fence is 1,800 posts per year (see **Table 3-28**, Permits Issued for Forestry Products Fiscal Years 2007-2010). Demand for commercial harvest has been declining over the past two decades; however there is still a steady demand for small scale commercial wood harvesters.

Table 3-28
Permits Issued for Forestry Products Fiscal Years 2007-2010

Category	2007	2008	2009	2010
Fuelwood (cords)	430	584	745	292
Posts	1,670	1,400	2,051	2,095
Wildings (feet)	257	624	567	60
Christmas Trees	795	795	930	813

Biomass

Biomass resources are a byproduct of BLM actions on public lands and are not specifically cultivated for feedstock production. The BLM defines woody biomass as "the woody plants and portions of the trees, including limbs, tips, needles, leaves, and other woody parts, or rangeland environment, that are the byproducts of the management, restoration, and/or hazardous fuel reduction treatment." Biomass can be collected and harvested from BLM lands through timber sales, stewardship, and hazardous fuels reduction.

Current Management and Use. Biomass harvest and utilization has not been a part of existing management actions within the GJFO and is not addressed in the current GJFO RMP (BLM 1987).

Resource Potential. The BLM/NREL study (BLM and DOE 2003) evaluated the long-term sustainability to support biomass plants using the monthly Normalized Difference Vegetation Index computed from National Aeronautics and Space Administration's Advanced Very High Resolution Radiometer Land Pathfinder satellite program.

The GJFO is not in the top 25 BLM planning areas having the highest potential for biomass resources. For an area to have biomass development potential, it must meet the following criteria (BLM and DOE 2003):

- Having a Normalized Difference Vegetation Index of 0.4 for at least four months between April and September;
- Having a slope of less than 12 percent;
- Being located no more than 50 miles from a town with at least 100 people; and
- Having BLM compatible land use.

Biomass potential for any given area is dependent upon: (1) vegetation type and productivity, which is determined by soil and microclimate conditions; and (2) BLM management actions that may result in the production of biomass as byproduct. Wooded landscapes have a greater potential to produce biomass than shrublands, which in turn have a greater potential to produce biomass than grasslands and barren areas. Vegetation types available for biomass production are as follows (**Figure 3-12**, Biomass Energy Potential):

- Pinyon-juniper – 520,100 acres;
- Saltbush – 174,500 acres;
- Mountain shrub – 159,300 acres;
- Sagebrush – 83,200 acres;
- Douglas-fir and white Fir – 31,700 acres;
- Greasewood – 25,500 acres;
- Riparian – 9,800 acres;
- Aspen – 7,700 acres;
- Blackbrush – 7,000 acres;
- Ponderosa pine – 6,400 acres; and
- Barren land – 10 acres.

Existing Activity. There are no current or historical biomass energy facilities on public lands within the GJFO decision area, nor has the GJFO received any ROW applications for such facilities (GeoCommunicator 2009).

Trends

There is evidence that woodland tree species, especially pinyon and juniper, are spreading and becoming established in areas that are below their historic elevation limits as a result of fire suppression and climate variation (Miller and Taucsh 2001). Should this trend continue, the availability of fuel wood and other products may continue to increase. However, the trend towards more frequent and more severe wildfire in denser stands may counter some of this increase.

The demand for Christmas trees, firewood, and posts is expected to remain at current levels. Firewood demand largely decreased over the past 15 years due to burning limitations and the availability of relatively cheap electricity and natural gas. This trend may reverse itself should further increases in natural gas and fuel oil prices occur. The supply of firewood and wood fiber for other uses is expected to increase in response to fuel management and forest health projects.

A new sector of forestry use is biomass materials. There is potential for providing renewable biomass fuel within woodlands. Removal of forest and

woodland materials as a result of energy development is expected to increase and create the greatest demand on forest and woodland products. Growth of this market sector is anticipated to continue, placing higher demand on small sawlogs and woodlands. Numerous projects and programs have been developed to identify and promote the use of small sawlogs and woody biomass in Colorado (BLM 2009g). The US DOI collaborates with the Departments of Energy and Agriculture to encourage the use of woody biomass by-products from restoration and fuel treatment projects. Legislation in 2003 expanded and extended the use of stewardship contracting by the BLM and US Forest Service (Section 323 of Omnibus Appropriations bill, Public Law 108-7). These contracts will allow private companies, communities, and others who engage in contracts to retain forest and rangeland products in exchange for the service such as thinning trees and brush and removing dead wood. Long-term contracts foster a public-private partnership to restore forest and rangeland health by giving those who undertake the contracts the ability to invest in equipment and infrastructure needed to productively utilize material generated from forest thinning, such as brush and other woody biomass, to make wood products or to produce biomass energy, all at savings to taxpayers.

Past decisions regarding forest and woodland products management emphasized wood products, but forest management policy on federal lands has changed, emphasizing forest health and hazardous fuel reduction. Much of the current forest management is guided by the National Fire Plan (US DOI 2000) and the Healthy Forests Restoration Act of 2003 (16 USC at 1611-6591). The National Fire Plan established an intensive, long-term hazardous fuels reduction program and provisions to hasten hazardous fuel reduction. In fiscal year 2009 alone, more than 16,000 acres of fuels on BLM-managed lands in Colorado were treated by prescribed fire and mechanical methods in part as a result of this directive. Direction for forest restoration projects is provided for in the Healthy Forests Restoration Act, which also emphasizes retaining larger trees and removing in-growth to promote healthy forests that are more resistant to fire, insects, and disease.

3.3.2 Livestock Grazing

In 1997, the BLM and the three Resource Advisory Councils, in close coordination with permittees, the environmental community, and interested members of the public, completed land health standards and grazing guidelines specifically for BLM-administered lands in Colorado (**Appendix E**). These standards and guidelines are designed to provide specific measurements of land health and to identify best management practices in keeping with the characteristics of a region, such as climate and vegetation types. These standards describe conditions needed to sustain public land health for soil, riparian systems, upland vegetation, wildlife habitat, threatened and endangered species, and water quality. They relate to all uses of public lands, including livestock grazing. Standards are integrated into the BLM's land management through incorporation into land use plans, as a basis for environmental assessments and

through NEPA analysis, and as a basis for monitoring. Guidelines are integrated into land management by applying them to livestock grazing authorizations.

Current Conditions

Level of Use

Approximately 971,900 acres of BLM-administered lands are open to grazing within grazing allotment boundaries and are managed by the GJFO in accordance with the 1987 RMP (**Figure 2-11**, Alternative A: Grazing Allotments). Approximately 13,000 acres of BLM-administered lands are not currently allocated. Approximately 48,800 acres of BLM-administered lands are closed to livestock grazing on Sewemup Mesa and the LBCWHR. The establishment of allotments is a result of the grazing districts and permitting system established to manage livestock grazing in these districts by the 1934 Taylor Grazing Act.

In some cases, to make grazing management more efficient, allotment boundaries cross field office boundaries. Therefore, the GJFO administers allotments outside of its administrative boundary, and, conversely, there are allotments within the GJFO administrative boundary that are administered by other field offices under an MOU with the parent field office. These agreements are as follows:

- The Buckhorn, Bar-X, and San Arroyo Allotments are within the GJFO planning area but are managed by the Moab Field Office and are included in the Moab Field Office RMP;
- Portions of the Prairie Canyon, Jouflas, Mountain Island (Lost Canyon, Lost Horse, and Fish Park pastures), Spring Creek, Hubbard, and Dolores Point allotments are within the Moab Field Office but are administered by the GJFO and are covered in this RMP;
- The Cathedral Bluff Allotment is within the GJFO planning area but is managed by the White River Field Office and is included in the White River Field Office RMP; and
- A portion of the West Salt Allotment (East Evacuation) is within the White River Field Office planning area but is administered by the GJFO; it is covered under this RMP.

Allotments/Animal Unit-Months

There are 207 allotments managed by the GJFO in the RMP planning area. Of these allotments, 186 are permitted for livestock grazing and 21 are vacant. Allotments that are vacant have been relinquished to the BLM and involve small amounts of public land, are not suitable for grazing, or have resource concerns that make repermitting undesirable. In addition to BLM-administered land, these allotments may contain National Forest System, Bureau of Reclamation,

municipal, state, and private lands. There are 145 permits authorizing grazing on these allotments. Total active preference (permitted use) is 63,859 animal unit-months (AUMs), with an additional 24,344 AUMs in suspension. Total permitted numbers adjust occasionally due to conversions of the class of livestock, changes in allotment boundaries or livestock management, and changes to meet carrying capacities, as determined by vegetative inventories and monitoring. Between 2000 and 2009, an average of 36,125 AUMs were grazed annually in the RMP planning area. Some permit holders used 100 percent of their permitted use every year, while others used zero percent during the 10 year period. The reasons for partial or full non-use include but are not limited to: personal convenience, resource protection, economic conditions, and public lands access issues.

Of the 207 grazing allotments managed within the RMP planning area, 203 are used for cattle grazing, primarily cow/calf operations. The Woods and Snyder Flats allotments are used for both sheep and cattle, and the 4-A Mountain and Upper Brush Mountain allotments also include a small amount of domestic horse use. The 1987 RMP allowed sheep grazing on 30 allotments. **Appendix J**, Allotments and Allotment Management Levels, lists all of the grazing allotment names and numbers, the type of livestock, the season of use, the acres of private and public lands, the management category, and the amount of AUMs and public land acres by alternative within the RMP planning area.

Land Health Assessments

Land health assessments use ecological site potential and interdisciplinary site evaluations to determine the current state and health of the land. For over a decade, the GJFO has been working to complete its land health assessment for the entire field office (see **Figure 3-13**, BLM Land Health Assessments). These assessments have identified concerns with land health in areas below 6,000 feet in elevation. Generally referred to as desert country, these areas receive less than 10 inches of annual precipitation. While livestock grazing (current or historical) is often not the sole factor in the cause for this land health condition, it is often a contributing factor.

There are 42 allotments with all or a portion of their area below 6,000 feet. Of these allotments, 26 have more than one-quarter of the allotment area that does not meet land health or that meets land health but with problems. In most cases, the areas not meeting or meeting with problems are suitable for grazing (e.g., they have gentle slopes and vegetation types with herbaceous forage). Areas that are meeting land health standards often are unsuitable for grazing (e.g., they have steep slopes, badlands, pinion-juniper, and shrub communities with limited herbaceous components). **Table 3-29**, Grazing Allotments Below 6,000 Feet Not Meeting Land Health or Meeting With Problems, displays the acres and percentage of allotments below 6,000 feet that are struggling to meet or that do not meet land health standards. These areas are displayed on **Figure 3-14**, Land Health Assessment Below 6,000 Feet.

Table 3-29
Grazing Allotments Below 6,000 Feet Not Meeting Land Health or Meeting With Problems

Allotment	Acres Below 6,000 Feet	Acres with Land Health Concerns	Ratio with Land Health Concerns
Ames	257	189	73.54%
Badger Wash	7,687	5,356	69.68%
Beaver Mesa	969	132	13.62%
Berry Homestead	2,510	1,155	46.02%
Big Park	11,236	1,583	14.09%
Big Salt	5,758	3,808	66.13%
Blue Mesa	7,272	308	4.24%
Bull Draw Common	3,127	118	3.77%
Casto-Lines Common	1,634	225	13.77%
Coon Hollow Common	14,845	6,456	43.49%
Cottonwood	2,646	213	8.05%
Davis Amp	4,273	1,160	27.15%
Dolores River	3,086	328	10.63%
Dry Canyon-Demaree	3,983	1,852	46.50%
EastSalt	29,877	15,446	51.70%
EHL	193	182	94.30%
Garr Mesa	6,077	3,066	50.45%
G-M-L	3,176	1,240	39.04%
Hamilton	635	131	20.63%
Highway 50	884	882	99.77%
Hunter Wash	12,784	4,885	38.21%
Jerry Gulch	1,133	184	16.24%
J.L.	164	38	23.17%
Kannah Creek Common	14,319	12,390	86.53%
Little Salt	27,330	14,327	52.42%
Logan Gulch	3,466	964	27.81%
Lower Rapid-Cottonwood	2,080	37	1.78%
Lyons/Anderson	1,836	211	11.49%
Mogensen	1,396	196	14.04%
Mt. Garfield	25,527	17,876	70.03%
Mule Trail Draw	179	161	89.94%
North Fork Kannah Creek	454	194	42.73%
Salt Wash	1,349	36	2.67%
Sinbad Valley Common	5,707	3,173	55.60%
Sunnyside Common	5,195	1,424	27.41%
Tom Casto	79	79	100.00%
Ute Creek Common	4,566	3,143	68.83%
West Salt Common	15,036	7,355	48.92%
West Spears	3,599	662	18.39%
Whitewater Common	18,327	8,918	48.66%
Wild Country	3,910	531	13.58%
Winter Flats-Deer Park	20,840	13,597	65.24%
Total *(rounded to nearest 100)*	***279,400***	***134,200***	

Source: BLM 2010a

Management Categories and Allotment Management Plans

The three selective management categories for allotments are custodial, maintain, and improve. The initial categorization occurred before the 1987 RMP and was updated in 2000. Custodial allotments in the planning area are generally small parcels of public land intermingled with larger tracts of private land. These allotments generally have few sensitive resources. They generally have few issues with low controversy, and the range condition is satisfactory. Maintain category allotments generally contain more public lands than custodial allotments, as well as more diverse resources. These allotments are generally in satisfactory condition with few resource issues. Improve category allotments are either in unsatisfactory condition or contain significant sensitive resources or issues that may require investments of time and money. These allotments have the highest priority for monitoring and range improvement development. In addition, management changes have occurred as needed on a case-by-case basis as circumstances deem necessary.

As of 2008, 42 allotments are part of implemented allotment management plans (AMPs) or grazing use agreements that identify a change in livestock management or more intensive management. Thirty-four of these allotments are in the improve category, three are in the maintain category, and five are in the custodial category. Changes in management may be due to conflicts with other uses or resources, adjustment in authorized active AUMs based on ecological site inventory, or a land health assessment where livestock grazing has been determined to be a causal factor. Although in general, improve category allotments have priority for completing AMPS, new resource issues or conflicts may require the development of an AMP for specific maintain or custodial allotments before the AMPs are completed for all improve category allotments.

Monitoring and Inventories

Monitoring continues to be an important component of the livestock management program. All allotments within the GJFO have some sort of monitoring study. Study methods include photo points, nested frequency transects, utilization, apparent trend, actual use, big game transects, and allotment supervision. Each allotment has one or more of these studies, depending on the issues and concerns and prioritization category. Monitoring data are analyzed during the grazing permit renewal process or as needed.

Trends

Trends in livestock grazing reflect changes in livestock types, changes in permittees and their perspectives, changes in permitted use or season of use, and changes in other resource uses and priorities. Since the early 1970s, sheep producers in the area have been converting to cattle, which has caused a conversion of sheep grazing to cattle grazing in most allotments in the planning area. Absentee ownership of many of the allotments has increased, as has the number of permittees that do not rely on livestock grazing for their primary source of income. Changes in the types of permittees that graze livestock have

resulted in diversification of perspectives. Some permittees value other resources on their grazing allotments as much if not more than livestock grazing.

Results from the land health assessments and ecological site inventories have led to changes in livestock management. Changes in permitted use (active use), livestock numbers, and season of use are in response to changes in rangeland condition, socioeconomics, and other factors. Variations in the condition of the land are in response to climatic factors, wildlife, past and present livestock use, oil and gas development, recreational use, insect infestations, and population increases. The increases in all activities are competing for resources that limit livestock grazing. If rangeland conditions deteriorate, the BLM can reduce the number of permitted AUMs, manage plant communities that provide forage and browse through vegetation treatments, change the season of use, require deferment and pasture rotations, and install range improvements, such as fences, water pipelines, spring developments, and reservoirs. These range improvements often enable more intensive grazing systems and encourage better livestock distribution and grazing utilization, but they also require more management on the part of the grazing permittee. Range improvement and permittee involvement may become more crucial in sustaining future resource demands. The BLM's traditional goal in managing livestock grazing is to provide sustainable forage for livestock and habitat for wildlife, which is likely to remain the primary focus of its management of livestock.

Urbanization of rural areas within the GJFO has caused conflicts with livestock grazing. New landowners are often unfamiliar with state livestock laws and associated fencing requirements. Conflicts develop when livestock authorized on public land drift onto private land. This is largely the result of public/private land boundaries that are not fenced or that are poorly fenced, or where fences have not been maintained. It is BLM policy not to fence or be responsible for maintaining boundaries bordering public land. In most instances the BLM has determined that it is not in the public interest to construct these fences, largely because it would not be practical or economical.

Increasing elk populations have been an issue for many grazing permittees and are often in direct competition with livestock for forage resources. This resource competition occurs primarily on private lands during the winter. Further increases in elk populations may increase the potential for these forage competitions to occur on public lands as well. The level of concern varies among grazing permittees. Those who own land where concentrated elk use occurs typically express the most concern over distributional problems. On the other hand, many grazing permittees are engaged in guiding and outfitting activities as another source of income and do not express the same concern as their neighbors.

Increased gas development and activity in the northern portion of the GJFO planning area has increased conflicts with livestock operations on public lands. As new roads are constructed and use of existing roads increases, control of livestock has become more difficult.

Increasing recreation is also leading to conflicts with livestock operations in terms of range improvement damage, gates being left open, livestock harassment, and in some cases shooting of livestock.

3.3.3 Energy and Minerals

Energy and minerals are discussed in four separate subsections: leasable minerals (both solid and fluid), locatable minerals, mineral materials (salables), and renewable energy.

- **Leasable minerals** include oil and gas, coal, oil shale, humate, uranium, and potash. Leasable minerals are governed by the Mineral Leasing Act of 1920, as amended, which authorized specific minerals to be disposed of through a leasing system. Geothermal heat is also considered a leasable mineral and is governed by the Geothermal Steam Act of 1970. Underground gas storage agreements and injection/disposal wells are also considered leasable minerals. All federal leasable minerals are managed and regulated through 43 CFR 3100 including On Shore Orders:
  - Order #1: Approval of Operations
  - Order #2: Drilling
  - Order #3: Site Security
  - Order #4: Measurement of Oil
  - Order #5: Measurement of Gas
  - Order #6: Hydrogen Sulfide Operations
  - Order #7: Disposal of Produced Water
  - Order #8: Well Completions/Workovers/Abandonment (Proposed Rule)
  - Order #9: Waste Prevention and Beneficial Use of Oil and Gas
- **Locatable minerals** include uranium, vanadium, gold, alabaster/gypsum, copper, silver, tungsten, gem minerals (amethyst, fluorite), limestone, and zeolite. Locatable minerals can be located and claimed under the Mining Act of 1872.
- **Mineral materials** include sand and gravel, limestone aggregate, building stone, moss rock, cinders (clinker), clay, decorative rock, and petrified wood. Mineral materials are sold or permitted under the Mineral Materials Sale Act of 1947.

- **Renewable energy** resources include wind, solar, biomass, and hydropower.

Figures showing oil and gas development potential in the GJFO can be found in the Reasonably Foreseeable Development Scenario for Oil and Gas Grand Junction Field Office, Colorado (BLM 2012a). Figures showing resource potential for other minerals in the GJFO including coal, oil shale, uranium/vanadium, placer gold, copper, silver, dimension stone, potash and salt can be found in the Mineral Potential Report for the Grand Junction Resource Area, Grand Junction Field Office (BLM 2010d). Both documents are available on BLM's RMP Web site (http://www.blm.gov/co/st/en/fo/gjfo/rmp.html).

Current Conditions

The BLM was established as the responsible agency for the administration of leasing and development of the federal mineral estate in the Mineral Leasing Act of 1920. In the Planning Area, subsurface mineral estate administered by the BLM (i.e., federal mineral estate) totals 1.2 million acres. The mineral estate acres are greater than BLM surface acres (1,061,400 acres) because BLM manages federal mineral estate underlying some privately owned and State-owned lands. The BLM also manages the federal mineral estate underlying National Forest System Lands. The US Forest Service has the authority and responsibility (Federal Onshore Oil and Gas Leasing Reform Act, 1987) to determine which National Forest System lands are available for oil and gas leasing and identify the specific lands which BLM may offer to lease. Additionally, for National Forest System lands, the US Forest Service is the surface management agency responsible for prescribing lease terms that provide reasonable protection to surface resources and values, and for implementing the terms of the leases. The BLM is responsible for all subsurface activities related to exploration and development.

The GJFO manages mineral estate underlying National Forest system lands within portions of the White River National Forest and the Grand Mesa, Uncompahgre and Gunnison National Forests. Lease parcels within the Planning Area are reviewed for conformance with Oil and Gas Leasing EISs issued by those forests (see **Section 1.10.1**). The review includes a process whereby the lease parcel is reviewed to determine if it was identified as administratively open to leasing in the relevant Forest Plan and the identification of stipulations included in the plan which the US Forest Service, as the surface management agency, identified as necessary for protection of surface resources. Both forests are revising their oil and gas leasing plans and BLM is a cooperating agency. Should the plans be finalized, the BLM would adopt those documents and refer to the decisions reached to review parcels for availability for leasing subject to the stipulations identified in the plan.

Management coordination between the US BOR and the BLM on US BOR acquired and withdrawn lands (BOR lands) is spelled out in the Interagency

Agreement Between the Bureau of Reclamation and the Bureau of Land Management signed March 25, 1983 (BOR and BLM 1983). Within the GJFO planning area, the US BOR administers approximately 3,700 acres of acquired lands, and approximately 4,883 acres of withdrawn lands associated with 3 constructed and active Reclamation projects (Collbran Project, Grand Valley Project, and the Grand Valley Unit of the Colorado River Basin Salinity Control Project). These lands are classified as 5A lands by the 1983 IA; the US BOR has full management jurisdiction on these lands. Approximately 3,073 acres are withdrawn by the US BOR for the Dominguez Project, which was not authorized for construction. These lands are classified as 5B lands; the BLM has the jurisdiction for these lands, subject to coordination with the US BOR. The US BOR has identified the Dominguez Project withdrawal for revocation.

Management of BOR lands and associated resources is pursuant to BOR law, policy and regulations; other federal laws, policies and regulations; and various agreements. All US BOR withdrawn lands are withdrawn from mineral entry, but not necessarily mineral leasing. On 5A lands the US BOR determines whether federal mineral or geothermal leasing is permissible; the BLM issues such leases only upon the US BOR's consent and concurrence on all conditions and stipulations. BOR lands within Vega State Park, Highline State Park, and Horsethief Canyon State Wildlife Area are managed under agreements with the State of Colorado.

The US DOE Office of Legacy Management currently administers the US DOE's Uranium Leasing Program, managing one lease tract containing approximately 5,800 acres within the GJFO planning area. These lands are withdrawn from mineral entry and leased by US DOE for the management of uranium and vanadium resources. The US DOE has the jurisdiction for these resources, and the surface management of other resources, such as grazing and recreation, is under GJFO's jurisdiction. The US DOE Uranium Leasing Program is managed under the authority and in accordance with Title 10 CFR Part 760, in cooperation with the BLM and the State of Colorado.

Leasable Minerals

Leasable minerals defined by the Mineral Leasing Act (February 1920; and 43 CFR 3000-3599, 1990) include the subsets leasable solid and leasable fluid minerals. Leasable solid minerals include coal, oil shale, native asphalt, phosphate, sodium, potash, potassium, uranium, and sulfur.

Leasable fluid minerals include oil, gas, and geothermal resources. The rights to explore for and produce these minerals on public land may only be acquired through leasing.

<u>Solid Leasable Minerals.</u> Solid leasable minerals in the planning area include coal, oil shale, potash, and uranium.

Coal. There is one idle underground coal mine operating within the GJFO along Highway 139 in the Book Cliffs. Another larger underground coal mine is proposed in the Book Cliffs near the McClane Canyon mine and is going through the NEPA/permitting process.

There are two geologic intervals of coal-bearing rocks in the GJFO planning area: The Dakota Group and the Mesaverde Group. The Dakota Group coals consist of localized shallow coal outcrops in bluffs above the Dolores and Gunnison rivers. The Dakota is exposed and partly eroded on the flanks of the Uncompahgre Uplift west of Delta, Colorado.

The Mesaverde Group coals are exposed in the cliff edge of the Book Cliffs north of Grand Junction. The majority of the coal resources in this study are located in the Book Cliffs Region north of Grand Junction.

The coals present in the GJFO planning area vary from semi-bituminous to bituminous B and C in apparent rank. The coal is non-coking, non-agglomerating in nature.

Although the Grand Mesa coal field partly lies within the GJFO planning area, there are no historic coal mines in that part of the GJFO area. The Dakota Sandstone contains coal up to six feet thick in the BLM Grand Junction area. Mostly, it is an impure coal with high ash content. Small pockets of Dakota Group coal represent Low to Moderate potential for mineable coal because they are on geologic trend with the New Horizon mine (BLM 2012a).

Oil Shale. Oil shale is an organic-rich sedimentary rock consisting of calcareous shale with a large amount of organic material known as kerogen. The kerogen likely originated as decaying algae and bacteria that thrived in the nutrient-rich waters of Lake Uinta. It is present throughout the lower Parachute Creek Member and the underlying Garden Gulch Member of the Green River Formation. Oil shale can be found at or near the surface within parts of 20 townships in the northeastern part of the area. Within this area resource grades can be as high as one billion barrels of oil in-place per square mile (Bbbl/sqmi) and average approximately 0.33 Bbbl/sqmi. This is lower than the resources found to the north of the planning area, where grades can exceed two Bbbl/sqmi in places. The entire Piceance Basin is estimated to contain as much as 1,525 billion barrels of oil in place (BLM 2012a).

The oil shale resources in the GJFO planning area occur in mesas that are erosional remnants of a formerly larger area of extent. While this means that the total resource may be lower on a township by township basis, the resources are well exposed and more accessible by surface or underground mining methods (BLM 2012a).

There are no active or proposed oil shale projects as of May 2010. A Final EIS was completed and a Record of Decision was issued in November 2008

amending the 1987 RMP to make lands available for oil shale leasing, but leases have not yet been issued. A NEPA analysis would be conducted prior to lease issuance (BLM 2009d).

Potash. There is a potential undefined potash resource underneath Sinbad Valley, and in 2008 a company expressed interest in exploring the area for potential development via solution mining. Prior to 2008 there had been no exploration activity for potash within the planning area (BLM 2009d).

Potash and salt (sodium chloride) are known to occur in the Paradox Formation, outcropping in the Sinbad Valley at the extreme southwest corner of the GJFO planning area. The probability of occurrence in the Sinbad Valley area is considered High (BLM 2012a).

Uranium. Uranium is considered both a leasable and locatable mineral. It is discussed in detail under Locatable Minerals, below.

Liquid Leasable Minerals. Liquid leasable minerals in the planning area include oil, natural gas, and geothermal fluids.

Oil and Gas. The GJFO planning area contains approximately 1,444,000 acres of federal oil and gas estate. Of these acres, there are 1,273,000 acres of BLM-managed surface, 166,000 acres of privately owned surface, 2,000 acres of State lands, and 7,900 acres of BOR-managed lands. In addition, there are approximately 3,580 acres of BLM-managed surface overlying private minerals.

Private surface lands, where there is no federal oil and gas mineral estate, account for 554,000 acres (BLM 2009d).

Leasing of oil and gas since 1992 has varied from 0 acres in 2011 to 122,937 acres in 2006, with an average of 29,522 acres per year (**Table 3-30**, Federal Oil and Gas Acreage Leased By Year). Existing mineral leases for oil and gas are shown in **Figure 3-15**, Oil and Gas – Leases and Wells. The planning area has 820 active leases containing 690,100 acres. The average size of these leases is 840 acres. Currently, there are 961,600 acres open to leasing within the planning area. The GJFO has approved an average of 13 wells per year in the past 20 years (**Table 3-31**, Wells Approved and Drilled By Year).

As of January 2011 there were 30 BLM-approved multi-well pads that contain an average of six federal wells per pad. These pads are located on federal and private surface. A majority of the multi-well pads have been approved since 2005 and are necessary to efficiently develop high well density areas. Two underground gas storage agreements are currently leased for a total of 2,404 acres. Five injection/disposal wells have been permitted since 1987.

Table 3-30
Federal Oil and Gas Acreage Leased By Year

Year	Acres Leased	Year	Acres Leased
1992	17,596	2002	20,441
1993	17,202	2003	48,839
1994	44,169	2004	61,085
1995	32,990	2005	42,810
1996	14,893	2006	122,937
1997	13,894	2007	12,404
1998	7,927	2008	10,517
1999	5,665	2009	2,060
2000	38,395	2010	4,513
2001	72,094	2011	0
		Average Acres:	*29,522*

Source: BLM 2009d, 2010a

Table 3-31
Wells Approved and Drilled By Year

Year	Wells Aproved	Wells Drilled	Year	Wells Approved	Wells Drilled
1992	20	23	2002	4	3
1993	7	7	2003	11	10
1994	17	17	2004	20	13
1995	7	7	2005	16	19
1996	8	8	2006	43	39
1997	4	4	2007	25	18
1998	6	3	2008	35	25
1999	3	6	2009	13	3
2000	3	2	2010	0	2
2001	5	6	2011	10	5
Total	*257*	*220*	*Average*	*13*	*11*

Source: BLM 2009d, 2010a

The BLM has approved 170 federal wells on the multi-well pads. In some cases, additional private wells are located on each multi-well pad. On average there are seven wells located on each multi-well pad. This number may be low, as additional wells are added to private surface pads without any required approval or notification to the BLM.

In the Collbran area, where wells are being drilled at a density of 10 acres per well (downhole locations), the pads may contain as many as 21 wells. See **Table 3-32,** Status of Existing Federal Mineral Estate Wells, for the status of wells in the GJFO.

Table 3-32
Status of Existing Federal Mineral Estate Wells

Status of Well Development	No. of Wells
Currently completed – producing or shut in	521
Approved applications, but not drilled	35
Plugged and abandoned	68
Abandoned – surface reclamation is pending acceptance	67
Drilling or not completed	7
Total	*698*

Source: BLM 2009d

Recent BLM guidance (BLM Instruction Memorandum 2010-117, Oil and Gas Leasing Reform – Land Use Planning and Lease Parcel Reviews) introduces the Master Leasing Plan concept as a mechanism for completing the additional planning, analysis, and decision making that may be necessary for areas meeting listed criteria. During the development of this RMP, GJFO received an external recommendation to prepare a Master Leasing Plan for the Shale Ridges and Canyons area. The full analysis of this external recommendation is presented in **Appendix P**, Leasing Reform and Master Leasing Plans.

Geothermal. The BLM has statutory authority for leasing geothermal mineral rights under the Geothermal Steam Act of 1970 (PL 91-581; 30 USC §§ 1001-1027, December 24, 1970, as amended, 1977, 1988, and 1993). Geothermal resources are a source of energy that uses the natural heat of the earth's interior, carried to the surface by steam and/or hot water. Geothermal resources have been used in Colorado since the early 1900s.

In cooperation with the National Renewable Energy Laboratory (NREL), the BLM assessed renewable energy resources on public lands in the western US (BLM and DOE 2003). The BLM reviewed the potential for geothermal energy on BLM, Bureau of Indian Affairs, and US Forest Service lands in the western US, except Alaska. In May 2008, the BLM signed a ROD for the Geothermal Leasing Programmatic EIS (BLM 2008d). This document serves as the baseline for the assessment of geothermal resources in the GJFO decision area.

Renewable energy potential within the planning area, excluding right-of-way exclusions, WSAs, and no-lease areas under oil and gas stipulations, are discussed below under Current Management. Geothermal energy potential for all lands within the planning area, including lands excluded under the Current Management discussion, are discussed below under Resource Potential.

Current Management. The GJFO RMP (BLM 1987) does not address geothermal energy; however, the RMP was amended by the 2008 Programmatic EIS for Geothermal Leasing in the Western US (BLM 2008d). The ROD for the PEIS identified 420,106 acres as being open to geothermal leasing, and 66,622 acres as being closed to geothermal leasing. The open areas generally encompass the eastern half of the GJFO.

Resource Potential. The GJFO decision area, excluding WSAs and areas closed to oil and gas leasing, has 397,500 acres of federal mineral estate identified as having geothermal potential. As shown in **Figure 3-16,** Geothermal Energy Potential, all of this acreage lies within the mid-to-eastern portion of the planning area.

The Programmatic EIS for Geothermal Leasing in the Western US (BLM 2008d) evaluated 12 states for geothermal energy potential. It focused on areas where there may be underground reservoirs of hot water or steam created by heat from the earth or that have subsurface areas of dry hot rock. These areas are where the BLM would mostly likely receive geothermal lease nominations and applications in the future. The Programmatic EIS used GIS data from the Colorado Geological Survey and included areas of both direct (non-electrical) use and indirect (electrical power) applications. This information was based on data from known hot springs combined with oil and gas basins that have potential for geothermal resources by virtue of bottom-hole temperatures. Colorado Geological Survey considered geothermal heat flow and gradient data from other sources in creating the potential area.

Existing Activity. There are no geothermal facilities, leases, or pending lease applications in the GJFO decision area (BLM 2009d; GeoCommunicator 2009). No existing hot springs or other geothermal features have been identified within the planning area (BLM 2009d).

Locatable Minerals

Locatable minerals (metallic and non-metallic) are those that can be located and claimed under the Mining Act of 1872. Placer gold, limestone (special quality/special use variety), alabaster, copper, silver, gemstones (amethyst and fluorite), and uranium are further discussed below.

Gold. Gold has been mined within the GJFO planning area from both lode and placer deposits. Most of the placer gold activity in the GJFO planning area has occurred on and off for 135 years, mainly in the terrace gravels along the Dolores River corridor in the far southwest portion of the area, with additional interest in the Gunnison and Colorado River areas.

Lode gold was reported in the copper deposits in both the Unaweep Canyon and Sinbad Valley. The deposits are reported to occur in "fissure veins" mainly in sandstone (BLM 2012a).

There are no large-scale mining operations or dredging activities within the planning area. There has been recreational small-scale placer activity along the Dolores River south of Gateway (BLM 2009d).

Alabaster/Gypsum. Historically there has been one small-scale surface mining operation south of Gateway along Highway 141. There are no active operations underway (BLM 2009d).

Uranium/Vanadium. Uranium and vanadium are considered together, because they occur together in the ores of the GJFO planning area. Within the GJFO planning area, uranium and vanadium are known to occur primarily in the Salt Wash Member of the Jurassic Morrison Formation, although mineralization has been reported from both the Chinle Formation and the overlying Wingate Sandstone and Kayenta Formation of the Glen Canyon Group.

The Chinle Formation hosts uranium deposits that have been mined in Utah and in other areas of the Uravan Mining District in Colorado; however no mining has taken place within the GJFO planning area in this formation. Uranium has been found in the Wingate and Kayenta Formations on the Colorado Plateau, but none within the GJFO planning area (BLM 2012a).

There has been extensive exploration and mining for uranium and vanadium in the Uravan mineral belt since the early 1900s. The first underground uranium/vanadium mine permitted in the planning area since implementation of the BLM 3809 regulations occurred in September 2008. There have been approximately 15 exploration drilling projects and 3 to 4 bulk sampling projects conducted between 2005 and 2008 (BLM 2009d).

Copper. Early descriptions of copper in southwest Colorado, observed that copper mineralization in the area was associated with faults and fissure-filling dikes that cut both the Paleozoic redbeds and the underlying crystalline Precambrian rocks. Copper mineralization has been found mainly at the base of the Triassic Wingate Formation (Glen Canyon Group), although it has been reported from the Chinle Formation, the Entrada Sandstone, and even in the Salt Wash Member of the Jurassic Morrison Formation. Copper (and minor gold) mineralization was also found associated with veins in Precambrian rocks in Glade Park.

The occurrence potential for copper in the Sinbad Valley, in the extreme southwest corner of the GJFO planning area, is considered to be High as well as areas of historic small-scale copper mining in the Unaweep District northeast of Gateway. In the Unaweep Canyon area, areas away from the historic mines have a Moderate potential, as do other geologic strata in the south of the GJFO planning area that contain redbed copper deposits in adjacent states (BLM 2012a).

There is one Notice of Intent on file for collection of hand specimen quality copper minerals (azurite and malachite) from an existing underground mine. Copper was produced from some of the historic uranium/vanadium mines in the Uravan mineral belt within the GJFO (BLM 2009d).

Silver, Tungsten, Zeolite, Limestone. Silver has been found sporadically within the GJFO planning area, commonly associated with copper. The copper deposits of the Sinbad Valley have yielded silver, associated with faulting and fracturing. In

the Unaweep Canyon area, silver has been described as occurring in "fissure veins in sandstones" (BLM 2012a).

The documented occurrence of silver deposits in the southwest end of the GJFO and adjacent areas of the Colorado Plateau leads to an assessment of Moderate occurrence potential for silver in the Sinbad Valley. Small, localized deposits containing silver in the Unaweep Canyon provide a Low occurrence potential (BLM 2012a).

There currently is no interest or activity related to these minerals within the GJFO (BLM 2009d).

Gemstones (Amethyst and Fluorite). There are no approved mining operations for these minerals at the current time, but the public has been mineral collecting at a few abandoned underground mines along Highway 141 southwest of Whitewater, Colorado (BLM 2009d).

Mineral Materials

Mineral materials include sand and gravel, and construction materials that are sold or permitted under the Mineral Materials Sale Act of 1947. The mineral materials program on BLM-administered lands within the GJFO planning area centers mainly around the use of sand and gravel for concrete aggregate, road base and coverings, construction fill, and rock for aggregate, riprap, and decorative purposes (flagstone and moss rock). Other mineral materials, such as silica sand, are also produced in Colorado but not in the GJFO planning area. Mineral materials are sold at a fair market value or through free use permits to governmental agencies. Local government agencies and non-profit organizations may obtain these materials free of cost for community purposes. County and state road construction divisions are the significant users of gravel and sand resources (BLM 2009d).

Sand and gravel, as construction aggregate, is an extremely important resource. The extraction of the resource varies directly with the amount of development nearby – road building and maintenance, and urban development, as sand and gravel is necessary for that infrastructure development. Even more so than other resources, however, the proximity of both transportation and markets are key elements in the development of a deposit.

Generally the most valuable is the gravel component, so commonly deposits are sought that contain higher proportions of gravel. Stream channel deposits are commonly sought. Flood plain and older terrace deposits are commonly utilized, along with alluvial fans. In general, flood plain areas are privately owned, including both surface and mineral estate, and not under the administration of the GJFO.

Eight areas within the GJFO planning area contain sand and gravel deposits – the Colorado River flood plain, the Gunnison River valley, upland deposits in the

Whitewater area, the Plateau Creek area, the Upper Grand Valley (north of the Colorado River and south of the Book Cliffs), the Uncompahgre Plateau area, the Dolores River area, and the Roan Creek area (BLM 2012a).

There are two active commercial sand and gravel operations and three common use areas identified for disposal of decorative rock (moss rock, flagstone, and basalt boulders), bentonite clay, adobe fill, and red gravel via over-the-counter permit sales. Three common areas were closed due to a new NCA designation (BLM 2009d).

Dimension stone is a general term for rock products that are finished to specific shape and size for building, monuments, industrial applications, or other end use. Other stone of similar characteristics is sold "raw," and uncut and later sorted into shapes and sized. Flagstone consists of thin slabs of stone used for paving. Fine-grained sandstone is the most popular and common type, and the principle rock type found in the GJFO planning area.

The Wingate Sandstone, in particular, has been a popular source of dimension stone as flagstone. Quartzite within the Dakota Sandstone tends to break into angular blocks and shows some potential for use as building stone. Boulders within glacial deposits from the Grand Mesa, just south of the GJFO planning area, can be utilized as decorative stone. In the GJFO planning area, the most common type is termed "moss rock," for the covering with lichens that give the rock an aged appearance.

Salable varieties of clay are widespread in the GJFO planning area and present in several stratigraphic units. None of the clays present have been defined or described as locatable varieties. The Brushy Basin Member of the Morrison Formation contains abundant bentonite but its occurrence is sporadic. The Mancos Shale contains layers of clay and the weathered products of clay-rich zones of the Mancos have been used in the area as adobe bricks.

The Dakota Sandstone is known to contain usable clay in other areas of Colorado, including refractory clay that has been mined commercially.

The existing Little Park Road community pit has a High occurrence potential, while the remainder of the Morrison Formation has a Moderate occurrence potential (BLM 2012a).

Renewable Energy

Renewable energy includes solar, wind, geothermal, and biomass resources. Geothermal resources are discussed under Leasable Minerals, above. Biomass resources are discussed under **Section 3.3.1**, Forestry. As demand has increased for clean and viable energy to power the nation, consideration of renewable energy sources available on public lands has come to the forefront of land management planning.

In cooperation with the NREL, the BLM assessed renewable energy resources on public lands in the western US (BLM and DOE 2003). The BLM reviewed the potential for concentrated solar power, photovoltaics, and wind energy on BLM, Bureau of Indian Affairs, and US Forest Service lands in the western US, except Alaska. In December 2005, the BLM signed a ROD for the Wind Programmatic EIS (BLM 2005b). These documents will serve as the baseline for the assessment of renewable energy resources in the GJFO decision area.

Renewable energy potential for solar and wind within the planning area is broken down into subcategories below. The potential for these resources are described below under *Current Management,* and excludes the following areas:

- Solar: areas designated as right-of-way exclusion areas and WSAs; and
- Wind: areas designated as right-of-way exclusion areas and WSAs.

The renewable energy potential for all lands (i.e., regardless of ownership) within the planning area, including lands excluded under the section *Current Management*, are discussed below under the section *Resource Potential*. Geothermal energy is discussed under the following section, *Leasable Minerals*.

Solar

Current Management. Solar energy development on BLM-administered lands is managed through ROW authorization under Title V of the FLPMA and 43 CFR 2800. The GJFO RMP does not address the development of solar energy resources (BLM 1987). The Office of Energy Efficiency and Renewable Energy, Department of Energy; and the BLM are preparing a Programmatic Environmental Impact Statement to evaluate utility-scale solar energy development, to develop and implement Agency-specific programs or guidance that would establish environmental policies and mitigation strategies for solar energy projects, and to amend relevant BLM land use plans with the consideration of establishing a new BLM Solar Energy Program. A decision is expected prior to finalizing the GJFO RMP.

Resource Potential. Excluding unsuitable public utility areas (ROW exclusions) and WSAs, the GJFO planning area has solar potential as follows:

- 220,569 acres with moderate concentrated solar power potential or very good photovoltaic potential (five to six kilowatt-hours per square meter per day).
- 589,660 acres with good concentrated solar power potential or excellent photovoltaic potential (six to seven kilowatt-hours per square meter per day) (BLM 2012a).

Based on resource availability, portions of the GJFO have potential for utility-scale solar energy development; however, based on feasibility for industrial production, the planning area did not rank among the top 25 BLM planning areas in the US having the highest concentrated solar power or photovoltaic potential. An area was considered to have high potential as a solar emphasis zone if it met the following criteria (BLM and DOE 2003):

- A minimum direct solar resource of six kilowatt-hours per square meter per day;
- Terrain slope of less than or equal to five percent for concentrated solar power or one percent for photovoltaic;
- Within 50 miles of 115- to 345-kilovolt transmission lines;
- Within 50 miles of a major road or railroad;
- A minimum parcel size of 40 contiguous acres;
- On Bureau of Indian Affairs, BLM, or US Forest Service lands; and
- BLM and US Forest Service compatible land use.

While strong solar resources are available across the planning area, there are limited areas with the above-listed appropriate conditions for utility-scale solar emphasis zones. As shown in **Figure 3-17**, Solar Energy Potential, the area with the most notable appropriate conditions for utility-scale solar energy development is the desert north of Grand Junction, from Mt. Garfield to the Utah state line. A programmatic EIS (PEIS) is being prepared for solar energy on BLM-administered lands.

Solar Energy Zones (SEZs) are being identified in the PEIS that would allow for development of projects that would produce more than 20 megawatts (MW) of power. Under the PEIS projects that would produce more than 20 MW of power would not be allowed unless they are located in SEZs. BLM has determined that development of new SEZs will be necessary in order to meet the reasonably foreseeable development scenario for solar energy. The RFDS for Colorado identifies the need to provide an additional 2,194 MW by 2030, which would require approximately 19,746 acres of public land managed by the BLM.

Criteria for adding creating new SEZs is currently being identified and analyzed in a supplement to the draft solar PEIS. Criteria for identifying new SEZs is similar to the criteria discussed above for developing solar emphasis areas. When determining the location of new SEZs BLM should consider transmission, load, solar resources, terrain, and According to the supplement to the draft PEIS new SEZs should meet the following criteria, "unless identified areas are otherwise well suited for development and provide for economically viable projects" (SDPEIS D-3):

- Size Threshold – Generally encompass 5,000 acres (20.2 km2) or more;
- Solar Insolation Level – 6.5 kWh/m2/day is preferred;
- Slope Threshold – Slopes of less than 5 percent is preferred, but dependent on technology;
- Load Center Area to be Served – Demand for new solar energy production; and
- Infrastructure Access – Consider proximity to existing infrastructure and access.

Existing Activity. No applications for solar power have been received by the GJFO (GeoCommunicator 2009), though several parties have made inquiries and BLM held one pre-application meeting in 2009.

Wind

Current Management. Wind energy development on BLM-administered lands is managed through ROW authorization in accordance with the terms and conditions of BLM's Wind Energy Development Policy (Instruction Memorandum 2009-043 [BLM 2009h]). This policy provides guidance on processing ROW applications for wind energy site testing and monitoring facilities, as well as applications for wind energy development projects on BLM-administered lands. The GJFO RMP does not address the development of wind energy resources (BLM 1987) and it was not amended by the Wind Programmatic EIS (BLM 2005b).

Resource Potential. The Wind Programmatic EIS (BLM 2005b) categorizes public lands into areas having a low, medium, or high potential for wind energy development from 2005 through 2025. Wind resources in Class 3 and higher areas could be developed economically with current technology over the next 20 years. Class 3 resources have medium potential; Class 4 and higher resources have high potential. The Wind Programmatic EIS (BLM 2005b) identifies public land parcels in the following areas with medium or high wind resource potential that might be developed economically with current technology:

- Cow Ridge, approximately 10 miles northwest of the town of DeBeque;
- Garfield Mesa, approximately 21 miles west of DeBeque;
- Pike Ridge, approximately 33 miles northwest of DeBeque;
- Unnamed mountain ridge around the town of Atchee; and
- Upper 4A Mountain, approximately 23 miles northwest of DeBeque.

These areas, which are concentrated along ridgetops, are shown in **Figure 3-18,** Wind Energy Potential.

In general, lands within the GJFO do not have high potential for wind energy. The GJFO planning area has 106 acres identified as having excellent (500 to 600 W/m^2) wind energy potential and 10 acres identified as having outstanding (600 to 700 W/m^2) wind energy potential (BLM 2005b). These areas are concentrated along Cow Ridge towards the eastern side of the ridge. Other areas with marginal (200 to 300 W/m^2), fair (300 to 400 W/m^2), and good (400 to 500 W/m^2) wind energy potential are concentrated on ridges along either side of Route 139 in the northwest portion of the planning area (acreages provided below). Additionally, ridges along the Colorado-Utah border in the southwestern corner of the planning area also have areas with marginal and fair energy potential.

Acreages by wind power potential class in the GJFO planning area, excluding unsuitable public utility areas (ROW exclusions) and WSAs, are as follows:

- Class 1 (unsuitable for utility-scale wind development) (0 to 200 W/m^2) – 803,516 acres
- Class 2 (marginal) (200 to 300 W/m^2) – 3,130 acres
- Class 3 (fair) (300 to 400 W/m^2) – 1,930 acres
- Class 4 (good) (400 to 500 W/m^2) – 458 acres
- Class 5 (excellent) (500 to 600 W/m^2) – 106 acres
- Class 6 (outstanding) (600 to 700 W/m^2) – 10 acres

Existing Activity. A 2,620-acre wind energy testing site in the Horse Mountain area south of Palisade, authorized under COCO 73717, has been approved and one meteorological tower was constructed in 2009.

Trends

Solid Leasable Minerals

Coal. The Mesaverde Group coals in the GJFO planning area are the main source for potential future development. The development potential for Mesaverde coals at less than 3,000 foot depth is High; for Mesaverde coals at greater than 3,000 feet is Moderate. The development potential for coals in the Dakota group is Low. Coal development activity is expected to result in three new underground mines in the Book Cliffs near the now active McClane Canyon coal mine (BLM 2012a).

Oil Shale. The potential for increasing prices for petroleum and the constantly developing technological advances are interpreted to give the area a Moderate

level of probability for development. This development will probably involve small, experimental pilot operations (BLM 2012a).

Potash. Recent inquiry about an exploration permit for the area supports the conclusion that development potential within the next twenty years is High (BLM 2012a).

Fluid Leasable Minerals

Oil and Gas. Swings in the natural gas market price are the likely driver in the industry's interest for oil and gas leases and the resulting requests for drilling permits. As prices rise, more interest in oil and gas development is expected (BLM 2009d).

Recently there has been increasing interest in horizontal drilling in the Mancos/Mowry shale play. Approximately 50 percent of the drilling proposals received by the GJFO since 2010 have been for horizontal wells targeting the shale formation. GJFO mineral lessees indicate there will be little interest in development of conventional or shale gas at current prices. However, exploration is expected to continue.

Geothermal. There is some potential for geothermal energy throughout the eastern part of the planning area. The potential for geothermal energy may be of interest to commercial developers, depending on economic factors. No interest has been shown for geothermal development.

Locatable Minerals

It is unlikely that any significant metallic (gold or other metallic minerals) mining, except uranium, will be present in the planning area in the next 20 years. Casual use and recreational gold mining activities have increased and will likely increase more in the future (BLM 2009d).

Gold. The occurrence potential for gold in the GJFO planning area is High (High D) as placer deposits along the Dolores River corridor. The development potential on the alluvial plane and the benches above the Dolores River is considered High also. There is considered to be No potential for occurrence or development of lode gold within the GJFO planning area (BLM 2012a).

Uranium/Vanadium. The areas of historical mining are considered to have a High potential for development, the NURE Favorable Area has a Moderate potential for development, and the Morrison Formation in the GJFO planning area, outside those two areas, is considered to have Low potential.

The assumption is made that the price of uranium will encourage mine development in the GJFO planning area in the next twenty years (BLM 2012a).

Copper. Copper resource development potential in the Sinbad Valley is Moderate and development potential is Low in the other areas (BLM 2012a).

Silver, Tungsten, Zeolite, Limestone. There is considered to be no reasonably foreseeable development for silver alone. It is more likely that silver would be a by-product of copper mining, noted above (BLM 2012a).

Mineral Materials

As the population of the Grand Valley and surrounding areas continues to grow, demand for mineral material resources will increase from current conditions. Increased emphasis on xeriscaping will also likely increase demand. The GJFO planning area will be the best source for the regional market since it is the closest source (BLM 2009d).

The potential for sand and gravel development is Moderate for any specific area within the GJFO planning area.

Decorative stone development potential for the Glen Canyon Group (and specifically the Wingate Sandstone) is Moderate, as are the glacial deposits. The development potential of the Dakota Sandstone is Low.

Clay resources development potential at the existing pit is High, while it is Moderate for the rest of the Morrison Formation and Mancos Shale in the planning area (BLM 2012a).

Renewable Energy

The demand for renewable energy-related ROWs should increase nationally, although within the GJFO planning area, the potential for wind and solar energy is low.

Based on available acreage, the potential for solar energy is greater than for wind energy, although the only project application received to date from the GJFO has been for wind energy.

3.3.4 Recreation and Visitor Services

The following section describes recreation and visitor services on BLM-managed lands in the GJFO planning area.

Current Conditions

The primary recreational activities in the GJFO are mountain biking, trail running, all-terrain vehicle use, off-road motorcycling, motorized vehicle touring, hiking, big and small game hunting, backpacking, horseback riding, sight-seeing, rock climbing, and river boating. Recreation-based visitor use in the GJFO has increased in most areas, with the greatest increase in the North Fruita Desert, Bangs Canyon area, and most recently, the Gateway area. In accordance with BLM's multiple-use mandate, per the FLPMA, the agency seeks to provide

recreational opportunities that include dispersed, organized, competitive, and commercial uses.

Recreation-Tourism Elements

Western Colorado is a world-renowned destination for outdoor recreation enthusiasts. Recreation visitors to the GJFO planning area come from not only the local Grand Valley area (which includes the City of Grand Junction, as well as other smaller communities such as Fruita and Palisade) and other regions of Colorado, but also from other national and international locations.

Grand Valley Visitors. An increasing number of people are living near or seeking local public lands for diverse recreational opportunities. The Grand Valley area is visited by recreationists year-round resulting in increased recreational demands on BLM lands. Grand Junction, Fruita, Loma, Mack, Palisade, Whitewater, Gateway, and DeBeque all have public lands bordering them that are used as community-based recreation assets by local residents. Due to the proximity of these lands to local communities and the heavy use by their residents, these public lands experience the greatest use on a daily basis. In local communities where populations are increasing rapidly, such as Grand Junction and Fruita, recreation demands on public lands are also intensifying.

Visitors From Outside Grand Valley but Within Colorado. During the spring and fall, many Colorado residents who seek relief from the long winters come to the Grand Valley to recreate on public lands in the GJFO planning area. The Grand Valley's relatively mild climate allows recreationists to participate in outdoor activities that are otherwise not possible due to unfavorable weather conditions in other regions. While visitors to the area come from all parts of the state, a large portion come from the Denver metropolitan area and other Front-Range Colorado communities because it is easily accessible via Interstate 70.

National (Outside Colorado) and International Visitors. The GJFO planning area is located in a popular tourist corridor that connects Moab, Utah to the high country of the Rocky Mountains via Interstate 70. Visitors outside of Colorado are attracted to this area because of the first-class recreation opportunities it provides. The range of year-round recreation opportunities in the GJFO includes mountain biking, horseback riding, OHV use, hiking, rock climbing, camping, skiing, and water-sports, such as kayaking, fishing, and rafting.

Recreation Management Areas

Special Recreation Management Areas. Current BLM guidance identifies SRMAs as administrative units where the existing or proposed recreation opportunities and recreation setting characteristics are recognized for their unique value, importance and/or distinctiveness, especially as compared to other areas used for recreation. SRMAs are managed to protect and enhance a targeted set of activities, experiences, benefits, and desired recreation setting characteristics.

SRMAs may be subdivided into recreation management zones (RMZs) to further delineate specific recreation opportunities. Within SRMAs, recreation and visitor service management is recognized as the predominant land use planning focus, where specific recreation opportunities and recreation setting characteristics are managed and protected on a long-term basis. SRMAs/RMZs must have measurable outcome-focused objectives. Supporting management actions and allowable use decisions are required to: 1) sustain or enhance recreation objectives, 2) protect the desired recreation setting characteristics, and 3) constrain uses, including non-compatible recreation activities that are detrimental to meeting recreation or other critical resource objectives (e.g., cultural or threatened and endangered species).

The 1987 GJFO RMP identified the Gateway area (41,000 acres) and Grand Valley area (176,000 acres) as Intensive Recreation Management Areas[2] (IRMAs) to protect high value recreation sites and sensitive areas. Since that time, approximately 58,106 acres of the Grand Valley IRMA was carved out to create Bangs Canyon SRMA (**Figure 2-18**, Alternative A: Special Recreation Management Areas) and 72,656 acres as the North Fruita Desert Planning Area. Plans written for both of these areas provided for enhanced recreational opportunities, made travel management decisions, and took a community-based planning approach.

Extensive Recreation Management Areas. Current BLM guidance defines Extensive Recreation Management Area (ERMAs) as administrative units that require specific management consideration in order to address recreation use, demand or recreation and visitor service program investments. ERMAs are managed to support and sustain the principal recreation activities and the associated qualities and conditions of the ERMA. Management of ERMA areas is commensurate with the management of other resources and resource uses. Supporting management actions and allowable use decisions must facilitate the visitors' ability to participate in outdoor recreation activities and protect the associated qualities and conditions. Non-compatible uses, including some recreation activities, may be restricted or constrained to achieve interdisciplinary objectives.

More than half of the lands within the GJFO planning area are managed as the GJFO ERMA, which is characterized by a diverse range of natural resource settings and variety of recreation opportunities (**Figure 2-15,** Alternative A: Extensive Recreation Management Areas). This area is managed under previous BLM guidance for ERMAs, where recreation is unstructured and does not require intensive management or significant investments in trails or facilities. Within the ERMA, recreation management is reactive and custodial, addressing visitor health and safety, resource protection, and use and user conflicts. This

[2] The term "Intensive Recreation Management Area" is no longer used by BLM. An area where recreation is the management focus is now referred to as a "Special Recreation Management Area (SRMA)."

type of undirected, or dispersed, recreation management affords visitors the opportunity to create their own adventure. Visitors receive little in the way of services or developed recreational facilities.

Use Figures

Most public land use and activity participation estimates depend on a mix of computerized trail counter data, field observations, and professional judgment of the recreation staff and hence are not scientifically based. The general trend across the GJFO has been a 7-10 percent increase in visitation each year. Recreation data are recorded in the BLM's Recreation Management Information System, which is a web-based application used to track, store, and retrieve data. Estimated recreation-related visits during fiscal year 2002 (October 1, 2001 to September 30, 2002) totaled 502,860, and increased to 839,252 for fiscal year 2011 (October 1, 2010 to September 30, 2011) (BLM 2009j), resulting in an approximately 4 percent annual increase. In 2011, there were an estimated 30,117 visits at the Bangs Canyon Trailhead in Bangs Canyon SRMA and 67,156 visits at the Tabeguache Trailhead for the Lunch Loops Trail System (also in Bangs Canyon SRMA). There were an estimated 68,029 visits to the North Fruita Desert SRMA (BLM 2009j).

River Recreation Management

The GJFO has management responsibilities on the Gunnison River from the Whitewater river access to its confluence with the Colorado River, and the Dolores River from the Montrose-Mesa County line to the Colorado-Utah state line. The third river is the Colorado River, the majority of which crosses private land in the GJFO planning area.

Management and Use – Gunnison River. The section of the Gunnison River within the planning area is primarily used by private boaters for day use boating from Whitewater to Redlands Dam and from Redlands Dam to the confluence with the Colorado River. The Whitewater public river access is just upriver from the Highway 141 bridge and is co-managed by the GJFO, Dominguez-Escalante NCA, and Mesa County. It consists of a basic boat ramp, parking lot and restroom. There are two other public river access points, one just upriver and one just downriver of the Redlands Dam, but no developed public facilities are provided. The section of the Gunnison River managed by the GJFO is approximately 15 miles long and is mostly Class I with a few sections of Class II water. Most of the six commercial outfitters currently permitted on the lower Gunnison River exit the river at the Whitewater access, only occasionally utilizing the final two segments within the GJFO planning area.

Management and Use – Dolores River. The Dolores River is less developed than the Gunnison River and receives much less use. There are no official put-ins or identified campsites and the river use is generally limited to 2-3 weeks per year. River flow is regulated by releases at the McPhee Reservoir. The GJFO manages approximately 23 miles of the Dolores River between the Montrose-Mesa

County line and the Colorado-Utah state line. There are no designated launches on this section of river due to its irregular and unpredictable flow (i.e., it is dam controlled and not floatable in relatively dry years). There is one undesignated launch on county highway property near the bridge on Highway 141 in Gateway that is suitable for trailer and raft use, although most recreational use of this section is via kayak or canoe. Many people put in at this location and float to Dewey Bridge in the BLM's Moab Field Office.

There is a diversion dam west of Gateway that requires a portage in all but the highest flow, and the Stateline Rapids are generally Class III or Class IV depending on water volume. Recreational use in low water is virtually impossible; however, the river receives light use between May and July during high water years.

Management challenges exist on both the Dolores and Gunnison Rivers because recreation sites (e.g., campgrounds and picnic areas) have not been developed to meet the activity demands of the users. Additional infrastructure and maintenance resources may be required to meet the additional recreation demand created by residents and visitors.

Developed Recreation Facilities

Developed recreation sites and facilities have been constructed to enhance recreation opportunities, protect resources, manage activities, or reduce recreation use conflicts. These infrastructure developments range from designated campgrounds to trailheads with simple bulletin boards. The GJFO manages more than 30 developed sites that provide a wide variety of recreation opportunities. Among these sites are two campgrounds, 13 trailheads, 19 restrooms, three river access points, two developed shooting ranges, two picnic areas, and two scenic overlooks (**Figure 3-19,** Developed Recreation Sites).

BLM upgrades recreation facilities as demand for such upgrades increases. These upgrades will be managed in accordance with the prescribed setting character for each particular area. The need for any upgrades or development of additional facilities is overshadowed by a shortfall in maintenance and rehabilitation funds for existing facilities and the high cost of construction for new facilities. Developed recreation sites are maintained by BLM park rangers, seasonal staff, and volunteers.

Developed Campgrounds. Within the GJFO planning area, the GJFO manages two developed campgrounds that contain 53 individual campsites and three group campsites (**Table 3-33**, GJFO Developed Campgrounds). Some of the campgrounds receive heavy use during the shoulder seasons (spring and fall). Most of the developed campgrounds have basic infrastructure, including toilets and picnic tables.

Table 3-33
GJFO Developed Campgrounds

Name	Location	Number of Sites	Fee (2011)
18 Road	North of Fruita	35	None
Mud Springs	South of Glade Park	18	$10

Mud Springs Campground typically has a volunteer host and collected fees of approximately $2,500 each of the past two years from between 800 and 1,100 recreational visits annually. While the fees collected are used for maintenance, the maintenance costs far exceed the revenue collected.

Recreation Administration

Special Recreation Permits. As authorized by 43 CFR 2932, the following four types of uses require Special Recreation Permits (SRPs): commercial use, competitive events, organized groups, and recreation use in special areas. The BLM can issue SRPs for noncommercial use in certain special areas, including rivers, backcountry and camping areas. Most SRPs issued by the GJFO are related to big game and mountain lion hunting outfitters, and mountain bike and OHV tours. Requests for competitive event SRPs are on the rise as well. No permanent camps and facilities are authorized by SRPs on BLM-administered public lands.

The GJFO administers an average of 80 to 85 SRPs (approximately 55 for activities within the planning area) each year. Approximately 40 percent of those permits are for upland guide and outfitter services, including mountain bike and OHV tours and training, rock climbing, horseback riding, and educational tours. Approximately 30 percent of the GJFO permits are issued for big game and mountain lion hunting, 25 percent for competitive events and organized groups, and five percent for river outfitters. Demand for SRPs on public lands within the GJFO has been steadily increasing over the past 20 years, and this trend is expected to continue.

The GJFO currently collects about $30,000 to $35,000 per year in SRP fees from permittees operating in the planning area. Roughly 15 percent of this revenue is expended in program administration with the remainder spent on visitor services, monitoring, and maintenance.

Accessibility

Participation in outdoor recreation can be restricted by age, disabilities, poor health, lack of appropriate facilities within an accessible distance, undesirable recreation settings, lack of information about recreation opportunities, poor transportation, or lack of convenience.

The BLM continually improves facilities to make them more accessible to people with disabilities, and to provide easier access to public lands and better

information about recreation opportunities. All construction is reviewed for compliance with Uniform Federal Accessibility Standards and the Americans with Disabilities Act Guidelines. As newer Accessibility Guidelines for Outdoor Developed Areas become final, those standards will also be followed.

Environmental Education and Interpretation

Marketing and Tourism. For many communities within the GJFO planning area, tourism provides a significant portion of the economic base. Typically, BLM staff does not directly market recreation activities on public lands, but recreation and heritage tourism opportunities available on public lands are often marketed by the local communities to increase visitation, which in turn increases dollars spent in their communities.

It is incumbent upon the BLM to identify information and marketing service providers and educate those providers how the BLM is managing an area for recreation opportunities so that the providers can identify the niche they inhabit to produce beneficial personal outcomes. Marketing is not simply the act of increasing use, it is putting people in the right place so they can achieve their desired recreation experiences.

Interpretation and Education. No formal education or interpretation program exists in the GJFO. Education and interpretation on recreational opportunities and land stewardship is conducted informally through brochures, signs, and the GJFO web site. The GJFO staff participates in school programs, attends user groups/club meetings, and participates in the Grand Junction Convention and Visitors Bureau.

Recreation Monitoring and Evaluation

The GJFO recreation staff and law enforcement officers monitor all forms of recreation activities and public use for user conflicts, recreation effects on natural and cultural resources, visitor health and safety issues, and conflicts with adjacent private landowners. In addition, recreation staff monitors implementation of recreation management actions and the attainment of management objectives.

Recreation Setting Character Conditions

Recreation Setting Characteristics (RSCs) are an expression of recreation setting conditions in the future that are expected to result if objectives are achieved and land use plan and implementation decisions are executed. Three recreation setting components are considered: a) the desired future recreational qualities of the landscape (physical), b) the qualities associated with use (social), and c) the conditions created by management (operational). These components influence the kinds of recreation activities that are emphasized and recreation outcomes realized. The BLM establishes these criteria in the land use plan to guide management action and allowable use decisions as well as the identification of site-specific use levels for activities during plan implementation

(BLM H-1601-1, Page 13). Proposed initial allocations are provided in **Appendix K**, Recreation and Visitor Services Management Framework. RSCs can be adjusted over time to meet recreation objectives as a result of monitoring and evaluation.

Physical Setting Character Conditions

The fundamental physical setting character trends for the GJFO planning area are clear and predictable, realizing the physical changes in the region. The Grand Valley has experienced rapid growth since the 1987 RMP. During this time, the natural resource recreation settings have generally become physically less remote due to many factors, including energy development, urban growth, and mechanized/motorized use on public lands.

This change in the physical setting has accelerated change in the social setting character of GJFO public lands.

Social Setting Character Conditions

Public visitation to BLM-administered lands has increased over the past 25 years. This is especially true near communities and around popular destinations like the Gunnison River, LBCWHR, the North Desert, and Bangs Canyon. On weekends and in the evenings, interactions with other people are very common in the more popular recreation areas.

Many upland areas (e.g., Glade Park, LBCWHR, Uncompahgre Plateau) receive low levels of visitation (especially weekdays) and offer uncrowded social settings. However, many residents and nonresident hunters utilize GJFO public lands during big game hunting seasons, and the number of contacts with other visitors dramatically increases throughout the GJFO. In addition, more people are seeking out these less-visited areas for relief from some of the crowded areas and are modifying the social setting of the less crowded areas. With use levels growing, the evidence of visitation is also increasing. Evidence of alteration, including vehicle use, litter, manmade structures, tree damage, surface vegetation impacts, vandalism to cultural resources, hardened campsites, human-caused wildfires, and compacted soils, can be found in more and more places.

Administrative Setting Character Conditions

The GJFO has rules and regulations in place to assist in achieving the following goals: maintain natural resource settings; direct recreation use; and protect resources. To achieve these goals, the GJFO has also implemented administrative tools such as limiting motorized use in specific areas and by season, increasing signage, increasing field staff, and improving visitor services by creating new brochures and maps. Many of these actions were precipitated by increased accessibility and crowding. Within some recreation areas and in urban-interface areas, new issues such as social trails, domestic animals, noise, and visual aesthetics have necessitated additional administrative remedies to

address recreation-related use. No individual user fees for recreational activities are charged on public lands within the GJFO.

Outcomes Focused Management

Landscape attributes affect recreational activities and the outcomes for people, communities, economies, and the environment. For example, an area's remoteness, naturalness, or facilities may facilitate different opportunities for hiking, wildlife viewing, or camping. The outcome of engaging in one of those opportunities in a particular setting may have an impact on the individual, the community, the economy, and the environment. The BLM focuses on providing specific, positive outcomes while at the same time attempting to minimize negative outcomes by engaging recreation-tourism participants, non-participating but affected community residents, and national and international visitors. This holistic approach attempts to satisfy the ever increasing and competing demands which are difficult to manage utilizing a traditional activity-based recreation management model (Driver 2008).

Trends

Five key issues are causing the setting character of the GJFO to change:

1. Increased urbanization as a result of population growth and changing demographics;
2. Changing public expectations and demand for outdoor recreation opportunities, especially for dispersed recreation;
3. Increased energy development in portions of the GJFO;
4. Close proximity of BLM public lands to private property, specifically in the Grand Valley, and the growing use of public lands as a community-based recreation asset; and
5. Technological advances, such as all-terrain vehicles (ATVs) and mountain bikes, affordable GPS units, as well as better outdoor equipment and clothing.

All of these natural resource setting trends are likely to continue. At the broadest level, the physical, social, and administrative recreation character of BLM public lands is potentially changing from natural to more developed, from less crowded to more contacts with others, and from less restrictive to more rules and regulations. These changes will impact the activity opportunities that can be offered and the recreation experience and benefit opportunities that can be produced by land managers and partners.

3.3.5 Comprehensive Travel and Transportation Management

Transportation is an integral part of virtually every activity that occurs on public lands. Comprehensive Travel and Transportation Management (CTTM) is the BLM's proactive interdisciplinary planning, on-the-ground management, and administration of roads and trails for both motorized and non-motorized travel

to ensure that public access, natural and cultural resources, and regulatory needs are considered. The CTTM process must address variability among landscapes, users' interests, equipment options, and cultural and biological resource constraints. The primary goal of the CTTM process is to develop a systematic network of routes with appropriately designated uses that provides opportunities for a diverse set of activities to occur on public lands, such as recreation, energy development, grazing, and wildlife management.

Traditionally, the BLM's travel management program focused primarily on motor vehicle use. However, the introduction of CTTM significantly expanded the planning scope to include all forms of travel, including travel by foot, horseback and other livestock, mechanized vehicles (e.g., bicycles), motorized vehicles (e.g., two-wheeled, such as motorcycles, and four-wheeled, such as ATVs, cars, and trucks), and travel by motorized and non-motorized boats.

There is considerable overlap between travel management and all other uses on BLM lands. For example, many people visit public lands for recreation purposes. For these visitors, a route system may serve as either a means to reach a destination where the activity occurs (e.g., a road to a trailhead or parking area) or as the focus of the recreation activity itself (e.g., a four-wheel driving, hiking, or horseback riding trail).

To reduce the duplication of narrative between travel management and the other sections of this document, this section addresses only public travel and access (i.e., management area designations, route designations, types of travel, and seasonal area limitations).

Off-highway Vehicle Management Areas

Off-highway vehicle is synonymous with off-road vehicle. Off-road vehicle is defined in 43 CFR 8340.0-5(a): Off-road vehicle means any motorized/battery-powered 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 in times of national defense emergencies. Types of OHVs commonly used on public lands include dirt motorcycles, dune buggies, sand rails, jeeps, four-wheel drive vehicles, snowmobiles, and ATVs.

In the context of the BLM planning process, it is important to note definitions of the most common OHV types. A four-wheel drive vehicle is a passenger vehicle or light truck having power available to all wheels. A Utility Type (or Terrain) Vehicle (UTV) refers to any recreational motor vehicle other than an ATV, motorbike, or snowmobile, designed for and capable of travel over designated unpaved roads, traveling on four (4) or more low-pressure tires, maximum width less than seventy-four (74) inches, usually a maximum weight less than

two thousand (2,000) pounds, or having a wheelbase of ninety-four (94) inches or less. UTV does not include vehicles specially designed to carry a person with disabilities. An ATV is a wheeled vehicle, other than a snowmobile, which has a wheelbase and chassis of 50 inches in width or less, is steered with handlebars, generally has a dry weight of 800 pounds or less, travels on three or more low-pressure tires, and has a seat designed to be straddled by the operator. A motorcycle is defined as a motorized vehicle with two tires and with a seat designed to be straddled by the operator.

The BLM's regulations for OHV management, 43 CFR 8342.1, stipulate "the authorized officer shall designate all BLM lands as either open, limited, or closed to [OHVs]." As such, all BLM lands within the planning area have been designated in one of three OHV designation categories, as follows:

Open area designations are used for intensive OHV or other transportation use areas where there are no special restrictions or where there are no compelling resource protection needs, user conflicts, or public safety issues to warrant limiting cross-country travel.

Limited area designations are used where travel must be restricted to meet specific resource and/or resource use objectives. For areas classified as limited, the BLM must consider a full range of possibilities, including travel that will be limited to types or modes of travel, such as foot, equestrian, bicycle, and motorized; limited to existing roads and trails; limited to time or season of use; limited to certain types of vehicles (e.g., motorcycles, ATVs, high clearance); limited to licensed or permitted vehicles or users; limited to BLM administrative use only; or other types of limitations. In addition, the BLM must provide specific guidance about the process for managing motorized vehicle access for authorized, permitted, or otherwise approved vehicles for those specific categories of motorized vehicle uses that are exempt from a limited designation.

Closed area designations prohibit any and all motorized travel and transportation. Areas or trails are designated closed if closure to all vehicular use is necessary to protect resources, promote visitor safety, or reduce use conflicts. Non-motorized uses are permitted in these areas.

Emergency Closures

Emergency closures are sometimes necessary to protect public health and safety or prevent unnecessary or undue resource degradation due to unforeseen circumstances. Where off-road vehicle travel is causing or will cause considerable adverse effects upon soil, vegetation, wildlife, wildlife habitat, cultural resources, historical resources, threatened or endangered species, wilderness suitability, other authorized uses, or other resources, the affected areas shall be immediately closed to the type(s) of use causing the adverse effect until the adverse effects are eliminated and measures implemented to prevent recurrence.

Per Instruction Memorandum 2010-028, Change 1 (Requirements for Processing and Approving Temporary Public Land Closure and Restriction Orders) (BLM 2009k), temporary closures and restrictions should be implemented for the shortest time and in the smallest area necessary to protect resources, public health, and safety.

Existing Route Systems

Many routes within the planning area were created to access BLM lands for timber/vegetation management projects, gas/mineral development, range management, and various ROWs. Some of these routes are maintained by the authorized permittee to access the improvement, such as a livestock/wildlife pond or fence. Over the years, many of these routes have become part of the roads and trail system frequently used by visitors who are engaged in recreation activities.

Many more recreation-based routes have been created, or pioneered, by users themselves. Open travel designations that allow cross-country travel, coupled with high levels of use and improvements in mechanized and motorized technology, have allowed users to gain access through rough terrain. The repeated passage of users creates and maintains these routes. Because these routes were not designed, but rather created by consistent use, these routes often cause conflict with public land resources and other public land uses.

Current Conditions

Emerging travel management issues within the GJFO planning area include:

- Rapid expansion of recreational use and visitation on public lands outstripping the travel planning framework in the 1987 GJFO RMP (BLM 1987);
- User-created, non-system routes causing adverse impacts on other resources;
- Routes and areas open to public use but are accessible only to adjacent landowners; and
- Increasing conflicts among recreational users over route use.

Motorized Travel

Approximately 43 percent of the planning area is designated as open to cross-country travel, 44 percent is limited to existing or designated roads and trails, 11 percent has seasonal limitations, and 3 percent is closed to motorized use. Travel Management designations for the planning area are summarized in **Table 3-34**, Off-Highway Vehicle Designations in the GJFO Planning Area, and depicted on **Figure 2-22**, Alternative A, Comprehensive Travel and Transportation Management.

Table 3-34
Off-Highway Vehicle Designations in the GJFO Planning Area

OHV Designations	Acres
Closed	35,300
Limited to designated roads and trails	220,000
Limited to existing roads and trails	234,700
Seasonal limitations (existing routes only)	108,000
Seasonal limitations (designated routes only)	5,500
OHV Intensive Use Areas	12,500
Open	445,400
Total	**1,061,400**

Source: BLM 2010a

Foot and horse travel is not limited to existing or designated routes, except within the Bangs Canyon and North Fruita Desert SRMAs. Areas closed to motorized use and seasonal limitations currently do not apply to foot, horse, or bicycle travel.

High Use/Interest Areas

The following information provides a basic profile of high use areas in the GJFO planning area.

27¼ Road. This area is very popular for OHV use, recreational target shooting and hiking/dog walking by neighboring residents. A portion of the area east of 27¼ Road is open to cross-county travel, while travel in the area west of 27¼ Road and north of the open area is limited to existing routes. 27¼ Road is heavily used as the only access to two developed shooting ranges at the base of the Book Cliffs. Also, due to its location adjacent to an open area, this area sees frequent illegal cross-county use. Although an entrance kiosk was constructed near the BLM boundary on 27¼ Road, very little additional signage has been installed.

Bangs Canyon SRMA. The Bangs Canyon SRMA provides for multiple uses in close proximity to the urban center of Grand Junction. The Lunch Loops is a heavily used system of non-motorized singletrack trails. These trails are highly valued for their location only minutes away from downtown Grand Junction and are used by mountain bikers, hikers, trail runners, and dog walkers. The Free Lunch trail is open to mountain bikes only. There are also several non-mechanized trails in this area, including East Creek, Bangs Canyon, Rough Canyon, and Ladder Canyon. Rough and Ladder Canyons are very popular, year-round recreation destinations and are accessed from the Bangs Canyon trailhead on Little Park Road. The Mica Mine in Ladder Canyon is the primary destination in that area for hiking, especially for family groups.

The Bangs Canyon Management Plan (BLM 1999b) is the implementation-level plan written to manage the Bangs Canyon SRMA. The plan established a system of designated travel routes and called for a significant amount of trail construction and rehabilitation (specific projects are outlined in the Bangs Canyon Management Plan Implementation EA [BLM 2004b]). The Tabeguache Trail is an important recreation route that crosses public land for 142 miles, from Montrose to Grand Junction. A portion of the route is located within Bangs Canyon SRMA, including a non-motorized section from Monument Road to Little Park Road and a motorized section from Little Park Road to Highway 141. The existing trail crosses private property at Highway 141 and the BLM has identified acquisition of an access easement as a priority.

DeBeque Area and Coal Canyon. This high-use area has experienced a significant increase in use in recent years. The DeBeque area is designated as open to cross-country travel, and the predominant recreation activities are OHV, mountain bike, and equestrian use. There is moderate ATV and equestrian use in Coal Canyon. However, this area has seasonal limitations (motorized use is prohibited between December 1 and May 1), and during the remainder of the year (between May 2 and November 30), motorized vehicles are limited to existing roads and trails.

Castle Rock, an area southwest of DeBeque, has become a popular destination for those seeking singletrack motorcycling or mountain biking opportunities, or a trials motorcycle riding experience. The Castle Rock travel network is comprised mainly of user-created routes, some of which are in conflict with cultural resources and/or threatened and endangered plant species sites.

North Fruita Desert SRMA. Visitation is highest mid-March to May and mid-September to mid-November with OHV use and mountain biking as the predominant uses. The North Fruita Desert Management Plan (BLM 2004a) outlined a multiple use trail system that features many loop routes, most of which are signed. The mountain bike emphasis area (approximately 4,000 acres) contains approximately 35 miles of singletrack mountain bike trails. This area also has a 400-acre designated open OHV area, designated staging area, a system of designated motorized loop routes, and several routes open to administrative use only. The plan also identified a polygon east of Q.5 Road for non-motorized, non-mechanized uses.

North Desert. This high-use area is in close proximity to Grand Junction, located east of the North Fruit Desert Planning Area and south of the Book Cliffs. Similar to the North Fruita Desert Planning Area, this area receives the highest use during the shoulder seasons (i.e., spring and fall). The North Desert draws visitors for a wide variety of activities. The Grand Valley OHV Area, an 11,400-acre OHV open area, has the highest use of any area in the GJFO planning area, over 250,000 visitor days per year. The Grand Valley OHV Area is highly valued by the local community and visitors from around the region for

motorcycle and ATV use. It contains a large, unofficial motocross area that is maintained by a local motorcycle club. There is also a fair amount of mountain bike use in this area, which is influenced by local guidebooks advertising routes. Most of the non-mechanized use is from area residents who enjoy the close-to-home location for dog walking or daily exercise. There is also light equestrian use in this area, most of which also originates from the nearby residents.

Gateway. The Gateway area is a popular multiple-use recreation destination. Travel management in this area consists of designations of open, closed, limited to existing roads and trails, and limited to designated roads and trails. There is light non-mechanized use in the area mostly consisting of climbing in the Palisade WSA or hiking from the nearby Gateway Canyons Resort. A stacked loop trail system (currently eight miles in length) designed for mountain biking and hiking lies immediately south of Gateway Canyons Resort at the mouth of Lumsden Canyon.

In the area east of Highway 141, there is an extensive system of old mining routes, many of which receive light to moderate recreational use. The major constraint in this area is the potential for future mineral exploration and effective management of existing routes due to the density. This area is popular during hunting season but is also becoming a year-round recreation destination. Gateway Canyons Resort rents ATVs and Jeeps for visitors to tour this area and facilitates climbing, equestrian, and float trips.

John Brown Canyon provides motorized access into Utah BLM's Moab Field Office and receives heavy recreation use. Uranium exploration and development has the potential to increase truck traffic that can present a safety hazard to recreational users. There is existing motorized access into the Palisade WSA via Bull Draw and Wright Draw, which has resulted in some illegal cross-country use within the WSA.

Seasonal Travel Limitations

Seasonal limitations are in place on several areas and routes within the GJFO planning area. OHV travel is subject to seasonal limitations on existing routes on 108,833 acres and on designated routes on 5,496 acres. **Table 3-35**, Seasonal Travel Management Limitations, summarizes the roads within the planning area that have restrictions.

Types of Routes

The majority of the existing route system in the GJFO was not built with consideration for sustainability, resource concerns or conditions, or recreation experiences. Most routes either follow historic routes, such as those for grazing, mining, or administrative access, or were user created. As a result, these trails do not always provide desirable recreation experiences and can have unmitigated impacts on natural or cultural resources.

Table 3-35
Seasonal Travel Management Limitations

Type of Limitation	Area or Road
Limited: Between December 1 and May 1, motorized vehicle use is prohibited. Between May 2 and November 30, motorized vehicle use is limited to existing roads and trails.	• Coal Canyon portion of LBCWHR
Limited: Between December 1 and May 1, motorized vehicle use is prohibited, except on county-maintained roads. Between May 2 and November 30, motorized vehicle use is limited to existing roads and trails.	• The Beehive • Lands End/Grand Mesa Slopes • Chalk Mountain • Sunnyside • Big Salt Wash/Coal Gulch/16 Road • Blue Mesa • Demaree

There are approximately 3,322 miles of routes in the planning area. Approximately 93 percent of those are open to motorized travel.

Mechanized Travel

Mountain biking is becoming increasingly popular on public lands, and several areas in Colorado are considered top national destinations. Mountain bike use is occurring on old motorized routes, game trails, and user-created mountain bike trails, as well as on planned singletrack routes. Popular mountain bike areas for both community and destination visitors in the GJFO include the North Fruita Desert Trailhead (18 Road north of Fruita), the Gateway area, areas near the Town of Palisade, and areas around Grand Junction, such as the Lunch Loops trail system. The Lunch Loops trail system includes the BLM's first designated mountain bike-only trail, Free Lunch, which was constructed with challenging features for downhill-specific travel.

Non-Mechanized Travel

Hiking and horseback riding has been increasing on BLM lands bordering municipalities within the GJFO. The communities of Grand Junction, Fruita, Loma, Mack, Palisade, Whitewater, Gateway, and DeBeque have all experienced population growth and, consequently, the BLM lands adjacent to them have become community-based recreation assets.

Popular hiking trails and areas include Gunnison Bluffs/Old Spanish Trail, Mt. Garfield, Book Cliffs, Little Book Cliffs Wild Horse Area, the North Desert, and Bangs Canyon. Horseback riding is common but dispersed throughout the GJFO on existing trails and roads.

Trends

Local population growth and an increasing awareness of the GJFO as a recreation destination are expected to drive the trend toward additional recreational use and accompanying requests for improved access.

In the past, comprehensive and proactive transportation planning has not been an emphasis area for the BLM in RMPs. The development of transportation routes, whether planned through projects such as oil and gas developments or created by recreation users, has traditionally been viewed as an acceptable part of the development of BLM lands. Research from the past 20 years on the impacts of roads to resources, wildlife, and other users, and actual experience by the BLM on these impacts, is increasing the need for well-designed and integrated transportation planning.

Mountain biking has continued to increase in popularity over the past 15-20 years. Trail systems within the North Fruita Desert and Bangs Canyon SRMAs are expected to experience a continued increase in mountain bike use. New trails in the Palisade and Gateway areas will also likely increase mountain bike use in those areas. At the same time, advances in mountain bike technology have resulted in riders' ability and desire to access more remote and technically challenging terrain throughout the GJFO, sometimes contributing to the widening, deepening, braiding, and eroding of existing routes, and the creation of new social trails. Increasing mountain bike use is also resulting in the displacement of other trail users (primarily pedestrians and equestrians) in some locations as those other users seek to avoid frequent encounters with mountain bikers.

Hiking, trail running and dog walking continue to grow in popularity, especially on BLM lands in close proximity to the local communities of Grand Junction, Fruita, Palisade and Gateway. Pedestrian use is highest in the Bangs Canyon SRMA at the trailheads off of Monument Road and Little Park Road. Other popular hiking destinations include the Mount Garfield trail and the Palisade Rim trail. The increasing use of these close-to-home areas frequently results in the proliferation of undesignated social trails as pedestrians seek easy access from adjacent residences and neighborhoods, or as they seek alternative routes and experiences. These social trails typically do not meet BLM design criteria or management objectives. Increasing congestion and user conflicts on popular trails has also resulted in shifting use patterns. For example, hiking and dog walking use has increased at the Little Park Trailhead as trail users seek to avoid traffic and congestion at the Tabeguache Trailhead.

Equestrian use in the GJFO is light to moderate, and demand for equestrian opportunities has not grown significantly over the past 20 years. A flat or declining trend in equestrian use is expected to continue. Most local equestrian use is concentrated in the adjoining McInnis Canyons NCA and Dominguez-Escalante NCA. The exception is the LBCWHR, which is a popular riding destination for local equestrians. Many trails in that area do not meet BLM design criteria, and exhibit deepening, widening, braiding and erosion. Other equestrian use is generally scattered throughout the field office and tends to avoid areas where other recreation use is concentrated. The North Fruita Desert SRMA receives some equestrian use away from the bicycle trail system and the OHV Open Area. The Gunnison Bluffs Area receives a moderate amount of equestrian use as well. Much

of the equestrian use in the GJFO is local in nature, versus users seeking this area as an equestrian destination. Some use conflicts have arisen as horse owners with property adjoining BLM-managed lands seek riding opportunities on trails not designed or managed for equestrian use (i.e., the Lunch Loop trail system).

Current OHV use exceeds historic levels and new, more-powerful vehicles are capable of accessing steeper and rougher terrain. In the past, visitors drove principally Jeeps, trucks, and motorcycles. Today the BLM has seen an increase in use of OHVs of all types and sizes. As with all types of use, increased visitation has contributed to the widening, deepening, braiding, and eroding of some existing routes. The increased demand for cross-country opportunities has also led to an increasing number of hill-climb, play, and camping areas. The Grand Valley OHV area is the most heavily used area in the GJFO planning area; use is expected to continue increasing, as is OHV use in the Bangs Canyon area, the Gateway area, and near DeBeque.

Some of the key drivers for the increase in travel in the GJFO planning area include:

- Increasing visitation on all public lands within the GJFO planning area;
- A longer season of use in comparison to many Colorado locations; and
- Increasing urban and suburban populations proximate to the planning area.

3.3.6 Lands and Realty

BLM public lands are used for a variety of purposes. Major focus areas for the lands and realty program include land tenure adjustments, mineral estate, ROWs, other leases or permits, ROW corridors, and communication sites. Wind and solar renewable resource production is also permitted by ROWs through the lands and realty program.

The goals of the lands and realty program are to manage public lands to support the goals and objectives of other resource programs, provide for uses of public lands in accordance with regulations and compatibility with other resources, and improve management of public lands through land tenure adjustments. The lands and realty program is a support program to all other resources to help ensure that BLM-administered public lands are managed to benefit the public.

The following section describes the current conditions and characterization of lands and realty within the planning area.

Current Conditions

Land Ownership

Surface land ownership within the planning area is summarized in **Table 1-1**, Land Status within the GJFO Planning Area (refer to **Section 1.3**, Description of the Planning Area). Acreages for the McInnis NCA, Dominguez-Escalante NCA, and Colorado National Monument are not included in this table because they are not within the planning area boundary.

Lands and realty actions can be divided between land tenure adjustments and land use authorizations. Land tenure adjustments focus primarily on land acquisition and disposal (including easement acquisition), while land use authorizations consist of ROWs, communication sites, and other leases or permits. Lands and realty actions help ensure that BLM lands are managed to benefit the public.

Land Tenure Adjustments

Land tenure adjustments are used to consolidate the BLM's land ownership patterns through various disposal and acquisition authorities:

- Disposal. Public lands have potential for disposal when they are isolated or difficult to manage or are suitable for public purposes or community expansion. Disposals result in a title transfer, wherein the lands leave the public domain. **Figure 2-30,** Alternative A: Land Tenure Adjustments, shows lands in the planning area that are designated for disposal. Lands may be disposed of via sale or exchange, as discussed below. In addition, the Recreation and Public Purposes Act of 1926 was established as a means for state and local government or non-profit organizations to acquire or lease public lands at a reduced or no cost. The transferred land must be used for an established or proposed public project, need, historic monument, or recreational purposes.
- Sale. The BLM's general sale authority for public land is Section 203 of FLPMA. Public lands determined suitable for sale are offered on the initiative of the BLM. The lands are not sold at less than fair market value. Lands suitable for sale must be identified in the RMP (refer to Chapter 2, Table 2-2, Lands and Realty, Disposals).
- Acquisition. Acquisition of lands can be pursued to facilitate various resource management objectives. Acquisitions, including easements, can be completed through exchange, Land and Water Conservation Fund purchases, donations, or receipts from Federal Land Transaction Facilitation Act sales or exchanges.
- Exchange. Land exchanges are initiated in direct response to public proposals, or by the BLM to improve management of public lands. Lands need to be formally determined as suitable for exchange. In

addition, lands considered for acquisition through exchange would be those lands that meet specific land management goals identified in the RMP. Non-federal lands are considered for acquisition through exchange of suitable public land, on a case-by-case basis, where the exchange is in the public interest and where the non-federal lands to be acquired contain higher resource or public values than the public lands for which they are exchanged.

- Withdrawal. Withdrawals are used to preserve sensitive environmental values, protect major federal investments in facilities, support national security, and provide for public health and safety. Withdrawal segregates a portion of public lands and suspends certain operations of the public land laws, such as mining claims. Federal policy now restricts all withdrawals to the minimum time and acreage required to serve the public interest, maximize the use of withdrawn lands consistent with their primary purpose, and eliminate all withdrawals that are no longer needed.

Since approval of the RMP in 1987, the GJFO has exchanged 2,271 acres, acquired 2,253 acres through exchange, issued patents for 440 acres through the Recreation and Public Purposes Act, purchased 2,096 acres, and acquired 375 acres through donation. The RMP placed 14 tracts in a cooperative management agreement (CMA) category, which offers the tracts to qualified federal, state, or local agencies or entities for management, transfer, or exchange. Management of nine CMA tracts totaling approximately 500 acres in the Horsethief State Wildlife Area has been transferred to CPW through a withdrawal to US BOR.

The BLM and the Grand Junction Regional Airport (previously known as Walker Field Airport) entered into a Memorandum of Understanding (MOU) in July 1991 to recognize the airport's need to acquire public lands in their long-term expansion plans, and to acknowledge BLM's intent to make such lands available to the airport when needed. The MOU encompasses 2,163 acres north of the airport, and these lands were withdrawn from location and entry under the mining laws in January 1994 (**Figure 3-20,** Airport Withdrawal).

Some of the BOR lands within the GJFO planning area are within the Grand Mesa National Forest and managed under agreement with the US Forest Service, others are within Vega State Park, Highline State Park, and Horsethief Canyon State Wildlife Area and are managed under agreements with the State of Colorado. The three active US BOR projects and project works, including lands, are operated and maintained for primary BOR project purposes under agreements with the Collbran Water Conservancy District (Collbran Project), the Grand Valley Water Users Association and the Orchard Mesa Irrigation District (Grand Valley Project and Grand Valley Unit, Colorado River Basin Salinity Control Project), and the Western Colorado Wildlife Habitat Association (Grand Valley Unit, Colorado River Basin Salinity Control Project

wildlife mitigation lands). Approximately 3,073 acres are withdrawn by the US BOR for the Dominguez Project, which was not authorized for construction. The US BOR has identified the Dominguez Project withdrawal for revocation.

The BLM has moved toward the consolidation of BLM-administered public lands to benefit the public. To achieve this goal, candidates for land ownership adjustment through disposal, sale, exchange, or acquisition include parcels that are difficult to manage or that do not have public access, relatively small parcels adjacent to other federally or state-managed lands, parcels that would increase conservation of natural resources, and parcels that increase access and use of public lands.

The enactment of the Federal Land Transaction Facilitation Act of 2000 has placed an increased emphasis on public land sales. Although the authority has expired, the Act may be reauthorized in the future and is an excellent management tool for land tenure actions. The act provides for the use of receipts from the sale of public lands, identified for disposal as of the date of enactment, to fund qualifying acquisitions and to cover expenses associated with land disposal actions.

Land Use Authorizations

The most common form of authorization to permit uses of public lands by commercial, private, or governmental entities is the ROW, which is used to permit private and public roads that cross public lands, pipelines not eligible for authorization under oil and gas lease rights, public utilities, communications facilities, reservoirs, and a variety of other purposes (**Table 3-36,** Active Right-of-Way Authorizations in the GJFO Planning Area). Short-term permits (not to exceed three years), and long-term leases for uses such as agricultural, industrial, and commercial, are authorized under 43 CFR 2900. Leases are also issued to federal, state, and local governments, special district or non-profit groups under the authority of the Recreation and Public Purposes Act of 1926.

The planning area covers 2.2 million acres of federal, state, and private land in Mesa, Delta, Montrose, and Garfield Counties in northwestern Colorado. Eighty-six percent of BLM-administered public lands in the planning area border private land. Authorizations to permit uses on BLM-administered public lands are in high demand.

In the GJFO planning area, the placement of major linear facilities depends on meeting the following location criteria:

- Concentrate linear facilities within or next to existing ROW corridors where possible;
- Avoid locations in sensitive wildlife habitat;
- Avoid steep topography, poor soils, or other fragile areas such as threatened and endangered species habitats; and

Table 3-36
Active Right-of-Way Authorizations in the GJFO Planning Area [1]

Facility Type	Number of Authorizations
Roads	275
Power Lines	104
Telephone/Fiber Optic Lines	62
Irrigation Ditches/Canals	88
Water Facilities (e.g., spring development, water pipelines, salt water disposal wells)	62
Communication Sites	55
Natural Gas Pipelines	220
Oil and Gas Facilities (e.g., meter stations, compressor stations)	38
Other Pipelines	5
Short-term Authorizations (short-term ROW and temporary use permits)	19
Wind Facilities	1
Railroad	16
Easements (FLPMA)	16
Other	31
Total	**992**

Source: BLM 2010g
[1]Data may include some ROWs within the GJFO but outside the planning area, and may include small acreages of non BLM-administered lands. There may be additional pre-FLPMA facilities (such as historic irrigation ditches) that are not recorded or accounted for in this table.

- Avoid cultural sites that are listed on or eligible for listing on the NRHP.

Designated ROW Corridors. Many electricity, telephone, water, and railroad corridors (above and below ground) serve the public throughout the planning area (**Table 3-37**, Right-of-way Corridors in the GJFO Planning Area). ROW applicants are encouraged to use these designated corridors.

Additionally, Section 368 of the Energy Policy Act of 2005 directs the Secretaries of Agriculture, Commerce, Defense, Energy, and the Interior to designate corridors on federal land in 11 western states for oil, gas, and hydrogen pipelines and electricity transmission and distribution facilities. In accordance with that act, the Approved RMP Amendments/ROD for Designation of Energy Corridors on BLM-Administered Lands in the 11 Western States was published in January 2009 (US DOE and BLM 2009). The approved RMP amendments designate multiple-use corridors within the planning area that vary only slightly from the corridor designations of the 1987 Grand Junction RMP. Near the northern boundary of the planning area, the corridor designated in US DOE and BLM 2009 was moved a few miles east of the 1987 RMP location to follow the TransColorado pipeline route.

Table 3-37
Right-of-way Corridors in the GJFO Planning Area

Location	Type of Utility	Approximate Corridor Width
Unaweep Canyon	Telephone and small electrical lines	0.50-mile
Between Colorado National Monument and Black Ridge WSA (most of this corridor is located outside the planning area)	Small water, telephone, and electrical lines	0.25-mile
Along Mid-American pipeline company pipeline in West Salt Creek	Major pipelines and power lines	0.50-mile
Along Northwest Pipeline and State Highway 139	Major pipelines and power lines	0.50-mile
Coal Canyon	Major power lines	0.50-mile
From DeBeque to Southern Boundary of Resource Area*	Major power lines	4.0 miles
Along Roan Creek from DeBeque to the Community Center*	Railroads; power lines; major water and oil and gas pipelines	1.0 mile
Along Clear Creek from Community Center to Northern Resource Area Boundary*	Major power lines and pipelines	0.50-mile
Westwide Energy Corridor (US DOE and BLM 2009) along I-70 and Highway 50 to Delta	Oil, gas, and hydrogen pipelines and electricity transmission and distribution facilities	0.50- to 4.0 miles

Source: BLM 1987 (Table 21)
* These corridors are part of the West-wide Energy Corridor

A total of 234,113 acres in the planning area are designated unsuitable (exclusion) for ROWs, and proposals in these zones are denied on the basis that project impacts could not be mitigated to prevent undue damage to the resources of concern. Another 606,456 acres are designated sensitive (avoidance) to development, and ROW and projects in these zones are designed to protect resources of concern from undue damage. Remaining public lands are suitable for consideration for ROW authorizations, and proposals are considered in these zones. In sensitive (avoidance) and suitable zones, use of existing corridors or upgrading of existing facilities is encouraged.

Communication Sites. Communication site applications, on both existing and new sites, have increased on BLM-administered lands within the planning area. Communications facilities are authorized under the 43 CFR 2800 ROW regulations, and the authorizations are granted through a Communications Use Lease rather than a ROW grant.

Several sites within the planning area host communications equipment for various public and private tenants such as telephone companies, cellular and

internet service providers, local utilities, and local, state, and federal agencies. There are three multiple-facility communication sites on BLM-administered land within the planning area: Lands End, Nine Mile Hill, and Lee's Point. Individual communication site plans have been written and approved for each of these sites. In addition, the GJFO has issued communication site authorizations for six single-facility communication sites within the planning area. **Table 3-38**, Communication Sites in the GJFO Planning Area, lists the communication sites authorized by the GJFO.

Table 3-38
Communication Sites in the GJFO Planning Area

Site Name	Site Type	Township, Range, Section
Lands End	Multiple facility	11 South, 97 West, 15
Nine Mile Hill	Multiple facility	13 South, 99 West, 19 and 30
Lee's Point	Multiple facility	51 North, 19 West, 32
Crawford Point	Single facility	14 South, 103 West, 27
DeBeque	Single facility	8 South, 97 West, 24
Douglas Pass	Single facility	5 South, 101 West, 26
East Orchard Mesa	Single facility	1 South, 2 East, 30
Gunnison Bluffs	Single facility	2 South, 1 East, 6
Highway 50	Single facility	2 South, 1 East, 3

Rights-of-Way

The BLM issues ROWs, permits, and leases under the authority of FLPMA (Section 302 and Title V) for surface-disturbing activities on public lands that are not eligible for authorization under mining laws and regulations. The GJFO manages approximately 1,000 ROWs on public lands within the planning area.

ROWs are the most common form of land use authorizations issued to permit the use of public land by private, commercial, and governmental entities. ROWs are authorized under 43 CFR 2800 and 2880. ROWs are most often granted for private and public roads, natural gas pipelines, water pipelines, power lines, telephone lines, communication facilities, reservoirs, and irrigation ditches and canals. Facilities located within an oil and gas lease are authorized under the NEPA analysis of the proposed action to develop the lease (if the point of sale or custody transfer point is within a lease boundary, a ROW is required for the portion of the pipe past the transaction point).

Land use permits authorized under 43 CFR 2800 and 2880 are another form of land use authorization that permits the use of public land. Land use permits are often used to authorize short-term uses that are temporary in nature. Temporary Use Permits are authorized under the Mineral Leasing Act or 43 CFR 2880. Temporary Use Permits and short-term ROWs are used to authorize temporary workspace during the construction of facilities that are authorized under ROW grants. Permits comprised approximately 20 percent of the new land use authorizations in the GJFO during 2007 and 2008.

Increased exploration and development of natural gas resources, along with increased land development and population growth within the GJFO, have increased the number of land use authorization applications received for commercial and private uses. The GJFO has processed approximately 30 applications annually for new land use authorizations over the past few years. The types of new applications typically received included those for new facilities, changes or amendments to existing facilities, and short-term or temporary authorizations for short-term use or construction. Applications for new facilities typically accounted for 50 percent of the new authorizations granted each year. Approximately 13 percent of the applications for new authorizations received each year were from private parties. The remaining 87 percent of these types of applications were from commercial parties. Over the last five years, the majority of the ROW applications received have been for roads and pipelines. Other common ROW applications received were for power lines, telephone lines, and water pipelines. Applications for saltwater disposal wells were also received in 2008. An application for a carbon sequestration facility was received in 2009.

The majority of the ROWs are in the northern portion of the GJFO, as shown in **Figure 3-21**, Right-of-Way Locations. Two of the ROW corridors extend across the full width of the GJFO and provide a continuous route. Approximately 300 ROWs are currently contained by these corridors, and approximately 120 ROWs are partially within or pass through these corridors. The GJFO has strived to co-locate multiple facilities in adjacent locations when possible to reduce the amount of new surface disturbance in previously undisturbed areas. The majority of ROWs in the GJFO are located in the West Salt Creek Corridor, Highway 139 Corridor, and the West-wide Energy Corridor. These corridors are in the northwest and southeast portions of the GJFO. The corridors that were identified in the 1987 RMP, and amendments thereto, are shown in **Figure 2-26**, Alternative A: Right-of-Way Corridors, Exclusion and Avoidance Areas.

Trespasses are unauthorized use of public land that require the removal of facilities and reclamation, or authorization for continued use. The GJFO has worked to resolve trespass cases as they have been identified through removal and reclamation or authorization. A current inventory of trespasses within the field office has not been completed, but the GJFO has been working to develop a list of existing trespasses. Trespass cases are prioritized based upon human health and safety and severity of resource damage.

Trends

As with other BLM field offices in Colorado, the GJFO is consolidating its lands to benefit the public. To achieve this, candidates for land ownership adjustment through disposal, sale, exchange, or acquisition include parcels that are difficult to manage or that do not have public access, parcels that are relatively small and are adjacent or of special importance to local communities or other federally or

state-managed lands, parcels that would increase conservation of natural resources, and parcels that increase access to and use of BLM land.

Under current management, parcels eligible for disposal through sale, exchange, or transfer have been limited to those identified for disposal in the 1987 RMP. Lands available for disposal in this RMP, and the criteria used to determine eligibility for disposal are identified in Table 2-2. Considerations for disposal are also continuing to account whether the action would adversely affect or conflict with existing uses or management of renewable resources.

Other federal, state, and local governments have indicated a continued interest in cooperative management agreement tracts which are offered for management, transfer, or exchange to qualified agencies or entities for purposes such as riparian and wildlife habitat management, community open space, and recreation.

Many of the management decisions related to lands and realty in the GJFO are increasingly driven by growth and urbanization issues. Other driving issues include the interface between private landowners and the demands on BLM-administered lands to locate the facilities (e.g., access roads, communication sites, pipelines, and water tanks) needed to support the fast-growing infrastructure.

Most utility type ROWs and associated facilities have been in place over 30 years, so it is likely that the infrastructure would require replacement or upgraded technology. There are many ROWs throughout the GJFO that could be utilized to upgrade existing infrastructure. As communities continue to expand in the planning area, it is likely that requests for the use of BLM-administered land for facilities would increase.

3.4 SPECIAL DESIGNATIONS

This section is a description of the special designation areas in the GJFO planning area and follows the order of topics addressed in Chapter 2:

- Wilderness Study Areas
- Areas of Critical Environmental Concern
- Wild and Scenic Rivers
- National Trails
- National, State, and BLM Byways

Special Recreation Management Areas and Extensive Recreation Management Areas are discussed in **Section 3.3.4**, Recreation and Visitor Services.

3.4.1 Wilderness Study Areas

In 1964, Congress passed the Wilderness Act, thereby establishing a national system of lands for the purpose of preserving a representative sample of ecosystems in a natural condition for the benefit of future generations. Until 1976, most land considered for, and designated as, wilderness was managed by the NPS and the US Forest Service. 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. Section 603 of FLPMA specifically required the BLM to provide Congress with recommendations as to the suitability or non-suitability of roadless areas greater than 5,000 acres and roadless islands for wilderness designation. Congress gave the BLM 15 years to complete the wilderness inventory, which was done on a state-by-state basis. Only Congress can ultimately decide which areas, if any, will be designated as wilderness and added to the National Wilderness Preservation System.

In 1989, the BLM Grand Junction Resource Area issued its Final Wilderness Environmental Impact Statement that included analysis and recommendations for seven WSAs within the GJFO (BLM 1989). Three areas have since been designated as wilderness and are not within the planning area for this RMP. The recommendations were based on the findings of the 15-year wilderness study process (from 1976 to 1991) that included each area's resource values, present and projected future uses, and manageability as wilderness; the environmental consequences of designating or not designating the areas as wilderness; mineral surveys; and public input. Until Congress acts on the recommendations and either designates them as wilderness or releases them for other uses, these areas are managed under Interim Management Policy for Lands under Wilderness Review (BLM Handbook H-8550-1, [BLM 1995a]) to preserve their wilderness values. Activities that would impair wilderness suitability are prohibited in WSAs. There are six primary provisions of FLPMA with regard to interim management of WSAs:

- WSAs must be managed so as not to impair their suitability for preservation as wilderness;
- Activities that are permitted in WSAs must be temporary uses that create no new surface disturbance nor involve permanent placement of structures;
- Grazing, mining, and mineral leasing uses that existed on October 21, 1976, may continue in the same manner and degree as on that date, even if this would impair wilderness suitability of the WSAs;
- WSAs may not be closed to appropriation under the mining laws to preserve their wilderness character;
- Valid existing rights must be recognized; and

- WSAs must be managed to prevent unnecessary or undue degradation.

In summary, WSAs must be managed in a manner that would not impair the suitability of the area for preservation as wilderness and to prevent unnecessary or undue degradation. Except for grandfathered uses and valid existing rights, permitted activities in WSAs are temporary uses that create no new surface disturbance and don't involve placement of permanent structures.

The BLM's authority to conduct wilderness reviews, including establishing new WSAs, expired in 1991. However, BLM has authority under Section 201 and 202 of FLPMA to maintain an inventory of all BLM lands and their resources, including wilderness characteristics, and to consider such information during land use planning. Through the land use planning process, BLM will consider all available information to determine the mix of resource use and protection that best serves the FLPMA multiple-use mandate. Wilderness characteristics findings are discussed in **Section 3.2.14**, Lands with Wilderness Characteristics outside Existing Wilderness Study Areas.

Current Conditions

Three WSAs within the GJFO have been designated as Wilderness. The Black Ridge Canyons and Black Ridge Canyons West were combined and designated as the Black Ridge Canyons Wilderness Area in 2000 (Public Law 106-353) and are managed as part of the McInnis Canyons NCA. In 2009, Congress designated the Dominguez Canyon Wilderness Area (Public Law 111-11), which is managed as part of the Dominguez-Escalante NCA. These areas are outside of the planning area for this RMP.

Four WSAs totaling 96,400 acres are within the GJFO RMP decision area: Demaree Canyon, Little Book Cliffs, the Palisade, and Sewemup Mesa (**Figure 2-69**, Alternatives A, B, C, and D: Wilderness Study Areas). In 1991, the BLM recommended as nonsuitable for wilderness designation all of Demaree Canyon, Little Book Cliffs, and the Palisade WSAs. Sewemup Mesa WSA was recommended as suitable for wilderness designation except for approximately 130 acres (BLM 1991). It should be noted that the Sewemup Mesa WSA extends into the Uncompahgre Field Office to the south. The acreages discussed here are only for the portion of the WSA in the GJFO. As such, acreage figures differ slightly from the 1991 study report and recommendation.

A description of each WSA is provided in **Table 3-39**, Wilderness Study Area Characteristics. All WSAs are managed according to interim management policy (BLM Handbook H-8550-1, [BLM 1995a]) which recognizes valid existing rights and grandfathered uses. Grandfathered uses include grazing, mining, and mineral leasing conducted in the manner and degree in which these uses were being conducted on October 21, 1976, as long as they do not cause unnecessary or undue degradation of the lands under wilderness review.

Table 3-39
Wilderness Study Area Characteristics

Demaree Canyon WSA	
Location:	Approximately 25 miles northwest of Grand Junction in Garfield County.
Size:	22,700 acres
Natural Values:	• A series of north-south-trending canyons separated by narrow ridges. • The southern boundary of the WSA is defined by the base of the Book Cliffs. • Vegetation is scattered pinyon-juniper on the canyon slopes and ridges. • Sagebrush, saltbrush, and various grasses are found in the five major canyon bottoms. • Outstanding opportunities for solitude.
Current Uses/ Management Prescriptions:	• Very light hiking and equestrian use except for during hunting season. • Energy development. • Big game hunting and outfitting.
Valid Existing Rights and Grandfathered Uses:	• Cattle grazing. • As of October 1990, there were 20 oil and gas leases and 220 acres of a coal leases all dating from before FLPMA. Two of the leases expired in June 2009 due to lack of production, leaving 18 held by production leases. There are three active wells within the WSA boundary.
Current Management Issues:	• Increasing energy and road development may begin to threaten opportunities for solitude and recreation. • Illegal OHV incursions into the WSA from illegal social routes beginning at Colorado Highway 139 and adjacent private land.
Little Book Cliffs WSA	
Location:	West of DeBeque in Mesa County.
Size:	29,300 acres
Natural Values:	• The WSA is a gently upward sloping plateau dissected by four major canyon systems. • The canyons are characterized by steep cliff walls up to 1,000 feet high. • The base of the Little Book Cliffs defines the southern boundary of the WSA. • Vegetation is scattered pinyon-juniper on the canyon slopes and ridges. Sagebrush, saltbrush, and rabbitbrush are found in the canyon bottoms. • Outstanding opportunities for solitude except in the area of oil and gas development. • Outstanding opportunities for primitive and unconfined recreation.
Current Uses/ Management Prescriptions:	• Hiking, backpacking, camping, equestrian use, wildlife viewing, photography. • Energy development. • LBCWHR overlaps much of the WSA.
Valid Existing Rights and Grandfathered Uses:	• Two miles of roads have been built inside the WSA to support pre-FLPMA oil and gas leases having valid existing rights. • As of October 1990 there were 25 oil and gas leases and 1,934 acres in three coal leases all dating from before the passage of FLPMA. Currently there are 17 authorized oil and gas leases within or partially within the WSA boundary and four producing or shut-in wells within the WSA boundary.

Table 3-39
Wilderness Study Area Characteristics

Current Management Issues:	• Motorized and mechanized incursions into the WSA from private property near Cameo. • Proliferation of social trails at the southern access point near Cameo. • The northern access to the WSA consists of a series of cherry-stemmed roads, off of which branch social trails that provide illegal motorized access into the WSA. • Main Canyon has been temporarily closed to motorized use as the way has deteriorated such that the way is no longer passable by most motorized vehicles. • Management of horses (e.g., fences and structures) and the vegetation community (e.g., vegetation treatments) while complying with interim management policy (BLM Handbook H-8550-1, [BLM 1995c]).
The Palisade WSA	
Location:	North of Gateway and approximately 60 miles south of Grand Junction in Mesa County.
Size:	26,700 acres
Natural Values:	• Vertical cliffs, deep rugged canyons, and rolling to flat desert valley bottoms varying from rolling terrain to flat terrain dissected by gulches. The most prominent feature is the Palisade, which is a three-mile-long, rocky, butte-like spine that cuts the unit north and south. • Higher elevations consist of open sloping-to-flat grasslands varying from rolling terrain to flat terrain and meadows with moderate to heavy stands of intermixed pinyon-juniper and oak brush; lower elevations are characterized by pinyon-juniper and desert shrub vegetation. • Upper drainages contain aspen and ponderosa pine, while the North Fork of West Creek and Fish Creek have riparian vegetation.
Current Uses/ Management Prescriptions:	• Hiking, climbing, camping, equestrian use, photography. • Moderate ATV use. • Big game hunting and outfitting. • Power line ROW. • 1,920 acres closed to OHV use.
Valid Existing Rights and Grandfathered Uses:	• Cattle grazing. • Motorized use on Bull Draw and Wright Draw roads.
Current Management Issues:	• Motorized use of Bull Draw and Wright Draw ways. • The area is seeing an increase in recreational rock climbing. There is one permit for guided climbing trips into the area, and safety and access issues are increasing in prominence. Wilderness characteristics of this area are threatened by the increase in use and the desire of some climbers to add permanent bolts within the WSA. Depending on the future amount of use that occurs, the main Palisade climbing route may require a permit system with use restrictions to protect wilderness character and experiences.

Table 3-39
Wilderness Study Area Characteristics

Sewemup Mesa WSA	
Location:	Approximately ten miles south of Gateway in Mesa County.
Size:	17,800 acres
Natural Values:	• Sewemup Mesa (approximately 73 percent of the WSA) is an isolated mesa top surrounded by sheer 500- to 700-foot cliffs on three sides. • The southern edge of the mesa has a broken, rocky slope rather than a solid cliff face. • The Sinbad Valley portion of the WSA is part of a collapsed salt dome which, over geologic time, has created a deep valley nearly circular in shape. • Numerous parallel canyon systems create a complex and varied topography. • Mostly pinyon-juniper woodland on the mesa top, with relatively high tree density.
	• Outstanding opportunities for solitude. • Outstanding opportunities for primitive and unconfined recreation.
Current Uses/ Management Prescriptions:	• Light hiking and backpacking use. • Big game hunting. • 17,775 acres closed to OHV use. • 17,775 acres designated as unsuitable for public utilities.
Valid Existing Rights and Grandfathered Uses:	None.
Current Management Issues:	• Montrose County has a Colorado Revised Statute (RS) 2477 claim to improve an old route that runs along the western boundary of the WSA. This improved access route, coupled with an overall increase in use in the Gateway area, may lead to a significant increase in visitation to this area.

3.4.2 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 (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." The BLM prepared regulations for implementing the ACEC provisions of FLPMA. These regulations are found at 43 CFR 1610.7-2(b).

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 resulting in more than five acres of disturbance under the mining laws.

Existing Areas of Critical Environmental Concern

There are five ACECs totaling 32,208 acres on BLM-managed land in the planning area: Badger Wash ACEC, the Palisade ACEC/Outstanding Natural Area (ONA), Pyramid Rock ACEC/Research Natural Area (RNA), Rough Canyon ACEC/RNA, and Unaweep Seep ACEC/RNA (**Figure 2-65**, Alternative A: Areas of Critical Environmental Concern). The size of each area and the values it is designed to protect are listed in **Table 3-40**, Existing Areas of Critical Environmental Concern. The values for which the ACECs were designated to protect are still present and require continued management attention.

Table 3-40
Existing Areas of Critical Environmental Concern

Badger Wash ACEC	
Location:	Approximately nine miles northwest of Loma in Mesa County.
Size:	1,900 acres
Natural Values:	• Small drainage system entirely within the desert. • Contains one of the best condition sites in the state of a remnant saltbush community, gardner saltbush/salina wildrye. • Provides important habitat for two rare plant species, grand buckwheat (*Eriogonum contortum*) and Ferron's milkvetch (*Astragalus musiniensis*). • Provides habitat for sensitive wildlife, including burrowing owl and kit fox.
Current Uses/ Management:	• The ACEC has been used for USGS hydrologic studies since the 1950s. The study area within the ACEC is comprised of four paired watersheds, 1A and 1B to 4A and 4B. The study examines sediment and erosion impacts of cattle grazing between the four pairs of grazed (unfenced) and ungrazed (fenced) watersheds. • Cattle grazing exists, except within the fenced portions of the paired watersheds. • Light to moderate recreational use (e.g., hiking, OHV use). • No Surface Occupancy (NSO) stipulation within the hydrologic study area (685 acres). • Closed to mineral materials disposal.
Valid Existing Rights:	• No private in-holdings (surface or subsurface) within the ACEC. • As of January 2010, there were three permitted wells. The status of these wells are: o East Bar X-2: drilled and abandoned in 1956. o Government #2-A: completed and currently shut-in. o Federal #5: producing gas well. • Eleven valid federal leases. • One road ROW. • Two pipelines for wells within the ACEC and one pipeline ROW running through the far northeastern corner of the ACEC. • One telephone ROW.

Table 3-40
Existing Areas of Critical Environmental Concern

Current Management Issues:	• Increasing new energy exploration, development, and access roads may threaten native plant communities and long-term hydrologic studies. • The ACEC spans two grazing allotments with different management and permittees. • Partial NSO oil and gas stipulation does not cover the entire ACEC.
	The Palisade ACEC/ONA
Location:	North of Gateway and approximately 60 miles south of Grand Junction in Mesa County.
Size:	23,600 acres
Natural Values:	• Vertical cliffs, deep rugged canyons, and rolling to flat desert valley bottoms dissected by gulches; the most prominent feature is The Palisade, which is a three-mile-long, rocky, butte-like spine that cuts the unit north and south. • Higher elevations consist of open sloping to flat grasslands and meadows with moderate to heavy stands of intermixed pinyon-juniper and oak brush; lower elevations are characterized by pinyon-juniper and desert shrub vegetation. • Upper drainages contain aspen and ponderosa pine, while the North Fork of West Creek and Fish Creek have riparian vegetation. • Contains peregrine falcon and golden eagle breeding areas and Gunnison sage-grouse habitat.
	• Contains numerous rare plants including Osterhout's cryptantha, Dolores River skeletonplant, horseshoe milkvetch, and Fisher Tower's milkvetch.
Current Uses/ Management Prescriptions:	• Hiking, climbing, camping, equestrian use, photography. • 1,920 acres closed to OHV use. • 1,920 acres designated as VRM Class I. • 17,258 acres designated as VRM Class II. • Big game hunting and outfitting. • Cattle grazing. • No Surface Occupancy stipulation.
Valid Existing Rights:	None.
Current Management Issues:	• The Palisade ACEC/ONA falls within the Palisade WSA, deemed nonsuitable for wilderness based on marginal manageability (BLM 1987).
	Pyramid Rock ACEC/RNA
Location:	Approximately two miles west-southwest of DeBeque in Mesa County.
Size:	550 acres
Natural Values:	• Eroded sandstone pinnacle. • Important habitat for the federally-listed Colorado hookless cactus (formerly Uinta Basin hookless cactus, federally-listed DeBeque phacelia, adobe thistle *(Cirsium perplexans)*, Naturita milkvetch, aromatic Indian breadroot (*Pediomelum aromaticum*), and DeBeque milkvetch.

Table 3-40
Existing Areas of Critical Environmental Concern

Current Uses/ Management:	• Conservation area for the federally-listed Colorado hookless cactus. • Proposed critical habitat for DeBeque phacelia. • Rare plant monitoring and study site. • Cattle grazing. • Closed to mineral material disposal. • No Surface Occupancy stipulation. • Closed to motorized vehicles. • Closed to public utilities.
Valid Existing Rights:	• V.20 Road along west side of ACEC boundary. • Natural gas pipeline ROW east of V.20 Road.
Current Management Issues:	• Open areas surround the ACEC, making OHV incursions a continuous problem. • Cheatgrass invasion of adjacent landscape. • Current and future energy development. • Current boundary does not fully include adjacent cultural resources.
Rough Canyon ACEC/RNA	
Location:	Seven miles south of Grand Junction in Mesa County.
Size:	2,700 acres
Natural Values:	• Habitat for two BLM special status plants: Grand Junction milkvetch and Osterhout's cryptantha. • Significant breeding area for the canyon tree frog and red-spotted toad *(Bufo punctatus)*. • Habitat for peregrine falcon and midget faded rattlesnake. • Visual and geologic resources including the Ladder Creek Monocline, Ladder Canyon fault, and a portion of the Bangs Canyon fault. • Historic quartz/mica mine. • High concentration of prehistoric archaeological sites.
Current Uses/ Management:	• Hiking, mountain biking, equestrian use, photography, camping. • Motorized vehicles allowed only on the Tabeguache Trail. • Cattle grazing. • Designated as VRM Class II. • Unsuitable for public utilities. • No Surface Occupancy. • Closed to mineral material disposal. • Withdrawn from locatable mineral entry.
Valid Existing Rights:	None
Current Management Issues:	• Continued increase in use, braiding of routes in canyon bottom, and lack of interpretive educational efforts puts protected resources at risk. • ACEC boundaries are not depicted on any of the BLM 1:100,000 maps.

Table 3-40
Existing Areas of Critical Environmental Concern

Unaweep Seep ACEC/RNA	
Location:	In Unaweep Canyon, eight miles northeast of Gateway in Mesa County.
Size:	80 acres
Natural Values:	• Habitat for the Great Basin silverspot butterfly *(Speyeria nokomis nokomis)* and 67 other species of butterflies. • Large hillside spring complex consisting of at least 22 springs and seeps. • Riparian plant species including the giant helleborine *(Epipactus gigantea)*. • Designated as a Colorado "Important Bird Area" by Audubon Colorado. • Bordered on the south by the Unaweep-Tabeguache Scenic and Historic Byway (Highway 141) (see Section 3.4.5, National Byways).
Current Uses/ Management:	• Sightseeing, fishing, photography. • Cattle grazing. • Designated as VRM Class II. • No Surface Occupancy stipulation. • Withdrawn from mineral entry. • Closed to mineral material disposal.
Valid Existing Rights:	None
Current Management Issues:	• Spread of noxious weeds, particularly Canada thistle and bull thistle.

Each of the five existing ACECs is also a designated Natural Area under the CNAP. Such areas are designated through voluntary land management agreements between the CNAP and a landowner (in this case, the BLM) who agrees to work cooperatively with the state to assure the protection of the site's significant features.

Potential Areas of Critical Environmental Concern

In accordance with BLM Manual 1613, Areas of Critical Environmental Concern (BLM 1988), the GJFO ID Team reviewed all BLM-managed land in the planning area to determine whether any areas should be considered for designation as ACECs. The BLM reviewed both internal and external nominations, as well as areas identified through inventory and monitoring, and adjacent designations of other federal and state agencies. Areas determined to meet the relevance and importance criteria, as defined by 43 CFR 1610.7-2(a)(1) and 43 CFR 1610.7-2(a)(2), and guidance in BLM Manual 1613 (BLM 1988), are provided temporary management to protect human life and safety or significant resource values from degradation until the area is fully evaluated through the RMP process.

The review found 24 proposed ACECs (167,400 acres) to meet the relevance and importance criteria. Upon further review of the Rapid Creek ACEC, it was determined that the fish species initially thought to be present and meet the

relevance and importance criteria do not occur within the creek that crosses BLM-administered land. As such, 23 ACECs totaling 168,000 acres were brought forward for analysis. **Table 3-41**, Potential Areas of Critical Environmental Concern, displays such proposed ACECs. Where an expansion of an existing ACEC is proposed, the total acres presented includes the existing ACEC. See **Figure 2-67**, Alternative C: Areas of Critical Environmental Concern, for the location of all ACECs that met the relevance and importance criteria for at least one value. More information on the evaluation of proposed ACECs, including methodology for analysis, can be found in **Appendix D**, Summary of Areas of Critical Environmental Concern Report on the Application of the Relevance and Importance Criteria. Each of the potential ACECs is evaluated for designation in at least one alternative of the EIS (see **Chapter 2**, Alternatives, and **Chapter 4**, Environmental Consequences).

Table 3-41
Potential Areas of Critical Environmental Concern

ACEC	Natural Values	Acres
Atwell Gulch	Plants, Wildlife, Scenic, Cultural	6,100
Badger Wash ACEC and Expansion	Plants, Wildlife, Hydrological	2,200[1]
Colorado River Riparian ACEC	Wildlife, Fish, Scenic, Riparian Habitat	880
Coon Creek ACEC	Fish	110
Dolores River Riparian ACEC	Plants, Wildlife, Fish, Scenic, Riparian Habitat	7,400
Glade Park-Pinyon Mesa ACEC	Wildlife	27,100
Gunnison River Riparian ACEC	Plants, Wildlife, Fish, Riparian Habitat	460
Hawxhurst Creek ACEC	Fish	860
Indian Creek ACEC	Cultural	1,700
John Brown Canyon ACEC	Wildlife	1,400
Juanita Arch ACEC	Plants, Geologic	1,600
Mt. Garfield ACEC	Scenic	5,700
Nine-mile Hill Boulders ACEC	Paleontological	90
The Palisade ACEC/ONA and Expansion	Plants, Wildlife, Scenic	32,300[1]
Plateau Creek ACEC	Fish	220
Prairie Canyon ACEC	Plants, Wildlife	6,900
Pyramid Rock ACEC/RNA and Expansion	Plants, Cultural	1,300[1]
Reeder Mesa ACEC	Plants	470
Roan and Carr Creeks ACEC	Fish, Riparian Habitat	33,700
Rough Canyon ACEC/RNA and Expansion	Plants, Wildlife, Cultural, Geologic	2,800[1]
Sinbad Valley ACEC	Plants, Scenic, Cultural, Geologic	6,400
South Shale Ridge ACEC	Plants[3], Wildlife, Scenic	28,200
Unaweep Seep ACEC/RNA and Expansion	Wildlife, Fish, Plants, Riparian Habitat, Hydrologic	85[1]
Total		**168,000**

Source: BLM 2010a
[1]Acreage includes existing ACEC
[2]During BLM's initial review of the proposed ACEC, the BLM identified fish species that met the relevance and importance criteria. Upon further review of the area, it was determined that the fish species are not present but that the area does provide habitat that supports the presence of riparian-obligate bird species.
[3]Plant value includes federally threatened DeBeque phacelia, which was inadvertently omitted from the ACEC report (BLM 2010c).

3.4.3 Wild and Scenic Rivers

Wild and Scenic Rivers are rivers or river sections designated by Congress under the authority of the WSR Act of 1968 (Public Law 90-542, as amended; 16 USC 1271-1287) to protect outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values and to preserve the river or river section in its free-flowing condition.

Designation affords certain legal protection and prevents development that would impact the outstandingly remarkable values, free-flowing nature, or classification of the stream segment. Where private lands are involved, the federal managing agency works with local governments and owners to develop protective measures. Section 5(d)(1) of the WSR Act directs federal agencies to consider potential WSRs in their land and water planning process. To fulfill this requirement, the BLM inventories and evaluates rivers when it develops an RMP for BLM lands in a specified area.

To be eligible for inclusion in the National Wild and Scenic Rivers System, a river segment must be free flowing and contain at least one river-related value considered to be outstandingly remarkable (BLM Manual 8351) (BLM 1993c). Eligible segments are tentatively classified as wild, scenic, or recreational based on the current level of human development and activity within the corridor. The general definitions provided by the WSR Act are as follows:

- Wild river areas. 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 areas. Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.
- Recreational river areas. 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.

Following the eligibility phase, BLM-managed river segments that have been determined to meet the eligibility criteria for WSR are evaluated for suitability. The purpose of the suitability study is to determine whether eligible rivers would be appropriate additions to the National Wild and Scenic Rivers System. The study includes an evaluation of each eligible segment in regards to the 12 suitability criteria factors. **Appendix C**, Draft Wild and Scenic River Suitability Report, describes the methodology, data, and determinations made during the suitability phase.

Activities that would adversely affect eligible and suitable WSR stream segments include those that would diminish the outstandingly remarkable values or impair the free-flowing nature of the segment. Because many outstandingly remarkable values rely on a certain instream flow, activities that decrease instream flow may have an adverse effect on eligible and suitable WSR segments. Similarly, activities that affect the tentative classification of a stream segment, such as construction of a road in a segment with a wild classification, would impact the segment.

It is BLM policy to manage all eligible segments to preserve their free-flowing nature and identified outstandingly remarkable value(s) and tentative classification to the extent that the BLM has the authority to do so (BLM Manual 8351, Section .32C) (BLM 1993c). Should a nonsuitable determination be made in the RMP process, then the river shall be managed in accordance with management objectives as outlined in the plan document.

Current Conditions

There are no designated WSR streams in the GJFO planning area. Twenty BLM-managed segments in the GJFO were identified as eligible in the Wild and Scenic River Eligibility Report for BLM, GJFO (BLM 2009c). On March 30, 2009, after the release of the eligibility findings, Congress designated the Dominguez-Escalante NCA, which includes the Dominguez Canyon Wilderness. All or portions of five segments identified as eligible fall within the Dominguez-Escalante NCA: Dominguez Creek, Big Dominguez Creek, Little Dominguez Creek Segments 1 and 2, and Gunnison River Segment 1. These segments will be considered for suitability during development of the RMP for the Dominguez-Escalante NCA. In addition, the Little Dolores River was removed from further consideration due to land status that was verified through an updated cadastral survey. This was addressed in an amendment to the eligibility report in September 2011.

A suitability study was done for the remaining 14 eligible stream segments, resulting in a preliminary suitability determination for each segment. The methodology and detailed analysis are in **Appendix C**, Draft Wild and Scenic River Suitability Report.

Table 3-42, Summary of Wild and Scenic River Study Segments, lists the 14 eligible segments, their preliminary classification assigned during eligibility, lengths, and acreages (**Figure 2-70**, Alternatives A and C: Stream Segments Eligible [Alternative A] or Suitable [Alternative C] for Inclusion in the National Wild and Scenic Rivers System). While there are no management measures currently in place to specifically protect the free-flowing nature and outstandingly remarkable value(s) of eligible stream segments, overlapping ACECs, Wilderness or WSAs, SRMAs, and stipulations for oil and gas leasing (i.e., no surface occupancy, controlled surface use, and timing limitation) provide protection to the areas. For more details, refer to **Appendix C**, Draft Wild and Scenic River Suitability Report.

Table 3-42
Summary of Wild and Scenic River Study Segments

River or Creek	Total Segment Length (miles)	Length on BLM Land (miles)	Total Wild and Scenic River Study Corridor (acres)	Area on BLM Land (acres)	Tentative Classification	Outstandingly Remarkable Values
Blue Creek	11.2	10.0	3,200	2,900	Scenic	Scenic, Fish, Cultural
Carr Creek	9.8	5.1	3,100	1,700	Scenic	Fish
Colorado River Segment 1	17.8	7.3	5,600	2,200	Recreational	Scenic, Fish, Wildlife
Colorado River Segment 2	3.5	1.3	1,200	100	Recreational	Fish
Colorado River Segment 3	19.7	19.1	6,400	5,700	Scenic	Scenic, Recreation, Fish, Wildlife, Geologic, Historic
Dolores River	32.0	18.6	9,600	6,100	Recreational	Scenic, Fish, Recreation, Geologic, Paleontological
East Creek	18.9	9.0	5,800	2,900	Recreational	Geologic
Gunnison River Segment 2	6.0	3.8	1,900	1,000	Recreational	Fish, Historic
North Fork Mesa Creek	2.1	2.1	700	900	Scenic	Vegetation
North Fork West Creek	3.3	3.3	1,100	1,100	Wild	Scenic
Roan Creek	15.8	6.5	4,500	2,000	Scenic	Fish
Rough Canyon Creek	4.2	4.2	1,400	1,200	Scenic	Scenic, Wildlife, Geologic
Ute Creek	4.2	4.2	1,400	1,400	Scenic	Scenic, Vegetation
West Creek	5.8	4.9	1,900	1,700	Recreational	Scenic, Wildlife, Geologic, Vegetation

Source: BLM 2010a

Interim Protection

All eligible stream segments must be managed to protect the preliminary classification (wild, scenic, or recreational), free-flowing nature, and outstandingly remarkable values related to the segment to the level that they existed when the segment was found eligible. The preliminary classification restricts certain types of development depending upon the classification. Proposed developments must comply with those permitted by the WSR Act. Through regular monitoring of the outstandingly remarkable values, the BLM can assess whether or not they are present at the same level that they were when the segment was found eligible.

3.4.4 National Trails

National Scenic Trails and National Historic Trails are congressionally designated under the authority of the National Trails System Act of 1968. National Scenic Trails are extended trails that provide maximum outdoor recreation potential and for the conservation and enjoyment of the various qualities – scenic, historical, natural, and cultural – of the areas through which they pass. The BLM currently manages land along 5 National Scenic Trails, none of which are within the GJFO planning area.

National Historic Trails are extended trails that closely follow a historic trail or route of travel of national significance. Designation identifies and protects historic routes, historic remnants, and artifacts for public use and enjoyment. Nationwide, the BLM currently manages 11 National Historic Trails. They must meet the following three criteria listed in Section 5(b)(11) of the National Trails System Act:

- They must follow actual documented route of historic use;
- They must be of national significance; and
- They must possess significant potential for public recreation and/or interpretation.

The Old Spanish National Historic Trail was designated on December 4, 2002, by the Old Spanish Trail Recognition Act of 2002 (Public Law 107-325). The northern branch of the trail passes through a portion of the GJFO (**Figure 2-91**, Alternative A: National Historic Trails and State and BLM Byways).

The Old Spanish National Historic Trail was a 2,700-mile trade route linking Santa Fe, New Mexico, and Los Angeles, California, passing through New Mexico, Colorado, Utah, Arizona, Nevada, and California. The trail had brief but heavy use between 1829 and 1848. During that period, Mexican and American traders took woolen goods west over the trail by mule train and returned eastward with California mules and horses for the eastern US and Mexican markets (Old Spanish Trail Association 2009).

Spanish traffic was fairly constant between 1765 and 1821 to trade with the Ute. Some trail users chose to trade with the Utes as far north as Salt Lake, and followed a path now labeled the "North Branch," which led to Grand Junction, Colorado before heading south to rejoin the other major route from Santa Fe via Green River, Utah. Mexican trader Antonio Armijo made the first commercial, round-trip journey along a southern variant of the route in 1829 to 1830. William Wolfskill and George Yount's commercial pack train of 1830 to 1831 inaugurated consistent use of the entire route from 1830 to 1848. Use lapsed after the end of the Spanish American War in 1848, and by 1853, the Old Spanish National Historic Trail had been abandoned as a principal trade route (NPS 2001). The various historical routes together make up what is today known as the Old Spanish National Historic Trail.

Current Conditions

BLM and NPS jointly administer the Old Spanish National Historic Trail. The Old Spanish Trail Association serves as the primary non-federal partner. A draft trail-wide comprehensive plan and EIS are being prepared for the entire trail by the BLM and NPS. The trailwide comprehensive plan will provide strategic direction and guidance for future administration and management of the Old Spanish National Historic Trail. The trail-wide comprehensive plan does not make land use allocations and does not direct the actions of National Trail managers."

Fifty-one miles of the Old Spanish National Historic Trail fall within the GJFO field office boundary, and 40 miles are within the GJFO planning area. However, only 6.9 miles of the congressionally designated route are under BLM jurisdiction, as the remaining portions are on land with other surface ownership (**Figure 2-91**, Alternative A: National Historic Trails and State and BLM Byways). Location of the congressionally designated route may change as on-the-ground surveys and additional archival work establish the location of the Old Spanish National Historic Trail.

Within the planning area, the Old Spanish National Historic Trail was classified as VRI Class IV during a 2009 visual resource inventory except for a short stretch of VRI Class III on private land (Otak 2009). Much of the Old Spanish National Historic Trail corridor within the planning area has been greatly impacted by residential, commercial and transportation developments in the past 10-20 years. This change in character is especially evident near Whitewater, where the expanding urban and suburban footprint has curtailed visitors' ability to experience the historic trail in a relatively unaltered landscape. Between Whitewater and Grand Junction a recreation route (approximately 4.5 miles in length) has been identified as the Old Spanish Trail. However, the historic alignment of the trail is likely further north and east along the Highway 50 corridor. The recreation route provides an opportunity for visitors to experience the general area of the historic trail in a slightly less developed setting.

Trends

The trail-wide comprehensive plan will examine trail resources along the entire route of the Old Spanish National Historic Trail. At the local level, the BLM will continue to work with the local branch of the Old Spanish Trail Association to manage trail use and provide educational opportunities in a manner that safeguards the nature and purposes of the trail.

3.4.5 National, State, and BLM Byways

Background

Byways and backways are routes that range from multilane freeways to narrow, graded roads open part of the year. Designations include All American Roads, National Scenic Byways, Colorado Scenic Byways, and BLM Back Country byways. Designation as a byway or backway can occur at the national level by the US Secretary of Transportation, at the state level, or at the BLM Field Office level. There are three designated byways or backways in the GJFO planning area.

National Scenic Byways

The National Scenic Byways Program was established under the Intermodal Surface Transportation Efficiency Act of 1991 and was reauthorized in 1998 under the Transportation Equity Act for the 21st Century. Under the program, the US Secretary of Transportation recognizes certain roads as National Scenic Byways or All American Roads based on their archaeological, cultural, historic, natural, recreational, and scenic qualities. For a highway to be considered for inclusion in the National Scenic Byways Program, it must provide safe passage for passenger cars year-round, it must be designated a State Scenic Byway, and it must have a current corridor management plan in place. To receive an All American Road designation, a road must possess multiple intrinsic qualities that are nationally significant and contain one-of-a-kind features that do not exist elsewhere. The road must also be considered a "destination unto itself." That is, the road must provide an exceptional traveling experience so recognized by travelers that the primary reason for their trip would be to drive along the byway (National Scenic Byways Program 2009).

Colorado Scenic Byways

Similar to National Scenic Byways, Colorado Scenic Byways are paved highways that have been designated by official state declaration for their scenic, historic, recreational, cultural, archaeological, or natural qualities. The byways are paved roads that are generally safe, year-round, for passenger cars.

BLM Back Country Byways

The BLM Back Country Byways Program was developed by the BLM to complement the National Scenic Byways Program. Back Country Byways highlight the spectacular nature of the western landscapes. Back Country Byways vary from narrow, graded roads, passable only during a few months of the year, to two-lane paved highways providing year-round access.

Current Conditions

There are two National Scenic Byways that cross through the GJFO planning area: Dinosaur Diamond National Scenic and Historic Byway and the Grand Mesa National Scenic and Historic Byway. In addition, there is one State Scenic byway, the Unaweep-Tabeguache State Scenic and Historic Byway, that crosses through the GJFO planning area. Refer to **Figure 2-91**, Alternative A: National Historic Trails and State and BLM Byways, for the location of the byways. The BLM serves as a project partner for each of these byways and is committed to making decisions that focus on thoughtful marketing and comprehensive resource protection. There are no BLM Back Country Byways in the GJFO planning area.

Dinosaur Diamond Scenic and Historic Byway

The Dinosaur Diamond National Scenic and Historic Byway is a 480-mile, two-state byway that provides opportunities to see dinosaur bones being excavated and prepared by paleontologists for museum display. Visitors can also visit museums along the byway that showcase reconstructed skeletons and fleshed-out re-creations of dinosaurs found in the area. In addition to dinosaur sites, archaeological areas are scattered throughout the region that encompasses Dinosaur Diamond, and visitors can observe prehistoric Native American petroglyphs and pictographs that cover rock cliffs across the northern edge of the Colorado Plateau. It was designated a National Scenic Byway in 2002. The Dinosaur Diamond Partnership is currently preparing an application to be considered by the National Scenic Byways Program for All American Road listing (Dinosaur Diamond Partnership 2009).

There are existing oil and gas leases off of the byway and, under the current plan, the area is open for oil and gas leasing. The proposed Red Cliff Mine and the McClane Canyon coal mine are also adjacent to this byway.

Unaweep-Tabeguache Scenic and Historic Byway

Since its designation, the Unaweep-Tabeguache State Scenic and Historic Byway has experienced a more active motorized tourist industry. The byway travels through Unaweep Canyon from Whitewater to Gateway, then along the Dolores and San Miguel Rivers to Uravan, Naturita and Placerville. The Unaweep section follows the ancient path of the Gunnison River as it carved a deep channel in the earth to expose dramatic walls of pre-Cambrian granite. Unaweep Canyon has a unique geological feature—a divide in the middle that causes water to flow "out of two mouths" (the roughly translated meaning of the word Unaweep). The waters that fall on the east side of Unaweep's divide flow to the Gunnison River via the seasonal East Creek. The western waters flow to the Dolores River via the year-round-flowing West Creek.

Nine-Mile Hill is a legendary wagon route once used for hauling supplies into and radium ore out of Gateway during the radium boom of the early 1900s. During this time, Nine-Mile Hill's grueling 18 percent grade often exhausted the

stock teams pulling wagonloads up and was equally treacherous coming down. The infamous hill even proved too steep for early motor-powered vehicles, and passengers frequently had to climb the hill on foot. This route, which is now Colorado Highway 141, was once known as Uranium Road. It served as the only access between the ore-rich mines in Gateway, Uravan, Naturita, and Nucla and the processing mills in Grand Junction. Today, Nine-Mile Hill is only five miles long and less steep than before.

The Tabeguache section runs south from Gateway to the communities of Nucla and Naturita in the Uncompahgre Field Office of the BLM. The Dolores River cuts a dramatic path through the sandstone as the byway winds its way alongside, sometimes hundreds of feet above the river. Here in this section visitors find a world-famous hanging flume and recently closed Uravan mining site, both evidence of the area's rich history of mining and mineral extraction.

Grand Mesa Scenic and Historic Byway

The 63-mile Grand Mesa National Scenic and Historic Byway was designated a scenic byway in 1996. The byway begins at Interstate 70 and follows Colorado Highway 65 up Plateau Canyon to an elevation of more than 11,000 feet and leads visitors to a variety of year-round outdoor recreation opportunities. Less than four miles of the Grand Mesa Scenic and Historic Byway actually cross GJFO-managed land, but the byway provides several points at which visitors can access BLM lands for recreational purposes.

Trends

Driving for pleasure is expected to increase through the GJFO planning area, particularly along the existing scenic byways. Development pressures are likely to increase both on private and public lands adjacent to the byways. It is likely that increased development proposals on current private ranch lands will increase over time as population increases. As both the Dinosaur Diamond and the Unaweep-Tabeguache byways traverse BLM lands with both existing mineral leases and the opportunity for future mineral exploration and development, development pressure is also expected to increase on public lands. The BLM continues to work with partnership groups such as the Dinosaur Diamond Prehistoric Highway Partnership (Dinosaur Diamond Scenic and Historic Byway) to enhance and promote the scenic byways in the project area.

3.5 SUPPORT

This section is a description of the support conditions in the GJFO planning area and follows the order of topics addressed in Chapter 2:

- Cadastral
- Interpretation and Environmental Education
- Transportation Facilities

3.5.1 Cadastral

Cadastral survey is one of the BLM's basic responsibilities as the keeper of over 200 years of federal survey records and plats. In addition, the cadastral program supports all other functions by conducting land surveys and resurveys to identify public/private land boundaries. These surveys are often needed where there are unauthorized uses, land tenure adjustments, or BLM projects near a public/private land boundary. The costs of cadastral surveys are borne by the federal program or private interest that benefit from the boundary identification.

Current Conditions

Cadastral survey has been used extensively throughout the GJFO over the past 20 years primarily with trespass issues related to lands and realty. Unauthorized agricultural and mineral development, residential development, fence construction, and road development have been the primary uses for cadastral survey. Cadastral has also been used to survey boundaries related to legislative actions and boundaries associated with land acquisitions, exchanges, and disposals throughout the GJFO.

Trends

As development of urban areas adjacent to BLM lands increases throughout the planning area, so will the need for cadastral efforts. The need for accurate surveys will be critical in areas of mixed federal and private ownership, such as Whitewater, the Grand Mesa Slopes, DeBeque, and Glade Park. The need for boundary surveys related to land tenure adjustments will also continue. The current capacity of the cadastral program is not sufficient to meet the increasing survey needs in the planning area associated with urban interface development.

3.5.2 Interpretation and Environmental Education

Interpretation is the voice for all BLM resource management programs. A well-developed program supports the goals and objectives of all resources and programs by serving customers; promoting land health; and enhancing the public's enjoyment, understanding, and appreciation of the public lands' natural and cultural resources and their management. An interpretive program reaches out to dispersed visitors across varied landscapes and serves visitors who are exploring many facets of public lands.

Management issues are addressed within the interpretive story in a way that relates those issues to the visitors' experiences. Interpretive planning is done collaboratively with internal and external groups, and clear measurable objectives are established to gauge the cost/benefit and the program's effectiveness. The BLM's interpretive program aims to respect and serve people with diverse backgrounds and abilities.

Current Conditions

Interpretation and education opportunities in the decision area have not been extensively developed. Only a handful of small interpretive sites and a variety of

single interpretive signs are scattered throughout the decision area. Currently, visitors receive information on opportunities in the decision area, as well as on safety concerns, from both off-site and on-site sources. Off-site sources include assorted resource brochures distributed throughout the area, maps, programs given by resource specialists or local historians, teacher information packets, fact sheets, and various Internet web sites. Many program- or area-related brochures have been automated and are available on the Internet. Informational tours for volunteer groups and the general public are periodically given by BLM specialists.

On-site information is obtained from directional signs, road markers, ranger patrols, and interpretive signs. An integral part of the BLM's recreation outreach is the GJFO visitor center in Grand Junction, with an average of 75 visits per day. The visitor center provides interpretation, education, and information to visitors interested in route conditions, recreation opportunities available in the region, and current events.

The GJFO visitor center coordinates with other providers locally and regionally to provide the public with current, accurate information. Brochures and other information are sent to the Chamber of Commerce and Visitor Centers in Grand Junction and Fruita, Colorado, and in Moab, Utah. Other BLM partnerships have been developed with the Unaweep-Tabeguache State Scenic and Historic Byway and Dinosaur Diamond National Scenic Byway.

Trends

A developed interpretive program will focus on the GJFO's public lands and the interrelationship between the physical elements, biological systems, and cultural and historical events. Many of these efforts are accomplished in partnership with other land-management agencies and involve local communities. The BLM will continue to partner with other organizations and government agencies, thereby sharing costs and more effectively delivering interpretive products and services to the public. Making interpretive and educational resources available electronically on the Internet also furthers this goal.

3.5.3 Transportation Facilities

The BLM's transportation system represents one of the most critical assets to the accomplishment of the BLM's mission to manage public lands. It affords entry for public access and provides the infrastructure that supports uses ranging from recreation to commercial activity and is the primary means of access to public lands under BLM GJFO jurisdiction.

Current Conditions

Federal, State, and County Roads

A network of federal, state, and county roads provides access throughout the planning area. Interstate 70 bisects the planning area, bringing traffic to the region from throughout the US.

Traffic volumes on the road network are highly variable. The highest volume counts are found on major roadways in or near the largest communities. Interstate 70 and state highways (Highway 6/50, 141, and 139) carry the largest traffic volumes, followed by county roads.

BLM Roads

BLM roads provide public and administrative (agency and permittee) access to public lands, through public lands, and to inholdings of private land within the planning area. The BLM responds to public requests for land use authorizations. Reasonable administrative access is made available to persons engaged in valid uses, such as mining claims, mineral leases, livestock grazing, and energy development. Most use of BLM roads would be described as casual.

Related to transportation planning is travel management. Travel management (**Section 3.3.5**, Comprehensive Travel and Transportation Management) is the identification, through RMP planning, of areas where foot, pack stock, and mechanized and motorized vehicle travel is appropriate, restricted, or not allowed, depending on resource objectives and use considerations. Refer to **Section 3.3.5**, Comprehensive Travel and Transportation Management, for more information.

Road System Maintenance. The BLM maintains roads under standards set forth in the BLM 9100 series manuals and the GJFO 1987 RMP (BLM 1987). Maintenance provides for resource protection, accommodation of users, and protection of the BLM's investment. The BLM uses the road maintenance intensities described in **Table 3-43**, Road Maintenance Intensity Levels. Road system maintenance has focused on maintaining major recreational access roads, which generally receive most of the traffic volume. The BLM annually maintains approximately 100 miles of road within the planning area, depending on road conditions and funding availability; approximately 95 miles are planned for maintenance in Fiscal Year 2010. Road maintenance generally consists of blading or grading and is usually performed in the summer or fall. Additional corrective maintenance or water drainage work (installation of culverts, drains, or other water-management devices) is performed as needed, such as after periods of heavy rainfall. Snow is not removed.

The BLM has changed from "Maintenance Levels" to "Maintenance Intensity" and simplified the standards for consistency across all linear features. The old "Maintenance Levels" definitions addressed both the type of road (road geometry or construction material) and the level of use but did not provide a clear standard for the actual maintenance level. As a result, they were used inconsistently across the BLM as a means for describing everything from road construction type through appropriate maintenance standards. BLM route maintenance intensities provide guidance for appropriate "standards of care" (e.g., appropriate intensity, frequency, and type of maintenance activities that

Table 3-43
Road Maintenance Intensity Levels

Maintenance Intensity Level	Maintenance Description, Objectives, and Funds
Level 0	*Maintenance Description:* Existing routes that will no longer be maintained and no longer be declared a route. Routes identified as Level 0 are identified for removal from the Transportation System entirely. *Maintenance Objectives:* • No planned annual maintenance • Meet identified environmental needs • No preventive maintenance or planned annual maintenance activities *Maintenance Funds:* No annual maintenance funds
Level 1	*Maintenance Description:* Routes where minimum (low intensity) maintenance is required to protect adjacent lands and resource values. These roads may be impassable for extended periods of time. *Maintenance Objectives:* • Low (Minimal) maintenance intensity • Emphasis is given to maintaining drainage and runoff patterns as needed to protect adjacent lands. Grading, brushing, or slide removal is not performed unless route bed drainage is being adversely affected, causing erosion. • Meet identified resource management objectives • Perform maintenance as necessary to protect adjacent lands and resource values • No preventive maintenance • Planned maintenance activities limited to environmental and resource protection • Route surface and other physical features are not maintained for regular traffic *Maintenance Funds:* Maintenance funds provided to address environmental and resource protection requirements. No maintenance funds provided to perform preventive maintenance.
Level 2	The BLM has reserved this level for possible future use; no current description or objective.
Level 3	*Maintenance Description:* Routes requiring moderate maintenance due to low volume use (e.g., seasonally or year-round for commercial, recreation, or administrative access). Maintenance Intensities may not provide year-round access but are intended to generally provide resources appropriate to keep the route in use for the majority of the year. *Maintenance Objectives:* • Medium (Moderate) maintenance intensity • Drainage structures will be maintained as needed. Surface maintenance will be conducted to provide a reasonable level of riding comfort at prudent speeds

Table 3-43
Road Maintenance Intensity Levels

Maintenance Intensity Level	Maintenance Description, Objectives, and Funds
	for the route conditions and intended use. Brushing is conducted as needed to improve sight distance when appropriate for management uses. Landslides adversely affecting drainage receive high priority for removal; otherwise, they will be removed on a scheduled basis. • Meet identified environmental needs • Generally maintained for year-round traffic • Perform annual maintenance necessary to protect adjacent lands and resource values • Perform preventive maintenance as required to generally keep the route in acceptable condition Planned maintenance activities should include environmental and resource protection efforts, annual route surface • Route surface and other physical features are maintained for regular traffic *Maintenance Funds:* Maintenance funds provided to preserve the route in the current condition, perform planned preventive maintenance activities on a scheduled basis, and address environmental and resource protection requirements.
Level 4	The BLM has reserved this level for possible future use; no current description or objective.
Level 5	*Maintenance Description:* Routes for high (Maximum) maintenance due to year-round needs, high volume traffic, or significant use. Also may include routes identified through management objectives as requiring high Intensities of maintenance or to be maintained open on a year-round basis. *Maintenance Objectives:* • High (Maximum) maintenance intensity • The entire route will be maintained at least annually. Problems will be repaired as discovered. These routes may be closed or have limited access due to weather conditions but are generally intended for year-round use. • Meet identified environmental needs • Generally maintained for year-round traffic • Perform annual maintenance necessary to protect adjacent lands and resource values • Perform preventive maintenance as required to generally keep the route in acceptable condition • Planned maintenance activities should include environmental and resource protection efforts, annual route surface • Route surface and other physical features are maintained for regular traffic

Source: BLM 2006b

should be undertaken) for recognized routes. Recognized routes by definition include roads, primitive roads, and trails carried as Assets within the BLM Facility Asset Management System. It includes four primary "Maintenance Intensity" levels that allow for low, medium, and high maintenance intensities, irrespective of the type of route (road, primitive road, or trail) (BLM 2006b).

Maintenance intensities must be consistent with land use planning management objectives (for example, natural, cultural, recreation, and visual settings).

Functional Road Classification Types for BLM System Roads. Based on BLM Manual Section 9113 (Roads) (BLM 1985), roads on BLM lands are classified into three classes based on the amount of traffic movement: collector, local, and temporary resource roads.

Collector Roads—These BLM roads normally provide primary access to large blocks of land and connect with or are extensions of a public road system. They accommodate mixed traffic and serve many uses. They generally receive the highest volume of traffic of all roads in the BLM road system. User cost, safety, comfort, and travel time are primary road management considerations. Collector roads usually require application of the highest standards used by the BLM.

Local Roads—These BLM roads normally serve a smaller area than collectors and connect to collectors or public road systems. Local roads receive lower volumes, carry fewer traffic types, and generally serve fewer users. User cost, comfort, and travel time are secondary to construction and maintenance cost considerations. Low volume local roads in mountainous terrain, where operating speed is reduced by terrain, may be single-lane roads with turnouts. Environmental impacts are reduced because steeper grades, sharper curves, and lower design speeds than would be permissible on collector roads are allowable.

Resource Roads—These BLM roads are spur roads that provide point access and connect to local or collector roads. They carry very low volume and accommodate only one or two types of use. Use restrictions are applied to prevent conflicts between users needing the road and users attracted to the road. The location and design of these roads are governed by environmental compatibility and minimizing bureau costs with minimal consideration for user cost, comfort or travel time.

Mineral and Energy Development-related Transportation Issues

Road capacity, maintenance, and safety issues from mineral and energy development-related traffic are an issue in the GJFO planning area in areas where mineral and energy resources are being developed. A short-term increase in the volume of both heavy and light traffic occurs during the construction, well drilling, and completion phases of developing mineral and energy resources. Temporary conflicts (including a potential for delays, dust, road degradation, and increased vehicle safety) occur during the

construction/drilling phase and recompletion/workover activities. County roads also are affected by heavy equipment use, fugitive dust, and traffic-related noise. All associated impacts are lower after gas wells are in operation because traffic levels drop.

Many existing unimproved roads have been repaired and improved to accommodate the increase traffic and heavy equipment. Many new roads have also been created to facilitate gas production by providing access to the many gas wells. These new roads across public lands are often only open to gas development personnel for administrative vehicle access.

Airports and Railroads

Grand Junction Regional Airport is the only public airport in the planning area. There are a number of locations throughout the GJFO that are commonly known and consistently used for aircraft landing and departure activities that, through such casual use, have evolved into backcountry airstrips. The major rail line that serves the planning area is the Union Pacific. However, this rail line operates mostly within the McInnis Canyons and Dominguez-Escalante NCAs, which are outside of the GJFO planning area.

Trends

Road system maintenance in the GJFO has focused on maintaining major recreational access roads, which generally receive most of the traffic volume. For the past 8 to10 years, the GJFO has annually maintained approximately 100 miles of road.

3.6 SOCIAL AND ECONOMIC CONDITIONS

This section is a description of the support conditions in the GJFO planning area and follows the order of topics addressed in Chapter 2:

- Native American Tribal Uses
- Public Health and Safety
- Socioeconomics
- Environmental Justice

3.6.1 Native American Tribal Uses

Current Conditions

Contemporary Native American tribes with interests in the planning area include the Northern Ute, Ute Mountain Ute, and Southern Ute Tribes. The Northern Ute Tribe resides on the Uintah and Ouray Indian Reservation in northeastern Utah. Three bands of Utes comprise the Northern Ute Tribe: the Whiteriver Band, Uncompahgre Band, and Uintah Band. The Ute Mountain Ute Tribe and Southern Ute Tribe have separate reservations in the extreme southwestern corner of Colorado. The Ute's aboriginal homelands

encompassed large areas of Utah, New Mexico, Arizona, and Colorado, including the entire GJFO. The ancestors of the Uncompahgre and White River Ute bands are associated with the GJFO planning area in particular and were forcibly removed to the reservation lands in eastern Utah in 1881. How this has affected the Utes own view of themselves, their history and their culture is critical to understanding the concept of a Traditional Cultural Properties and establishing continuity in cultural significance. In consultation Ute elders and traditional leaders have identified that this event, when they were disenfranchised from their ancestral homeland, is considered by them to be a recent event and the psychological trauma experienced in those events persists to the present day. There is an effort to move toward reconciliation and participate in projects intended to reconnect the Ute to their homeland. Whether a traditional community has visited an area for traditional culture practices is especially relevant for the planning area because of this recent event. (Ott 2010).

Shoshone and Comanche populations were also present in northwestern Colorado during various historic periods, primarily north of the GJFO. The Hopi and Zuni Tribes, as well as the Navajo Nation, also connected to the planning area through past use or evidence from oral traditions.

Potential Native American interests in planning area lands include a wide range of overlapping economic, social, traditional, and religious practices and uses. Because the BLM manages lands ceded under treaties, or that are within historical and traditional aboriginal use areas, the agency has the responsibility to consult with tribes to consider the conditions necessary to satisfy any economic or resource access rights and to continue traditional uses in interest areas. Currently, tribal members may be using public lands for subsistence and cultural purposes. Tribes having traditional or economic interests in the planning area need to be considered during land use and project planning under treaties (if applicable), the tribal trust relationship, various federal laws, US DOI and BLM regulations and guidance, and executive orders. These requirements are sometimes further interpreted through specific court decisions, agreements, and regulations.

Treaty rights are not rights granted from the US, but rather are rights specifically reserved or retained by tribes under the terms of treaties or agreements. Several treaties and agreements affecting the planning area were initiated by the federal government beginning in 1849. The level of participation and understanding by the Utes in these treaties varied, as did federal ratification, appropriations, protections, and compliance (Burns 2004). The result of these treaties was the loss of Ute lands in the planning area.

Indian Trust Assets are legal interests in property, physical assets, or intangible property rights held in trust by the US for Indian tribes or individual Indians. Common examples of trust assets may include lands, minerals, hunting and

fishing rights, water rights, other natural resources, and money. This trust responsibility requires that all federal agencies ensure that their actions protect Indian Trust Assets.

The planning area is not contiguous to any tribal lands. There are no programmatic agreements, MOUs, or plans that are co-signed between the BLM and the Tribes. There are no known off-reservation treaty rights or Indian Trust Assets present in the planning area.

Characterization

There is little information available on specific economic, traditional, and sacred uses or locations within the planning area. Because of the long displacement of the Ute bands to reservations and boarding schools and the subsequent ownership and management by others, it has been difficult to maintain relationships with the sites, natural resources, and landscapes of ancestral lands. Tribal concerns regarding natural resource management and economic uses of resources are only beginning to be documented, but generally these include expanding the understanding of cultural sites to include the physical setting, vistas, landscapes, and plants. It is anticipated that there are documented and unrecorded cultural use areas, traditional cultural properties, rock art, trails, wickiups, camps, eagle traps, burials, battle locations, and ceremonial sites that are of interest to tribes. These are discussed primarily in **Section 3.2.11**, Cultural Resources.

The 1987 RMP does not contain any specific decision guidance relating to Native American issues or concerns. There was no documented Native American Consultation for the 1987 RMP. Consultation with the tribes between 1987 and 2000 was not documented. Native American consultation on both a programmatic and project-specific basis to identify any traditional cultural properties, sacred/religious sites, and special use areas began through letters, phone calls, presentations to Tribal Councils, and on-site visits with Ute tribal members in a systematic manner in 2001. Field site visits were conducted to share the results of compliance projects where sites that are affiliated to the Ute Tribes are recorded. In 2006 the BLM became a partner in the Ute Ethnobotany Project, bringing Ute elders and students to reconnect with traditional lands, the project resulted in the development of the Ute Learning Garden and this project continues in partnership with the Ute Indian Tribe.

The Ute Ethnohistory Project is a long-term partnership and research project with the Ute Tribes dedicated to identifying areas and sites of cultural and religious importance to the Ute people. The Ute Ethnohistory Project coordination meeting between the BLM managers and the Ute cultural representatives was in November 2007 with follow-up field and office meetings in 2008 and 2009.

On April 8, 2006, the GJFO invited the Southern Ute Indian Tribe, the Northern Ute Indian Tribe, and the Ute Mountain Ute Tribe to become

cooperating agencies for the RMP revision process. To date, none of the Tribes have signed an MOU with the BLM to become a cooperating agency.

3.6.2 Public Health and Safety

The BLM's mission to sustain public lands for the use and enjoyment of present and future generations includes efforts to minimize and reduce threats from releases of hazardous substances that could have an impact on the health, diversity, and productivity of the public lands as well as on the health and safety of the individuals who utilize and work on these lands. In addition, the Federal Land Policy and Management Act of 1976 require that BLM actions comply with approved standards for public health and safety. Of particular concern to BLM are the safety impacts related to abandoned mines, debris flows, and hazardous materials.

The goals public safety management are to (1) protect public health and safety and environmental resources by minimizing environmental contamination from past and present land uses (i.e., abandoned mine lands) on public lands and on BLM owned and operated facilities; (2) comply with Federal, State, and local hazardous materials management laws and regulations; (3) maintain the health of ecosystems through assessment, cleanup, and restoration of contaminated lands; (4) manage the costs, risks, and liabilities associated with hazardous materials so that the responsible parties and not the government bear the brunt of financial liabilities; and (5) integrate environmental protection and compliance with all environmental statutes into BLM activities.

Public health and safety topics include law enforcement, hazardous materials and sites, illegal dump sites, target shooting, abandoned mines, energy development, hydrogen sulfide wells, motor vehicle operations, and remoteness and natural hazards.

Current Conditions

Law Enforcement

The BLM law enforcement officers and rangers enforce federal laws and regulations governing the public lands and resources. They conduct high-priority investigations and enforcement actions that focus on resource protection and public health and safety, ensuring compliance with both federal laws and land use regulations on public lands.

The mission of the Colorado BLM law enforcement program is as follows:

- Enforcing federal laws and regulations related to the use, management, and development of the public lands and their resources, including activities related to the administration of the public lands;
- Public education of laws, policies, regulations and user ethics;

- Protecting critical resources from being removed, damaged, or destroyed; and
- Providing a public service on public lands in a manner that is complementary to the proprietary jurisdictional nature of such lands (BLM 2010h).

Implementation of the law enforcement program ensures that:

- Critical resources are protected from being removed, damaged, or destroyed without authorization or in violation of environmental requirements or restrictions;
- The lands and waters are free from illegal dumping or pollution;
- The users of the public lands will have a safe and enjoyable experience that is not impacted by the illegal acts or inappropriate conduct of others;
- The revenues owed to the government for authorized or unauthorized uses are paid and collected;
- Unauthorized use is prevented and discouraged through termination, investigation, and appropriate resolution;
- Authorized or unauthorized users of the public lands or their resources are held accountable for any required repairs or reclamation;
- Criminal activities are reported, investigated, or referred to appropriate agencies (BLM 2010h).

Hazardous Materials and Sites

Hazardous materials can be defined as any item or chemical that has the potential to cause harm to humans, natural resources, or the environment when spilled, released, or contacted. Hazardous wastes are hazardous substances that have been discarded (e.g., spilled, released, dumped, etc.). The United States Environmental Protection Agency (EPA) classifies hazardous materials as toxic, corrosive, ignitable, or reactive, and some materials may exhibit multiple characteristics.

The primary regulators of hazardous wastes and hazardous waste sites in Colorado are, the EPA and the Colorado Department of Public Health and Environment (CDPHE). Other state agencies regulate specific types of hazardous waste sites, such as the Colorado Oil and Gas Conservation Commission (oil and gas development waste materials) and the Colorado Department of Labor and Employment, Division of Oil and Public Safety (leaking petroleum storage tanks).

Illegal Dump Sites

Illegal dumping is defined as the disposal of waste in an unpermitted area (US 21 EPA 1998). Illegally dumped wastes are primarily nonhazardous materials that are dumped to avoid disposal fees or to avoid the time and effort required for proper disposal. Illegal waste dump sites commonly contain the following materials:

- Construction and demolition waste such as drywall, roofing shingles, lumber, bricks, concrete, and siding;
- Abandoned automobiles, auto parts, and scrap tires;
- Appliances, containing harmful refrigerants;
- Furniture;
- Yard waste;
- Household trash; and
- Medical waste.

If not addressed, illegal dumps often attract more waste, potentially including hazardous wastes, such as asbestos containing materials, household chemicals and paints, automotive fluids, and commercial or industrial wastes (US EPA 1998). Sites used for illegal dumping vary but may include abandoned industrial, residential, or commercial buildings, vacant lots on public or private property, and infrequently used roadways (US EPA 1998). Because of their accessibility and poor lighting, areas along rural roads and railways are particularly vulnerable.

Target Shooting

Littering, unsafe target shooting, and illegal dumping have become major issues on federal lands where recreational shooting occurs (Responsive Management 2009). Some shooters leave behind fragments of clay pigeons and spent shotgun shells, as well as metal, plastic, and glass objects brought out for use as targets. Environmental and property damage (release of refrigerants the atmosphere, the shooting of trees and signs) is also a significant problem.

Outdoor shooting ranges provide recreational facilities for shooting sports enthusiasts. Recently, there has been a growing public concern about the potential negative environmental and health effects of range operations. In particular, the public is concerned about potential risks associated with past and continued use of lead shot and bullets at outdoor ranges. Historically, the three major sources for human exposure to lead are lead-based paint, lead in dust and soil and lead in drinking water. The main human exposure to lead associated with shooting ranges is through lead contaminated soil. However, other pathways are discussed below, along with lead's detrimental effects on humans and animals. Lead can be introduced into the environment at shooting ranges in

one or more of the following ways. Each of these pathways is site-specific and may or may not occur at each individual range:

- Lead oxidizes when exposed to air and dissolves when exposed to acidic water or soil.
- Lead bullets, bullet particles, or dissolved lead can be moved by storm water runoff.
- Dissolved lead can migrate through soils to groundwater.

The GJFO manages two developed target shooting ranges and one undeveloped shooting area, and many other sites are historically known for dispersed target shooting. The GJFO has made attempts in certain areas to make target shooting safer for the public and environment, often by encouraging target shooting in places where other recreational use is low. The GJFO relies on the public to encourage safe shooting practices.

Open OHV Areas (i.e., Grand Valley, 18 Road, and 34 and C) have experienced safety issues and user conflicts associated with dispersed target shooting due to high use by OHV users seeking cross-country travel experiences. The 1987 RMP closed the Grand Valley Open OHV area to target shooting but did not close the 34 and C area.

BLM-administered lands near 34 and C Roads outside of the open OHV area are within close proximity to residential areas, industrial areas, and Federal Aviation Administration infrastructure. As a result, recreational shooting in those areas directly conflicts with state and federal use and conduct laws. BLM law enforcement personnel as well as the Mesa County Sheriff's Office receive multiple complaints each week regarding unsafe shooting behaviors within the 34 & C Roads area. Federal Aviation Administration infrastructure has been subject to shooting vandalism raising concerns about Federal Aviation Administration communications outages. This area of public land is utilized by OHV users, off-road enthusiasts, target shooters, and hikers. There is a lack of adequate backstops and screening within these areas.

Portions of the Bang's Canyon and North Fruita Desert SRMAs, the Gunnison River Bluffs area, and developed recreation sites (e.g., Mud Springs Campground, trailheads, wildlife viewing areas, picnic areas, day use areas, etc.) have high, concentrated use. Much of these areas also lack adequate topographic screening that has resulted in user conflict and safety concerns. Portions of the Bang's Canyon SRMA (i.e., the Little Park road corridor) and North Fruita Desert SRMA (i.e., the open OHV area) are closed to recreational shooting. Bang's Canyon is within close proximity to residential and industrial areas, causing recreational shooting in this area to be in direct conflict with state and federal use and conduct laws, which could result in serious safety issues due to the lack of backstops and screening within the areas identified. The current shooting

closure areas have been very effective in providing a safe environment for public land users.

The GJFO agreed to close the Gunnison River Bluffs area to target shooting through a cooperative agreement with the City of Grand Junction and Mesa County. This area has a patchwork of public, private, and county lands, and the parties agreed that closure was necessary for public safety and to protect important county infrastructure (e.g., the landfill and county buildings). While the county lands (including trailheads to BLM-administered lands) have been closed, the GJFO has not formalized closure of the BLM-administered lands with an RMP amendment or Federal Register Notice. Shooting is not a popular activity in this area.

Coal and Main Canyons provide the primary public access to the Little Book Cliffs Wild Horse Range from the Grand Valley. Visitation is very high. The local tourism industry directs tourists to visit this area to see wild horses and has advocated for a shooting ban due to conflicts with tourism. Many of the visitors access the horse area on horseback. The close proximity to Grand Junction also makes this location very popular for recreational shooting, and unauthorized recreational shooting occurs on private lands adjacent to the trailhead as well. It is anticipated that when this trespass situation is stopped by the private landowner, shooting activity will increase on public lands in the trailhead area. Several incidents have occurred in the past ten years where riders and/or horses were injured due to the sound of gunfire. Riders have been thrown from their horses and in one incident the horse ran into a wire fence with rider aboard. Two wild horses were killed from gunshots in 1982 and 1998.

Abandoned Mine Lands (AML)

Increased population growth is reflected in higher demand for outdoor recreation on public lands. Recreation areas and campground facilities on public lands can be located in proximity to AML sites. Use of Off-Highway Vehicles can lead to AML sites and increases the exposure risks to dangerous mine shafts or old dilapidated buildings. Fishing can place anglers in proximity of AML sites, and is impacted by decreased fish population among polluted waters stemming from AML sites, and available fish may pose a significant source of contaminants when consumed.

Abandoned mine sites may pose hazards to the environment, employee and/or visitors health and safety. Changes in the chemical composition or soil loss near abandoned mines can result in alterations or loss of natural habitat for native wildlife. Environmental problems stemming from AML sites include: contaminated/acidic surface and ground water; and stockpiled waste rock and mill tailing piles. Many affected watersheds are in arid climates in the West, where water is scarce, and the need to improve water quality for human and aquatic resources use is critical. Some watersheds may be significantly impacted by widespread mercury contamination. In addition to abandoned mine sites,

there are abandoned smelter sites where remaining tailings piles from past milling operations continue to impact the environment through air pollution caused by dust. Exposure to radiation, particularly radon gas, can be a hazard, especially in abandoned uranium mines.

Open mines are unstable; openings or tunnels may collapse, internal supports may fail, and mine shafts (vertical openings) may be obstructed or unseen. Oxygen levels can be at lethally low levels, or toxic gases could be present at high concentrations. Hazardous wastes, such as containers of explosives, and chemicals used in milling or drilling operations could be present. Illegal dumping of hazardous wastes within abandoned mines is also a possibility.

Energy Development

Energy development can include oil, gas, geothermal, wind, and solar energy sites. Oil and gas development is often associated with concerns over public health and safety. The BLM requires all oil and gas operators to comply with applicable regulations designed to protect the environment and the public (e.g., COGCC rules for waste and BLMs Onshore orders 1,2, and 7), and with additional requirements imposed by the BLM as part of the land use lease or Right of Way grant.

Hazardous chemicals are used and produced by oil and gas extraction processes (Witter et al. 2008). Spills of oil and gas wastes and/or chemicals used in production can contaminate surface water, groundwater and soil. Active wells can produce hazardous chemical emissions through well control valves (e.g., venting of pressurized well gas), leaking equipment (e.g., well heads), water or condensate tanks (e.g., entrained gas can flash or evaporate), and gas compressors. Well work over operations can also result in the release of hazardous chemicals.

Certain waste materials from oil and gas exploration and production activities have been exempted from standards created to protect health under a number of federal statutes, including provisions of the Clean Air Act, the Clean Water Act, the Safe Drinking Water Act, the Resource Conservation and Recovery Act, the Superfund Act, and the Emergency Planning and Community Right to Know Act (the Toxics Release Inventory) (Witter et al. 2008). These exemptions, however, do not preclude these wastes from control under state regulations, under the less stringent RCRA Subtitle D solid waste regulations, or under other federal regulations. In addition, although they are relieved from regulation as hazardous wastes, the exemption does not mean these wastes could not present a hazard to human health and the environment if improperly managed. In general exempted waste is that which comes from down-hole or was brought to the surface from the well, and waste that has otherwise been generated by contact with the oil and gas production stream during the removal of produced water or other contaminants from the product

Local government efforts to chart and guide energy development within the GJFO planning area are underway. Mesa County has developed an Energy Master Plan that identifies the following:

1. The known energy resources and opportunities within Mesa County;
2. The potential impacts on the community associated with the development of those resources;
3. An analysis of current energy-related policies in Mesa County; and
4. A set of recommended clear and understandable policies that will guide reasonable regulation and development of energy resources and mitigation of the impacts (Mesa County 2011).

The Energy Master Plan is a policy document implemented in coordination with the community and with energy industries through the planning and development review processes.

Hydrogen Sulfide Wells

Hydrogen sulfide is a poisonous gas that can occur in association with oil and gas operations. Hydrogen sulfide (H2S, CAS# 7783-06-4) is an extremely hazardous, toxic compound. It is a colorless, flammable gas that can be identified in relatively low concentrations, by a characteristic rotten egg odor. The gas occurs naturally in coal beds, sulfur springs, gas wells, and as a product of decaying sulfur-containing organic matter, particularly under low oxygen conditions. Industrial sources of hydrogen sulfide include petroleum and natural gas extraction and refining, hydrogen sulfide can be present at AML sites. Hydrogen sulfide has a very low odor threshold, with its smell being easily perceptible at concentrations well below 1 part per million (ppm) in air. The odor increases as the gas becomes more concentrated, with the strong rotten egg smell recognizable up to 30 ppm. Above this level, the gas is reported to have a sickeningly sweet odor up to around 100 ppm. However, at concentrations above 100 ppm, a person's ability to detect the gas is affected by rapid temporary paralysis of the olfactory nerves in the nose, leading to a loss of the sense of smell. This means that the gas can be present at dangerously high concentrations, with no perceivable odor.

Hydrogen sulfide is classified as a chemical asphyxiant, similar to carbon monoxide and cyanide gases. It inhibits cellular respiration and uptake of oxygen, causing biochemical suffocation. Typical exposure symptoms include:

- LOW 0 - 10 ppm: Irritation of the eyes, nose and throat.
- MODERATE 10 - 50 ppm: Headache, dizziness, nausea and vomiting, coughing and breathing difficulty.

- HIGH 50 - 200 ppm: Severe respiratory tract irritation, eye irritation, acute shock, convulsions, coma, death in severe cases.

Motor Vehicle Operations

Except for approximately 35,300 closed acres, Off Highway Vehicle (OHV) travel is allowed on an open or limited basis in the entire GJFO planning area (BLM 1987).

Motorized vehicle operations consist of two and four-wheel-drive vehicles, large and small commercial vehicles used in mineral resource extraction and development of natural resources (e.g., oil shale and natural gas) as well as an assortment of OHV's used for recreation, hunting activities, sightseeing, and firewood gathering. Motorized and, non-motorized vehicles, horses and pedestrians all share and concurrently utilize a large portion of the Field Offices resource areas.

All users have the ability to impact natural habitats, land features, travel routes, and outdoor structures located near travel corridors in a variety of ways:

- Travel conditions change due to elevation, terrain, and weather. All users much adapt to changing travel route conditions, resource damage along a travel route corridor is expensive to repair, damages habitat, and is unsightly.
- Wet conditions make roads and trails muddy and often impassable. Continued use of these travel routes will cause destruction.
- Gouging of dirt roads, ATV/motorcycle and bicycle routes occurs when wheels spin while traveling uphill, and hard braking when descending steep grades or turning sharply.
- Noxious weed spread; seeds are caught in the mud caked to tires, wheel wells and fenders. Caution needs to be practiced especially when coming from another geographical area.
- Encounters between motorized and non-motorized or equestrian users in the field; slow down or stop, signal or announce your intentions before passing. In general, downhill traffic yields to uphill traffic, and motorized traffic yields to non-motorized traffic.

Remoteness and Natural Hazards

Exposure to natural hazards such as inclement weather, rough terrain, and dangerous animals is an inherent risk in any activity conducted within the GJFO planning area. Proper equipment and adequate planning should be taken prior to conducting activities in order to prepare for the remoteness and natural hazards present in much of the planning area.

Trends

Law Enforcement
As the local population increases, the need for BLM law enforcement is expected to increase. It is believed that an increased presence of BLM staff on the ground would help alleviate problems like the creation of social trails by recreationists, trespass on private land, and unauthorized use of seasonally closed trails.

Hazardous Materials and Sites
The frequency of hazardous materials incidents in the past has mirrored the rate of economic activity and population growth, with economic boom and population growth usually resulting in more illegal dumping and more materials transportation accidents and accidental spills.

Illegal Dump Sites
Illegal dumping is increasing as the local population grows and as dump fees at permitted sites increase.

Target Shooting
Requests for shooting closures are expected to increase in high use areas with increasing conflicts between users and concerns over safety.

Abandoned Mines
If abandoned mines are discovered, they will be addressed in accordance with the Abandoned Mine Lands program.

Energy Development
Trends in well activity on BLM-administered lands within the GJFO planning area have mirrored economic conditions. Across all surface and mineral ownerships, 964 oil and gas wells have been spud within the GJFO planning area since 1998 (IHS Energy Group 2008). This represents nearly twice the total number of active wells in the GJFO planning area as of December 2011. Approximately 15 percent of the conventional wells and 70 percent of the coalbed natural gas wells drilled since 1998 were drilled on federal mineral interests (BLM 2012a).

In addition, new issues such as enhanced protection of sage-grouse habitat need to be addressed. The BLM has also seen technological advancements like directional drilling and modern drilling rigs used to improve access to energy resources.

Hydrogen Sulfide Wells
The release of hydrogen sulfide at well sites on BLM lands in the GJFO planning area is not expected.

Motor Vehicle Operations

Increased energy development and other factors could cause expansion of the existing road network to allow for construction and maintenance of projected wells and to handle the demands of an increasing population. As a result, traffic and the potential for accidents would likely increase.

Remoteness and Natural Hazards

The GJFO planning area has become generally less remote due to many factors, including energy development, urban growth, and increased recreational use on public lands. Improvements in equipment will likely mitigate the effects of some natural hazards, but users will continue to accept risk when the chance of encountering a natural hazard is present. Wilderness areas and other places far removed from infrastructure and services will continue to pose risks to unprepared visitors.

3.6.3 Socioeconomics

This section was prepared for the GJFO by researchers at Colorado Mesa University.

In many ways, the communities that adjoin the 1.2 million acres of public lands managed by the GJFO are archetypical of the split personality of the twenty-first century American west. These lands include the planning area for the GJFO, the McInnis Canyon National Conservation Area and the Dominguez-Escalante National Conservation Area. Their populations include some residents committed to traditional agricultural pursuits, such as ranching and orchard culture, and some who seek to expand into niche markets, such as vineyards and organic farming. These communities seek to balance the benefits of extractive industries against their long experience of boom and bust cycles. They also evince increasing concern over the potential environmental damage, particularly to water, resulting from extraction. In diversifying their economies away from dependence on extraction, these communities use the recreational opportunities offered by available public lands to entice businesses by highlighting the quality-of-life advantages of the valley's moderate climate and fantastic scenery: scenery which includes the tallest flat-topped mountain in the world (The Grand Mesa), the Colorado National Monument, the Colorado River, the Dominguez-Escalante NCA, Mt. Garfield and the McInnis Canyons National Conservation Area. The diversity of the communities themselves represent contending voices in the discussion of the management of public lands—some raised to preserve traditional agriculture, some raised to encourage tourism, some favoring expansion as medium-sized urban areas, some in favor of the preservation of their small-town character the protection of public lands promises. As a public lands agency supporting multiple-use, the BLM must find an appropriate balance between these contending voices. Many factors—fluctuations in populations, attempts to attract a young professional class, attempts to attract retirees, and increasing infrastructure demands on local governments from residents employed on public lands beyond the GJFO—

combine to impact the way in which the communities relate to the management of our public lands.

Social Context

The largest portion of lands managed by the GJFO, some 938,000 acres or 73 percent of the total, lie within Mesa County, and the remainder of lands are spread between three other counties: Garfield with 322,000 acres (25.2 percent), Montrose with 17,000 acres (1.3 percent), and Delta with 2,000 acres (0.1 percent). Because it contains the largest portion of the GJFO land, and nearly 100 percent of the population, Mesa County is the focus of this description.

Government

While the planning area overlaps four counties, as mentioned above, the vast majority of the lands managed by the GJFO lie inside Mesa County. Mesa County was incorporated on February 11, 1883, and is governed by a three-member Board of County Commissioners.

Social Context

Communities in the GJFO resemble a hub and spoke system with Grand Junction acting as the hub and several smaller communities acting as the spokes. Despite their inter-connectedness, each community has its own social context, sense of tradition, and connection to public lands. Some like Glade Park and Palisade are small, tight-knit communities that are intimately tied to public lands through ranching and agriculture; others, like Grand Junction and Fruita are much larger, growing exponentially, and are marketing their public lands to tourists and potential businesses. Because of their unique attributes, each of these communities is discussed separately. This discussion is taken, in part, from research conducted by the Natural Resource and Land Policy Institute at Colorado Mesa University in 2009 and summarized in the "GJFO Community Assessment Report." That report presents the results of 11 focus groups held with citizens and leaders in the seven communities located in the GJFO planning area.

While each has a distinct personality, all the communities share a similar history. Most began as agricultural settlements where ranching and orchards—most famously peach and cherry orchards—dominated. Each community was impacted at the beginning of the twentieth century by the discoveries of first oil and then radium, with each producing its own economic boom. Communities then experienced a subsequent bust, decline in population, and realignment. Cold War demand for uranium and America's increasing need for energy benefitted each community to varying degrees, and, subsequently, each was subject to extensive environmental remediation (Gulliford 2003).

Grand Junction: As the largest city between Denver and Salt Lake City, Grand Junction is the center for regional activity in Mesa County. Ample shops, restaurants, and medical services contribute greatly to the city's economic role

as a regional hub. The city has gone to great lengths to diversify its economy while maintaining a robust extraction industry. To do this, the city seeks to attract a talented pool of professionals eager to expand the area's economic base. Outdoor recreation is important to the professionals the city seeks to attract. Access to public lands and the variety of recreational opportunities that can be provided on BLM lands play a significant role in the Grand Junction Economic Partnership's efforts to expand the community's economic base.

Fruita: Like Grand Junction, Fruita has experienced a dramatic population increase over the last 20 years. The community prides itself on its small town atmosphere and its role as "Gateway to our Federal Lands." Like other Grand Valley locales, Fruita sees public lands as a good buffer against sprawl. While the community would like to promote its economy, the focus is much more on developing its potential tourism industry. Consequently, residents are somewhat suspicious of growth and support good planning to maintain a small-town atmosphere while promoting economic vitality. The benefit of access to public lands is at the heart of the Fruita community.

Palisade: Like Fruita, Palisade is small and very community oriented. It is surrounded by high-end agriculture consisting of orchards and many wineries that cultivate their own grapes. The area is also well known for its stunning scenery and viewscapes. The town's vision includes further development of its downtown core to promote entertainment and economic activity. Each year the town sponsors a number of festivals—like the Wine and Peach festivals—and events that highlight its heritage and agricultural background.

De Beque: Located in the far eastern part of Mesa County along the I-70 corridor, De Beque is a town with a little over 500 residents. Traditional agriculture, such as ranching, and the natural gas industry provide much of the economic base for residents. The town expects rapid growth due to the boom in the natural gas industry. Many think the development of natural gas reserves can be done with minimal environmental consequences, but some fear the community could experience adverse effects.

Community members live in De Beque because the surrounding public lands provide opportunities to observe wildlife, hunt, fish, and enjoy "God's Country." They would like to see the BLM continue to promote the family values and the agricultural heritage of the area by providing greater access to public lands, continuing grazing opportunities on public lands, and providing better signs on trails to protect sensitive areas. The town would not mind having more recreational visitors in the area, as this promotes more economic activity for local businesses. However, increased tourism would probably create a need for another road through town to access BLM lands.

Glade Park: A part of unincorporated Mesa County, Glade Park is a small community located behind the Colorado National Monument southeast of Grand Junction bordering McInnis Canyon National Conservation Area.

Consequently, the area is fairly well isolated from the Grand Valley, a fact that appeals to its residents. Families in the community have strong historical ties to the area. Ranching and traditional agriculture represent the community's heritage and have always been a major part of the economy. Area residents wish to preserve this lifestyle for the future.

Loma/Mack: Like Glade Park, the residents of Loma and Mack have a strong connection to ranching and farming. Located west of Fruita, the traditional agricultural community is in transition to a bedroom community for Grand Junction as more and more residents commute there to work. The rural lifestyle, the quiet, and the lack of local government and its ability to tax were reasons cited for living in the Loma/Mack area. Residents want their community to stay the way it is – based in agriculture and affordable.

Gateway: Located in the southern part of Mesa County, Gateway is a small unincorporated community with a strong heritage connected to traditional agriculture and resource extraction, particularly uranium. Since 2005, the community has been changed by the development of Gateway Canyons Resort. Residents are concerned that the resort's new emphasis on recreation will interfere with future resource-extraction activity, as well as grazing and other economic activity that have provided a living for generations of family members. The area is almost entirely surrounded by BLM-managed lands.

Collbran: A small town of 708 residents located in the Plateau Valley in northeastern Mesa County. Surrounded by public lands managed by varying agencies, this community is impacted by the planning decisions of public lands agencies.

Demography and Social Indicators

In many ways the social character of Mesa County resembles that of many western locations whose economic fortunes are tied to the boom and bust cycles so prevalent in communities reliant on extraction industries as their primary economic driver. From the first oil and radium booms a century ago, to uranium mining in the 1950s, to the oil shale boom of the late 1970s and early 1980s, to the most recent natural gas boom of the 2000s the area has dealt with the social challenges presented by an overheated economy as well as the difficulties posed by surviving each subsequent recession. Since 1980, Mesa County has experienced consistent population growth due primarily to in-migration. While the boom times created difficulties for local government to keep pace with infrastructure demands, the down cycles encouraged Mesa County communities to diversify their economies. The results have helped stabilize the economy but also create conflict between long-time residents with ties to traditional agriculture and mining and new residents attracted to the area for its natural beauty and recreational opportunities.

Population

According to the US Census Bureau, Mesa County's population in July 2008 was estimated to be 143,171 (US Census Bureau 2009). A majority of Mesa County's citizens live on the valley floor in the cities of Fruita and Grand Junction, the town of Palisade, and the unincorporated lands in and around these municipalities.

Like the rest of the state of Colorado, Mesa County has experienced dramatic population growth since 1987. In the decade between 1990 and 2000, the county's population grew from 93,145 to 116,255 and was estimated to stand at 143,000 residents in 2008 (US Census Bureau 2010a). This represents a 25 percent increase between 1990 and 2000 with an additional 20 percent growth between 2001 and 2008. Between the years 1980 and 2008, the population of Mesa County has grown approximately 75.6 percent.

As illustrated in **Table 3-44**, Population Totals (1980-2008), dramatic population increases have been widely distributed across population centers. These population centers have exhibited anywhere from 70 to 164 percent growth rate. The three largest incorporated population centers include Grand Junction, Fruita and Palisade. The largest unincorporated area in Mesa County is Clifton, which is located on the eastern periphery of Grand Junction between Grand Junction and Palisade. Growth in these areas has been spurred by increased employment opportunities in Mesa County, especially in the energy and healthcare sectors. A more detailed discussion of the economy can be found in section five in this report.

Table 3-44
Population Totals (1980-2008)

Location	1980	1990	1980-1990 % Change	2000	1990-2000 % Change	2008	2000-2008 % Change	1980-2008 % Change
State of Colorado	2,889,735	3,294,394	14.0	4,301,261	30.6	4,939,456	14.8	70.9
Mesa County	81,530	93,145	14.2	116,255	24.8	143,171	23.2	75.6
Grand Junction	27,956	29,034	3.8	41,986	44.6	49,688	18.3	77.7
Clifton	not available	12,671	not available	17,345	36.8	not available	not available	not available
Fruita	2,810	4,045	43.9	6,478	60.1	7,418	14.5	164.0
Palisade	1,551	1,871	20.6	2,579	37.8	2,840	10.1	83.1

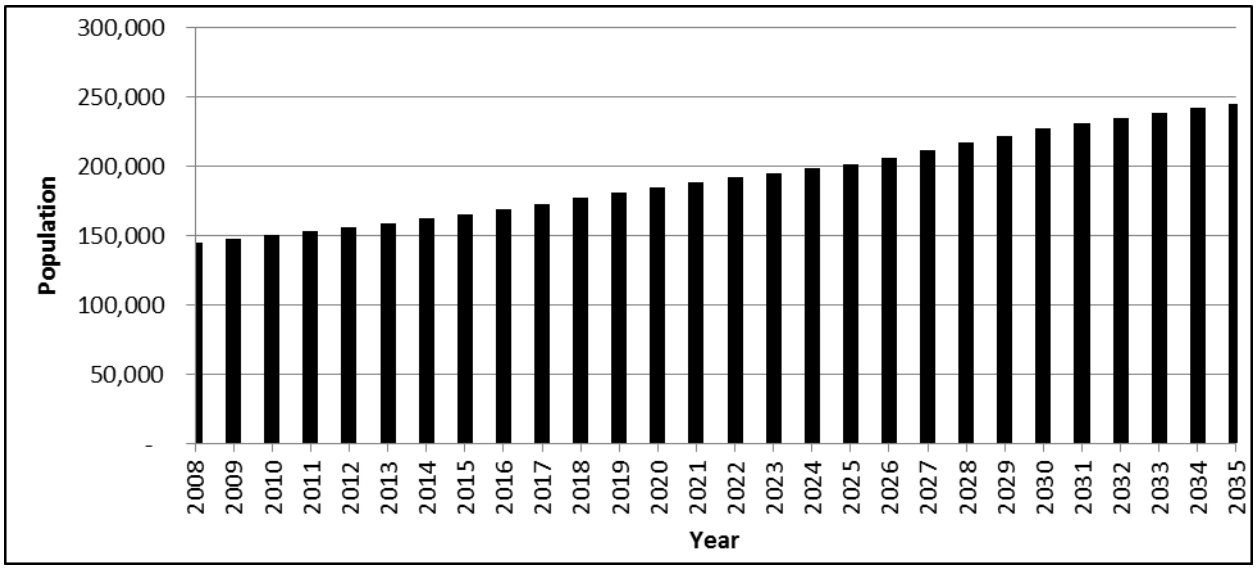
Sources: 1980-2000 Data: Colorado Division of Local Government, State Demography Office 2009a; Clifton Data: US Census Bureau 2010b; 2008 Municipalities and County Data: US Census Bureau 2010a; 2008 State of Colorado Data: US Census Bureau 2009

Growth can also be partly attributed to a growing retirement population. This increase may partly be due to natural aging of the existing population. But

efforts to diversify the Mesa County economy after the oil shale bust have had a major impact as well. A significantly deflated housing market during the late 1980s and early 1990s provided a great opportunity for local realtors to attract retirees primarily from California and the Denver metro area. These retirees were referred to as "active seniors" drawn to the area by low housing values, great climate, and plenty of recreational opportunities, much of which occurs on GJ BLM land (Redifer 2010). The recession of 2008 has temporarily halted growth in Mesa County but the upward trend is expected to continue as natural gas prices begin to increase.

As illustrated in **Diagram 3-12**, Mesa County Population Forecast (2008-2035), the population of Mesa County is estimated to steadily increase for the foreseeable future. According to population projections (which account for the 2008-2010 economic recession), the county will grow at an average rate of 2.0 percent per year between 2010 and 2015. The population of Mesa County is projected to reach 200,000 residents by 2025 and 245,000 residents by 2035. Much of the residential growth in the area is continuing to occur in unincorporated areas and puts further stress on county government for services.

Diagram 3-12
Mesa County Population Forecast 2008-2035



Source: Colorado Division of Local Government, State Demography Office 2008

Much of the past and anticipated future growth is due to migration. Net migration added an average of 1,972 persons to Mesa County per year between 1990 and 1999. This number is projected to increase to 2,987 persons per year between 2000 and 2009 and 2,387 between 2010 and 2020. This trend is important because migration is estimated to have contributed an average of 641

more persons per year than births between 1990 and 1999 and is estimated to grow to 1,249 persons between 2000 and 2009 (Colorado Division of Local Government, State Demography Office 2009b). It may also explain some of the tension that has emerged between new (and often transient) arrivals and more established residents.

The median age of Mesa County in 2007 was estimated at 36.9 years of age, which is slightly older than the state median age (35.6) (US Census Bureau 2008a). The largest population gains have historically occurred in the 25 to 44 and 45 to 64 age groups. Gains in these groups are expected to continue between the years 2010 and 2020. The age groups with the smallest population in Mesa County are 15-24 year olds closely followed by citizens 65 years of age and older. However, as more economic opportunities emerge from the rapid economic growth in the region, and the retiree population grows, these numbers are apt to change.

Social Difference

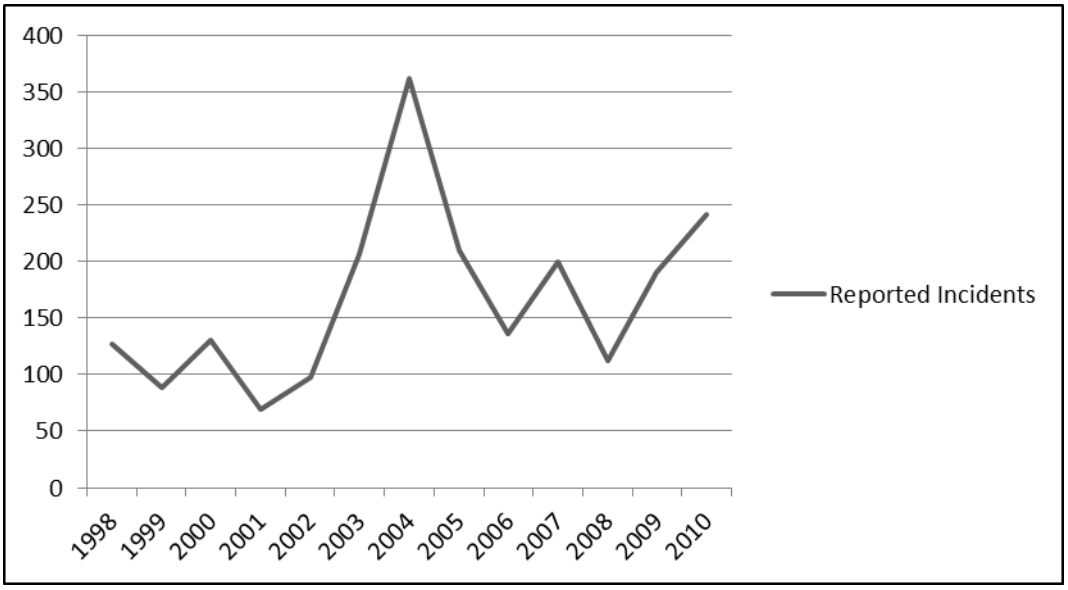
The racial composition of Mesa County is decidedly more homogeneous than the rest of the state. In 1990, white non-Hispanic residents comprised approximately 90 percent of Mesa County's population (US Census Bureau 1990) and decreased to 84 percent of the population by the end of 2008 (US Census Bureau 2008a). Comparatively, white non-Hispanic residents made up 71.2 percent of Colorado's population in 2008 (US Census Bureau 2008a). In both 1990 and 2008, Hispanics comprised Mesa County's largest racial minority group making up approximately 8 percent (US Census Bureau 1990) and 11.8 percent (US Census Bureau 2008a) of the region's population, respectively. Comparatively, Mesa County's Hispanic population trails the state's where Hispanics accounted for 19.9 percent of the population in 2008 (US Census Bureau 2008a).

Crime Indicators

Growth has the potential of degrading the quality of life in any community. Transient workers and newcomers are less invested and have little attachment to traditions and history. Changes in economic emphases can displace workers. With population growth in the region, there is concern that there will be a corresponding increase in crime, especially violent crime. The rural nature of Mesa County and surrounding environs raises concerns about the production of methamphetamine. Between 1997 and 2004, violent crime in the county fluctuated between a high of 2,280 reported felonies and a low of 1,307 felonies. From 2005 through 2008, the number of reported felonies trended between 1,900 and 2,100 felonies per year (Colorado Bureau of Investigation 2009).

The number of reported incidents on GJFO land has ranged between 70 and 360 incidents per year. Data illustrated in **Diagram 3-13**, Reported Incidents on BLM-managed Lands (1998-2010), provides two important insights into law

Diagram 3-13
Reported Incidents on BLM-managed Lands (1998-2010)



Source: Boik 2009

enforcement challenges faced by the field office. First, as illustrated in the general upward trend of reported incidents between 1998 and 2010, population growth in the Grand Valley has placed added pressure on public lands. Second, as illustrated in the various spikes of reported incidents in 2004 and 2010, the GJFO has been more effective in managing for this increased pressure when given adequate resources to do so. For a majority of time from 1998 through 2010, the GJFO has had one full-time ranger, except in the years 2004 and 2010 when there were three rangers.

An area of concern for the Sheriff's Department that relates to population growth and increased recreation in Mesa County's backcountry relates to Search and Rescue calls. Since 2000 the Sheriff's Office reports that the Search and Rescue Team has seen calls increase from 10 to 15 per year to 55 calls last year. This is attributed to more visitors with less experience and to the increased capacity of the rescue unit. As the unit's success increases so does the community's expectations of its performance.

Transportation

Development brings a constellation of problems; this is particularly clear in transportation. Dramatic population and economic growth means that traffic is becoming an increasing issue in the Grand Valley. The result is more cars and trucks on the roads leading to traffic congestion which, in turn, increases the demand for more roads.

Transportation growth has also been hampered by previous planning decisions and inadequate funding for transportation. For example, land use decisions that place the vast majority of the county's retail industry on the western edge of Grand Junction place a great deal of stress on the county's four east-west routes, particularly Patterson Road and the I-70 Business Loop. As in many Colorado cities and towns, transportation funding is inadequate to meet the needs of future growth in Mesa County. Currently, most of the available federal funding is being spent on the I-70 Business Loop, but projections indicate that more will be needed. A 2008 ballot initiative proposed by the state legislature to secure long-term funding for transportation projects in Colorado was defeated by the voters, leaving the future of transportation funding in limbo (Colorado Mesa University Natural Resource and Land Policy Institute 2009).

Economic Indicators

The GJFO is located right in the middle of what the local newspaper calls "Energy Alley." This refers to the 150 mile stretch of I-70 between Rifle, Colorado, and Green River, Utah, where a variety of abundant energy resources can be found. Everything from uranium and coal to oil, oil shale and natural gas has been discovered in this area. More recently methane gas as well as alternative energy sources such as wind, solar and geothermal have generated interest from developers as well (Grand Junction Daily Sentinel 2010). Historically, resource extraction has been a primary economic driver in the communities surrounding the GJFO (Gulliford 2003; Hessler 2010).

The national demand for energy has had dramatic impacts on the economy of Mesa County. Four significant boom and bust cycles associated with energy development include radium and oil at the turn of the last century (Gulliford 2003), uranium mining in the 1950s, oil shale development in the 1970s, and more recently the explosion in natural gas development, which started in the early 2000s and busted with the national recession in 2008. As a result of these severe economic cycles, communities in Mesa County have put a great deal of effort into diversifying their economy.

Interrelationships among Producing Sectors

Between the late 1980s and the 2008 recession, Mesa County had been experiencing steady economic growth. This had been a welcome development given the region's economic troubles following the oil shale bust (Gulliford 2003). During the late 1980s, the recovery was aided by the effort to clean up uranium mill tailings left over from the days when uranium mining had provided its own economic boom. In the early 1990s, expansion continued as the availability of affordable land and a favorable climate assisted the promotion of Mesa County as a retirement community. Low property values, the natural beauty and recreational opportunities found in the area's public lands greatly enhanced efforts to attract retirees. Later in the decade the Mesa County Economic Development Council, the forerunner of the Grand Junction Economic Partnership (GJEP), was successful in helping to diversify the Mesa

County economy by encouraging a number of firms to relocate to the area. Access to public lands has been a critical contributor to this recruiting effort by increasing the quality-of-life appeal to potential businesses and their employees (BLM 2009l). Specifically, easy access to recreation and open space has increased the county's ability to recruit qualified professionals in higher education, medicine and business.

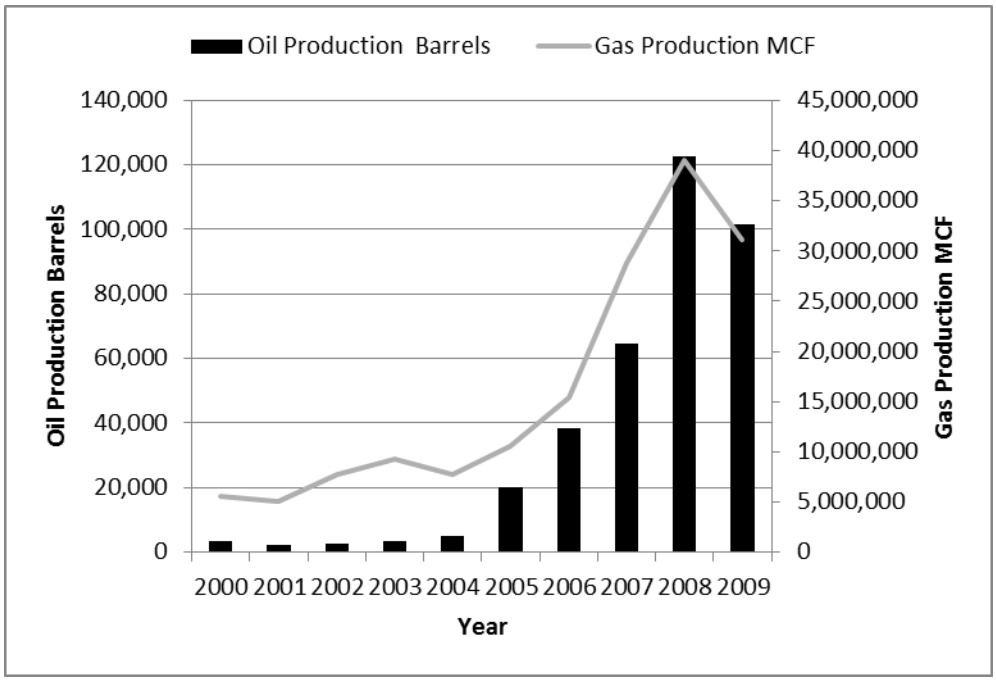
Throughout the 1990s and into 2000s, tourism played an important role in the area's economic expansion and diversification. Increased recreational activities, new golf courses, the natural beauty of the surrounding area as well as a growing wine industry encouraged many to visit Grand Junction. The designation of the McInnis Canyons and Dominguez-Escalante NCAs have the potential for increasing tourism to the area. The county's growing role as a regional hub for retail trade, healthcare, and other services also provide incentives for increased visitation. In 2000, Grand Junction was designated as a metropolitan statistical area. This designation has also encouraged many national retail and restaurant chains to locate within the county.

With a diverse economy come some unique challenges for Mesa County that will be affected by land use decisions made by the BLM's GJFO. The economy certainly thrives during periods where there is a high level of resource extraction activity, but most of this has little to do with the Grand Junction BLM lands. For instance, the majority of current natural gas development occurs to the east and northeast in Garfield and Rio Blanco counties outside the GJFO boundaries, but many workers prefer to live in Grand Junction and recreate on public lands managed by the GJFO. As a result, Mesa County has become an important part of northwest Colorado's oil and gas industry. The County provides a central location for industry infrastructure and material stockpiling, as well as an amenable place for their skilled workers to live. The BLM's recreational management decisions, on the other hand, have contributed significantly to GJEP's efforts to attract new industries. These companies see promotion of an active lifestyle as an advantage when competing in the labor market for employees.

Dependence on BLM Lands and Resources (value of visitor-day expenditures, grazing and mining to the local economy)

Energy: Energy development is a mandated use for public lands managed by the BLM. Despite efforts to diversify the economy, the energy industry is still seen by many as the primary economic driver in the county (Hessler 2010). Over the past decade Mesa County has consistently been one of the top ten counties in Colorado for active oil and gas wells. In **Diagram 3-14**, Mesa County Annual Oil and Gas Production (2000-2009), the results of the impact of the national recession on oil and gas production can be seen in the drop off in oil production levels in 2009 of approximately 17 percent over 2008 production levels while natural gas production decreased twenty percent.

Diagram 3-14
Mesa County Annual Oil and Gas Production 2000-2009



Source: Colorado Oil and Gas Conservation Commission 2010

Despite the significance of oil and gas activity it pales in comparison to other counties in "Energy Alley." A good indicator of oil and gas activity in a county is the ad valorem tax collected on oil and gas production. The ad valorem tax raised from oil and natural gas production in Mesa County peaked in 2009 with an assessed taxable value of roughly $2.8 million. By comparison, in the same year, Garfield County's taxable assessed value $3.9 billion.

Mesa County's economic dependence on the energy industry is not driven by energy development within the BLM's GJFO but by the number of energy industry employees who live in Mesa County but commute to work on drill rigs located outside the county. In the 2008 report, BBC Research Consulting noted the following:

- Fifty percent of energy workers who worked in Garfield County live in Mesa County
- Thirty percent of energy workers who worked in Moffat County lived in Mesa County
- Twenty percent of energy workers who worked in Rio Blanco County lived in Mesa County
- One hundred percent of energy workers who worked in Mesa County lived in Mesa County

Two more recent developments in energy-related activity on BLM lands in the GJFO may also have significant economic impacts on Mesa County. The Red Cliff coal mine north of Loma, Colorado, would increase Colorado's overall coal production by 6 to 8 million tons a year or 25 percent (Grand Junction Daily Sentinel 2010). Meanwhile efforts by Energy Fuels to build a uranium mill near Naturita may encourage renewed interest in uranium mining in the southern most region of the BLM's GJFO. If this occurs it could conflict with private efforts to develop tourism in the Gateway area (Grand Junction Daily Sentinel 2010).

Tourism and Recreation: Tourism and recreation are becoming increasingly important to the Mesa County economy. The Mesa County Commissioners see opportunities to increase tourism dollars from out of county visitors by increasing recreational attractions on BLM's GJFO lands. To this end they have appropriated money for a volunteer coordinator to work with BLM and other federal land managers to organize volunteer activity to build or improve trails in the area (Mesa County 2009c).

Recreation and tourism is another economic area that has experienced considerable growth since 2000. The area's many natural attractions have also been supplemented by efforts to encourage visitors to come to Mesa County. Special events like the Fruita Fat Tire Festival, as well as new and existing mountain bike trails, hiking, and whitewater activities have increased tourism in the county. Spending by overnight visitors to Mesa County, which can partly be attributed to the prevalence of its public lands, jumped from $132 million in 2000 to $259 million in 2007. Increased tourism to Mesa County has increased local tax revenue from $4 million in 2000 to a projected $7.2 million in 2007. Moreover, the number of tourism related jobs increased from 2,370 in 2000 to 3,240 in 2007 (Colorado Tourism Office 2008). The BLM's marketing and maintenance of the region's open lands has helped identify the region as a destination hotspot. Additionally, the large expanse of public lands has helped attract the young professionals needed to fill critical regional industries such as education, law, and medicine.

Agriculture: Traditional agriculture, while declining, remains an important part of the Mesa County economy.

Residents in the rural parts of the county still rely heavily on BLM grazing permits for their cattle operations (BLM 2009l). Many of the residents in communities like Gateway, Glade Park, and Loma are concerned about protecting the agricultural heritage of their area from the pressures of increased recreation and tourism development. This is contrary to the new and growing wine industry in the valley that would like to see increased recreational opportunities as a way to attract more wine enthusiasts.

A traditional and mandated use for BLM land is livestock grazing. Fees are paid by livestock producers that allow them to graze their animals in designated

areas on land managed by BLM. Livestock production has an impact on the regional economy but also on the region's social fabric, as it preserves a valued western lifestyle.

Livestock use of public lands is measure in AUMs. One AUM is roughly equivalent to the amount of forage necessary to graze one cow or cow/calf for one month. On GJFO land as well as other BLM managed lands, there is a difference between available AUMs and those actually used over the course of a year. Available AUM's are defined as active AUM's on a permittees grazing permit. Economic impact analysis requires a distinction between these two categories because only those AUMs utilized will have an impact on the regional economy. Actual AUM use has been substantially less than allowed AUM's for the past ten years. There are several factors that contribute to this difference. The primary reason is drought. From 2000 to 2006 the area was experiencing an extended drought that began back in 1998. The drought has been at various levels of severity annually with the greatest impact coming from 1998 to 2004. During these drought years grazing use was reduced, substantially in 2000 through 2004. It took several years for ranchers to restock to pre-drought numbers if they did at all. Other factors that have contributed to using fewer AUMs than allowed are fluctuations in livestock markets and changes in the demographics of permittees.

Employment, Income, and Subsistence

Labor Force, Employment, and Unemployment

Trends in the labor force, employment, and unemployment help describe the overall health of a region's economy. **Table 3-45**, Labor Force Trends, Mesa County and Colorado (1990-2008), illustrates labor force trends for Mesa County and Colorado. The labor force is defined as the civilian noninstitutional population 16 years old and over who are employed or actively seeking employment. Over the long term, labor force size reflects broader demographic trends. A growing population, for example, will be mirrored by an expanding labor force. Over shorter intervals, labor force participation responds cyclically to economic conditions. By definition the labor force shrinks when discouraged workers abandon their job searches; conversely, the labor force expands when more promising economic conditions draw hopeful job-seekers back into the labor market.

Table 3-45
Labor Force Trends, Mesa County and Colorado (1990-2008)

Area	1990	1996	2002	2009	% Change 1990-2009	% Change 1990-1996	% Change 1996-2002	% Change 2002-2009
Mesa	44,840	56,282	63,781	81,627	82	25.5	13.3	28
Colorado	1,770,678	2,175,564	2,455,708	2,701,106	52.5	22.9	12.9	10.0

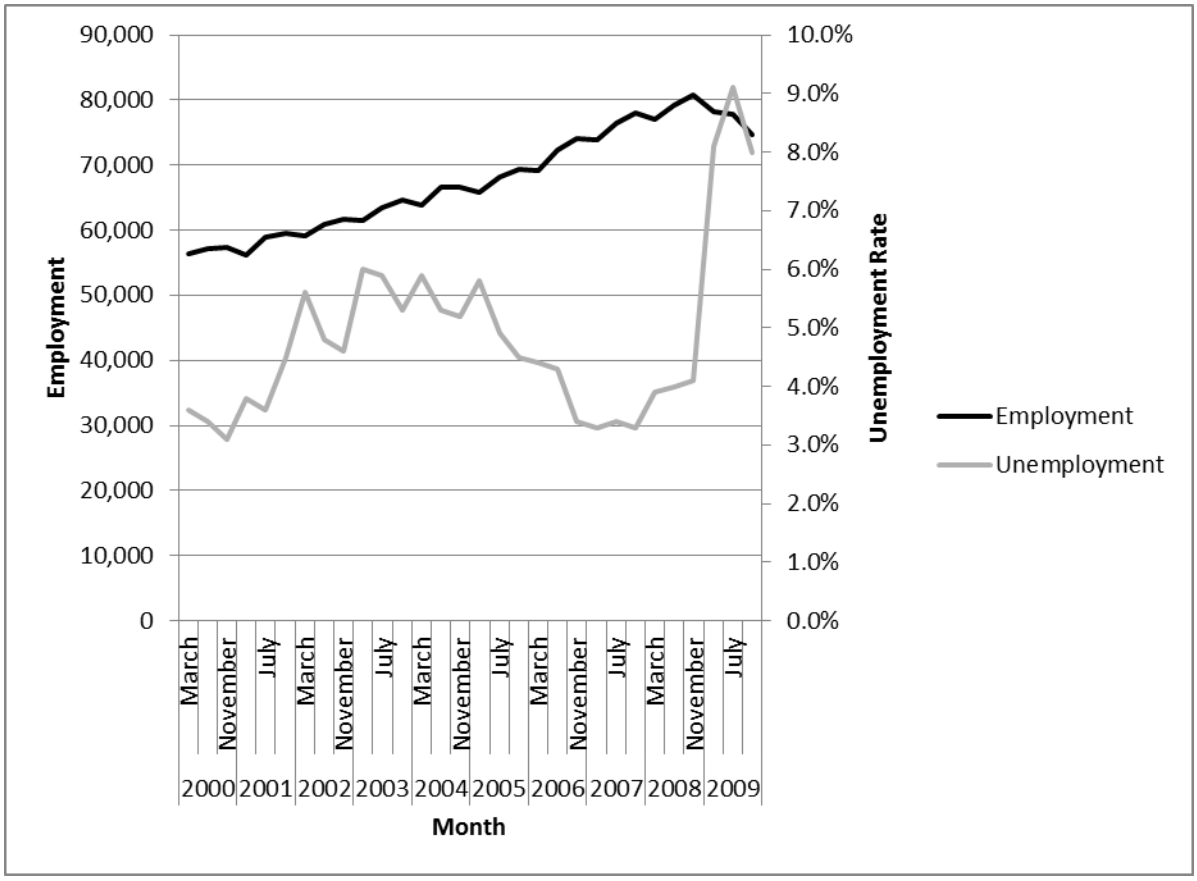
Source: US Department of Labor, Bureau of Labor Statistics (Bureau of Labor Statistics) 2009a

As can be seen in **Table 3-45**, Labor Force Trends, Mesa County and Colorado (1990-2008), Mesa County's labor force growth rate exceeded that for the state as a whole over the years 1990-2009. The table further shows that Mesa County's accelerated growth relative to Colorado's occurred primarily during the period 2002-2009. A drop in the labor force from 2008 to 2009 didn't negate the overall trend, but it likely reflects the effect of the recession on Mesa County. Those recent years, when Mesa County's labor force growth significantly outstripped Colorado's, correspond to a boom in natural gas production that will be further documented in this section. Most of the increased gas production will be seen to take place outside of Mesa County and outside of the BLM lands overseen by the Grand Junction Field Office.

Diagram 3-15, Mesa County Employment and Unemployment Rate (2000-2009), illustrates both the unemployment rate and the level of employment in Mesa County from 2000 to mid-2009. Together these two groups, the employed and the unemployed, are the labor force referred to above. The unemployment rate is likely the most familiar of all economic statistics. It reports the percent of the labor force that is without work and is actively seeking employment. Perhaps counter intuitively, being without work alone does not designate a person as unemployed. A discouraged worker, having given up looking for work, is not counted as unemployed no matter how readily she would take a job were one available. Looking at **Diagram 3-15**, Mesa County Employment and Unemployment Rate (2000-2009), it is clear that employment in Mesa County steadily increased between 2000 and mid-2008. Beginning late in 2008, employment in Mesa County dipped dramatically, with the loss of approximately 6,000 jobs from November 2008 through November 2009. Beginning in mid-2008, the unemployment rate increased dramatically from a low of 3.2 percent in 2007 to a high of 9.3 percent in July 2009. Trends for total jobs in Mesa County and Colorado for 1990 through 2008 are reported below in **Table 3-46,** Total Employment Trends in Mesa County and Colorado (1990-2008).

Comparing the county's unemployment rate with the state and national unemployment rate, it is clear that the County had outperformed the state and nation between 2002 and 2007. However, as illustrated in **Diagram 3-16**, Annual (Not Seasonally Adjusted) Unemployment Rate, since 2008, Mesa County has experienced higher rates of unemployment than the state of Colorado and the United States. Much of the low unemployment rate between 2002 and 2007 can be explained by a boom in the energy sector. With the crash of oil and gas prices in 2008 and 2009, as well as a significant downturn in the national economy, Mesa County employment increased nearly threefold from its low of 3.2 percent in 2007 to 9.3 percent in January, 2009. This far outpaced both the State of Colorado and the United States.

Diagram 3-15
Mesa County Employment and Unemployment Rate (2000-2009)



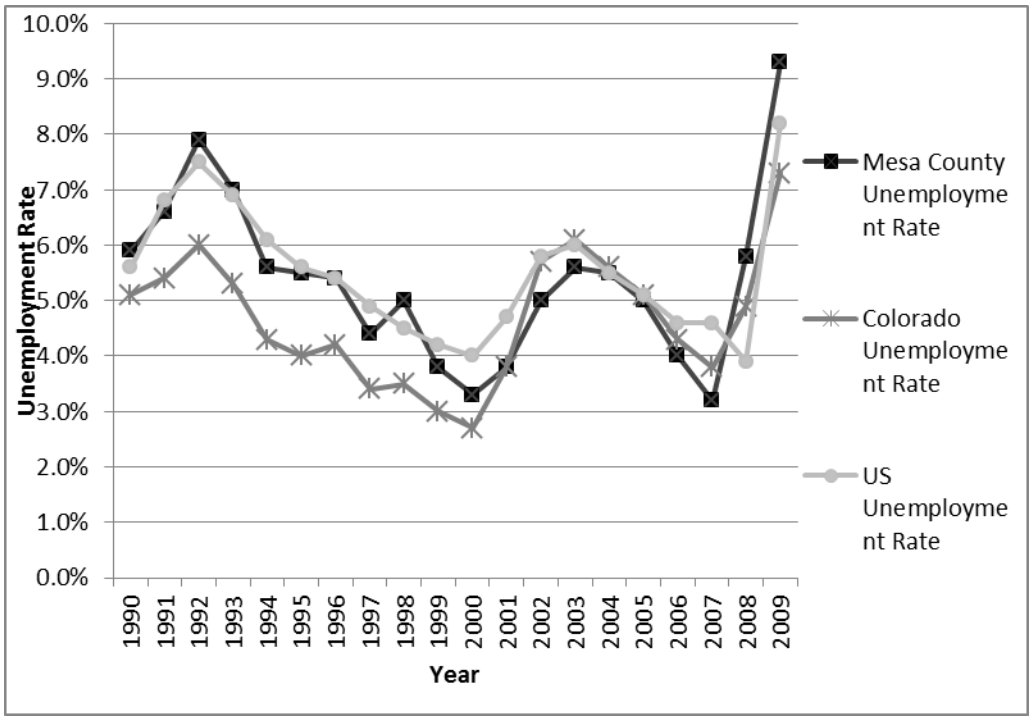
Source: Colorado Department of Labor and Employment 2009

Table 3-46
Total Employment Trends in Mesa County and Colorado (1990-2008)

Location	1990	2000	2001	2008	% Change 1990-2000	% Change 2001-2008
Colorado	2,039,626	2,926,410	2,941,343	3,285,413	43.5	11.7
Mesa County	49,479	70,123	70,820	91,728	41.7	29.5

Sources: US Department of Commerce, Bureau of Economic Analysis (BEA) 2010a, 2010b

Diagram 3-16
Annual (Not Seasonally Adjusted) Unemployment Rate



Sources:
Mesa County and Colorado data: Colorado Department of Labor and Employment 2009
United States Data: Bureau of Labor Statistics 2009a

Employment by Industry

The US Department of Commerce, Bureau of Economic Analysis (BEA), through its Regional Economic Information System, reports data on total employment and earnings as well as on employment and earnings by industry sector. The data is available for the national, state, and county level. Data from 1990-2008 will be used to describe employment and earnings trends in Mesa County and compare them to state and national trends.

Prior to 2001, BEA reported this data using the Standard Industrial Classification (SIC), which categorizes industries into sectors and then into smaller subgroups. In 2001, the North American Industrial Classification System (NAICS) was introduced to better identify new industries in the changing economy. One outcome is that data often cannot be compared between those different time periods. In this report some data will be reported side by side from the two systems; in most cases data will be reported only for 2001 through 2008.

Trends in total employment for Mesa County and Colorado are reported in **Table 3-46**, Total Employment Trends in Mesa County and Colorado (1990-2008). Total employment includes all jobs, full and part time. A person working two jobs is counted twice. The estimate is intended to count private and public

employment as well as self-employment. Over the entire period 1990 through 2008, total employment in Mesa County grew by 85.4 percent compared to 61 percent for Colorado. In **Table 3-46**, Total Employment Trends in Mesa County and Colorado (1990-2008), data is reported for 1990 through 2000 and 2001 through 2008 to avoid mixing data from SIC and NAICS calculations. It shows that from 1990 through 2000 total employment increased at roughly comparable rates in Mesa County and the state as a whole. During the 2001 through 2008 period, which includes the expansion of natural gas production in the region, Mesa's level of employment increased more than two-and-a-half times as fast as did Colorado's.

The largest sector by number of jobs for 2008 was retail trade, followed by health care and social assistance, government (all levels), construction, and accommodation and food services round out the top five sectors by total jobs. **Table 3-47**, Employment by Industry, Colorado and Mesa County (2001-2008), below presents all sectors by percent of jobs from highest to lowest. Mining, identified as the fastest growing sector, ranked tenth by number of jobs in the sector. Two factors not accounted for by this measure of the economy are the incomes generated by the various sectors and the relative number of part-time vs. full-time jobs in each sector. Earnings generated by the various sectors are examined below following the discussion of jobs by industry.

Table 3-47, Employment by Industry, Colorado and Mesa County (2001-2008), and **Table 3-48**, Industrial Sectors Ranked by Number of Jobs in Mesa County and Colorado (2008), use data on employment by industry sector to compare Mesa County and Colorado over the years 2001 through 2008. The first, **Table 3-47**, Employment by Industry, Colorado and Mesa County (2001-2008), compares Mesa County with Colorado by sector and shows the percent change in jobs for each sector over the eight year period. The rank of each sector from greatest to least percent change is also shown. This allows easy comparison between Colorado and Mesa County for the different sectors.

For Colorado the five fastest growing sectors were mining, management, educational services, real estate, and forestry and agricultural services. Only one of these fast growing sectors ranked in the top ten sectors by number of jobs in 2008, but these numbers indicate important trends in Colorado's economy over the period. In Mesa County, mining led growth with an increase of 595 percent. Mining was followed by real estate; arts, entertainment, and recreation; construction; and professional and technical services. These increases are consistent not only with an increase in resource extraction but with residential development and commercial development overall. For Mesa County, one of its five fastest growing sectors (construction) also shows up in the five largest sectors by jobs. Three more of the five fastest growing sectors (real estate, professional and technical services, and mining) are ranked in the top ten sectors by number of jobs.

Table 3-47
Employment by Industry, Colorado and Mesa County (2001-2008)

Industry Employment	Mesa 2001	Mesa 2008	% Change 2001-2008 (rank in % change)	Colorado 2001	Colorado 2008	% Change 2001-08 (rank in % change)
Accommodation & Food Service	5297	6,913	30.5 (8)	218,280	242,972	11.3 (13)
Administrative & Waste Serv.	4,155	5,122	23.3 (13)	176,777	201,660	14.1 (10)
Arts, Entertain. & Recreation	1,261	1,897	50.4 (3)	71,439	87,434	22.4 (8)
Construction	6,738	9,377	39.2 (4)	237,667	248,081	4.4 (17)
Educational Services	503	637	26.6 (11)	39,125	55,723	42.4 (3)
Farm Emp.	2,016	2,092	3.8 (17)	46,541	45,201	-2.9 (19)
Finance & Insurance	3,061	4,054	32.4 (7)	154,122	185,102	20.1 (9)
Forestry & Ag. Services	282	365	29.4 (9)	8,521	11,033	29.5 (5)
Government	8,460	9,681	14.4 (16)	390,700	435,542	11.5 (12)
Health Care & Social Assist.	8,043	10,177	26.5 (12)	219,627	271,847	23.8 (6)
Information	1,185	1,198	1.1 (19)	118,445	90,030	-24.0 (21)
Management of Companies	155	120	-22.6 (21)	19,750	30,758	55.7 (2)
Manufacturing	4,144	3,719	-10.3 (20)	192,291	158,598	-17.5 (20)
Mining	652	4,532	595.1 (1)	23,210	46,393	99.9 (1)
Other Services	3,904	4,699	20.4 (14)	145,587	163,065	12.0 (11)
Professional & Tech. Services	3,349	4,621	38.0 (5)	232,228	286,147	23.2 (7)
Real Estate & Rental/Leasing	3,025	5,006	65.5 (2)	137,404	190,681	38.8 (4)
Retail Trade	9,499	10,973	15.5 (15)	307,334	324,742	5.7 (15)
Transportation & Warehousing	2,592	3,433	32.4 (6)	84,998	89,503	5.3 (16)
Utilities	234	238	1.7 (18)	8,347	8,828	5.8 (14)
Wholesale Trade	2,265	2,874	26.9 (10)	108,950	112,073	2.9 (18)

Note: Number in ( ) indicates rank from greatest to least change
Sources: BEA 2010b

Table 3-48
Industrial Sectors Ranked by Number of Jobs in Mesa County and Colorado (2008)

MESA COUNTY 2008			COLORADO 2008		
Industry	**Jobs**	**Percent of All Jobs**	**Industry**	**Jobs**	**Percent of All Jobs**
Retail Trade	10,973	12.0	Government	435,542	13.3
Health Care & Social Assist.	10,177	11.1	Retail Trade	324,742	9.9
Government	9,681	10.6	Professional & Tech. Services	286,147	8.7
Construction	9,377	10.2	Health Care & Social Assist.	271,847	8.3
Accommodation & Food Service	6,913	7.5	Construction	248,081	7.6
Administrative & Waste Serv.	5,122	5.6	Accommodation & Food Service	242,972	7.4
Real Estate & Rental/Leasing	5,006	5.5	Administrative & Waste Serv.	201,660	6.1
Other Services	4,699	5.1	Real Estate & Rental/Leasing	190,681	5.8
Professional & Tech. Services	4,621	5.0	Finance & Insurance	185,102	5.6
Mining	4,532	4.9	Other Services	163,065	5.0
Finance & Insurance	4,054	4.4	Manufacturing	158,598	4.8
Manufacturing	3,719	4.1	Wholesale Trade	112,073	3.4
Transportation & Warehousing	3,433	3.7	Information	90,030	2.7
Wholesale Trade	2,874	3.1	Transportation & Warehousing	89,503	2.7
Farm Emp.	2,092	2.3	Arts, Entertain. & Recreation	87,434	2.7
Arts, Entertain. & Recreation	1,897	2.1	Educational Services	55,723	1.7
Information	1,198	1.3	Mining	46,393	1.4
Educational Services	637	0.7	*Farm Emp.*	45,201	1.4
AG. Services	365	0.4	Management of Companies	30,758	0.9
Utilities	238	0.3	AG. Services	11,033	0.3
Management of Companies	120	0.1	Utilities	8,828	0.3

Source: BEA 2010b

Looking at job losses, both Colorado and Mesa County lost significant numbers of manufacturing jobs over the period surveyed, with Colorado suffering a greater rate of loss than Mesa County. Colorado suffered its greatest rate of job loss in the information sector while Mesa County held a little better than even with 1.1 percent growth. Colorado's other job loss area was farm employment (-2.9 percent). Mesa County showed modest growth in farm jobs, but the trend is not clear. From 2001 through 2006 farm employment in Mesa County dropped by 6.4 percent; then in 2007 and 2008 jobs bounced back to show a 3.8 percent increase over the eight year period. Mesa County's greatest rate of job loss (-22.6 percent) occurred in management. By contrast this sector had Colorado's second highest rate of job growth.

Table 3-48, Industrial Sectors Ranked by Number of Jobs in Mesa County and Colorado (2008), ranks industrial sectors by total jobs from largest to smallest sector for 2008. This provides one snapshot of the structure of Mesa County's economy and allows comparisons to the economy of the state as a whole for the same year. A few observations follow. For Colorado and Mesa County the top five sectors by number of jobs comprise four of the same sectors (government, retail trade, construction, and health care and social assistance) although the sectors rank in different order for each entity. The top five sectors in Mesa County accounted for about 51.4 percent of the jobs in 2008 while the top five sectors for the state accounted for about 47.8 percent of total jobs. When we compare Mesa County to Colorado, we can see that construction, mining, and farm employment provided higher shares of jobs in Mesa than in Colorado overall.

Earnings by Industry

In addition to data for total employment, BEA reports total earnings and earnings by industry. **Table 3-49**, Total Earnings Trends in Mesa County and Colorado (1990-2008) (Thousands of Real 2008 Dollars), records the trend in total earnings over the years 1990 through 2008 for both Mesa County and Colorado. Earnings are reported in real 2008 dollars to adjust for inflation's effect on purchasing power. Over the full period Mesa County earnings grew by about 121 percent, compared to an increase for Colorado of 91.9 percent. As with total employment, the data in **Table 3-49**, Total Earnings Trends in Mesa County and Colorado (1990-2008) (Thousands of Real 2008 Dollars), are reported in two segments: 1990-2000 and 2001-2008. This avoids mixing data from SIC and NAICS, the two different systems for classifying industries. The data shows that the growth in earnings for Colorado slowed dramatically in 2001 through 2008 compared to 1990 through 2000. Mesa County, on the other hand, grew at a steadier rate over both periods and grew far faster than Colorado in total earnings for 2001 through 2008. This period of earnings growth greater than the state as a whole includes a boom in earnings driven by natural gas production in the region.

Table 3-49
Total Earnings Trends in Mesa County and Colorado (1990-2008)
(Thousands of Real 2008 Dollars)

Location	1990	2000	2001	2008	% Change 1990-2000	% Change 2001-2008
Colorado	87,031,272	144,701,087	147,385,632	167,020,895	66.3	13.3
Mesa County	1,655,873	2,471,245	2,482,252	3,662,956	49.2	47.6

Note: Earnings inflated to 2008 dollars using Consumer Price Index for all urban customers for Denver, Boulder, Greeley
Source: BEA 2010c

Earnings trends in Mesa County and Colorado for the various industry sectors are compared in **Table 3-50**, Earnings by Industry, Colorado and Mesa County (2001-2008) (Thousands of Real 2008 Dollars). In Mesa County earnings from mining grew by more than 1,000 percent for the fastest rate of growth from 2001 through 2008. No other sectors exceeded double digit increases in earnings, but several grew by more than 50 percent.

After mining, the fastest growing earnings in Mesa County came from arts, entertainment, and recreation; wholesale trade; administrative and waste services; professional and technical services; transportation and warehousing; and accommodation and food service. Each of these saw earnings increase by over 50 percent. For Colorado earnings grew fastest in the management sector at 83 percent. Earnings for mining grew next fastest at 74 percent. Mining is the only sector whose earnings growth ranked in the top five for both Mesa County and Colorado. It is important to remember that greater growth in earnings does not imply that an industry sector contributes large earnings overall. A small sector can have a high rate of growth and still remain a small sector.

In **Table 3-50**, Earnings by Industry, Colorado and Mesa County (2001-2008) (Thousands of Real 2008 Dollars), industrial sectors are ranked by earnings for Mesa County and Colorado in 2008. The earnings are expressed in real 2008 dollars. With this data the contribution of various sectors to Mesa County's economy can easily be observed. Retail trade, which ranked highest in number of jobs, ranks only fifth in terms of earnings. Mining, which includes natural gas, ranked only number ten in job numbers but ranks fourth in earnings for the county. Only three of the nine industrial sectors that ranked above mining in jobs exceed it in earnings. The obvious factors at play are wage levels and the relative number of part-time vs. full-time jobs in different sectors. Mining creates a greater proportion of higher paying, full-time jobs than retail trade, for example. One last finding from this data will be mentioned. Recall that earnings in the arts, entertainment, and recreation sector increased at the second fastest rate (93.8 percent) of any industry from 2001 through 2008, yet at the end of that rapid growth, earnings in the sector ranked only eighteenth out of twenty-one industries in contribution to total earnings for the county. Fast growth in

Table 3-50
Earnings by Industry, Colorado and Mesa County (2001-2008)
(Thousands of Real 2008 Dollars)

	Mesa County			Colorado		
Industry Earnings	**2008**	**% Change 2001-08**	**2008 % of All Earnings**	**2008**	**% Change 2001-08**	**2008 % of All Earnings**
Total	3,662,956	47.6		167,020,895	13.3	
Government	566,179	36.8	15.5	26,728,385	29.3	16
Health Care & Social Assist.	475,672	35.2	13	13,319,631	33.8	8
Construction	438,915	33.7	12	12,709,238	-7	7.6
Mining	358,445	1173.9	9.8	4,702,866	74	2.8
Retail Trade	307,712	22.4	8.4	9,631,858	1.2	5.8
Transportation & Warehousing	192,697	56	5.3	4,686,388	0.6	2.8
Other Services	177,642	42.2	4.8	6,308,054	22.6	3.8
Professional & Tech. Services	173,303	58.1	4.7	19,949,601	25.8	11.9
Manufacturing	170,275	0.1	4.6	11,312,645	-10.4	6.8
Wholesale Trade	163,920	65	4.5	8,699,206	14.5	5.2
Finance & Insurance	150,327	34	4.1	10,992,623	14.7	6.6
Administrative & Waste Serv.	147,384	60.5	4	6,966,206	16.5	4.2
Accommodation & Food Service	141,789	55.6	3.9	5,631,141	18.4	3.4
Real Estate & Rental/Leasing	65,033	10.8	1.8	4,040,987	-20.8	2.4
Information	56,908	17.1	1.6	11,454,142	-5.1	6.9
Arts, Entertain. & Recreation	21,891	93.8	0.6	2,296,626	15.1	1.4
Utilities	20,311	12.6	0.6	987,841	11.3	0.6
Educational Services	10,268	-22.6	0.3	1,622,323	45.7	1
Farming	7,343	-54.9	0.2	1,004,537	-19	0.6
Forestry and Ag. Services	8,712	-4.5	0.2	243,647	14.4	0.1
Management of Companies	8,230	-24.3	0.2	3,732,950	82.3	2.2

Note: : 2001 values inflated using Consumer Price Index for all urban customers for Denver, Boulder, Greeley
Source: BEA 2010b

earnings can identify important trends in a local economy, but the fast growth alone does not indicate a significant impact on total earnings. Again, a small sector can experience a high growth rate and not be a significant contributor to overall earnings.

Comparing Colorado and Mesa County, government is the largest sector as measured by earnings. In addition three of the top five sectors and six of the top

ten sectors are common to both entities although not ranked at identical levels. Perhaps the most striking difference between the two economies is that mining ranks fourth in earnings for Mesa County but only thirteenth for Colorado.

Earnings losses were found in four Mesa County sectors (farming, management, educational services, and forestry and agricultural services) from 2001-2008. Colorado saw earnings losses in real estate, farming, manufacturing, construction, and information. Mesa matches a little better with Colorado in earnings losses when it is recalled that, while manufacturing along with real estate showed positive earnings growth over the eight year period in Mesa, they had shown three and four years respectively of earnings losses at the end of the reporting period. They were following the same trend earnings wise as was the state overall.

Diagram 3-17, Contributions to Jobs and Earnings by Industry Sector, Mesa County (2008), shows the share of jobs and earnings generated by each industrial sector in Mesa County for 2008. One obvious feature of the data is that the four highest contributors to earnings produce a larger share of earnings than of jobs. Meanwhile, retail trade, the largest sector by jobs, ranks only fifth in terms of earnings generated.

Cross County Income Flows

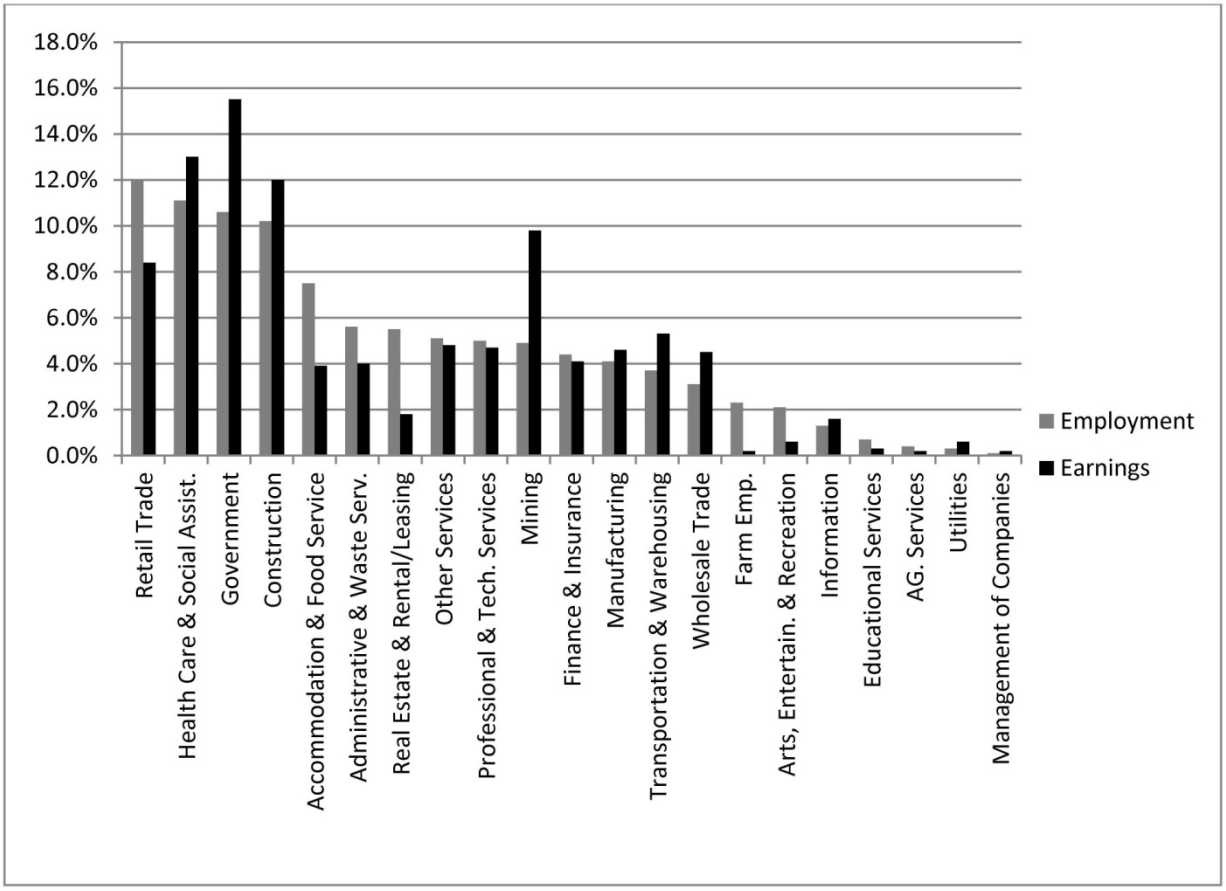
To adjust for cross-county flows of income, The Bureau of Economic Analysis (BEA) reports residence adjustments. Some Mesa county residents commute to other counties to work. These workers earn their incomes in other counties and bring them into Mesa County. Some residents of other counties commute to Mesa County. They earn their incomes in Mesa County but take them to their home county. The residence adjustment accounts for this cross-county flow of income by subtracting the outflow of income from the inflow of income for Mesa County. A positive number indicates that residents of the county earn more income from other counties than non-residents transfer out of the county. **Table 3-51**, Residence Adjustment, Mesa County (1990-2008) (Thousands of Real 2008 Dollars), reports the residence adjustment for Mesa County for 1990 and for 2001 through 2008 in both nominal and real dollars.

Table 3-51
Residence Adjustment, Mesa County (1990-2008) (Thousands of Real 2008 Dollars)

	1990	2001	2002	2003	2004	2005	2006	2007	2008
Nominal $	27,970	48,035	47,400	50,005	55,033	72,950	100,189	131,734	136,449
Real $	48,560	55,613	53,838	56,189	61,772	80,211	106,372	136,866	136,449

Note: Values inflated to 2008 dollars using Consumer Price Index for all urban customers for Denver, Boulder, Greeley
Source: BEA 2010d

Diagram 3-17
Contributions to Jobs and Earnings by Industrial Sector, Mesa County (2008)



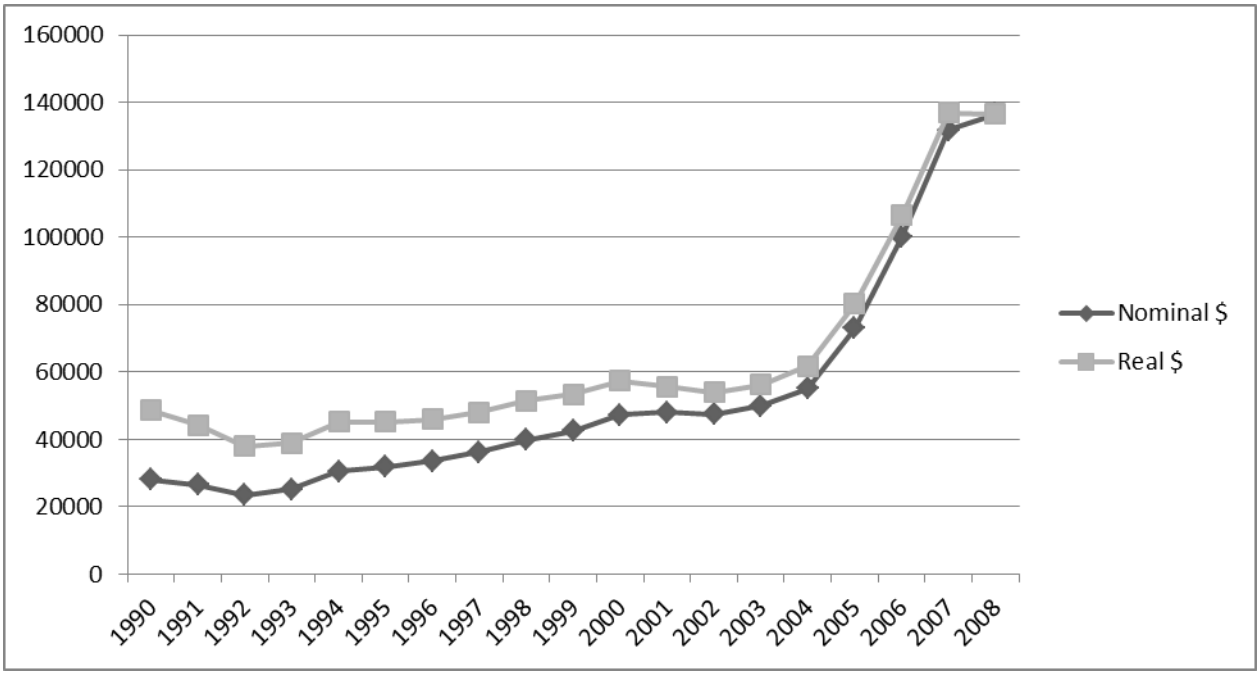
Source: BEA 2010b

The residence adjustment is positive for all those years and increases dramatically after 2004. Over that time natural gas and oil production were increasing significantly in Garfield County and the number of Mesa County employees in oil and natural gas production was increasing as well.

Diagram 3-18, Residence Adjustment, Mesa County (1990-2008) (Thousands of Real 2008 Dollars), graphs the dramatic increase in Mesa County's residence adjustment recorded in **Table 3-51**, Residence Adjustment, Mesa County (1990-2008) (Thousands of Real 2008 Dollars).

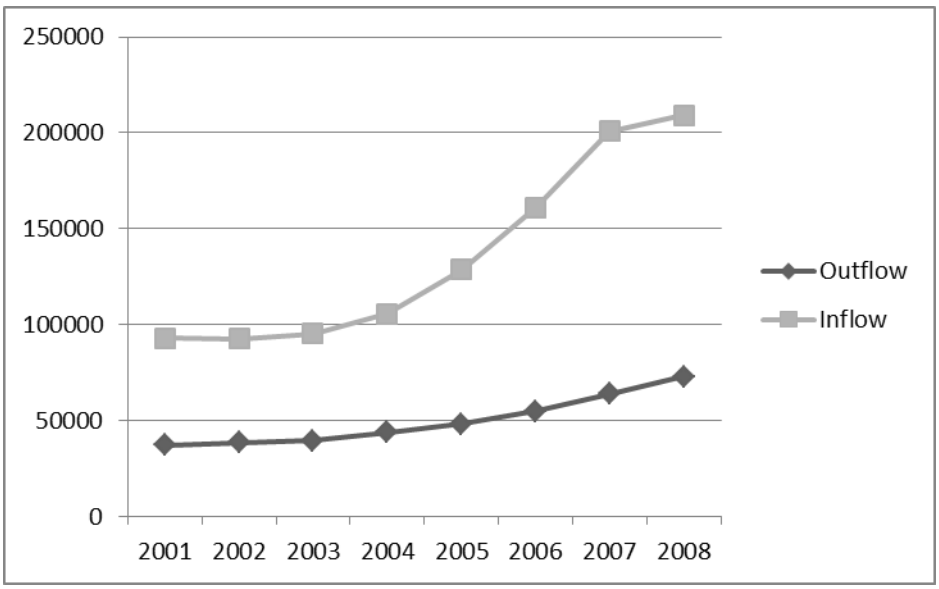
Diagram 3-19, Earnings Inflow vs. Outflow, Mesa County (2001-2008) (Thousands of 2008 Dollars), and **Diagram 3-20**, Earnings Inflow vs. Outflow, Garfield County (2001-2008) (Thousands of Real, 2008 dollars), represent the earnings inflows and outflows used to calculate the residence adjustment for Mesa County (**Table 3-51**, Residence Adjustment, Mesa County (1990-2008) (Thousands of Real 2008 Dollars)) and for neighboring Garfield County. The difference between the inflow and outflow is the residence adjustment. It can be

Diagram 3-18
Residence Adjustment, Mesa County, 1990-2008 (Thousands of Real 2008 Dollars)



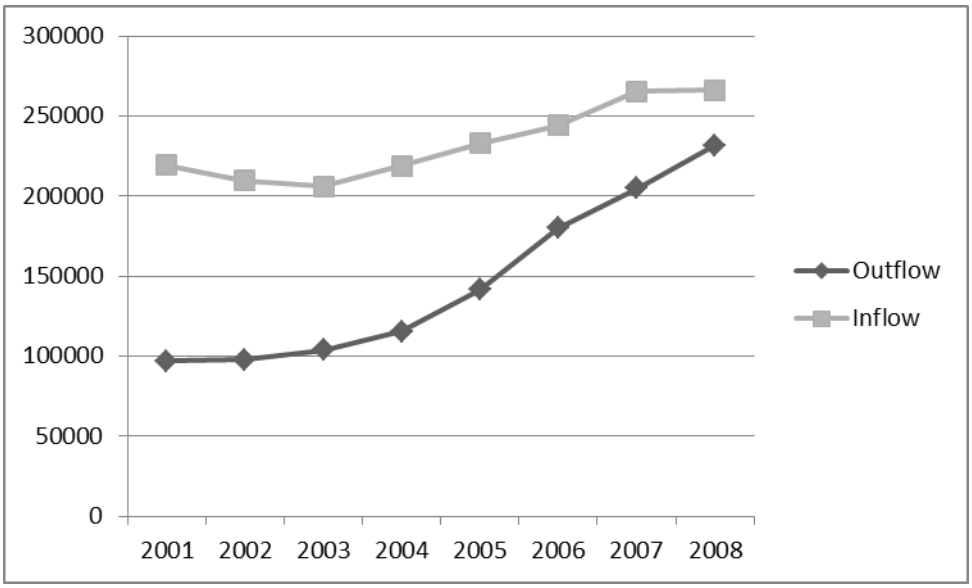
Note: Values inflated to 2008 dollars using Consumer Price Index for all urban customers for Denver, Boulder, Greeley
Source: BEA 2010d

Diagram 3-19
Earnings Inflow vs. Outflow, Mesa County, 2001-2008
(Thousands of 2008 Dollars)



Note: Values inflated to 2008 dollars using Consumer Price Index for all urban customers for Denver, Boulder, Greeley
Source: BEA 2010d

Diagram 3-20
Earnings Inflow vs. Outflow, Garfield County (2001-2008)
(Thousands of Real 2008 Dollars)



Note: Values inflated to 2008 dollars using Consumer Price Index for all urban customers for Denver, Boulder, Greeley.
Source: BEA 2010d

seen that the increased inflow of incomes for Mesa County coincides with an increase in outflow of incomes for Garfield County. This represents, in part, incomes to Mesa County oil and natural gas workers from oil and natural gas production in Garfield County, which showed substantial increases beginning in 2004.

Commuting patterns can help substantiate the connection between Mesa County workers and oil and natural gas production in Garfield County. The US Census Bureau reports data on commuting patterns between counties as part of its Local Employment Dynamics (LED) program. LED uses existing administrative reports from states combined with census, survey, and other administrative records. As such the LED statistics involve some synthetic data.

Table 3-52, Commuting Patterns Mesa County to Garfield County (2002-2008), reports commuting patterns for Mesa County residents working in Garfield County. Data are reported for those who commute for either full or part time jobs as well as those who commute only for their primary job. The number of commuters for each year is reported as well as the share that represents of all jobs held by Mesa County residents. There is a steady increase in both the number of commuters and their share of overall jobs from 2004 through 2007. There is a drop off in both commuters and their share of jobs in 2008, but both numbers are still higher than any other year except 2007.

Table 3-52
Commuting Patterns Mesa County to Garfield County (2002-2008)

	2002	2003	2004	2005	2006	2007	2008
Total Full & Part Time Jobs, All Mesa County Residents	49,434	49,144	52,066	53,023	55,716	61,839	64,806
Commuters to Garfield County	903	844	1,050	1,215	1,954	2,644	2,529
Share of All Jobs	1.8%	1.7%	2.0%	2.3%	3.5%	4.3%	3.9%
Total Primary Jobs, All Mesa County Residents	46,450	46,317	48,860	49,505	52,125	57,755	60,709
Commuters to Garfield County	853	793	976	1,133	1,844	2,506	2,389
Share of Primary Jobs	1.8%	1.7%	2.0%	2.3%	3.5%	4.3%	3.9%

Source: U.S. Census Bureau 2008a

Personal Income

The recent surge in economic activity since 2004, including the increased activity in the energy industry on public and private lands, has helped increase wages in Mesa County (see **Table 3-53**, Annual Average Wage Colorado and Mesa County (2001-2008)). Wages increased 43 percent between 2001 and 2008 which approximates an $11,800 wage increase during that time. It remains to be determined what impact the economic downturn of 2008 and 2009 will have on annual wages in Mesa County and the state of Colorado.

Table 3-53
Annual Average Wage Colorado and Mesa County (2001-2008)

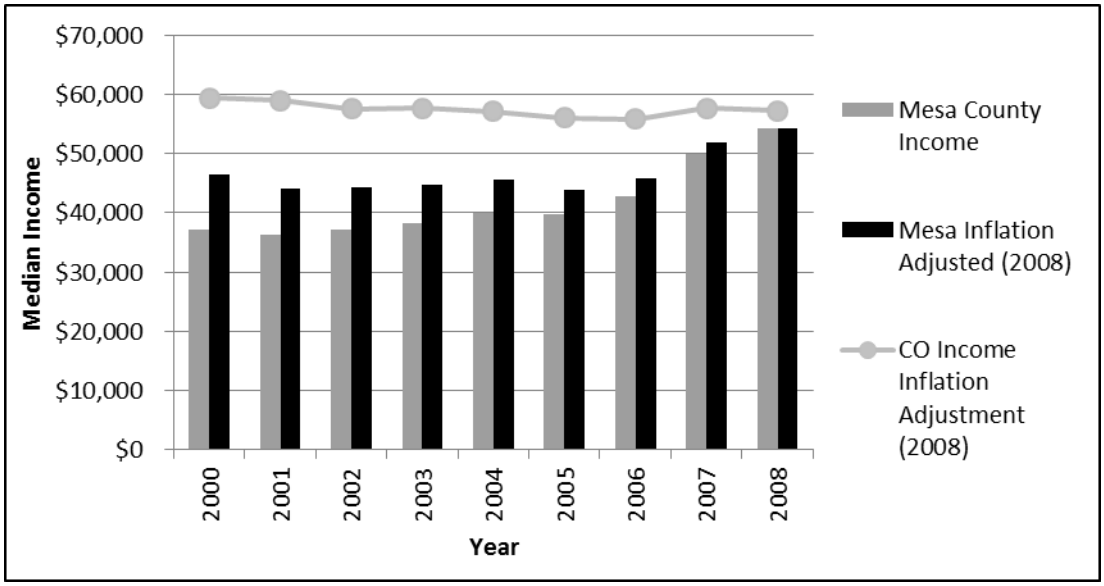
Year	Colorado	State % Change	Mesa County	Mesa County % Change	Ratio to State Average
2001	$37,952	n/a	$27,426	n/a	0.72
2002	$38,005	0.1%	$28,331	3.3%	0.75
2003	$38,942	2.5%	$29,053	2.5%	0.75
2004	$40,276	3.4%	$29,965	3.1%	0.74
2005	$41,601	3.3%	$31,611	5.5%	0.76
2006	$43,506	4.6%	$33,729	6.7%	0.78
2007	$45,396	4.3%	$36,221	7.4%	0.80
2008	$46,614	2.7%	$39,246	8.4%	0.84

Note: The data has not been adjusted for inflation.
Source: Bureau of Labor Statistics 2009b

Low unemployment and subsequent increases in wages has had a positive impact on family income in Mesa County. As illustrated in **Diagram 3-21**, Mesa County Annual Median Household Income (2000-2008), the median household income has increased by nearly 35 percent between 2000 and 2008. Adjusting for inflation, the County has seen approximately a $7,000 rise in median income between 2001 and 2008. With unemployment over nine percent in 2009 it is expected that median family income has dropped as well.

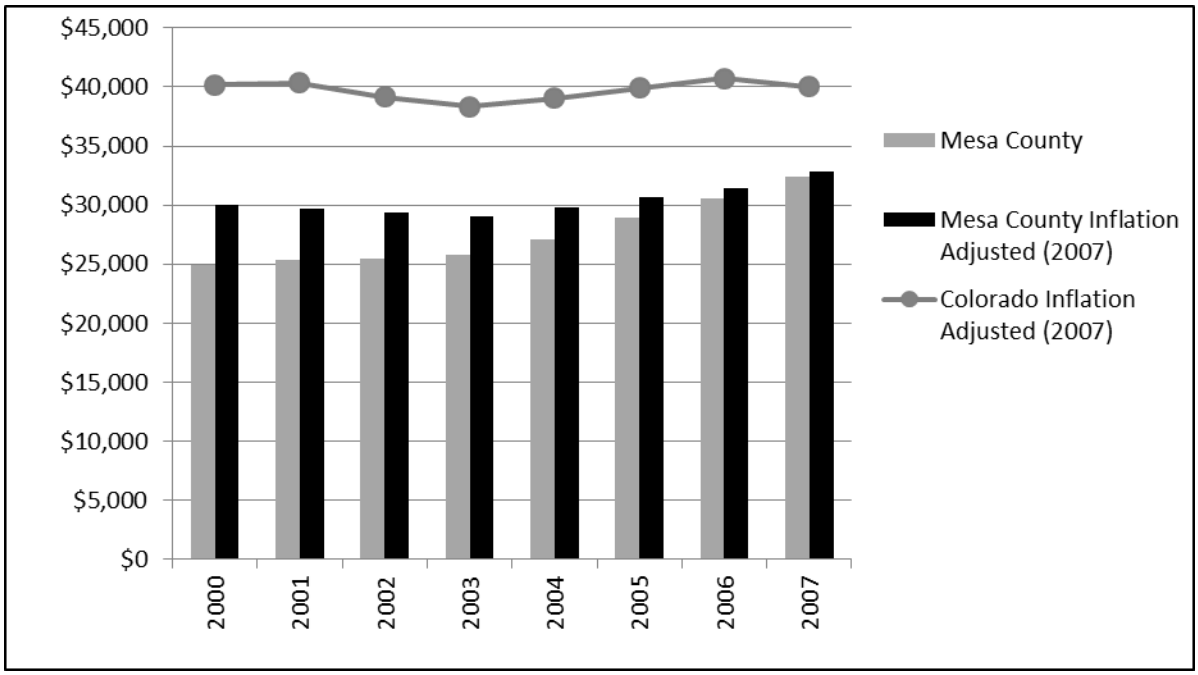
As illustrated in **Diagram 3-22**, Mesa County and Colorado per Capita Personal Income (2000-2007), per capita income in Mesa County has increased approximately 31 percent between 2000 and 20007. Adjusting for inflation, per capita personal income in Mesa County grew approximately 10 percent between 2000 and 2007. Traditionally there has been a relatively large gap between Mesa County and Colorado in per capita income. The data shows that Mesa County residents still earn less than their Colorado counterparts, but this gap has closed almost $3,000 since 2000. Again it is unclear how the recession of 2008 will impact per capita income, but the expectation is that it will decrease.

Diagram 3-21
Mesa County Annual Median Household Income (2000-2008)



Source: US Census Bureau 2008b

Diagram 3-22
Mesa County and Colorado per Capita Personal Income (2000-2007)

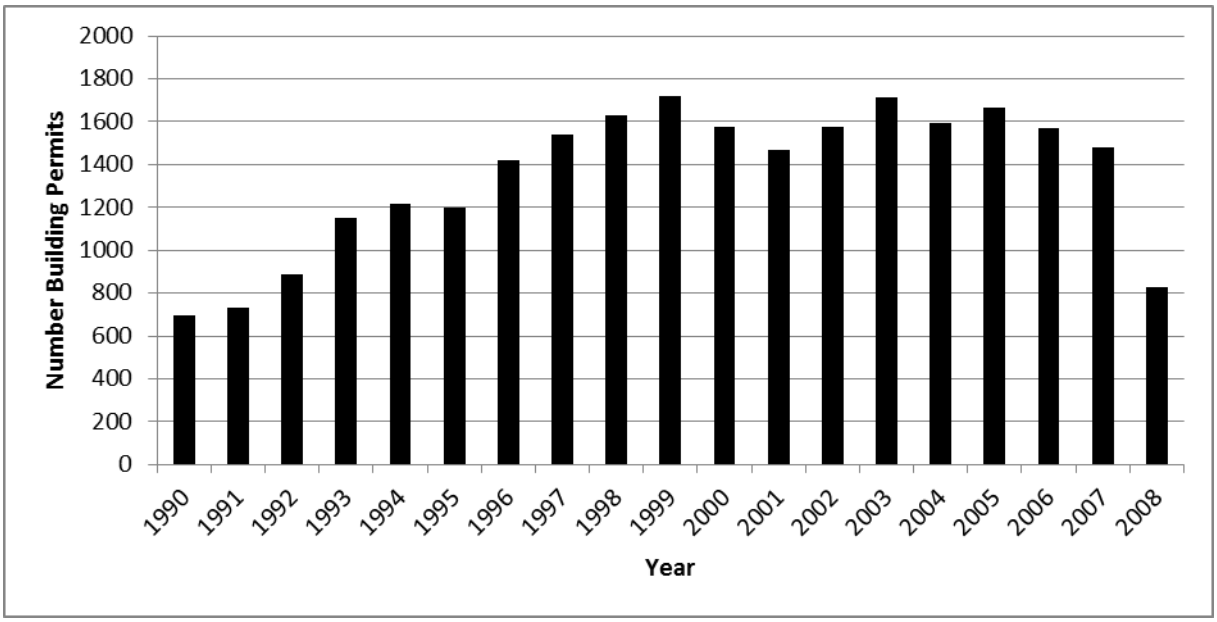


Source for Colorado: BEA 2007

Housing

As evidenced in **Diagram 3-23**, Residential Building Permits Issued in Mesa County (1990-2008), building in Mesa County has been strong since 1990, evidenced by the doubling of residential permits issued between 1990 and 1995. The increased number of permits can be explained by the County's growing population and healthy economy. In 2008 building permits decreased to 1991 levels thereby illustrating the impact the 2008 and 2009 economic downturn has had on Mesa County.

Diagram 3-23
Residential Building Permits Issued in Mesa County (1990-2008)



Note: Data does not include commercial building permits
Source: Mesa County Building Department. 2008.

The expansion of the economy helped maintain a robust real estate market in Mesa County. While higher interest rates and rising defaults on mortgages were driving down housing prices nationally, the median price of a home in the Grand Junction metropolitan area continued to increase. Between 2000 and 2008, the median home sales price in Grand Junction was estimated to nearly double from $118,900 to $233,000. In fact, according to a March 2008 report issued by the Office of Federal Housing Enterprise Oversight, Grand Junction ranked number two in the top 20 metropolitan statistical areas with the highest rate of house price appreciation (Housing Colorado 2009). The 2008 and 2009 economic downturn had a significant impact on home sales and prices in Mesa County. According to zillow.com the average home value in Grand Junction plummeted to $190,000 in January, 2010 (Zillow.com 2010). Foreclosure rates have also risen dramatically in Mesa County increasing 143 percent in the second quarter

of 2009 over the previous year while real estate sales dropped from 5568 in 2006 to just 1998 in 2009 (Inside Real Estate News 2009).

The rental market does not provide much of an alternative for those who cannot afford to buy a home. While the housing market was very affordable until 2004, there was very little incentive to build additional rental units. As the housing market became less affordable, the vacancy rate for apartments has dropped dramatically. Grand Junction vacancy rates for multi-family units ranged between 4.1 percent and 1.6 percent between 2007 and the second quarter of 2009 (Colorado Department of Local Affairs 2009a). Since then vacancy rates have skyrocketed to 7.5 percent for multi-family units (Grand Junction Free Press 2009).

Public Finance and Government Services

Government Revenues

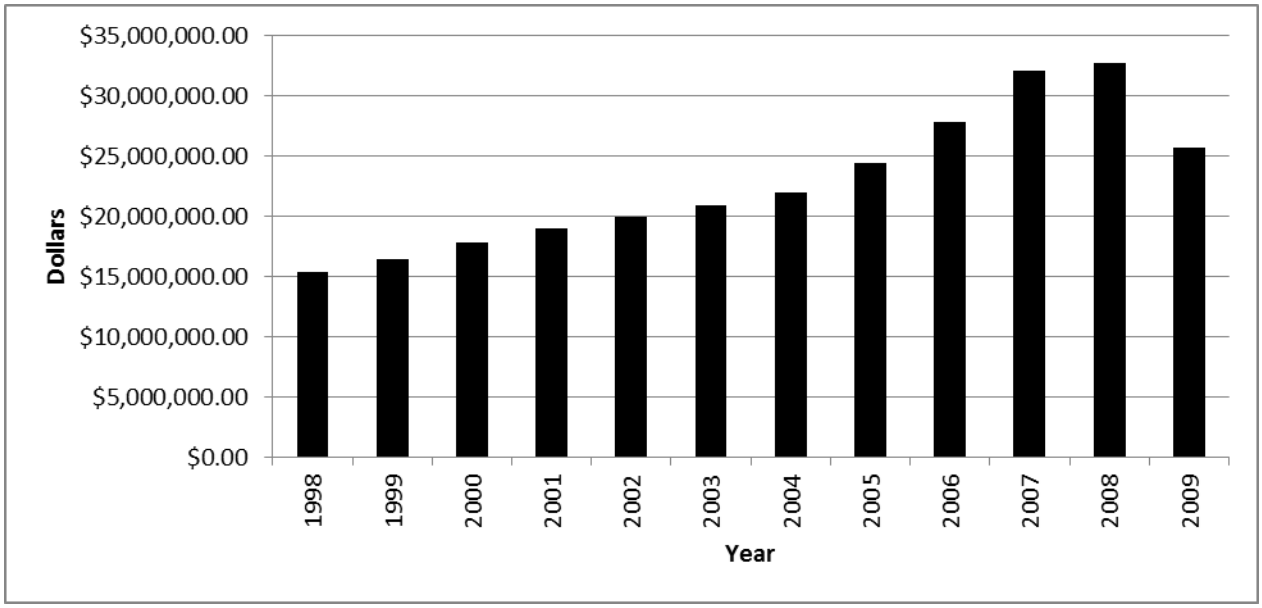
As the population and economy of Mesa County has grown over the last twenty years, the county's revenues and expenditures have also grown. The county has experienced increased revenue in three different areas: sales tax revenues, severance taxes, and payment in lieu of taxes (PILT) payments.

First, as illustrated in **Diagram 3-24**, Mesa County Sales Tax Revenues (1998-2009), Mesa County has experienced an increase in its sales tax revenues every year since 1998. While the percent change has ebbed and flowed over this period (with a low of 4 percent increase in sales tax collection to a high of 16 percent increase), the strength of this revenue reflects a healthy Mesa County economy. Sales tax revenues leveled off between 2007 and 2008 with a .01 percent growth rate. By January, 2010 the county's sales tax revenue had dropped 24 percent when compared to the same month in 2009 (Grand Junction Daily Sentinel 2010). This slowing illustrates the significant impact the 2008 and 2009 economic downturn has had on the county.

The second area of revenue growth relates to the energy industry. From 2003 to 2008 applications for permits to drill in Mesa County grew from 27 to approximately 501 (Colorado Oil and Gas Conservation Commission 2009). This represents approximately 6 percent of the total permits issued statewide. With 805 active wells[3] in 2008, Mesa County ranked eighth in the state for active oil and gas wells (Colorado Oil and Gas Conservation Commission 2009). In 2006 a total of 1,611 oil and gas employees lived in Mesa County (Mesa County 2007).

[3] Includes all wells regardless of mineral ownership.

Diagram 3-24
Mesa County Sales Tax Revenues (1998-2009)



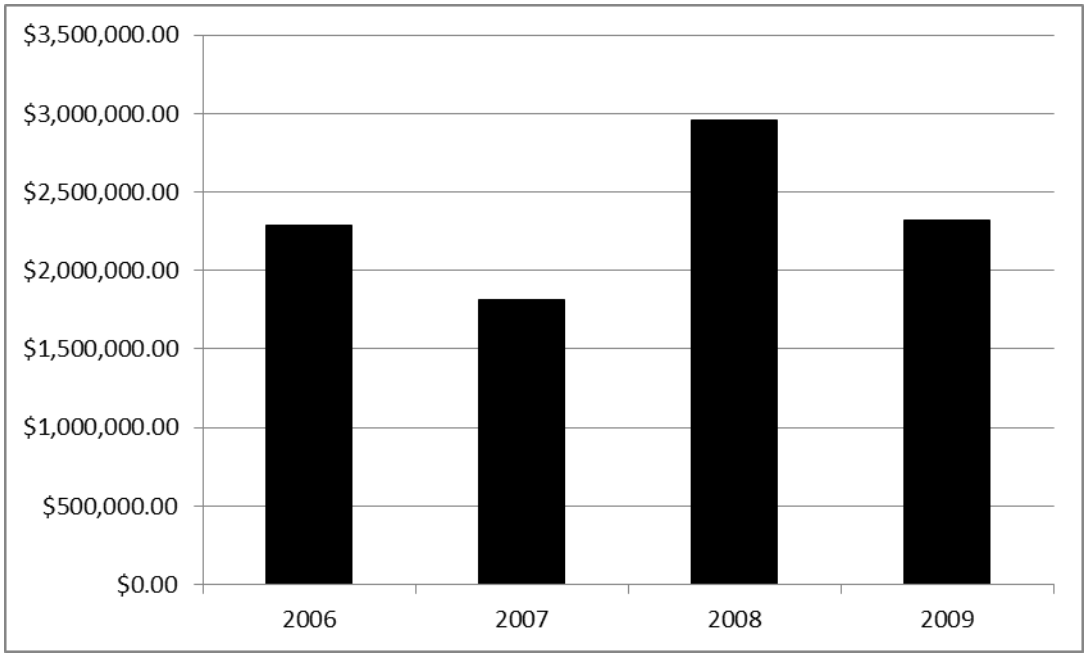
Note: 2009 data is projected revenue
Source: Mesa County Finance Department 2008

Growth of the oil and gas industry in Mesa County is best exhibited in **Diagram 3-25**, Federal Mineral Lease Direct Distribution to Mesa County (2006-2009). Between 2000 and 2008, oil production has increased from approximately 3,500 barrels to over 122,000 barrels. Likewise natural gas production has increased six fold between 2000 and 2008. Federal mineral lease payments to Mesa County have contributed significantly to Mesa County's tax base. As illustrated in **Diagram 3-26**, from 2006 through 2009, Mesa County received a low of $1.8 million to a high of $2.9 million.

Mesa County severance tax revenues were close to $3 million in 2006 and were projected to grow to as much $5 million by 2010 (Mesa County 2007). The decrease in national oil and gas prices in late 2008 had a significant impact on production levels. This decrease has significantly impacted Mesa County's severance tax projections. Revised 2010 severance tax projections after the crash in oil and gas prices anticipated County revenue to drop from $5 million to a little less than $1 million (Mesa County 2009c).

Mesa County oil and gas taxable assessed value grew from $9.4 million in 2000 to $2.8 million in 2009. This money helps Mesa County offset the costs of meeting the infrastructure needs of the oil and gas industry. This amount fluctuates based off the price and production of oil and gas.

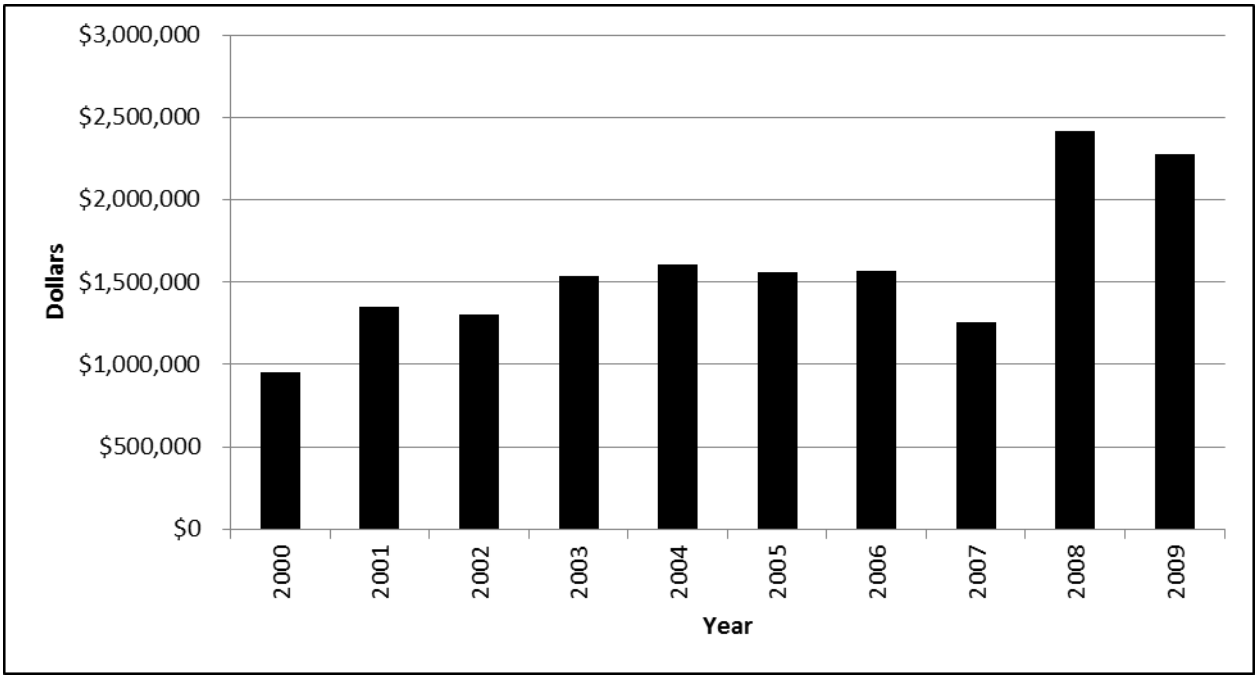
Diagram 3-25
Federal Mineral Lease Direct Distribution to Mesa County (2006-2009)



Source: Colorado Department of Local Affairs 2009b

In total, PILT payments received by Mesa County from the United States have contributed from $1 million to $2.5 million annually since the beginning of the program. **Diagram 3-26** shows the payments received from 2000. Annual variations occur, depending on the amount of money the Congress appropriates. If it is less than the full entitlements of the counties nationally the funds are prorated among all of the counties in the United States. PILT funds to counties also vary, depending on how much money a County receives from the United States from other sources such oil and gas, or coal leasing.

Diagram 3-26
Payments in Lieu of Taxes, Mesa County (2000-2008)



Source: US Department of the Interior

3.6.4 Environmental Justice

This section was prepared by researchers at Colorado Mesa University for the GJFO.

Executive Order 12898 instructs federal agencies to identify "disproportionately high and adverse human health or environmental effects on minority populations and low-income populations." To comply with Executive Order 12898 on Environmental Justice, this section examines the racial and economic conditions of the planning area.

Assess Potential for Disproportionate Impacts to Environmental Justice Populations

Exhibited in **Table 3-54**, Mesa County and Colorado Racial Composition (2006-2008 Estimates), below, the racial diversity of Mesa County is homogeneous when compared to the state of Colorado. The County is predominantly white with a relatively small minority population. The largest racial minority is Hispanic, comprising 11.8 percent of the population, compared to 19.9 percent of Colorado's population.

Looking at **Diagram 3-27**, Percent of Mesa County Residents in Poverty (2000-2007), Mesa County's poverty rate has ebbed and flowed between a low of 10.6 percent and a high of 12.5 percent between 2000 and 2008. Since 2000, Mesa County has fared much better than the US as a whole, but not as well as

Table 3-54
Mesa County and Colorado Racial Composition (2006-2008 Estimates)

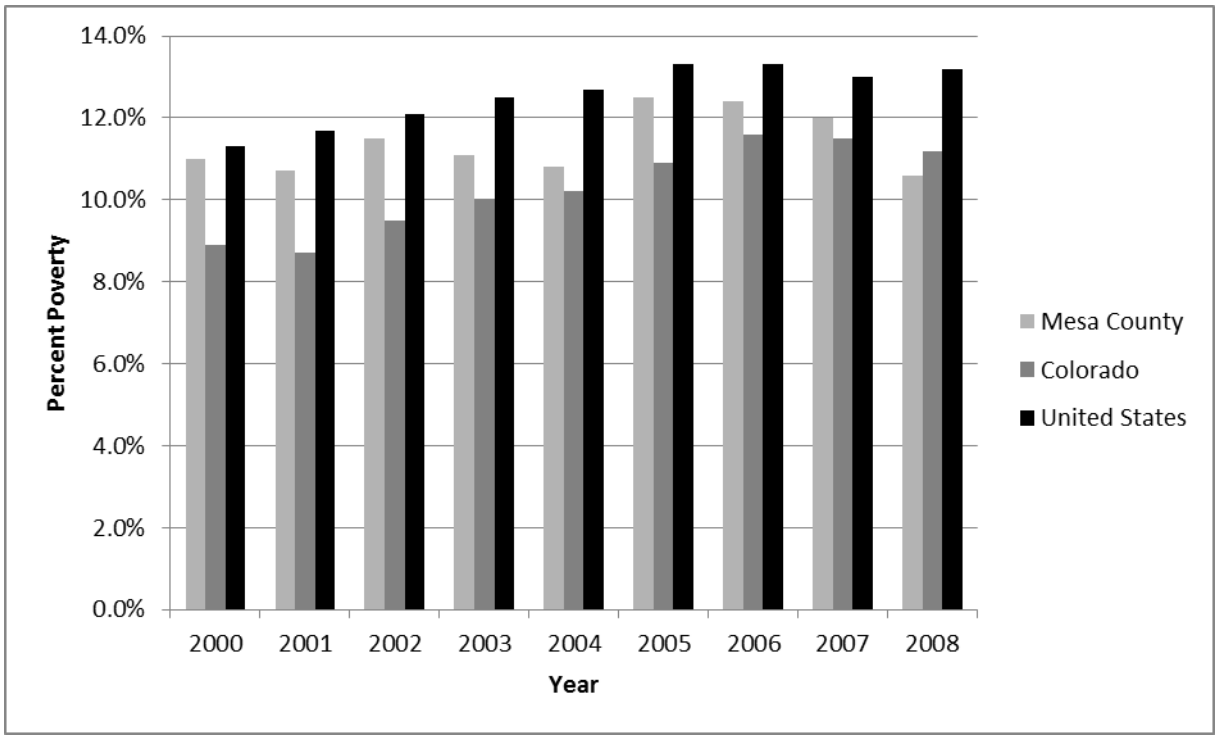
Race	Mesa County		Colorado	
	Total Population	Percentage	Total Population	Percentage
	138,641	**100**	**4,844,568**	**100**
Hispanic or Latino (of any race)	16,342	11.8	963,831	19.9
Mexican	11,346	8.2	712,498	14.7
Puerto Rican	296	0.2	18,236	0.4
Cuban	26	0.0	5,553	0.1
Dominican	0	0.0	1,714	0.0
Central American	132	0.1	26.228	0.0
South American	348	0.3	14,113	0.3
Other Hispanic or Latino	4,194	3.0	185,489	3.8
Not Hispanic or Latino	122,299	88.2	3,880,737	80.1
White alone	117334	84.6	3,448,171	71.2
Black or African American alone	754	0.5	177,105	3.7
American Indian and Alaska Native alone	775	0.6	30,772	0.6
Asian alone	767	0.6	124,787	2.6
Native Hawaiian and Other Pacific Islander alone	137	0.1	4,305	0.1
Some other race alone	52	0.0	10,101	0.2
Two or more races	2,480	1.8	85,496	1.8
Two races including Some other race	120	0.1	3,294	0.1
Two races excluding Some other race, and Three or more races	2,360	1.7	82,202	1.7

Source: US Census Bureau 2008a

the state of Colorado. Until 2009 the county's economic health was largely insulated from changes in the national market. Since then the global recession has hit Mesa County full force. According to the Mesa County Workforce Center employment peaked in April 2009. At that time the labor force in Mesa County stood at 86,122, but the number of individuals unemployed was almost 7,000, an unemployment rate of 8 percent. This is a notable change from one year earlier when the labor force was 80,268 with 2,600 individuals unemployed for an unemployment rate of just 3.2 percent (Mesa County Workforce Center 2010).

Communities within Mesa County, which include Grand Junction, Palisade, Fruita, Debeque, Glade Park, Loma/Mack, Gateway, and Collbran, are roughly similar to Mesa County in minority population and poverty rates. Like the county, the minority populations located within these communities are not dissimilarly affected by BLM management decisions.

Diagram 3-27
Percent of Mesa County Residents in Poverty (2000-2007)



Source: US Census Bureau 2008a

Conclusion

The descriptions in this report represent a snapshot of current demographic and economic trends in the area adjoining the GJFO. As in the past, new demand for oil, the predicted shift towards nuclear power as a means to reducing carbon output, increasing tourism, and/or the designation of new NCAs might produce profound changes in what actually occurs. A return, for example, to uranium mining could bring conflicts between residents who remember the economic boon it provided and residents who express concerns about environmental damage. Improvement of the technology for the extraction of oil from oil shale might raise hopes of a new, pre-1980s boom or concerns about the water demands such technology might represent. A growing professional class, with their recreational preferences, and the quality-of-life benefits provided by the area, a continuing increase in an aging population of retirees, the opportunities to remain in the area for natives forced to seek their economic fortunes elsewhere, any one of these factors might alter the description significantly. Like many communities in the twenty-first century west, those locations abutting the GJFO present a split-personality that is constantly changing.

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