BLM

Chapter 6

Acronyms, Glossary and References

Public Lands USA: Use, Share, Appreciate

CHAPTER 6 ACRONYMS, GLOSSARY AND REFERENCES.....6-1

6.1 Acronyms 6-1

6.2 Glossary.....6-13

6.3 References 6-37

List of Tables

Table 6-1 English to Metric Conversion Table for Commonly Used Measurements 6-36

CHAPTER 6
ACRONYMS, GLOSSARY AND REFERENCES

6.1 Acronyms

2D	Two Dimensional
3D	Three Dimensional
10^6	Million
AADT	Average Annual Daily Traffic
ACEC	Areas of Critical Environmental Concern
ACHP	Advisory Council of Historic Preservation
ADA	Americans with Disabilities Act
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model Improvement Committee's Dispersion Model
AGNC	Associated Governments of Northwest Colorado
AML	Appropriate Management Level
AMP	Allotment Management Plan
AMS	Analysis of the Management Situation
ANC	acid neutralizing capacity
APCD	Air Pollution Control Division
APD	Application for Permit to Drill (an oil or gas drill)
APLIC	Avian Power Line Interaction Committee
AQCC	Air Quality Control Commission
AQRV	Air Quality-Related Values
ARMP	Air Resource Management Plan
ARTSD	Air Resources Technical Support Document
ATV	All Terrain Vehicle
AUM	Animal Unit Month
BA	Biological Assessment

BBC	BBC Research & Consulting
bcf	billion cubic feet
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BMP	Best Management Practice
BOCC	Birds of Conservation Concern
BOPE	Blowout Preventer Equipment
BSC	Biological Soil Crusts
BTEX	Benzene, Toluene, Ethylbenzene, and Xylene
CAA	Clean Air Act
CAAQS	Colorado Ambient Air Quality Standards
$CACO_3$	Calcium Carbonate
CAMx	Comprehensive Air Quality Model with Extensions
CASTNET	Clean Air Status and Trends Network
CBNG	Coal Bed Natural Gas
CCD	Census County Division
CCLT	Colorado Coalition of Land Trusts
CCR	Code of Colorado Regulations
CDLE	Colorado Department of Labor and Employment
CDNR	Colorado Department of Natural Resources
CDOT	Colorado Department of Transportation
CDOW	Colorado Division of Wildlife
CDP	Concentrated Development Plans
CDPHE	Colorado Department of Public Health and Environment
CEC	Colorado Environmental Coalition
CEQ	Council on Environmental Quality

CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CFR	Code of Federal Regulations
cfs	Cubic Feet Per Second
CH_4	Methane
CHS-OAHP	Colorado Historical Society, Office of Archaeology and Historic Preservation
CNAP	Colorado Natural Areas Program
CNHP	Colorado Natural Heritage Program
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon dioxide equivalent
COA	Conditions of Approval
COGCC	Colorado Oil and Gas Conservation Commission
CPNHD	Canyon Pintado National Historic District
CPW	Colorado Parks and Wildlife
CR	County Road
CRCT	Colorado River Cutthroat Trout
CRPP	Cultural Resource Protection Plan
CRVFO	Colorado River Valley Field Office
CSU	Controlled Surface Use
CWA	Clean Water Act
CWP	Citizen's Wilderness Proposal
DAT	Deposition Analysis Threshold
DAU	Data Analysis Units
dBA	decibel
dbh	Diameter Breast Height
DEA	Development Exclusion Area

DEIS	Draft Environmental Impact Statement
DMA	Denver Metropolitan Area
DOE	U.S. Department of Energy
DOI	Department of the Interior
DOLA	Department of Local Affairs
DOT	U.S. Department of Transportation
DPC	Desired Plant Community
DPS	Distinct Population Segment
dv	deciviews
DVF	Future Design Value
E. Coli	*Escherichia coli*
e.g.	For example
EA	Environmental Assessment
EIA	U.S. Energy Information Administration
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
EPCA	Energy Policy and Conservation Act
eq	equivalents
ERMA	Extensive Recreation Management Area
ESA	Endangered Species Act
FACA	Federal Advisory Committee
FAR	Functional At-Risk
FAR-DOWN	Functional At-Risk with a downward trend
FAR-NA	Functional At-Risk no apparent trend
FAR-UP	Functional At-Risk with an upward trend
FEIS	Final Environmental Impact Statement

FLAG	Federal Land Managers' Air Quality Related Values Workgroup
FLF	Federal Leadership Forum
FLM	Federal Land Manager
FLPMA	Federal Land Policy and Management Act (of 1976)
FML	Federal Mineral Lease
FMP	Fire Management Plan
FMU	Fire Management Unit
FR	Federal Register
FRCC	Fire Regime Condition Class
FSA	Farm Service Agency
FY	Fiscal Year
FS	U.S. Forest Service
FWS	U.S. Fish and Wildlife Service
GHG	Greenhouse Gas
GIS	Geographic Information System
GMU	Game Management Unit
GOCO	Great Outdoors Colorado
GPO	Government Printing Office
GRA	Geographic Reference Area
GWP	Global Warming Potential
H_2S	hydrogen sulfide
HA	Herd Area
HAP	Hazardous Air Pollutant
HFR	Historic Fire Regime
HFRA	Healthy Forest Restoration Act
HMA	Herd Management Area

HMRRP	Hazard Management and Resource Restoration Program
HUC	Hydrologic Unit Code
i.e.	That is
I-70	Interstate 70
IB	Information Bulletin
ICS	Incident Command System
ID	Interdisciplinary
IDLH/10	Immediately Dangerous to Life or Health Divided by 10
IM	Instruction Memoranda
IMP	Interim Management Policy
IMPROVE	Interagency Monitoring of Protected Visual Environments
IMT	Incident Management Team
INPS	invasive, non-native plant species
IPCC	Intergovernmental Panel on Climate Change
IPM	Integrated Pest Management
K factor	soil erodibility
km	kilometer
km^2	square kilometer
LAC	Limit of Acceptable Change
LAU	Lynx Analysis Unit
LGS	Liquids Gathering System
LN	Lease Notice
LOC	Level of Concern
LSFO	Little Snake Field Office
MBTA	Migratory Bird Treaty Act
MEI	maximally exposed individual

meq/L	milliequivalents per liter
MFP	Management Framework Plan
mg/L	Milligrams Per Liter
MLA	Mineral Leasing Act
MLE	Most Likely Exposure
MLP	Master Leasing Plan
MMBtu	million British thermal units
MMscf	million standard cubic feet
mmhos/cm	millimhos per centimeter
MOU	Memorandum of Understanding
MPA	Mesaverde Play Area
mt	metric tons
mtpy	metric tons per year
μeq/l	microequivalents per liter
$\mu g/m^3$	micrograms per cubic meter
μmhos/cm	micromhos per centimeter
MY	Million Years Old
N	Nitrogen
N_2O	Nitrogen Oxide
NAAQS	National Ambient Air Quality Standards
NAIP	National Agriculture Imagery Program
NDIS	Natural Diversity Information Source (Colorado Division of Wildlife)
NEPA	National Environmental Policy Act (of 1969)
NF	Non-Functional
NFS	National Forest System
NHD	National Historic District

NHPA	National Historic Preservation Act
NLCS	National Landscape Conservation Service
NM	National Monument
NO_2	Nitrogen Dioxide
NOA	Notice of Availability
NOC	Notice of Completion
NOI	Notice of Intent
NO_x	Nitrogen oxides
NP	National Park
NPDES	National Pollutant Discharge Elimination System
NPS	U.S. National Park Service
NRCS	Natural Resource Conservation Service (United States)
NRDC	Natural Resources Defense Council
NREL	National Renewable Energy Laboratory
NRHP	National Register of Historic Places
NRHP	National Register of Historic Places
NSCR	Non-selective catalytic reduction
NSO	No Surface Occupancy (a stipulation on an oil and gas lease)
NTL	Notice to Lessees
NTT	National Technical Team
NTU	nephelometric turbidity units
NWPS	National Wilderness Preservation System
NWRAC	Northwest Resource Advisory Council
OHV	Off-Highway Vehicle
ONRR	Office of Natural Resources Revenue
ORV	Off-Road Vehicle

OSHS	Occupational Safety and Health Standards
PBA	Programmatic Biological Assessment
PCA	Potential Conservation Areas
PBO	Programmatic Biological Opinion
PCGCC	Pew Center on Global Climate Change
PDF	Adobe Portable Document Format
PDEIS	Preliminary Draft Environmental Impact Statement
PEIS	Programmatic Environmental Impact Statement
PFC	Proper Functioning Condition (of riparian/wetland areas)
PFYC	Potential Fossil Yield Classification
pH	Measure of acidity or alkalinity
PHMSA	Pipeline and Hazardous Materials Safety Administration
$PM_{2.5}$	respirable particulate matter less than 2.5 microns in effective diameter
PM_{10}	respirable particulate matter less than 10 microns in effective diameter
PNC	Potential Natural Community
ppb	parts per billion
ppm	parts per million
PPR	Parachute-Piceance-Roan
PRL	Preference Right Lease
PSSA	Primary Socioeconomic Study Area
PSD	Prevention of Significant Deterioration
psi	Pounds per square inch
R&PP	Recreation and Public Purpose
R&PP Act	Recreation and Public Purposes Act
RAC	Resource Advisory Council
RBC	Rio Blanco County

RCRA	Resource Conservation and Recovery Act (1976)
RD&D	Research, Development, and Demonstration
REL	Reference Exposure Level
RfC	Reference Concentrations for Chronic Inhalation
RFD	Reasonable Foreseeable Development
RFFA	Reasonably foreseeable future actions
RMCO	Rocky Mountain Climate Organization
RMP	Resource Management Plan
RMNP	Rocky Mountain National Park
RMPA	Resource Management Plan Amendment
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
ROW	Right-of-Way
RRF	relative response factor
RV	Recreational Vehicle
RVA	Rement Vegetation Association
S	Sulfur
SCADA	Supervisory Control and Data Acquisition
SCS	Soil Conservation Service
SDWA	Safe Drinking Water Act
SH	State Highway
SHPO	State Historic Preservation Officer
SO_2	Sulfur Dioxide
SO_x	Sulfur Oxide
SRMA	Special Recreation Management Area
SRP	Special Recreation Permit

SSSA	Secondary Socioeconomic Study Area
SWA	State Wildlife Area
TD	Total Depth
TDS	Total Dissolved Solids
T/E	Threatened/Endangered
TEG	Triethylene glycol
TES	Threatened, Endangered, and Sensitive
TL	Timing Limitation
TMDL	Total Maximum Daily Loads
TSS	Total Suspended Solids
TWS	The Wilderness Society
USACE	U.S. Army Corps of Engineers
URS	URS Corporation
U.S. 40	U.S. Highway 40
USC	United States Code
USDA	U.S. Department of Agriculture
USDW	Underground Sources of Drinking Water
USGCRP	U.S. Global Change Research Program
USGS	U.S. Geological Survey
UT	Utah
VFO	Vernal Field Office
VOC	Volatile Organic Compound
VRI	Visual Resource Inventory
VRM	Visual Resource Management
WAFWA	Western Association of Fish and Wildlife Agencies
WAG	Water and Gas

WAP	Watershed Action Plan
WEPP	Water Erosion Prediction Project
WFU	Wildland Fire Use
WIC	Wyoming Interstate Company
WO	Washington Office (BLM)
WQCC	Water Quality Control Commission
WQCD	Water Quality Control Division
WRAP	Western Regional Air Partnership
WRCC	Western Regional Climate Center
WRFO	White River Field Office
WRNF	White River National Forest
WSA	Wilderness Study Area
WSR	Wild and Scenic River(s)
WUI	Wildland Urban Interface
WWEC	West-wide Energy Corridor
° F	Degrees Fahrenheit

6.2 Glossary

A

Access Road. Access roads are single-lane roads that carry a low volume of traffic at a low speed to individual well locations. Access roads are generally reclaimed upon field abandonment.

Actual Use. The amount of animal unit months consumed by livestock based on the numbers of livestock and grazing dates submitted by the livestock operator and confirmed by periodic field checks by the BLM.

Air Pollution. The contamination of the atmosphere by any toxic or radioactive gases and particulate matter as a result of human activity.

Allotment. An area of land in which one or more livestock operators graze their livestock. Allotments generally consist of Bureau of Land Management (BLM) lands but may also include other federally managed, state owned, and private lands. An allotment may include one or more separate pastures. Livestock numbers and periods of use are specified for each allotment.

Allotment Management Plan (AMP). A concisely written program of livestock grazing management, including supportive measures, if required, designed to attain specific management goals in a grazing allotment. An AMP is prepared in consultation with the permittee(s), lessee(s), and other affected interests. Livestock grazing is considered in relation to other uses of the range and to renewable resources, such as watershed, vegetation, and wildlife. An AMP establishes seasons of use, the number of livestock to be permitted, the range improvements needed, and the grazing system.

Alluvium. Unconsolidated material deposited by running water, including gravel, sand, silt, clay, and various mixtures of these.

Alternatives. Other options to the proposed action by which the BLM can meet its purpose and need. The BLM is directed by the National Environmental Policy Act (NEPA) to "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources..." (NEPA Section 102(2)(E).

Analysis of the Management Situation (AMS). Assessment of the current management direction. It includes a consolidation of existing data needed to analyze and resolve identified issues, a description of current BLM management guidance, and a discussion of existing problems and opportunities for solving them.

Animal Unit (AU). Defines forage consumption on the basis of one standard mature 1,000-pound cow, either dry or with calf up to 6 months old; all other classes and kinds of animals can be related to this standard, e.g. a bull equals 1.25 AU, a yearling steer equals 0.6 AU.

Animal Unit Day (AUD). One animal unit is defined as a 1,000 lb. (450 kg) beef cow with or without a nursing calf with a daily requirement of 26 lb. (11.8 kg) of dry matter forage (Ruyle and Ogden 1993). Therefore, one AUM is equal to 780 lb. (355 kg) of dry matter forage (30 days x daily forage requirement). Local AUM values may be modified and these values should be used only as a guide.

Animal Unit Month. The amount of forage needed to sustain one cow, five sheep, or five goats for a month. A full AUMs fee is charged for each month of grazing by adult animals if the grazing animal (1) is weaned, (2) is 6 months old or older when entering public land, or (3) will become 12 months old during the period of use. For fee purposes, an AUM is the amount of forage used by five weaned or adult sheep or goats or one cow, bull, steer, heifer, horse, or mule. The term AUM is commonly used in three ways: (1) stocking rate as in X acres per AUM, (b) forage allocation as in X AUMs in allotment A, and (3) utilization as in X AUMs consumed from Unit B.

Applications for Permit to Drill (APD). The Department of Interior application permit form to authorize oil and gas drilling activities on federal land or mineral estate.

Aquifer. A water-bearing bed or layer of permeable rock, sand, or gravel capable of yielding water.

Areas of Critical Environmental Concern (ACEC). Areas within the public lands where special management attention is required (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards. (From H-6310-1, Wilderness Inventory and Study Procedures.)

Atmospheric Deposition. Air pollution produced when acid chemicals are incorporated into rain, snow, fog or mist and fall to the earth. Sometimes referred to as "acid rain" and comes from sulfur oxides and nitrogen oxides, products of burning coal and other fuels and from certain industrial processes. If the acid chemicals in the air are blown into areas where the weather is wet, the acids can fall to Earth in the rain, snow, fog or mist. In areas where the weather is dry, the acid chemicals may become incorporated into dusts or smokes.

Authorized Officer (AO). The BLM employee delegated by the Field Manager the authority to perform specific duties.

Avoidance. The practice of finding acceptable alternatives.

Avoidance Area. An area where the preferred strategy for managing surface disturbing and disruptive activities is to avoid sensitive resources. Activities would be relocated. Where avoidance is determined not to be feasible, intensive mitigation to prevent adverse effects to the sensitive resources would be required. The extent of avoidance areas may vary, depending on the sensitive resources involved.

Avoidance Buffer. A specified area to help to minimize dust transport, weed invasion, unauthorized vehicular activities, chemical and produced-water spills; and helps to protect pollinator habitat.

AUM (Animal Unit Month). The amount of forage needed by an "animal unit" (AU) grazing for one month. The animal unit in turn is defined as one mature 1,000-pound cow and her suckling calf.

B

Back Country Byways. Vehicle routes that traverse scenic corridors utilizing secondary or back country road systems. National back country byways are designated by the type of road and vehicle needed to travel the byway.

Best Management Practices (BMPs). Are state-of-the-art mitigation measures applied to oil and natural gas drilling and production to help ensure that energy development is conducted in an environmentally responsible manner. BMPs protect wildlife, air quality, and landscapes as we work to develop vitally needed domestic energy sources.

Big Game. Indigenous ungulate wildlife species that are hunted, such as elk, deer, bison, bighorn sheep, and pronghorn antelope.

Biotic Integrity. The capacity of the soil biotic community to support ecological processes within the normal range of variability expected for the site, to resist loss in the capacity to support these processes, and to recover this capacity when losses do occur. The soil biotic community includes plants, animals, and microorganisms occurring both above and below ground.

BLM Sensitive Species. Species that require special management consideration to avoid potential future listing under the Endangered Species Act (ESA) and that have been identified in accordance with procedures set forth in BLM manual 6840. (From M6840, Special Status Species Manual.)

C

Candidate Species. Plants and animals that have been studied and the U.S. Fish and Wildlife Service (FWS) has concluded that they should be proposed for addition to the Federal endangered and threatened species list. These species have formerly been referred to as category 1 candidate species. From the February 28, 1996 Federal Register, page 7597: "those species for which the Service has on file sufficient information on biological vulnerability and threat(s) to support issuance of a proposed rule to list but issuance of the proposed rule is precluded." Separate lists for plants, vertebrate animals, and invertebrate animals are published periodically in the Federal Register. (From M6840, Special Status Species Manual.)

Casual Use. Means activities that involve practices which do not ordinarily cause any appreciable disturbance or damage to the public lands, resources or improvements and, therefore, does not require a right-of-way grant or temporary use permit (43 Code of Federal Regulations [CFR] 2800). Also means any short term non-commercial activity which does not cause appreciable damage or disturbance to the public lands, their resources or improvements, and which is not prohibited by closure of the lands to such activities (43 CFR 2920). Casual use generally includes the collecting of geochemical, rock, soil, or mineral specimens using hand tools, hand panning, and non-motorized sluicing. It also generally includes use of metal detectors, gold spears, and other battery-operated devices for sensing the presence of minerals, and hand battery-operated dry washers. Casual use does not include use of mechanized earth-moving equipment, truck-mounted drilling equipment, suction dredges, motorized vehicles in areas designated as closed to off-road vehicles, chemicals, or explosives. It also does not include occupancy or operations where the cumulative effects of the activities result in more than negligible disturbance.

Channery. A flat rock fragment that is 2-150 mm long.

Clean Air Act (CAA) of 1963 and Amendments. Federal legislation governing air pollution control.

Clean Water Act (CWA). The Federal Water Pollution Control Act (known as the Clean Water Act or CWA) has the objective of restoring and maintaining the chemical, physical, and biological integrity of waters of the United States. The CWA establishes the basic structure for regulating discharges of pollutants (both point and non-point sources) into the waters and regulating quality standards for surface waters as well as defining the roles of States and Federal Agencies. The basis of the CWA was enacted in 1948 and was called the Federal Water Pollution Control Act, but the Act was significantly reorganized and expanded in 1972. "Clean Water Act" became the Act's common name with amendments in 1977.

Closed. Generally denotes that an area is not available for a particular use or uses; refer to specific definitions found in law, regulations, or policy guidance for application to individual programs. For example, 43 CFR 8340.0-5 sets forth the specific meaning of "closed" as it relates to off-highway vehicle use, and 43 CFR 8364 defines "closed" as it relates to closure and restriction orders.(From H-1601-1, BLM Land Use Planning Handbook.)

Collector Roads. These Bureau roads normally provide primary access to large blocks of land, and connect with or are extensions of a public road system. Collector roads accommodate mixed traffic and serve many uses. They generally receive the highest volume of traffic of all the roads in the Bureau 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 Bureau. As a result, they have the potential for creating substantial environmental impacts and often require complex mitigation procedures.

Colluvium. Unconsolidated, unsorted earth material being transported or deposited on sideslopes and/or at the base of slopes by mass movement (e.g., direct gravitational action) and by local, unconcentrated runoff.

Compensatory Mitigation. The objective of the Clean Water Act (CWA) is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Toward achievement of this goal, the CWA prohibits the discharge of dredged or fill material into wetlands, streams, and other waters of the United States unless a permit issued by the U.S. Army Corps of Engineers (USACE) or approved by the State under the CWA Section 404 authorizes such a discharge. When there is a proposed discharge, all appropriate and practicable steps must first be taken to avoid and minimize impacts to aquatic resources. For unavoidable impacts, compensatory mitigation is required to replace the loss of wetland, stream, and/or other aquatic resource functions. The USACE (or approved state authority) is responsible for determining the appropriate form and amount of compensatory mitigation required. Methods of providing compensatory mitigation include aquatic resource restoration, establishment, enhancement, and in certain circumstances, preservation.

Concentrated Development Area (CDA). A core area identified within the White River Field Office (WRFO) where oil and gas development would take place. Energy development within the Concentrated Development Areas would leave large, contiguous blocks of land and corridors available for wildlife without oil and gas development activities. Development and reclamation of Concentrated Development Areas would be in accordance with the Concentrated Development Plan.

Concentrated Development Plan. A long-term strategy for development of a core area within the WRFO where the majority of development activity would take place. SEE ALSO Concentrated Development Area.

Condition Class (Fire Regimes). Fire Regime Condition Classes are a measure describing the degree of departure from historical fire regimes, possibly resulting in alterations of key ecosystem components such as species composition, structural stage, stand age, canopy closure, and fuel loadings. One or more of the following activities may have caused this departure: fire suppression, timber harvesting, livestock grazing, introduction and establishment of exotic plant species, introduced insects or disease, or other management activities.

Conditions of Approval (COA). A site-specific and enforceable requirement included in an approved APD or Sundry Notice that my limit or amend the specific actions proposed by the operator. Conditions of Approval minimize, mitigate, or prevent impacts to resource values or other uses of public lands.

Conformable. Of or pertaining to an unbroken sequence of strata or beds, characteristic of uninterrupted deposition.

Controlled Surface Use, (CSU). A category of stipulations that allows some use and occupancy of public land while protecting identified resources or values. The stipulation identifies the location protected, activities prohibited or restricted, and the resources protected. The extent of protection may range from a limited area for only one activity to all uses. Typically used in use authorizations. For the protected resource, some activities may be prohibited while others are allowed. Activities may be allowed, but only under certain conditions. Examples include: (1) Seismic operations prohibited within a certain distance of an unstable resource (i.e., historic structure). (2) Only tracked construction vehicles are allowed access to the site (see also Stipulation Category).

Cooperating Agency. Assists the lead Federal agency in developing an Environmental Assessment or an Environmental Impact Statement. A cooperating agency may be any agency that has special jurisdiction by law or special expertise for proposals covered by the NEPA (40 CFR 1501.6). Any Federal, State, tribal, or local government jurisdiction with such qualifications may become a cooperating agency by agreement with the lead agency.

Corridor. A tract of land forming a passageway for linear utilities or transportation uses.

Council on Environmental Quality (CEQ). An advisory council to the President of the United States established by the National Environmental Policy Act of 1969. It reviews Federal programs to analyze and interpret environmental trends and information.

Critical Habitat. An area occupied by a threatened or endangered species "on which are found those physical and biological features (1) essential to the conservation of the species, and (2) which may require special management considerations or protection."

Cultural Modification. Any human-caused change in the landform, water form, vegetation, or the addition of a structure which creates a visual contrast in the basic elements (form, line, color, texture) of the natural character of a landscape.

Cultural Resources: Past evidence, prehistoric or historic more than 50 years of age, of human use and occupation of the land.

Cumulative Action. Proposed actions, which, when viewed with the proposed action, potentially have cumulatively significant impacts related to one or more identified issues. Cumulative actions "should be discussed" in the same NEPA document (40 CFR 1508.25(a)(2)).

Cumulative Effect. " the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions" (40 CFR 1508.7 and 1508.25)

Current Management Decisions. A management decision is a decision made by the BLM to manage public lands. Management decisions are made on both land use plan decisions and implementation decisions. The BLM's current management decisions for oil and gas resources are described in the existing *White River Record of Decision and Approved Resource Management Plan* (approved July 1, 1997), as amended (referred to as the 1997 White River RMP).

D

Deferred Rotation. Rotation grazing with regard to deferring pastures beyond the growing season, if they were used early the prior year, or that have been identified as needing deferment for resource reasons.

Designated Right-of-way Corridor. A parcel of land with specific boundaries identified by law, a Secretarial order, the land-use planning process, or other management decision as being the preferred location for existing and future rights-of-way. The corridor could be suitable to accommodate more than one type of right-of-way or one or more rights-of-way that are similar, identical or compatible.

Designated Roads and Trails. Specific roads and trails identified by the BLM (or other agencies) where some type of motorized vehicle use is appropriate and allowed either seasonally or year-long. (From H-1601-1, BLM Land Use Planning Handbook.)

Direct Employment. Jobs specifically related to the sector under discussion. For example, drilling jobs and well and facility maintenance jobs in the natural gas industry.

Disposal. Transfer of public land out of federal ownership to another party through sale, exchange, Recreation and Public Purposes Act, Desert Land Entry or other land law statutes.

E

Easement. A right afforded a person or agency to make limited use of another's real property for access or other purposes.

Economic Base Jobs. Jobs in sectors and activities defined as economic drivers.

Economic Drivers. Activities that support the local economy by bringing in money from outside the region.

Eligibility. Qualification of a river for inclusion into the National Wild and Scenic Rivers System through the determination (professional judgment) that it is free-flowing and, with its adjacent land area, possesses at least one river-related value considered to be outstandingly remarkable. (From M-8351, BLM WSR Policy and Program.)

Endangered Species. Any species which is in danger of extinction throughout all or a significant portion of its range. (From M6840, Special Status Species Manual.)

Energy Policy Act of 2005. A bill passed by the 109th Congress in August 2005 that includes new authority (Section 388) for Minerals Management Service to regulate alternate energy resources on the outer continental shelf.

Environmental Analysis. An analysis of alternative actions and their short term and long-term environmental effects, incorporating physical, biological, economic, and social considerations (USDA, USDI 1994a).

Environmental Impact Statement (EIS). A detailed statement prepared by the responsible official in which a major Federal action which significantly affects the quality of the human environment is described, alternatives to the proposed action provided, and effects analyzed. (From BLM National Management Strategy for OHV Use on Public Lands.)

Ephemeral Stream - An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

Erosion. The wearing away of the land surface by running water, wind, ice, or other geological agents.

Exceedance. An event, characterized by duration and degree of exceedance, where the concentration of a pollutant is greater than (or equal to) the appropriate quality standard.

Exception. Is a one-time exemption for a particular site within the leasehold; exceptions are determined on a case-by-case basis; the stipulation continues to apple to all other sites with the leasehold. An exception is limited type of waiver.

Exclusion Areas. Land areas determined to be unavailable for corridor allocation or facility siting. Exceptions would only be considered for short-term land use permits involving no development and projects that are consistent with management objectives for the area.

Extensive Recreation Management Area (ERMA). Areas in which significant recreation opportunities and problems are limited and explicit recreation management is not required. Minimal management actions related to BLM's stewardship responsibilities are adequate in these areas.

F

Facility. An improvement or structure, whether existing or planned, that is or would be owned and controlled by the grant or lease holder within a right-of-way. For purposes of communication site rights-of-way or uses, facility refers to the building, tower, and related incidental structures or improvements authorized under the terms of the grant or lease.

Factor Competition. Competition for labor and other inputs, and corresponding wage and price increases that may constrain economic growth in some sectors.

Federal Land Policy and Management Act of 1976 (FLPMA). Public Law 94-579, October 21, 1976, often referred to as the BLM's "Organic Act," which provides the majority of the BLM's legislated authority, direction policy and basic management guidance. (From BLM National Management Strategy for OHV Use on Public Lands.)

Fire Frequency. A general term referring to the recurrence of fire in a given area over time. It is sometimes stated as number of fires per unit time in a designated area. It is also used to refer to the probability of an element burning per unit time.

Fire Intensity. The rate of heat release along a unit length of fireline, measured in kW m^{-1}.

Fire Regime. The combination of fire frequency, predictability, intensity, seasonality, and extent characteristic of fire in an ecosystem.

Fire Regime Condition Class (FRCC). Fire Regime Condition Classes are a qualitative measure describing the degree of departure from historical fire regimes, possibly resulting in alterations of key ecosystem components such as species composition, structural stage, stand age, canopy closure, and fuel loadings. One or more of the following activities may have caused this departure: fire exclusion, timber harvesting, livestock grazing, introduction and establishment of exotic plant species, introduced insects and disease, or other management activities.

Fire Severity. The effect of fire on plants. For trees, severity is often measured as a percentage of basal area removed.

Fire Suppression. All work activities connected with fire extinguishing operations, beginning with discovery of a fire and continuing until the fire is completely out.

Fluid Minerals. Oil, gas, coal bed natural gas, and geothermal resources.

Forage. Browse and herbage that are available for food for grazing animals or be harvested for feeding.

Forest. Contains tree species commonly harvested as a timber resource including ponderosa pine, lodgepole pine, Douglas-fir, spruce/fir mix, and aspen.

Functioning at Risk. (1) Condition in which vegetation and soil are susceptible to losing their ability to sustain naturally functioning biotic communities. Human activities, past or present, may increase the risks. (2) Uplands or riparian-wetland areas that are properly functioning, but a soil, water, or vegetation attribute makes them susceptible to degradation and lessens their ability to sustain natural biotic communities. Uplands are particularly at risk if their soils are susceptible to degradation. Human activities, past or present, may increase the risks. SEE ALSO Properly Functioning Condition and Nonfunctioning Condition. (From H-4180-1, BLM Rangeland Health Standards Manual.)

G

Global Positioning System (GPS). Computer software that records and stores coordinates for positions on earth via satellite.

Goal. A broad statement of a desired outcome. Goals are usually not quantifiable and may not have established time frames for achievement.

Grazing Allotment. A grazing arrangement comprised of numerous subdivisions (pastures) with a central component for livestock management and movement.

Grazing Preference. The total number of AUMs on public land apportioned and attached to base property owned or controlled by a lessee.

Ground Disturbance. The result of an activity that causes surface and or subsurface disruption to vegetation, soil layers, or rock.

H

Habitat. An environment which meets a specific set of physical, biological, temporal or spatial characteristics that satisfy the requirements of a plant or animal species or group of species for part or all of their life cycle.

Herd Management Area (HMA). Public land under the jurisdiction of the BLM that has been designated for special management emphasizing the maintenance of an established wild horse or burro herd.

Heritage Resources: evidence of past life on earth including paleontological resources (fossils) and cultural resources (human activity) on the land.

Historic Fire Regime (HFR). A classification of the effects of ecosystem disturbance caused by fire over time and space. Generally encompasses the period between 1500 to late 1800, before extensive settlement by European-Americans in many parts of North America, before intense conversion of wildlands for agricultural and other purposes, and before fire suppression effectively reduced fire frequency in many areas. Sometimes referred to as "presettlement" fire regimes.

Hydrologic Function. The capacity of an area to capture, store, and safely release water from rainfall, run-on, and snowmelt, to resist a reduction in this capacity, and to recover this capacity when a reduction does occur.

I

Impacts (or Effects). Consequences (the scientific and analytical basis for comparison of alternatives) as a result of a proposed action. Effects may be either direct, which are caused by the action and occur at the same time and place, or indirect, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable, or cumulative.

Implementation Action. An action that implements land use plan decisions.

Indicator. A measurable parameter (metric) or an index of multiple measurable parameters (metrics) used to track progress toward achieving a desired condition and/or standard. Indicators are measures that change in response to human activity and can be used to assess the quality of resource or experience conditions.

Infrastructure. The basic framework or underlying foundation of a community, including road networks, electric and gas distribution, water and sanitation services, and facilities.

Interdisciplinary Team. A group of individuals with different training, representing the physical sciences, social sciences, and environmental design arts, assembled to solve a problem or perform a task. The members of the team proceed to a solution with frequent interaction so that each discipline may provide insights to any stage of the problem and disciplines may combine to provide new solutions. The number and disciplines of the members preparing the plan vary with circumstances. A member may represent one or more discipline or Bureau program interest.

Interior Board of Land Appeals (IBLA). The Department of the Interior, Office of Hearings and Appeals board that acts for the Secretary of the Interior in responding to appeals of decisions on the use and disposition of public lands and resources. Because the Interior Board of Land Appeals acts for and on behalf of the Secretary of the Interior, its decisions usually represent the Department's final decision but are subject to the courts.

Interim Reclamation. Reclamation initiated on well pads, roads, and pipelines after drilling activity is completed and wells are in production. Interim reclamation is considered successful when reclamation performance objectives are met.

Intermittent Stream. An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.

Invasive Species. A plant or animal species that has moved into an area and reproduced so aggressively that it has replaced some of the original (native) species.

Issue. A point or matter of discussion, debate, or dispute about the potential environmental effects or impacts, of an action. Issues point to environmental effects and may drive the development of alternatives to the proposed action.

K

K factor. A soil erodibility factor used in the universal soil loss equation that is a measure of the susceptibility of soil particles to detachment and transport by rainfall and runoff. Estimation of the factor takes several soil parameters into account, including: soil texture, percent of sand greater than 0.10 mm, soil organic matter content, soil structure, soil permeability, clay mineralogy, and coarse fragments. K factor values range from .02 to .64, the greater values indicating the highest susceptibilities to erosion.

L

Late Season. Fall or late summer grazing.

Land Classification. When, under criteria of 43 CFR 2400, a tract of land has potential for either retention for multiple use management or for some form of disposal, or for more than one form of disposal, the relative scarcity of the values involved and the availability of alternative means and sites for realization of those values will be considered. Long-term public benefits will be weighed against more immediate or local benefits. The tract will then be classified in a manner which will best promote the public interest.

Land Tenure Adjustments. Ownership or jurisdictional changes are referred as "Land Tenure Adjustments." To improve the manageability of the BLM lands and improve their usefulness to the public, BLM has numerous authorities for "repositioning" lands into a more consolidated pattern, disposing of lands, and entering into cooperative management agreements. These land pattern improvements are completed primarily through the use of land exchanges, but also through land sales, jurisdictional transfers to other agencies, and through the use of cooperative management agreements and leases.

Land Use Allocation. The identification in a land use plan of the activities and foreseeable development that are allowed, restricted, or excluded for all or part of the Planning Area, based on desired future conditions. (From H-1601-1, BLM Land Use Planning Handbook.)

Land Use Plan. A set of decisions that establish management direction for land within an administrative area, as prescribed under the planning provisions of FLPMA; an assimilation of land-use-plan-level decisions developed through the planning process outlined in 43 CFR 1600, regardless of the scale at which the decisions were developed. The term includes both RMPs and MFPs. (From H-1601-1, BLM Land Use Planning Handbook.)

Leasable Minerals. A legal term that, for federal lands or a federally retained mineral interest in lands in the United States, defines a mineral or mineral commodity acquired through the Mineral Leasing Act of 1920, as amended, the Geothermal Steam Act of 1970, as amended, or the Acquired Lands Act of 1947, as amended. Acquisition of leasable minerals is by application for a government lease and permits to mine or explore after lease issuance.

Lease. Section 302 of the Federal Land Policy and Management Act of 1976 (FLPMA) provides the BLM's authority to issue leases for the use, occupancy, and development of the public lands. Leases are issued for purposes such as a commercial filming, advertising displays, commercial or noncommercial croplands, apiaries, livestock holding or feeding areas not related to grazing permits and leases, harvesting of native or introduced species, temporary or permanent facilities for commercial purposes (does not include mining claims), residential occupancy, ski resorts, construction equipment storage sites, assembly yards, oil rig stacking sites, mining claim occupancy if the residential structures are not incidental to the mining operation, and water pipelines and well pumps related to irrigation and non-irrigation facilities. The regulations establishing procedures for the processing of these leases and permits are found in 43 CFR 2920.

Lease Notice. Provides more detailed information concerning limitations that already exist in law, lease terms, regulations, or operational orders.

Lease Stipulation. Is a condition of the lease issuance that provides a level of protection for other resource values or land uses by restricting lease operations during certain times or locations or to avoid unacceptable impacts, to an extent greater than standard lease terms or regulations. A stipulation is an enforceable term of the lease contract; supersedes any inconsistent provisions of the standard lease form, and is attached to and made a part of the lease. Lease stipulations further implement the BLM regulatory authority to protect resources or resource values. Lease stipulations are developed through the land use planning process.

Lek. An assembly area where birds, especially sage-grouse, carry on display and courtship behavior.

Limited. Designated areas and trails where the use of off-road vehicles is subject to restrictions, such as limiting the number or types or vehicles allowed, dates and times of use (seasonal restrictions), limiting use to existing roads and trails, or limiting use to designated roads and trails. Under the designated roads and trails designation, use would be allowed only on roads and trails that are signed for use. Combinations of restrictions are possible, such as limiting use to certain types of vehicles during certain times of the year. (From BLM National Management Strategy for OHV Use on Public Lands.)

Local Roads. These Bureau 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 uses. 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 effort of terrain, may be single lane roads with turnouts. Environmental impacts are reduced as steeper grades, sharper curves, and lower design speeds than would be permissible on collector roads are allowable. (Note: for oil and gas development, a local road provides access to more than one well pad and provides the connection between collector roads and resource roads.)

Locatable Minerals. Minerals subject to exploration, development, and disposal by staking mining claims as authorized by the Mining Law of 1872, as amended. This includes deposits of gold, silver, and other uncommon minerals not subject to lease or sale.

Long-term Impacts. For the purpose of this NEPA analysis, long-term impacts last for the life of the project or beyond.

LU Project Lands. Privately owned submarginal farmlands incapable of producing sufficient income to support the family of a farm owner and purchased under Title III of the Bankhead-Jones Farm Tenant Act of July 22, 1937. These acquired lands became known as "Land Utilization Projects" and were subsequently transferred from jurisdiction of the U.S. Department of Agriculture to the U.S. Department of the Interior. They are now administered by the BLM.

M

Managed Development. In the context of this Resource Management Plan Amendment (RMPA), "managed development" refers to managing the spatial extent of surface disturbance by limiting the extent of impacts to sensitive wildlife habitats (e.g., the extent of sensitive big game seasonal range subjected to cumulative adverse behavioral effects, such as harassment or avoidance) at any one time. The managed development approach considered in this RMPA includes establishing thresholds for cumulative adverse behavior effects to be applied per Game Management Unit (GMU), as defined by Colorado Division of Wildlife (CDOW), and by leaseholder. The managed development concept differs from the traditional "phased development" approach (defined in this Glossary) in that limitation of the spatial extent of surface disturbance is achieved by managing the extent of impacts to sensitive wildlife habitats rather than limiting total surface disturbance to a specific geographic area, or specific acreage regardless of habitat, condition, or terrain. Further, reclamation to a particular wildlife habitat, rather than a geographic area, is used as the criterion for removing acres of habitat from the disturbance threshold computation. The overall vision for a managed development approach would be to cluster, collocate, and consolidate surface facilities and other ground-disturbing activities.

Management Decision. A decision made by the BLM to manage public lands. Management decisions include both land use plan decisions and implementation decisions.

Management Strategies. Policy, regulatory and programmatic strategies implemented in order to reach desired conditions. Examples of management strategies may include education programs, environmental improvement projects and land use policies.

Micromhos per centimeter. The basic unit of measurement of conductivity in water is the mho or siemens. Conductivity is measured in micromhos per centimeter (µmhos/cm) or microsiemens per centimeter (µS/cm).

Millimhos per centimeter. Reporting unit for electrical conductivity (salinity) in soils; is the ability of a solution to conduct an electrical current, or the reciprocal of the solution's ability to resist the current.

Mineral. Any naturally formed inorganic material, solid or fluid inorganic substance that can be extracted from the earth, any of various naturally occurring homogeneous substances (as stone, coal, salt, sulfur, sand, petroleum, water, or natural gas) obtained for man's use, usually from the ground. Under Federal laws, considered as locatable (subject to the general mining laws), leasable (subject to the Mineral Leasing Act of 1920), and salable (subject to the Materials Act of 1947).

Mineral Entry. The filing of a claim on public land to obtain the right to any locatable minerals it may contain.

Mineral Estate. The ownership of minerals, including rights necessary for access, exploration, development, mining, ore dressing, and transportation operations.

Mineral Materials. Materials such as sand and gravel and common varieties of stone, pumice, pumicite, and clay that are not obtainable under the mining or leasing laws but that can be acquired under the Materials Act of 1947, as amended.

Mining Claim. A parcel of land that a miner takes and holds for mining purposes, having acquired the right of possession by complying with the Mining Law and local laws and rules. A mining claim may contain as many adjoining locations as the locator may make or buy. There are four categories of mining claims: lode, placer, millsite, and tunnel site.

Mitigation. A method or process by which impacts from actions may be made less injurious to the environment through appropriate protective measures.

Mitigation Measures. Actions taken to reduce or minimize potential impacts to the environment.

Modification. Is a change to the provisions of the lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

Multiple Use. The management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to changing needs and conditions; the use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historical values; and harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output (FLPMA). (From M6840, Special Status Species Manual.)

N

National Wild and Scenic Rivers System. A system of nationally designated rivers and their immediate environments that have outstanding scenic, recreational, geologic, fish and wildlife, historic, cultural, and other similar values and are preserved in a free-flowing condition. The system consists of three types of streams: (1) recreation—rivers or sections of rivers that are readily accessible by road or railroad and that may have some development along their shorelines and may have undergone some impoundments or diversion in the past, (2) scenic—rivers or sections of rivers free of impoundments with shorelines or watersheds still largely undeveloped but accessible in places by roads, and (3) wild—rivers or sections of rivers free of impoundments and generally inaccessible except by trails, with watersheds or shorelines essentially primitive and waters unpolluted.

Nonfunctioning Condition. (1) Condition in which vegetation and ground cover are not maintaining soil conditions that can sustain natural biotic communities. (2) Riparian-wetland areas are considered to be in nonfunctioning condition when they do not provide adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows and thus are not reducing erosion, improving water quality, or other normal characteristics of riparian areas. The absence of a flood plain may be an indicator of nonfunctioning condition. SEE ALSO Properly Functioning Condition and Functioning at Risk. (From H-4180-1, BLM Rangeland Health Standards Manual.)

Notice of Availability (NOA). The *Federal Register* notice that an EIS (draft or final) or record of decision is available. Publication of a notice of filing of an EIS by the Environmental Protection Agency formally begins the public comment period. A NOA may also be published for an EA.

Notice of Intent (NOI). This *Federal Register* notice announces that an environmental impact statement or an EA-level land use plan amendment will be prepared. Publication of this notice formally starts the scoping process.

No Surface Occupancy, (NSO). Land use allocation or approval restriction used when surface disturbance cannot be mitigated and must be prohibited. The land use decision or stipulation identifies the NSO area and allowed or excepted uses in the area. NSO stipulations are used on oil and gas leases where drilling and/or operations impacts cannot be adequately mitigated but fluid mineral resources may be recovered by directional drilling. Exclusion Area designations in the Realty Program are NSO land use decisions. This stipulation can be used to prohibit other surface disturbing or disruptive activities such as commercial recreational activities, mining, and timber harvest (see also Stipulation Category).

O

Objectives. A description of a desired condition for a resource. Objectives can be quantified and measured and, where possible, have established time frames for achievement.

Occupied habitat. Intact habitat currently supporting special status plant species. Occupied habitat also includes areas that were previously mapped or confirmed as occupied habitat, but do not contain special status plant species presently

Off-Highway Vehicle (OHV). Any motorized vehicle capable of, or designed for, travel on or immediately over land, water, or other natural terrain, excluding: (1) any non-amphibious registered motorboat: (2) any military, fire, emergency, or law enforcement vehicle while being used for emergency purposes; (3) any vehicle whose use is expressly authorized by the authorized officer, or otherwise officially approved; (4) vehicles in official use; and (5) any combat or combat support vehicle when used for national defense. (From H-1601-1, BLM Land Use Planning Handbook.)

Old-growth Forest and Woodlands. Distinguished by the age/seral stage, structure, and function of the community. Old-growth forest typically contain large-diameter trees of specific species, a wide variation in age including old trees, accumulations of large dead standing and fallen trees, decadence in the form of broken or deformed tops and boles, multi-layered canopies, and canopy interspaces and understory patchiness.

Onshore Oil and Gas Orders. Onshore Oil and Gas Orders implement and supplement the oil and gas regulations found at 43 CFR 3160 for conducting oil and gas operations on Federal and Indian lands.

Open. Designated areas and trails where off-road vehicles may be operated, subject to operating regulations and vehicle standards set forth in BLM Manuals 8341 and 8343; or an area where all types of vehicle use is permitted at all times, subject to the standards in BLM Manuals 8341 and 8343. (From BLM National Management Strategy for OHV Use on Public Lands.)

Other Avoidance Area. An area where the preferred strategy for managing surface disturbing and disruptive activities is to avoid sensitive resources, not primarily addressed in 'avoidance areas.' Other Avoidance Areas may include discrete areas such as: wildlife habitat and breeding habitat; location of nests/burrows; river and creek corridors; areas prone to severe erosion, landslides, and sinkholes; viewsheds; and areas not delineated as state or federal areas of critical environmental concern.

Outstandingly Remarkable Values. Values among those listed in Section 1(b) of the Act: "scenic, recreational, geological, fish and wildlife, historical, cultural, or other similar values...." Other similar values which may be considered include ecological, biological or botanical, paleontological, hydrological, scientific or research values. (From M-8351, BLM WSR Policy and Program.)

Ozone. A faint blue gas produced in the atmosphere from chemical reactions of such sources as burning coal, gasoline and other fuels, and chemicals found in products including solvents, paints, hairsprays, etc.

P

Perennial Stream. A perennial stream has flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow.

Permit Long. Grazing for the duration of the permitted time with care taken not to overuse the resource.

Permitted Use. The forage allocated by, or under the guidance of, an applicable land use plan for livestock grazing in an allotment under a permit or lease, and is expressed in Animal Unit Months (AUMs) (43 CFR § 4100.0-5). (From H-4180-1, BLM Rangeland Health Standards Manual.)

Phased Development. Traditionally, "phased development" refers to prescribing the sequence of drilling operations by geographic area to allow for the development of certain areas while resting or temporarily restricting development of other areas. Subsequent development occurs as areas developed earlier are completed and reclaimed. Examples of a phased development approach include restricting drilling operations to prescribed geographical "development areas" at any one time and prohibiting shifting operations to the next development area until reclamation is complete; or limiting total surface disturbance at any one time to a specific acreage.

Plan Maintenance. The BLM regulation in 43 CFR 1610.54 provides that land use plans decisions and supporting components can be maintained through plan maintenance actions to reflect minor changes in data. Plan maintenance must not expand the scope of resource uses or restrictions or change the terms, conditions, and decisions of the approved plan.

Planning Analysis. A process using appropriate resource data and NEPA analysis to provide a basis for decisions in areas not yet covered by an RMP.

Plant Consideration Area. An area or zone of influence around occupied habitat for federally listed, proposed, or candidate species. The area of influence around a disturbance includes the species' niche (e.g. potential impacts to pollinator species, seed dispersal, etc.) related to the welfare and survival of the species.

Play. Refers to a group of hydrocarbon accumulations with a combination of common geologic, geographic, and/or temporal properties (e.g., source rock, migration pathway, timing, trap style, reservoir rock, hydrocarbon type, etc.) that have proven to be commercially productive in a given area.

Potential habitat. Unsurveyed habitat determined by the known geologic substrate on which the special status plant species are known to occupy.

Prevention of Significant Deterioration (PSD). An air pollution permitting program intended to ensure that air quality does not diminish in attainment areas.

Primary Socioeconomic Study Area. Rio Blanco County, Colorado.

Primitive and Unconfined Recreation. Non-motorized, non-mechanized (except as provided by law), and undeveloped types of recreational activities. Bicycles are considered mechanical transport. (From H-6310-1, Wilderness Inventory and Study Procedures.)

Priority Riparian/Wetland Habitat. Those areas with, or with potential to have, any of the following resource values: fisheries, special status species habitat, potential for system improvement or for persistent water flow or the presence of other identified riparian dependent values.

Proper Functioning Condition (PFC). (1) An element of the Fundamental of Rangeland Health for watersheds, and therefore a required element of State or regional standard and guidelines under 43 CFR § 4180.2(b). (2) Condition in which vegetation and ground cover maintain soil conditions that can sustain natural biotic communities. For riparian areas, the process of determining function is described in the BLM Technical Reference TR 1737-9. FEIS at 26, 72. (3) Riparian-wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high waterflows, thereby reducing erosion and improving water quality; filter sediment, capture bedload, and aid flood plain development; improve floodwater retention and groundwater recharge; develop root masses that stabilize streambanks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; and support greater biodiversity. (4) Uplands function properly when the existing vegetation and ground cover maintain soil conditions capable of sustaining natural biotic communities. SEE ALSO Nonfunctioning Condition and Functioning at Risk. (From H-4180-1, BLM Rangeland Health Standards Manual.)

Proposed Action. A proposal for the BLM to authorize, recommend, or implement an action to address a clear purpose and need. A proposal may be generated internally or externally.

Proposed Species. As defined by the FWS, any species of fish, wildlife, or plant that is proposed in the Federal Register to be listed under Section 4 of the Endangered Species Act (ESA). It is proposed for a limited amount of time to complete the status review, consideration of protective conservation measures, and make a final determination whether the species will be listed as threatened or endangered**.**

Protest. An opportunity for a qualified party to seek an administrative review of a proposed decision in accordance with program-specific regulations. For example, a protest may be filed with the Director of the BLM for review of a proposed resource management plan or plan amendment (43 CFR 1610.5-2), or a proposed grazing decision may be protested for review by the authorized officer (43 CFR 4160.2).

Public Land. Land or interest in land owned by the United States and administered by the Secretary of the Interior through the BLM without regard to how the United States acquired ownership, except lands located on the Outer Continental Shelf, and land held for the benefit of Indians, Aleuts, and Eskimos. (From H-1601-1, BLM Land Use Planning Handbook.)

R

Reasonable Foreseeable Development (RFD) Scenario. The prediction of the type and amount of oil and gas activity that would occur in a given area. The prediction is based on geologic factors, past history of drilling, projected demand for oil and gas, and industry interest.

Reclamation. Returning disturbed lands to a form and productivity that will be ecologically balanced and in conformity with a predetermined land management plan.

Recreation and Public Purposes (R&PP) Act (of 1926). Recreation and Public Purposes Act provided for the lease and sale of public lands determined valuable for public purposes. The objective of the R&PP Act is to meet the needs of state and local government agencies and non-profit organizations by leasing or conveying public land required for recreation and public purpose uses. Examples of uses made of R&PP Act lands are parks and greenbelts, sanitary landfills, schools, religious facilities, and camps for youth groups. The Act provides substantial cost-benefits for land acquisition and provides for recreation facilities or historical monuments at no cost.

Recreation Opportunity Spectrum (ROS). A continuum used to characterize recreation opportunities in terms of setting, activity and experience opportunities. The spectrum covers a range of recreation opportunities from primitive to urban. With respective to river management planning, ROS represents one possible method for delineating management units or zones. See BLM Manual Section 8320 for more detailed discussion. (From M-8351, BLM WSR Policy and Program.)

Recreational River. Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

Residuum. (residual soil material) Unconsolidated, weathered, or partly weathered mineral material that accumulates by disintegration of bedrock in place.

Resource Management Plan (RMP). A land use plan as prescribed by the FLPMA that establishes, for a given area of land, land-use allocations, coordination guidelines for multiple-use, objectives, and actions to be achieved.

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 BLM costs, with minimal consideration for user cost, comfort, or travel time.

Rest Rotation. Grazing rotation that rests pastures that have been grazed early the prior year or that have been identified as needing rest for resource reasons.

Right-of-Way (ROW). Means the public lands authorized to be used or occupied for specific purposes pursuant to a right-of-way grant, which are in the public interest and which require rights-of-way over, upon, under, or through such lands.

Riparian. Wetlands situated on or pertaining to the bank of a river, stream, lake or other body of water. Typically used to refer to the plants that grow rooted in the water table. In common use, this term can be synonymous with wetlands, but typically refers to areas along flowing water (see definition for Lentic and Lotic). (See also Wetland/Riparian)

Riparian Area. A form of wetland transition between permanently saturated wetlands and upland areas. Riparian areas exhibit vegetation or physical characteristics that reflect the influence of permanent surface or subsurface water. Typical riparian areas include lands along, adjacent to, or contiguous with perennially and intermittently flowing rivers and streams, glacial potholes, and the shores of lakes and reservoirs with stable water levels. Excluded are ephemeral streams or washes that lack vegetation and depend on free water in the soil.

Rock Art. Petroglyphs (carvings) or pictographs (painting) used by native persons to depict their history and culture.

Rotation. Grazing rotation between pastures in the allotment for the permitted time.

S

Sage-Grouse Population Area. An area that is currently occupied by sage-grouse that are physically separated by areas of non-habitat and that may have local work groups addressing their management in Colorado. There are parts of three population areas in the WRFO, including the Parachute-Piceance-Roan, the Northwest Colorado, and the Meeker-White River. Population areas are mapped and identified in the Colorado Greater Sage-Grouse Conservation Plan (January 2008). Signatories include CDOW, Forest Service Rocky Mountain Region, Natural Resources Conservation Service, BLM, and FWS.

Salable Minerals. A legal term that, for federal lands, defines mineral commodities sold by sales contract from the federal government. The applicable statute is the Mineral Materials Sale Act of 1947, as amended. Salable minerals are generally common varieties of construction materials and aggregates, such as, sand, gravel, cinders, roadbed, and ballast material. Common variety minerals do not have a distinct, special value beyond normal use. On federal lands such minerals are considered salable and are disposed of by sales or by special permits to local governments.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Salinity. The degree to which a soil is affected by soluble salts. Salinity is expressed as the electrical conductivity of the saturation extract in millimhos per centimeter at 25 degrees C. The degrees of salinity and their respective conductivities in millimhos per centimeter are:

- Nonsaline ..... 0 to 2
- Very slightly saline ..... 2 to 4
- Slightly saline ..... 4 to 8
- Moderately saline ..... 8 to 16
- Strongly saline ..... more than 16

Scenic Byways. Highway routes, which have roadsides or corridors of special aesthetic, cultural, or historic value. An essential part of the highway is its scenic corridor. The corridor may contain outstanding scenic vistas, unusual geologic features, or other natural elements.

Scenic River. A river or section of a river that is free of impoundments and whose shorelines are largely undeveloped but accessible in places by roads.

Season of Use. The time during which livestock grazing is permitted on a given range area, as specified in the grazing lease.

Secondary Employment. Jobs supported by the sector under discussion that are within other sectors, commonly referred to as "multiplier effects." Includes indirect employment effects (jobs supported by the purchases of goods and services by directly affected companies) and induced employment effects (jobs supported by the household purchases of employees in directly and indirectly affected businesses).

Scoping. The process of identifying the range of issues, management concerns, preliminary alternatives, and other components of an environmental impact statement or land-use planning document. It involves both internal and public viewpoints.

Seral Stage. Any stage of development of a plant community from a disturbed, unvegetated state to a climax plant community. (The climax plant community contains plants that inhabit an area within which the final stage of a succession has been reached.)

Secondary Socioeconomic Study Area. Garfield County, Mesa County and Moffat County, Colorado; Uintah County, Utah (except for cumulative effects, which exclude Uintah County due to modeling limitations).

Section 110 Inventory. Refers to Section 110 of the National Historic Preservation Act of 1966, as amended. Section 110 of the Act directs federal agencies to establish a preservation program for the identification, evaluation and nomination to the National Register of Historic Places, cultural properties that are under the agencies' jurisdiction or control. Section 110 also directs federal agencies to coordinate their respective preservation programs with the State Historic Preservation Offices, local governments and Indian tribes (110.a.2.D).

Soil stability. The capacity of an area to limit redistribution and loss of soil resources (including nutrients and organic matter) by wind and water.

Special Recreation Management Area (SRMA). A public lands unit identified in land use plans to direct recreation funding and personnel to fulfill commitments made to provide specific, structured recreation opportunities (i.e., activity, experience, and benefit opportunities). The BLM recognizes three distinct types of SRMAs: community-based; intensive; and undeveloped big open. (From H-1601-1, BLM Land Use Planning Handbook.)

Special Status Plant Species. Collectively, federally listed or proposed and BLM sensitive species, which include both Federal candidate species and delisted species within 5 years of delisting. (From M6840, Special Status Species Manual).

Split Estate. In split estate situations, the surface rights and subsurface rights (such as the rights to develop minerals) for a piece of land are owned by different parties. In these situations, mineral rights are considered the dominant estate, meaning they take precedence over other rights associated with the property, including those associated with owning the surface. However, the mineral owner must show due regard for the interests of the surface estate owner and occupy only those portions of the surface that are reasonably necessary to develop the mineral estate.

Split Season. Removing livestock from the allotment and returning them later in the year within the permitted time.

State Implementation Plan (SIP). A detailed description of the programs a state will use to carry out its responsibilities under the Clean Air Act. State implementation plans are collections of the regulations used by a state to reduce air pollution.

Stocking Rate. The number of specific kinds and classes of animals grazing or using a unit of land for specified time.

Stipulation Category. Land use decisions or authorization requirements intended to mitigate impacts of surface disturbing or disruptive activities. These include RMP decisions, oil and gas lease stipulations, conditions of approval, and terms and conditions. These stipulations may prohibit surface use, allow surface use under certain conditions, or allow surface use during certain times (see also No Surface Occupancy, Controlled Surface Use, and Timing Limitation).

Sundry Notice. A form designed for submitting proposals to perform or modify certain well operations and reports of such operations when completed as indicated on Federal and Indian lands as pursuant to applicable Federal law and regulations.

Surface Disturbing Activity. Any authorized action that disturbs vegetation and surface soil, increasing erosion potential above normal site conditions. This definition typically applies to mechanized or mechanical disturbance. However, intense or extensive use of hand or motorized hand tools may fall under this definition. Examples of surface disturbing activities are construction of well pads and roads, pits and reservoirs, pipelines and power lines, mining, and vegetation treatments.

Suitable habitat. Surveyed and mapped habitat occurring on the geologic substrate on which the special status plant species are known to occur, which includes associated vegetation and other subtle characteristics (such as vegetation cover, light availability, aspect, surface cobble size). Most habitat mapped as suitable has been surveyed and found to contain the correct geology but is not occupied the special status plant species.

T

Tackifier. A tackifier is a glue (organic or polyacrylamide polymer) used to tie mulch and soil together.

Take. In the Endangered Species Act, to "take" a species means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."

Threatened Species. Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. (From M6840, Special Status Species Manual.)

Timing Limitation. A stipulation that prohibits surface disturbing or disruptive activities during specified times to protect identified resource values during sensitive periods (see also Stipulation Category)

Total Maximum Daily Load (TMDL). An estimate of the total quantity of pollutants (from all sources: point, nonpoint, and natural) that may be allowed into waters without exceeding applicable water quality criteria.

Traditional Cultural Property. A property that derives significance from traditional values associated with it by a social and/or cultural group such as an Indian tribe or local community. A traditional cultural property may qualify for the National Register if it meets the criteria and criteria exceptions at 36 CFR 60.4. See National Register Bulletin 38.

U

Unconformable. Consisting of a series of younger strata that do not succeed the underlying older rocks in age or in parallel position, as a result of a long period of erosion or nondeposition.

V

Valid Existing Rights. Any lease established (and valid) prior to a new authorization, change in land designation, or in regulation.

Visibility (Air Quality). A measurement of the ability to see and identify objects at different distances.

Visitor Day. Twelve visitor hours, which may be aggregated by one or more persons in single or multiple visits.

Visitor Use. Visitor use of a resource for inspiration, stimulation, solitude, relaxation, education, pleasure, or satisfaction.

Visual Resource Management (VRM) Classes. Visual resource management classes define the degree of acceptable visual change within a characteristic landscape. A class is based on the physical and sociological characteristics of any given homogeneous area and serves as a management objective. Categories assigned to public lands based on scenic quality, sensitivity level, and distance zones. Each class has an objective which prescribes the amount of change allowed in the characteristic landscape. (From H-1601-1, BLM Land Use Planning Handbook.) The four classes are described below:

- **Class I** provides for natural ecological changes only. This class includes primitive areas, some natural areas, some wild and scenic rivers, and other similar areas where landscape modification activities should be restricted.
- **Class II** areas are those areas where changes in any of the basic elements (form, line, color, or texture) caused by management activity should not be evident in the characteristic landscape.
- **Class III** includes areas where changes in the basic elements (form, line, color, or texture) caused by a management activity may be evident in the characteristic landscape. However, the changes should remain subordinate to the visual strength of the existing character.
- **Class IV** applies to areas where changes may subordinate the original composition and character; however, they should reflect what could be a natural occurrence within the characteristic landscape.

Volatile Organic Compounds (VOCs). Volatile organic chemicals that produce vapors readily; at room temperature and normal atmospheric pressure. Volatile organic chemicals include gasoline, industrial chemicals such as benzene, solvents such as toluene and xylene, and tetrachloroethylene (perchloroethylene, the principal dry cleaning solvent).

W

Waiver. Is a permanent exemption from a lease stipulation. The stipulation no longer applies anywhere within the leasehold.

Well or Wellbore. The hole drilled from the surface to the gas-bearing formation, several of which may be developed from a single well pad.

Well Pad. Relatively flat work area (surface location) that is used for drilling a well or wells and for producing from the well once it is completed.

Wild and Scenic Study River. Rivers identified in Section 5 of the Wild and Scenic Rivers Act for study as potential additions to the National Wild and Scenic Rivers System. The rivers shall be studied under the provisions of Section 4 of the Act. (From M-8351, BLM WSR Policy and Program)

Wilderness. A congressionally designated area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, that is protected and managed to preserve its natural conditions and that (1) generally appears to have been affected mainly by the forces of nature, with human imprints substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least 5,000 acres or is large enough to make practical its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historic value. The definition contained in Section 2(c) of the Wilderness Act of 1964 (78 Stat. 891). (From H-6310-1, Wilderness Inventory and Study Procedures.)

Wilderness Characteristics. Wilderness characteristics include size, the appearance of naturalness, outstanding opportunities for solitude or a primitive and unconfined type of recreation. They may also include ecological, geological, or other features of scientific, educational, scenic, or historical value. However Section 2(c) of the Wilderness Act of 1964 has been updated by IM-2003-195, dated June 20, 2003. Indicators of an area's naturalness include the extent of landscape modifications; the presence of native vegetation communities; and the connectivity of habitats. Outstanding opportunities for solitude or primitive and unconfined types of recreation may be experienced when the sights, sounds, and evidence of other people are rare or infrequent, in locations where visitors can be isolated, alone or secluded from others, where the use of the area is through non-motorized, non-mechanical means, and where no or minimal developed recreation facilities are encountered.

Wilderness Study Area (WSA). A designation made through the land use planning process of a roadless area found to have wilderness characteristics as described in Section 2(c) of the Wilderness Act of 1964. (From H-6310-1, Wilderness Inventory and Study Procedures.)

Wild Horse Management Area. An area that has been designated for continuing management of wild horses.

Wildland Fire. Any fire, regardless of ignition source, that is burning outside of a prescribed fire and any fire burning on public lands or threatening public land resources, where no fire prescription standards have been prepared. (From H-1742-1, BLM Emergency Fire Rehabilitation Handbook.)

Wildland Fire Use (WFU). The management of naturally ignited wildland fires to accomplish specific pre-stated resource management objectives in predefined geographic areas.

Wildland Urban Interface (WUI). The line, area or zone where structures (most notably private homes) and other human developments meet or are intermingled with forest and other vegetative fuel types.

Wild River. Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.

Wild, Scenic, and/or Recreational (WSR). The term used in this Manual Section for what is traditionally shortened to "Wild and Scenic" rivers. Designated river segments are classified, i.e., wild, scenic, and/or recreational, but cannot overlap. (From M-8351, BLM WSR Policy and Program.)

Withdrawal. An action that restricts the use of described public lands from operation of certain laws, which are also described in the withdrawal order. Withdrawal also may be used to transfer jurisdiction or management to other federal agencies.

Woodland. Contains typically shorter-growing tree species than forest species that are commonly harvested for posts, poles, and Christmas trees including piñon pine and juniper.

Workover. Well maintenance activities that require onsite mobilization of a drill rig to repair the well bore equipment (casing, tubing, rods, or pumps) or the wellhead. In some cases, a workover may involve development activities to improve production from the target formation.

Table 6-1. English to Metric Conversion Table for Commonly Used Measurements

English Units	Metric Units
Distance	
1 mile =	1.6 kilometers
1 foot =	0.30 meters
1 inch =	2.54 centimeters
Area	
1 acre =	0.40 hectare (1 hectare = 10,000 square meters)
1 square foot =	0.09 square meters
Mass	
1 ton (short) = 2,000 pounds =	0.91 tonne (metric ton) (1 tonne = 1000 kilograms)
1 pound =	0.45 kilogram
1 ounce =	28.3 grams
Volume	
1 gallon =	3.8 liters
1 barrel =	42 gallons = 159 liters
1 acre-foot =	1,233 cubic meters

6.3 References

Adams, L.W., and A.D. Geis. 1983. Effects of roads on small mammals. Journal of Applied Ecology 20: 403-415.

Andrén, H. 1994. Effects of Habitat Fragmentation on birds and mammals in landscapes with different proportions of suitable habitat: a review. Oikos 71(3): 355-366.

Albee, Beverly J., Leila M. Shultz, and Sherel Goodrich. 1988. Atlas of the Vascular Plants of Utah. Utah Museum of Natural History.

Algermissen, S.T. 1969. Seismic Risk Studies in the United States. U.S. Dept. of Commerce, Environmental Science Services Administration, Coast & Geodetic Survey.

Athearn. 1981. Frederic J. Athearn, An Isolated Empire: A History of Northwestern Colorado, Bureau of Land Management, Colorado, Cultural Resources Series, Number Two (Third Edition).

Avian Power Line Interaction Committee (APLIC). 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, DC and Sacramento, CA.

APLIC and U.S. Fish and Wildlife Service (USFWS). 2005. Avian Protection Plan (APP) Guidelines. http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/APP/AVIAN%20PROTECTION%20PLAN%20FINAL%204%2019%2005.pdf (accessed 4/5/2012).

Bartis, J.T. T. LaTourrette, L. Dixon, D.J. Peterson, and G. Cecchine. 2005. Oil Shale Development in the United States, Prospects and Policy Issues. RAND Corporation. MG-414-NETL.

BBC Research & Consulting (BBC). 2008a. Northwest Colorado Socioeconomic Analysis and Forecasts. BBC Research & Consulting, prepared for the Associated Governments of Northwest Colorado. February, 2008.

BBC. 2008b. City of Rifle, A Case Study of Community Renewal, Growth and Change in Northwest Colorado. BBC Research & Consulting, prepared for the City of Rifle. May, 2008.

BBC. 2008c. The Economic Impacts of Hunting, Fishing and Wildlife Watching in Colorado (Revised Draft Report). BBC Research & Consulting, prepared for the Colorado Division of Wildlife. September, 2008.

Beard, T.N., D.B. Tait, and J.W. Smith. 1974. Nahcolite and Dawsonite Resources in the Green River Formation, Piceance Creek Basin, Colorado in Murray, D.K., Energy Resources of the Piceance Creek Basin, Colorado, 25th Field Conference: Rocky Mountain Association of Geologists, p. 101-122.

Beck, T.D.I. 1977. Sage grouse flock characteristics and habitat selection in winter. Journal of Wildlife Management 41(1):18-26.

Belnap, J., J.H. Kaltnecker, R. Rosentreter, J. Williams, S. Leonard, and D. Eldridge. 2001. Biological Soil Crusts: Ecology and Management. U.S. Department of Interior, BLM Technical Reference 1730-2, 119.

Blankenship Consulting and Sammons/Dutton. 2006. Blankenship Consulting LLC and Sammons / Dutton LLC, ExxonMobil Piceance Development Project Environmental Assessment.

Bureau of Land Management (BLM). 1984. BLM Manual 9112 – Bridges and Major culverts. Rel. 9-220. June 5, 1984.

BLM. 1985. BLM Manual 9113 - Roads. Rel. 9-247. June 7, 1985.

BLM. 1991. U.S. Department of the Interior (DOI), Colorado BLM Statewide Wilderness Study Report, Volume One, Craig District Study Areas. October 1991.

BLM. 1994. White River Resource Area Draft Resource Management Plan and Environmental Impact Statement. U.S. Department of the Interior. BLM White River Field Office, Meeker, CO. October, 1994.

BLM. 1995. Instruction Memoranda 2005-110 Old Growth Definitions. IM 2005-110. Available on the internet: http://www.blm.gov/nhp/efoia/wo/fy05/im2005-110attach1.pdf (accessed January 2, 2008).

BLM. 1995. Interim Management Policy and Guidelines for Lands Under Wilderness Review. BLM Manual H-8550-1. July 5.

BLM. 1996. White River Resource Area Proposed Resource Management Plan and Final Environmental Impact Statement. U.S. Department of the Interior. U.S. Department of the Interior. BLM White River Field Office, Meeker, CO. June.

BLM. 1997a. White River Record of Decision and Approved Resource Management Plan. U.S. Department of the Interior. BLM White River Field Office, Meeker, CO. July.

BLM. 1997b. Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado. United States Department of the Interior, Bureau of Land Management, Colorado State Office. February 3.

BLM. 1998. A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas. Prichard, D., J. Anderson, C. Correll, J. Fogg, K. Gebhardt. Technical Reference 1737-15. U.S. Department of the Interior National Applied Resource Sciences Center. BLM/RS/ST-98/001+1737.

BLM 1998a. Measuring and Monitoring Plant Populations. Elzinga C. L., D. Salzer, and J. Willoughby. Technical Reference 1730-1. U.S. Department of the Interior National Applied Resource Sciences Center. BLM/RS/ST-98/005+1730.

BLM. 1999a. Riparian Area Management: A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lentic Areas. Prichard D., F. Berg, W. Hagenbuck, R. Krapf, R. Leinard, S. Leonard, M. Manning, C. Nobel, and J. Staats. Technical Reference 1737-16 (Revised 2003). U.S. Department of the Interior National Applied Resource Sciences Center.. BLM/RS/ST-99/001+1737.

BLM. 1999b. White River Fire Management Plan: Environmental Assessment Record Number CO-017-WR-99-99-EA. U.S. Department of the Interior. BLM White River Field Office, Meeker, CO. Available upon request from the White River Field Office, 220 East Market Street, Meeker, CO. Phone 970-878-3800. Email wrfo_webmail@blm.gov.

BLM. 2000. Colorado BLM State Director's Sensitive Species List (Animals and Plants). June. Available at http://www.blm.gov/co/st/en/BLM_Programs/botany/Sensitive_Species_List_.html.

BLM. 2002. Instruction Memorandum No. 2002-164, Guidance to Address Environmental Justice in Land Use Plans and Related NEPA Documents, Washington, D.C.

BLM. 2004a. Final Figure Four Natural Gas Project Environmental Assessment. CO-WRFO-03-187-EA. December.

BLM. 2004b. Wolf Creek Watershed-Three Springs Ranch Landscape Health Assessment (CO-110-2006-055-EA). December 16.

BLM. 2004c. BLM Manual 8100 The Foundations for Managing Cultural Resources. December 3, 2004.

BLM. 2005a. Land Use Planning Handbook. BLM Handbook H-1601-1. March 11.

BLM. 2005b. 43 CFR 1600. Public Lands: Interior; Bureau of Land Management, Department of the Interior; Planning, Programming, Budgeting.

BLM. 2005c. West Douglas Herd Area, Amendment to the White River RMP Environmental Assessment (CO-WRFO-05-083-EA). U.S. Department of the Interior, BLM White River Field Office, Meeker, CO.

BLM. 2005d. Resource Note No. 80 Mancos Shale Literature Review on the Colorado Plateau. By Lynn Jackson, Resource Advisor – Science and Outreach, BLM, Moab Field Office, Utah.

BLM. 2006-2008. Baseline Geographic Information System Data. White River Field Office, Colorado.

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

BLM. 2006b. Shell Frontier Oil & Gas, Inc. Oil Shale Research, Development and Demonstration (R,D&D) Tracts Environmental Assessment (CO-110-2006-117-EA). http://www.blm.gov/co/st/en/fo/wrfo/oil_shale_wrfo/shell_frontier_oil.html (accessed May 3, 2007).

BLM. 2006c. Vegetation and Noxious Weeds Information received from Ken Holsinger, BLM WRFO Natural Resource Specialist.

BLM. 2006d. Personal conversation with Paul Daggett, BLM WRFO and David Mohrbacher, URS Corporation. November 10, 2006.

BLM. 2006e. Rangely Jeep Trails Environmental Assessment. CO-110-2005-218-EA. White River Field Office. Completed June 9, 2006.

BLM. 2006f. Instruction Memorandum (IM) 2006-073. http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2006/im_2006-073__.html

BLM 2007. U.S. Department of the Interior, Bureau of Land Management, White River Field Office, Reasonable Foreseeable Development Scenario for Oil and Gas Activities in the BLM White River Field Office: Rio Blanco, Moffat and Garfield Counties, Colorado, September 10, 2007.

BLM. 2007a. Final Scoping Report for the White River Field Office Oil and Gas Resource Management Plan Amendment/Environmental Impact Statement. May 2007.

BLM. 2007b. Final Analysis of the Management Situation for the White River Field Office Oil and Gas Resource Management Plan Amendment/Environmental Impact Statement. November 2007.

BLM. 2007c. Record of Decision for the Approval of Portions of the Roan Plateau Resource Management Plan Amendment and Environmental Impact Statement. June 11 2007.

BLM. 2007d. Onshore Oil and Gas Order Number 1: Onshore Oil and Gas Operations; Federal and Indian Oil and Gas Leases; Approval of Operations (issued under 43 CFR 3160).

BLM. 2008. U.S. Department of the Interior, Bureau of Land Management, White River Field Office, White River RMPA/EIS Chapter 1 – Purpose and Need for Action (Draft). July 2008.

BLM. 2008a. National Environmental Policy Act Handbook. BLM Handbook H-1790-1. January 2008.

BLM. 2008b. Geographic Information System data provided by the White River Field Office. Meeker, Colorado.

BLM. 2008c. Programmatic Biological Assessment for BLM's Fluid Minerals Program in Western Colorado re: Water Depletions and effects on the Four Endangered Big River Fishes: Colorado pikeminnow (*Ptychocheilus lucius*), humpback chub (*Gila cypha*), bonytail chub (*Gila elegans*), and razorback sucker (*Xyrauchen texanus*), May 2008. 34 pp.

BLM. 2008d. Bureau of Land Management Data and Metadata for White River BLM Field Office Management Area. Available on the internet: http://www.blm.gov/az/st/en/prog/maps/gis_files.html (accessed on August 1, 2008).

BLM. 2008e. Instruction Memorandum (IM) 2008-014. http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/20080/im_2008-014.html.

BLM. 2008f. Proposed Oil Shale and Tar Sands Management Plan Amendments to Address Land Use Allocations in Colorado, Utah, and Wyoming and Final Programmatic Environmental Statement (BLM WO GI 08-005-3900, DOI No. FES 8-32), September 2008.

BLM. 2008g. White River Field Office Oil and Gas RMPA/EIS Final Class I Overview of Cultural Resources Report. July.

BLM. 2008h. BLM Handbook H1740 – 2. Integrated Vegetation Management. Bureau of Land Management Rel. 1-1714. March 25, 2008.

BLM. 2010. Instruction Memorandum 2010-117. Oil and Gas Leasing Reform – Land Use Planning and Lease Parcel Reviews.

Bureau of Reclamation (BOC). 2011. Quality of Water Colorado River Basin: Progress Report No. 23. Available on the internet: http://www.usbr.gov/uc/progact/salinity/pdfs/PR23final.pdf (accessed March 26, 2012).

Boone, R.B., J.J. Taylor, D.M. Swift, P.H. Evangelista, and E. Hollowed. 2011. Developing a Resource Management and Monitoring Protocol for a Semi-arid Landscape with Extensive Oil and Gas Development Potential. Technical Note 439. U.S. Department of the Interior. Bureau of Land Management, National Operations Center, Denver, Colorado. 52 pp.

Bowker, J.M., J.E. Harvard III, John C. Bergstrom, H. Ken Cordell, Donald B.K. English, and John B. Loomis. 2005. The Net Economic Value of Wilderness. In, The Multiple Values of Wilderness, H. Ken Cordell, John C. Bergstrom, J.M. Bowker, ed. State College, Pennsylvania: Venture Publishing, Inc.

Boyle, J.M., K.J. Covay, and D.P. Baur. 1984. Quantity and Quality of Streamflow in the White River Basin, Colorado and Utah. Water-Resources Investigations Report 84-4022. USGS Lakewood, Colorado.

Boyle, S. 2006. North American river otter (*Lontra canadensis*): a technical conservation assessment. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/northamericanriverotter.pdf (accessed December 30, 2011).

Bradley, W.H. 1964. Geology of Green River Formation and Associated Eocene Rocks in Southwestern Wyoming and Adjacent Parts of Colorado and Utah. U.S. Geological Survey Professional Paper 496-A. In: Steigers 1999.

Brennan, M. 2008. Interview with Lloyd Levy Consulting, LLC, August 26, 2008.

Brown, Kim. 2008. Kim Brown, Branch Manager, First National Bank of the Rockies, Meeker, Colorado. Interview with Lloyd Levy Consulting, LLC, August 27, 2008.

Buseck, Rebecca S., Douglas A. Keinath, and Michele Giraud. 2005. Species Assessment for Great Basin Spadefoot Toad (*Spea intermontana*) in Wyoming. Prepared for U.S. Department of the Interior, Bureau of Land Management, Wyoming State Office, Cheyenne, Wyoming.

Carpenter, J., C. Aldridge, and M.S. Boyce. 2010. Sage-grouse habitat selection during winter in Alberta. Journal of Wildlife Management 74(8): 1806-1814.

Carsey, K., G. Kittel, K. Decker, D.J. Cooper, and D. Culver. 2003. Field Guide to the Wetland and Riparian Plant Associations of Colorado. Colorado Natural Heritage Program, Fort Collins, CO.

Cashion, W.B. 1973. Geologic and Structure Map of the Grand Junction Quadrangle, Colorado and Utah: U.S. Geological Survey Miscellaneous Investigations Series Map, I-736.

Claritas. 2008a. 2007 Housing Value. Claritas. Downloaded August 25, 2008.

Claritas. 2008b. 2007 Household Income. Claritas. Downloaded August 25, 2008.

Clean Air Status and Trends Network (CASTNET). 2007. Available on the internet: http://www.epa.gov/castnet/.

Cole, E.K., M.D. Pope, and R.G. Anthony. 1997. Effects of road management on movement and survival of Roosevelt elk. Journal of Wildlife Management 61: 1115-1126.

Cole, R.D., G.J. Daub, and L.K. Weston. 1995. Review of Geology, Mineral Resources, and Ground-Water Hydrology of Green River Formation, North-Central Piceance Creek Basin, Colorado. In, The Green River Formation in Piceance Creek and Eastern Uinta Basins, Grand Junction Geological Society, Grand Junction, Colorado.

Collins, Cameron P., and Timothy D. Reynolds. 2005. Ferruginous hawk (*Buteo regalis*) A Technical Conservation Assessment. Prepared for the USDA Forest Service, Rocky Mountain Region, Species Conservation Project

Colorado Department of Education (CDE). 2008. Education Statistics. Colorado Department of Education. Downloaded September 11, 2008.

Colorado Department of Labor and Employment (CDLE). 2008. Colorado Department of Labor and Employment 2006 Quarterly Census of Employment and Wages. Downloaded August 28, 2008.

Colorado Department of Public Health and Environment (CDPHE). 2007. Air emissions data provided by David Thayer via e-mail on May 14, 2007.

CDPHE Air Pollution Control Division (CDPHE APCD). 2006a. Air Quality Standards. January 18.

CDPHE APCD. 2006b. Colorado State Implementation Plan for Regional Haze Technical Support Document for Flat Tops Wilderness Area. August.

CDPHE APCD. 2007. Data recorded from the Piceance Basin Bar-D Wind Data Station – January 1, 2002 through March 15, 2007.

CDPHE Water Quality Control Commission (CDPHE WQCC). 2010. Aquatic Life Use Attainment, Methodology to Determine Use Attainment for Rivers and Streams: Policy Statement 10-1, Approved October 12, 2010. Available on the internet: http://www.cdphe.state.co.us/op/wqcc/New/10-1.pdf (accessed March 26, 2012).

CDPHE WQCC. 2012a. Regulation No. 37. Classifications and Numeric Standards for Lower Colorado River Basin. Effective January 1, 2012. Available on the internet: http://www.cdphe.state.co.us/regulations/wqccregs/37_2012(01).pdf (accessed April 3, 2012)

CDPHE WQCC. 2012b. Regulations No. 93. Colorado's Section 303(d) List of Impaired Waters and Monitoring and Evaluation List, Effective March 30, 2012. Available on the internet: http://www.cdphe.state.co.us/regulations/wqccregs/93_2012(03).pdf (accessed March 26, 2012).

CDPHE Water Quality Control Division. 2008. The Status of Water Quality in Colorado – 2008. April.

Colorado Division of Wildlife (CDOW). 2006. White River Resource Management Plan Amendment EIS Comments. Letter from Ron Velarde, Regional Manager, CDOW to Kent E. Walter, Field Office Manager, White River Field Office, Bureau of Land Management. October 9.

CDOW. 2007. Threatened and Endangered List. Available at: http://wildlife.state.co.us/WildlifeSpecies/SpeciesOfConcern/ (accessed February 2010).

CDOW. 2009. Species of Concern. Birds. Burrowing Owl. http://wildlife.state.co.us/WildlifeSpecies/SpeciesOfConcern/Birds/BurrowingOwl.htm

CDOW, BLM, USFWS. 2001. A Cooperative Plan for Black-footed Ferret Reintroduction and Management, Wolf Creek and Coyote Basin Management Areas, Moffat and Rio Blanco Counties, Colorado. October 2001.

Colorado Greater Sage-Grouse Steering Committee. 2008. Colorado Greater Sage-Grouse Conservation Plan. Colorado Division of Wildlife, Denver, Colorado, USA.

Colorado Natural Heritage Program (CNHP). 2007. 4th Annual Colorado Rare Plant Symposium. http://www.cnhp.colostate.edu/download/documents/2009/Fourth%20Annual%20Colorado%20Rare%20Plant%20Symposium%20-%20Minutes.pdf

CNHP. 2009. CNHP Tracked Vascular Plant Species. Updated August 6, 2009. http://www.cnhp.colostate.edu/download/list/vascular.asp.

Colorado Oil and Gas Conservation Commission (COGCC). 1991. Memorandum of Understanding between the Colorado Bureau of Land Management and the Colorado Oil and Gas Conservation Commission. http://cogcc.state.co.us/Library/mou-moa/MOU-BLM.htm (accessed March 26, 2012).

COGCC. 2006. COGCC GIS Online. Query Database Information System. http://www.oil-gas.State.Co.US/ (accessed November 11, 2006).

COGCC. 2008. Colorado Oil and Gas Conservation Commission, Staff Report, January 15, 2008. http://cogcc.state.co.us/ (accessed September 12, 2008).

COGCC. 2009. MOU: Permitting of Oil and Gas Operations on BLM and NFS Lands in Colorado

Colorado State Demography Office (SDO). 2010. Table 5: Colorado Population for Counties and Municipalities. Colorado State Demography Office. November 2007. Downloaded July 28.

Colorado State Forest Service. 2005. 2005 Report on the Health Colorado's Forests. Colorado Department of Natural Resources. Available on the internet: www.dnr.state.co.us (accessed January 18, 2007).

Colorado State Protocol. 1998. State Protocol Agreement Between the Colorado State Director of the Bureau of Land Management (BLM) and the Colorado State Historic Preservation Officer (SHPO) Regarding the Manner in which the BLM will meet its Responsibilities under the National Historic Preservation Act (NHPA) and the National Programmatic Agreement (NPA) Among the BLM, the Advisory Council On Historic Preservation (Council), and the National Conference of State Historic Preservation Officers (NCSHPO). Revised March 2011.Council on Environmental Quality (CEQ). 1981. Guidance Regarding NEPA Regulations, Forty Most Asked Questions Concerning NEPA.

CEQ. 1997. Council on Environmental Quality Environmental Justice Guidance Under the National Environmental Policy Act. December 10.

Day, Sharon, and Denise Sheridan. 2007. Sharon Day and Denise Sheridan, Town Administrator and Town Planner. Interview with BBC Research & Consulting. September 25, 2007.

Dinosaur Diamond Partnership, Inc. 2000. Dinosaur Diamond Prehistoric Highway Corridor Management Plan. Denver, Colorado.

Division of Plant Industry (DPI). 2006. Colorado Noxious Weed Information. Available on the internet: http://www.ag.state.co.us/DPI/home.html (accessed November 15, 2006).

Doherty, K.E. 2008. Sage-grouse and energy development: integrating science with conservation planning to reduce impacts. Ph.D. Dissertation. Univ. of Montana, Bozeman. 125pp.

Donnell, J.R. 1961. Tertiary Geology and Oil Shale Resources of the Piceance Creek Basin Between the Colorado and White Rivers, Northwestern Colorado. U.S. Geological Survey Bulletin 1082-L. In: Steigers 1999.

Dunn, H. 1972. The Piceance Basin and Axial Basin Uplift. In Geologic Atlas of the Rocky Mountain Region. Rocky Mountain Association of Geologists. Colorado: Hirschfeld Press.

Dyni, J.R. 1974. Sodium Carbonate from the Green River Formation. U.S. Geological Survey Open-File Report 96-0729.

Dyni, J.R. 2003. Geology and Resources of Some World Oil-Shale Deposits, Oil Shale, Vol. 20, No. 3, pp. 193-252.

Ekstrom, Bill. 2008. Bill Ekstrom, Extension Agent - Agriculture, Rio Blanco County Cooperative Extension, Meeker, Colorado. Interview with Lloyd Levy Consulting, LLC, August 12, 2008.

Ellingson, Lindsey, Andrew Seidl and CJ Mucklow. 2006. Tourists' Value of Routt County's Working Landscape, 2005. (EDR 06-05) Fort Collins Colorado: Department of Agricultural and Resource Economics, May 2006. Available here: http://www.cde.state.co.us/artemis/ucsu5/ucsu5213edr066internet.pdf (accessed February 12, 2009).

Elliott, B.A., S. Spackman Panjabi, B. Kurzel, B. Neely, R. Rondeau, and M. Ewing. 2009. Recommended Best Management Practices for Plants of Concern. Practices developed to reduce the impacts of oil and gas development activities to plants of concern. Unpublished report prepared by the Rare Plant Conservation Initiative for the National Fish and Wildlife Foundation.

Fahrig, L. 1997. Relative effects of habitat loss and fragmentation on population extinction. Journal of Wildlife Management 61(3): 603-610).

Fahrig, L. 2003. Effects of habitat fragmentation on biodiversity. Annual Review of Ecology, Evolution and Systematics 2003 (34): 487-515. Available http://www.annualreviews.org.Federal Land Managers' Air Quality Related Values Workgroup (FLAG). 2000. Phase I Report. U.S. Forest Service-Air Quality Program, National Park Service-Air Resources Division, U.S. Fish and Wildlife Service-Air Quality Branch. December 2000.

Fertig, Walter, Rick Black, and Paige Wolken. 2005. Rangewide Status Review of Ute Ladies'-Tresses (*Spiranthes diluvialis*). Prepared for the U.S. Fish and Wildlife Service and the Central Utah Water Conservancy District.

Fire Regime Condition Class (FRCC). 2007. Interagency website designed to provide guidance on the FRCC system and approach. Available on the internet: http://frcc.gov/.

Fitzgerald, J., C. Meaney, and D. Armstrong. 1994. Mammals of Colorado. Denver Museum of Natural History, University Press of Colorado, Niwot, Colorado.

Fotz, Randy B. 1996. Traffic, and No-Traffic on an Aggregate Surfaced Road: Sediment Production Differences. Presented at the Food and Agricultural Organization seminar on "Environmentally Sound Forest and Road and Wood Transport:" Sinaia, Romania June.

Franklin, M.A. "Ben". 2005. Plant Information Compiled by the Utah Natural Heritage Program: A Progress Report. Utah Division of Wildlife Resources Publication Number 05-40. Prepared for Utah Reclamation and Conservation Commission. http://dwrcdc.nr.utah.gov/ucdc/ViewReports/Plant_Report_2005.pdf

Frederick, G.P. 1991. Effects of Forest Roads on Grizzly Bears, Elk, and Gray Wolves: a literature review. USDA Forest Service, Kootenai National Forest Publication No. R1-91-73.

Freeman, A.M. 1994. The measurement of environmental and resource values: Theory and methods. Washington, DC: Resources for the Future.

Garfield County. 2008. Garfield County Quick Facts. Available on the internet: http://www.garfield-county.com/index.aspx?page=698.

Garfield County Public Health Service. 2007. Garfield County Air Quality Monitoring Study June 2005 - May 2007. December.

General Accounting Office (GAO). 2004. Renewable Energy: Wind Power's Contribution to Electric Power Generation and Impact on Farms and Rural Communities. September. www.gao.gov/news.items/d04756.pdf

Ghist, J.M. 2005. Touring Colorado Geology: General Stratigraphic Column. http://www.geocities.com/jghist/Explanations/Stratigraphy/stratcol.htm (accessed January 22, 2009).

Gilbert, M.M., and A.D. Chalfoun. 2011. Energy development affects populations of sagebrush songbirds in Wyoming. Journal of Wildlife Management 75(4): 816-824.

U.S. Government Printing Office (GPO). 2010. "National Ambient Air Quality Standards for Ozone." 75 Federal Register 2938. January 19, 2010.

Hagen, C.A. 1999. Sage grouse habitat use and seasonal movements in a naturally fragmented landscape, northwestern Colorado. M.S. Thesis. University of Manitoba, Winnipeg, Canada.

Hammerson, G.A. 1999. Amphibians and Reptiles in Colorado. Second edition. University Press of Colorado and Colorado Division of Wildlife.

Hann, W.J., and D.L. Bunnell. 2001. Fire and Land Management Planning and Implementation Across Multiple Scales. Int. J. Wildland Fire. 10:389-403.

Harju, S.M., M.R. Dzialak, R.C. Taylor, L.D. Hayden-Wing, and J.B. Winstead. 2010. Thresholds and time lags in effects of energy development on greater sage-grouse populations. Journal of Wildlife Management 74(3): 437-448.

Harpman, David A., Michael P. Welsh, and Richard C. Bishop. 1994. Nonuse Economic Value: Emerging Policy Analysis Tool. Funded by the U.S. Bureau of Reclamation's General Investigation Program, November 1994. Available here: http://www.usbr.gov/pmts/economics/reports/NUPAP1024.pdf (accessed February 12, 2009).

Herrick, Jeffrey E., Justin W. Van Zee, Kris M. Havstad, Laura M. Burkett and Walter G. Whitford. 2009. Monitoring Manual for Grassland, Shrubland and Savanna Ecosystems Volume 1: Quick Start. USDA-ARS Jornada Experimantal Range. ISBN 0-9755552-0-0. Las Cruces, New Mexico http://usda-ars.nmsu.edu.

Herrick, Jeffrey E., et.al. 2009a. Monitoring Manual for Grassland, Shrubland and Savanna Ecosystems Volume 2: Design, supplementary methods and interpretation. USDA-ARS Jornada Experimental Range. ISBN 0-9755552-0-0. Las Cruces, New Mexico http://usda-ars.nmsu.edu.

Hirsch, Christine L., Shannon E. Albeke, and Thomas P. Nesler. 2006. Range-wide Status of Colorado River Cutthroat Trout (*Oncorhyncus clarkia pleuritucus*): 2005. Available at http://www.fws.gov/mountain-prairie/species/fish/crct/

Holloran, M.J. 2005. Greater sage-grouse (*Centrocercus urophasianus*) population response to natural gas field development in western Wyoming. PhD Thesis. University of Wyoming, Laramie.

Holloran, M.J. and S.H. Anderson. 2005. Spatial distribution of greater sage-grouse nests in relatively contiguous sagebrush habitats. Condor 107: 742-752.

Holloran, M.J., R.C. Kaiser, and W.A. Hubert. 2010. Yearling greater sage-grouse response to energy development in Wyoming. Journal of Wildlife Management 74(1): 65-72.

Hood, S. M., and M. Miller, editors. 2007. Fire ecology and management of the major ecosystems of southern Utah. Gen. Tech. Rep. RMRS-GTR-202. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 110 p.

Husband, Michael B. 1984. Colorado Plateau County Historic Context. Colorado Historical Society, 1984 (facsimile edition 2006), Office of Archaeology and Historic Preservation, Colorado Historical Society http://www.coloradohistory-oahp.org/publications/contexts.htm (accessed February 25, 2008).

Inglefinger, F., and S. Anderson. 2004. Passerine response to roads associated with natural gas extraction in a sagebrush steppe habitat. Western North American Naturalist 64(3): 385-395.

Intergovernmental Panel on Climate Change (IPCC). 2007. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. [M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden, and C.E. Hanson, Eds.]. http://www.ipcc.ch/publications_and_data/ar4/wg2/en/contents.html

Johnson, R.C. 1979. Cross Section B-B' of Upper Cretaceous and Lower Tertiary Rocks, Northern Piceance Creek Basin, Colorado: U.S. Geological Survey Miscellaneous Field Investigations Map MF-1129B, 2 sheets.

Johnston, Robert J., and Joshua M. Duke. 2007. "Willingness to Pay for Agricultural Land Preservation and Policy Process Attributes: Does the Method Matter?" American Journal of Agricultural Economics 89(4) 1098-1115.

Joos, Michael. 2008. Rio Blanco County Undersheriff. Interview with Lloyd Levy Consulting, LLC, September 10, 2008.

Joy, Margie, M. 2008. Pioneers Hospital. Interview with BBC Research & Consulting, September 5, 2008.

Kade, A., and S.D. Warren. 2002. Soil and Plant recovery after historic military disturbances in the Sonoran Desert, USA." In Arid Land Research and Management 16: 231-243.

Kellogg, H.E. 1977. Geology and Petroleum of the Mancos B Formation, Douglas Creek Arch Area, Colorado and Utah. In Veal, Harry K., ed., Exploration Frontiers of the Central and Southern Rockies, Colorado: Rocky Mountain Association of Geologists.

Kingery, H. E. 1998. Colorado Breeding Bird Atlas. Colorado Bird Atlas Partnership. Copublished by the Colorado Division of Wildlife.

Lake, Phyllis. 2008. Phyllis Lake, County Executive Director, Farm Service Agency, Meeker, Colorado. Interview with Lloyd Levy Consulting, LLC, August 22, 2008.

Livo, L.J., and C. Loeffler (eds). 2003. Report on the Status and Conservation of the Boreal Toad (*Bufo boreas boreas*) in the Southern Rocky Mountains. 2001-2002. Prepared by the Boreal Toad Recovery Team, Colorado Division of Wildlife.

Loomis, John. 2005. United States Department of Agriculture Forest Service, Pacific Northwest Research Station. Updated Outdoor Recreation Use Values on National Forests and Other Public Lands. General Technical Report PNW-GTR-658, October 2005.

Loomis, John, Vicki Rameker and Andy Seidl. 2000. Potential Non-Market Benefits of Colorado's Agricultural Lands: A Review of the Literature (APR 00-02) Fort Collins Colorado: Department of Agricultural and Resource Economics, February 2000. Available here: http://www.cde.state.co.us/artemis/ucsu5/UCSU5212APR0002INTERNET.pdf (accessed February 12, 2009).

Lyon, A.G., and S.H. Anderson. 2003. Potential gas development impacts on sage grouse nest initiation and movement. Wildlife Society Bulletin 31(2): 486-491.

MacKinnon, W.C., J.W. Karl, G.R. Toevs, J.J. Taylor, M. Karl, C.S. Spurrier, and J.E. Herrick. 2011. BLM Core Terrestrial Indicators and Methods. Technical Note 440. U.S. Department of the Interior, Bureau of Land Management, National Operations Center, Denver, CO.

MacLachlan, M. 1987. General Geology of the Piceance Basin. Published in Oil Shale, Water Resource and Valuable Minerals of the Piceance Basin, Colorado: The Challenge and Choices of Development. Compiled by O. James Taylor. USGS Professional Paper 1310. U.S. Government Printing Office, Washington. 1987.

Magnan, Nicholas, Andrew Seidl, C.J. Mucklow and Deborah Alpe. 2005. The societal value of ranchlands to Routt County residents, 1995-2005 (EDR 05-01). Fort Collins Colorado: Department of Agricultural and Resource Economics, October 2005. Available here: http://nwcos.org/Resources/BLM%20Documents/Socioec%20Analysis/RoCo%20Ranchland%20Short%20Version.pdf (accessed February 12, 2009).

McDonald, L.A., H.W. Bender, E. Hurley, S. Donelly, and D. Taylor. 2007. Oil and Gas Economic Impact, Colorado Energy Research Institute Report 2007-1, Colorado School of Mines, June 2007. http://www.ceri-mines.org/documents/CERIOilGas.pdf (accessed August 7, 2007).

McGregor, R.L., D.J. Bender, and L. Fahrig. 2008. Do small mammals avoid roads because of the traffic? Journal of Applied Ecology 45: 117-123

McIntyre, S., and R. Hobbs. 1999. A framework for conceptualizing human effects on landscapes and its relevance to management and research models. Conservation Biology 13(6): 1282-1292.

McMahon, P.B., Paul von Guerard, Barbara Ruddy, Josh Linard, Jean Dupree, Robert Zuelllig. 2007. Regional Framework for Water-Resources Monitoring Related to Energy Exploration and Development. USGS Colorado Water Science Center.

Murray, D.K., and J.D. Haun. 1974. Introduction to the Geology of the Piceance Creek Basin and Vicinity, Northwestern Colorado. In: Murray, D.K. et al., editors, Energy Resources of the Piceance Creek Basin, Colorado. Rocky Mountain Association of Geologists Guidebook (1974). In: Steigers 1999.

National Atlas. 2005. Average Annual Precipitation Map of Colorado. Online data resource accessed at: http://nationalatlas.gov/printable/images/pdf/precip/pageprecip_co3.pdf.

National Diversity Information Source (NDIS). 2006. Natural Diversity Information Source, Colorado Division of Wildlife. Wildlife Mountain Lion Page. http://ndis.nrel.colostate.edu/. (accessed November 2006).

National Energy Policy Development Group. 2001. Reliable, Affordable, and Environmentally Sound Energy for America's Future. Report of the National Energy Policy Development Group. May.

NatureServe Explorer. 2009. An Online Encyclopedia of Life. http://www.natureserve.org/explorer/

Neely, B., S. Panjabi, E. Lane, P. Lewis, C. Dawson, A. Kratz, B. Kurzel, T. Hogan, J. Handwerk, S. Krishnan, J. Neale, and N. Ripley. 2009. Colorado Rare Plant Conservation Strategy. Developed by the Colorado Rare Plant Conservation Initiative. The Nature Conservancy, Boulder, Colorado. 117 pp.

Neilson, Renae. 2008. Rio Blanco County Assessor, Meeker, Colorado. Interviews with Lloyd Levy Consulting, LLC, September 5 and September 10, and email to Lloyd Levy Consulting, LLC, September 11, 2008.

O'Kane, Steven L. 1988. Colorado's Rare Flora. Great Basin Naturalist 48(4): 434-484.

Ortiz, Roderick F. 2002. Baseline Characterization of Water Quality and Mass Loading in Piceance Creek, Rio Blanco County, Colorado, December 2000. US Geologic Survey, Water Resources Investigation Report 02-4134. Denver, Colorado.

Partners in Flight. 2005. Partners in Flight Species Assessment Database. http://www.rmbo.org/pif/pifdb.html

Pauli, Johnathan N., Robert M. Stephens, and Stanley H. Anderson. 2006. White-tailed Prairie Dog (*Cynomys leucurus*): A Technical Conservation Assessment. Prepared for the USDA Forest Service, Rocky Mountain Region, Species Conservation Project.

PCGCC. 2007. Regional Impacts of Climate Change: Four Case Studies in the United States. Pew Center on Global Climate Change (PCGCC). December. http://www.pewclimate.org/docUploads/Regional-Impacts-FullReport.pdf

Pellant, Mike, Patrick Shaver, David A. Pyke, and Jeffery E. Herrick. 2000. Interpreting Indicators of Rangeland Health. U.S. Department of Interior (USDI, BLM) Technical Reference 1734-6, 130 p.

Preisler, H.K., A.A. Ager, and M.J. Wisdom. 2006. Statistical methods for analysing responses of wildlife to human disturbance. Journal of Applied Ecology 43: 164-172.

Rangely. 2008a. Rangely 2008 Proposed Budget. Submitted to BBC Research & Consulting by the Town of Rangely.

Rangely. 2008b. Town Administrator. Interview with BBC Research & Consulting, September 5, 2008.

Redifer J, G. Jouflas, T. Chase, and S. Morris. 2007. Socioeconomic Impacts of Growth: A Study by the Mesa State College Natural Resource and Land Policy Institute, September 2007. http://www.mesastate.edu/pdf/Socioeconomic%20Impacts%20of%20Growth.pdf (accessed July 14, 2008).

Redifer J., and G. Jouflas. 2008. Investigating Regional Collaboration in Northwest Colorado: A Study by the Mesa State College Natural Resource and Land Policy Institute, May 2008. http://www.mesastate.edu/pdf/irc/irc1.pdf (accessed July 14, 2008).

Reed, A.D., and M.D. Metcalf. 1999. Colorado Prehistory: A Context for the Northern Colorado River Basin. Colorado Council of Professional Archaeologists, Denver.

Rickey, M., and B.P. Kurzel. 2007 Ten-year Population Trends in Lesquerella congesta at Duck Creek Area of Critical Environmental Concern. Unpublished report prepared for Colorado Natural Areas Program, Denver, Colorado. 5 pp.

Riffell, S.K., K.J. Gutzwiller, and S.H. Anderson. 1996. Does repeated human intrusion cause cumulative declines in avian richness and abundance? Ecological Applications 6(2): 492-505.

Righter, R., R. Levad, C. Dexter, and K. Potter. 2004. Birds of Western Colorado Plateau and Mesa County. Grand Valley Audubon Society, Grand Junction.

Rio Blanco County. 2007. Welcome to the Rio Blanco County Home Page. Available on the internet: http://www.co.rio-blanco.co.us/

Rio Blanco County. 2008. Rio Blanco County Department of Social Services. Available on the internet: http://www.co.rio-blanco.co.us/socialservices/ (accessed August 22, 2008).

Ritter, Jr., Governor Bill. 2007. "Colorado Climate Action Plan: A Strategy to Address Global Warming." November. http://www.cdphe.state.co.us/climate/ClimateActionPlan.pdf

RMCO-NRDC. 2008. Hotter and Drier: The West's Changed Climate. The Rocky Mountain Climate Organization (RMCO) and the Natural Resources Defense Council (NRDC). March. http://www.nrdc.org/globalwarming/west/west.pdf

Rocky Mountain Area and Coordination Center. 2000-2007. Annual Reports 2000-2007. http://gacc.nifc.gov/rmcc/administrative/publications.html (accessed November 24, 2008).

Rocky Mountain News. 2007. Three's A Crowd in Two-Sided Garfield Politics. Study noted December 12.

Romme, W., C. Allen, J. Bailey, W. Baker, B. Bestelmeyer, P. Brown, K. Eisenhart, L. Floyd-Hanna, D. Huffman, B. Jacobs, R. Miller, E. Muldavin, T. Swetnam, R. Tausch and P. Weisberg. 2007. Historical and Modern Disturbance Regimes of Piñon-Juniper Vegetation in the Western U.S. http://www.cfri.colostate.edu/docs/P-J_disturbance_regimes_short%20synthesis_5-07.pdf (accessed January 2, 2008).

Rose, J.B. 1984. "Farmland preservation policy and programs." Natural Resource Journal. 24:591-640.

Rosenberger R., and R. Walsh. 1997. Non-Market Value of Western Valley Ranchland Using Contingent Valuation. Journal of Agricultural and Resource Economics, 22(2):296-309. Available here: http://ageconsearch.umn.edu/bitstream/30856/1/22020296.pdf (accessed February 12, 2009).

Rosenberger, R.S., and J.B. Loomis. 1999. "The Value of Ranch Open Space to Tourists: Combining Observed and Contingent Behavior Data." Growth and Change 30(3):366-383.

Rost, G.R., and J.A. Bailey. 1979. Distribution of mule deer and elk in relation to roads. Journal of Wildlife Management 43(3): 634-641.

Rowland, M.M., M.J. Wisdom, B.K. Johnson, and M.A. Penninger. 2005. Effects of roads on elk: implications for management in forested ecosystems. Pages 42-52 in Wisdom, M.J., technical editor, The Starkey Project: a synthesis of long-term studies of elk and mule deer. Reprinted from the 2004 Transactions of the North American Wildlife and Natural Resources Conference, Alliance Communications Group, Lawrence, Kansas.

Ruediger, B., J. Claar, S. Gniadek, B. Holt, L. Lewis, S. Mighton, B. Naney, G. Patton, T. Rinaldi, J. Trick, A. Vandehey, F. Wahl, N. Warren, D. Wenger, and A. Williamson. 2000. Canada Lynx Conservation Assessment and Strategy. USDA Forest Service, USDI Fish and Wildlife Service, USDI Bureau of Land Management, and USDI Park Service. Forest Service Publication #R1-00-53, Missoula, MT. 142pp.

Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, L.J. Lyon, and W.J. Zielinski. 1994. American marten, fisher, lynx, and wolverine in the western United States. USDA Forest Service. General Technical Report RM-254. 184p.

Saulnier, G.J., Jr. 1999. Groundwater Quality in Piceance Creek Basin. Duke Engineering and Services, Austin, Texas.

Sawyer, H., M.J. Kauffman, and R.M. Nielson. 2009a. Influence of well pad activity on winter habitat selection patterns of mule deer. Journal of Wildlife Management 73(7): 1052-1061.

Schenk, T. 2006. Wildlife Commission Meeting: November 8, 2006, Lynx Fact Sheet. Colorado Division of Wildlife. Available on the internet: http://wildlife.state.co.us/WidllifeSpeciesofConcern/Mammals/Lynx/LynxOverview.htm.

Smith, Brian E., and Douglas A Keinath. 2007. Northern Leopard Frog (*Rana pipiens*): A Technical Conservation Assessment. Prepared for the USDA Forest Service, Rocky Mountain Region, Species Conservation Project.

Smith, Michael A., Jerrold L. Dodd, Quentin D. Skinner, and J. Daniel Rodgers. 1993. Dynamics of vegetation along and adjacent to an ephemeral channel. J. Range Manage.46:56-64, January 1993.

Smith, J.W. 1980. Oil Shale Resources of the United States, Mineral and Energy Resources, Volume 23, No. 6, Colorado School of Mines.

Social Services. 2008. Social Services Administrator. Interview with BBC Research & Consulting, September 8.

Spackman, S., B. Jennings, J. Coles, C. Dawson, M. Minton, A. Kratz, and C. Spurrier. 1997. Colorado Rare Plant Guide. Prepared for the Bureau of Land Management, the U.S. Forest Service and the U.S. Fish and Wildlife Service, by the Colorado Natural Heritage Program.

Squires, John R. and Patricia L. Kennedy. 2006. Northern goshawk ecology: an assessment of current knowledge and information needs for conservation and management. Studies in Avian Biology 31:8-62.

Taylor, P.D., L. Fahrig, and K.A.With. 2006. Landscape connectivity: a return to the basics. Pp. 29-43 in K.R. Crooks and M. Sanjayan, (eds.) Connectivity Conservation. Cambridge University Press.

Tepedino, Vince. 2009. The Pollination Biology of a Piceance Basin Endemic: Physaria obcordata (Cruciferae). An unpublished report prepared for the Colorado Natural Areas Program, Denver, Colorado, by adjunct professor, Utah State University, Logan, Utah.

Thompson, J.G., and G. Williams. 1990. Vertical Linkage and Competition for local political Power: A Case of Natural Resource Development and Federal Land Policy, Impact Assessment, 10(4) pp. 33-58, 1990.

Thomas, J.C. and P.B. McMahon, in press, Overview of groundwater quality in the Piceance Basin, Western Colorado, 1946–2009: U.S. Geological Survey Scientific Investigations Report 2012.

Thomas, J.C., J.L. Moore, K.R. Schaffrath, J.A. Dupree, C.A. Williams, and K.J. Leib, in press, Characterization and data-gap analysis of surface-water quality in the Piceance study area, Western Colorado, from 1959-2009: U.S. Geological Survey Scientific Investigations Report.

Tobin Robert L. and Caroline P. Hollowed. 1990. Water-quality and Sediment-transport Characteristics in Kenney Reservoir, With River Basin, Northwestern Colorado. US Geological Survey, Water Resources Investigation Report 90-4071. Denver, Colorado.

Town of Meeker. 2005. Town of Meeker, Comprehensive Plan: Updated 2005. http://www.townofmeeker.org/Meeker%20Comp%20Plan%20Draft%20August%2023,%202005.pdf (accessed July 28, 2008).

Town of Meeker. 2008. Meeker 2008 Proposed Budget. Submitted to BBC Research & Consulting by the Town of Meeker.

Turner, Kai. 2008. Kai Turner, 5th Generation Committed to Rio Blanco Colorado (advertisement), Rio Blanco Herald Times, July 17, 2008, p. 10A.

University of Wyoming, Rocky Mountain Herbarium. 1998. Atlas of the Vascular Flora of Wyoming. http://www.rmh.uwyo.edu

URS Corporation (URS). 2007a. Air Quality Impact Assessment Protocol for the White River Resource Management Plan Amendment and Environmental Impact Statement. U.S. Department of Interior, Bureau of Land Management White River Field Office, Meeker, Colorado and Colorado State Office, Lakewood, Colorado. Prepared by URS Corporation. July.

URS. 2007b. Ozone Modeling Protocol for the White River Resource Management Plan Amendment and Environmental Impact Statement. U.S. Department of Interior, Bureau of Land Management White River Field Office, Meeker, Colorado and Colorado State Office, Lakewood, Colorado. Prepared by URS Corporation. November.

URS. 2011. Air Resources Technical Support Document for the White River Field Office Oil and Gas Resource Management Plan Amendment / Environmental Impact Statement. U.S. Department of Interior, Bureau of Land Management White River Field Office, Meeker, Colorado. Prepared by URS Corporation. January.

U.S. Bureau of Economic Analysis (BEA). 2008. Regional Economic Information System, Table CA25N. Downloaded August 15.

U.S. Department of the Interior (DOI) and U.S. Department of Agriculture (USDA). 2007. Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development. BLM/WO/ST-06/021+3071/REV 07. Bureau of Land Management. Denver, Colorado. 84 pp.

U.S. Census Bureau. 2000. Census 2000 Summary Tape File (STF) 3. U.S. Bureau of Census. Downloaded July 29, 2008.

U.S. Census Bureau. 2002.

U.S. Census Bureau. 2006a. Available on the internet: http://www.census.gov/population/projections/PressTab1.xls (accessed November 9, 2007).

U.S. Census Bureau. 2006b. Available on the internet: http://www.census.gov/popest/housing/tables/HU-EST2005-06.xls (accessed November 9, 2007).

U.S. Census Bureau. 2007. U.S. Census Bureau Tiger Data County Shapefiles. Available on the internet: http://www.census.gov/cgi-bin/geo/shapefiles/state-files?state=08 (accessed August 1, 2008).

U.S. Census Bureau. 2008. Available on the internet: http://quickfacts.census.gov/qfd/states/08/08081.html (accessed on January 7. 2008).

U.S. Department of Agriculture (USDA) Soil Conservation Service (SCS). 1982. Soil Survey of Rio Blanco County, Colorado.

USDA SCS. 1985. Soil Survey of Rifle Area, Parts of Garfield and Mesa Counties, Colorado.

USDA SCS. 2003. Soil Survey of Douglas-Plateau Area, Parts of Garfield and Mesa Counties, Colorado.

USDA Natural Resource Conservation Service (USDA, NRCS). 1997. National range and pasture handbook. USDA, NRCS, Grazing Lands Technology Institute 190-vi-NRPH, Washington, DC, U.S.A. http://www.ftw.nrcs.usda.gov/glti/NRPH.html 8-Nov-02.

NRCS. 2008a. Soil Survey of Rio Blanco County, Colorado.

NRCS. 2008b. Soil Survey of Rifle Area, Parts of Garfield and Mesa Counties, Colorado.

NRCS. 2008c. Soil Survey of Douglas-Plateau Area, Parts of Garfield and Mesa Counties, Colorado.

NRCS. 2008d. Soil Survey of Moffat County, Colorado.

NRCS. 2008e. Soil Survey of Dinosaur National Monument, Colorado and Utah.

NRCS 2009. The PLANTS database (http://plants.usda.gov. 23 November 2009. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

U.S. Department of Energy (DOE) and U.S. Department of the Interior (DOI), BLM. 2008. Programmatic Environmental Impact Statement, Designation of Energy Corridors on Federal Land in the 11 Western States (referred to as the West-Wide Energy Corridor Programmatic EIS). November.

U.S. Department of the Interior (DOI) and U.S. Department of Agriculture (USDA). 2007. Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (Gold Book). Fourth edition BLM/WO/ST-06/021+3071/REV 07. Bureau of Land Management. Denver, Colorado. 84 pp.

U.S. Department of Transportation, Federal Highway Administration. 2007. Available on the internet: http://www.byways.org/explore/byways/2107/ (accessed December 11, 2007).

U.S. Environmental Protection Agency (EPA). 1990. "National Oil and Hazardous Substances Contingency Plan Final Rule." U.S. Environmental Protection Agency (55 FR 8669, 40 CFR 300.340(e)(2)(i)(A)(2). March 8.

EPA. 2004. Attachment 3, The Piceance Basin, In. Evaluation of Impacts to Underground Sources of Drinking Water by Hydrofracturing of Coalbed Methane Reservoirs.

EPA. 2005a. "Air Toxics Database, Table 2, Acute Dose-Response Values for Screening Risk Assessments (6/02/2005)." Office of Air Quality Planning and Standards (OAQPS). Technology Transfer Network Air Toxics Website. http://www.epa.gov/ttn/atw/toxsource/Table2.pdf (accessed September 7, 2008).

EPA. 2005b. "Air Toxics Database, Table 1, Prioritized Chronic Dose-Response Values (2/28/2005)." Office of Air Quality Planning and Standards (OAQPS). Technology Transfer Network Air Toxics Website. http://www.epa.gov/ttn/atw/toxsource/Table1.pdf (accessed September 7, 2008).

EPA. 2008a. Stormwater Best Management Practices (BMP) Performance Analysis. Tetra Tech, Inc., December 2008, Revised March 2010. Pp 232.

EPA. 2008. USEPA AirData. http://iaspub.epa.gov/airsdata (accessed December 17, 2008).

EPA. 2010a. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2008. EPA 430-R-10-006/ USEPA, Washington, DC. April 15. http://www.epa.gov/climatechange/emissions/usinventoryreport.html

EPA. 2010b. "General Guidance for Implementing the New 1-hour National Ambient Air Quality Standard in Prevention of Significant Deterioration Permits, Including an Interim 1-hour NO2 Significant Impact Level." Air Quality Policy Division, USEPA. June 29.

EPA. 2010c. Climate Change Indicators in the United States. EPA 430-R-10-007. USEPA, Washington, DC. April. www.epa.gov/climatechange/indicators/pdfs/ClimateIndicators_full.pdf

EPA. 2010d. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2008. EPA 430-R-10-006. USEPA, Washington, DC. April 15. www.epa.gov/climatechange/emissions/usinventoryreport.html

U.S. Fish and Wildlife Service (FWS). 2002. Birds of Conservation Concern. Division of Migratory Bird Management, Arlington, VA. Available on the internet: http://migratorybirds.fws.gov/reports.bcc2002.pdf.

FWS. 2006a. Endangered and Threatened Wildlife and Plants; Proposed Threatened Status for Penstemon grahamii (Grahams beardtongue) with Critical Habitat; Proposed Rule. Federal Register 71(12):3158-3196.

FWS. 2006b. Endangered and Threatened Wildlife and Plants; Withdrawal of Proposed Rule to List Penstemon grahamii (Grahams beardtongue) as Threatened with Critical Habitat. Federal Register 71(243):76023-76035.

FWS. 2008. 5-Year Review, Dudley Bluffs bladderpod (*Lesquerella congesta* or *Physaria congesta*) and Dudley Bluffs twinpod (*Physaria Obcordata*). Region 6. Available at: http://www.fws.gov/mountain%2Dprairie/species/plants/dudleybluffs/

FWS. 2009. Review of Native Species that are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions; Proposed Rule. Federal Register 74(215):57804-57877.

FWS. 2010. Endangered and Threatened Wildlife and Plants; 12-month Finding on a Petition to List the White-tailed Prairie Dog as Endangered or Threatened; June 2010. Federal Register Volume 75, No. 104, June 1, 2010, pages 30338-30363.

U.S. Forest Service (USFS). 1993. Interim old growth definition for Douglas fir series, grand fir/white fir series, interior Douglas fir series, lodgepole pine series, pacific silver fir series, ponderosa pine series, Port-Orfordcedar and tanoak (redwood) series, subalpine fir series, western hemlock series. USDA For. Ser. Region 6.

USFS. 1998. "Guidelines for Evaluating Air Pollution Impacts on Wilderness Within the Rocky Mountain Region: Report of a Workshop, 1990." U.S. Department of Agriculture, U.S. Forest Service (USFS), April.

U.S. Global Change Research Program (USGCRP). 2009. Global Climate Change Impacts in the United States. Cambridge University Press. downloads.globalchange.gov/usimpacts/pdfs/climate-impacts-report.pdf.

U.S. Geological Survey (USGS). 1987. Oil Shale, Water Resources, and Valuable Minerals of the Piceance Basin, Colorado: the Challenge and Choices of Development. Compiled by O. James Taylor, USGS Professional Paper 1310.

USGS. 1989. Variations in vitrinite reflectance values for the Upper Cretaceous Mesaverde Formation, southeastern Piceance Basin, northwestern Colorado; implications for burial history and potential hydrocarbon generation and The Fryingpan Member of the Maroon Formation; a Lower Permian basin-margin dune field in northwestern Colorado. USGS Bulletin 1787-H,I.

USGS. 1995. 1995 National Assessment of United States Oil and Gas Resources. National Oil and Gas Resource Assessment Team. U.S. Geological Survey Circular 1118, U.S. Government Printing Office, Washington, D.C.

USGS. 2003. National Assessment of Oil and Gas Project: Petroleum Systems and Geologic Assessment of Oil and Gas in the Uinta-Piceance Province, Utah and Colorado. Digital Data Series DDS-69-B, Washington, D.C.

USGS. 2006a. National Earthquake Information Center database. http://neic.usgs.gov/neis/epic/database.html (accessed December 17, 2008).

USGS. 2011. Directory of Project Information and Data-Collection Sites. Available on the internet: http://waterdata.usgs.gov/co/nwis/annual/?referred_module=sw (accessed June 9, 2011).

USGS. 2011. USGS Surface-Water Data for the Nation. On-line resource at: http://waterdata.usgs.gov/nwis/sw (accessed October 2011).

Utah Department of Natural Resources. 2006. Range-wide Conservation Agreement and Strategy for Round-tail chub Gila robusta, Bluehead sucker Catastomus discobolus and Flannelmouth Sucker Catastomus latipinnis. Prepared for Colorado River Fish and Wildlife Council. Publication No. 06-18.

Van Liew, W.P., and M.L. Gesink. 1985. Preliminary Assessment of the Ground-water Resources of the alluvial Aquifer, White River Valley, Rio Blanco County, Colorado. Water-Resources Investigation Report 84-4307. USGS Lakewood, Colorado.

Walker, B.L., D.E. Naugle, and K.E. Doherty. 2007. Greater sage-grouse population response to energy development and habitat loss. Journal of Wildlife Management 71(8): 2644-2654.

Webb, S.L., M.R. Dzialak, R.G. Osborn, S.M. Harju, J.J. Wondzell, L.D. Hayden-wing, and J.B. Winstead. 2011. Using pellet groups to assess response on elk and deer to roads and energy development. Wildlife Biology in Practice 7(1): 32-40. Available online at http://socpvs.org

Weeks, J.B. and F.A. Welder, compilers. 1974. Hydrologic and geophysical data from Piceance Basin, Colorado: Colorado Department of Natural Resources Water Resources Basic Data Release No. 35, 121 p.

Welder, Frank.A. 1987. Unconsolidated Deposits of the Piceance Basin. Published in Oil Shale, Water Resource and Valuable Minerals of the Piceance Basin, Colorado: The Challenge and Choices of Development. Compiled by O. James Taylor. USGS Professional Paper 1310. US Government Printing Office, Washington. 1987.

Welder, Frank A. and George J. Saulnier, Jr. 1978. Geohydraulic Data from Twenty-Four Test Holes Drilled in the Piceance Basin, Rio Blanco County, Colorado, 1975-76. Open File Report 78-734. United States Geological Survey. Lakewood, Colorado. 1978.

Westbrooks, R. 1998. Invasive Plants, Changing the Landscape of America: Fact book. The Federal Interagency Committee for the Management of Noxious and Exotic Weeds (FICNMEW), Washington, D.C., p. 8.

Wix, Steve. 2008. Mr. Steve Wix, Owner, Backcountry Realty, Meeker, Colorado. Email to Lloyd Levy Consulting, LLC, August 30, 2008.

Western Regional Climate Center (WRCC). 1997. Average Annual Precipitation of Colorado. On-line resource accessed at http://www.wrcc.dri.edu/pcpn/co.gif.

WRCC. 2008a. Climate Narrative of Colorado. On-line resource accessed at http://www.wrcc.dri.edu/narratives/COLORADO.htm.

WRCC. 2008b. Evaporation Stations by State. On-line data resource accessed at http://www.wrcc.dri.edu/htmlfiles/westevap.final.html.

Wohl, E. 2005. Virtual Rivers: Understanding Historical Human Impacts on Rivers in the Context of Restoration. Ecology and Society 10(2): 2. [online] URL: http://www.ecologyandsociety.org/vol10/iss2/art2/.

World Resources Institute (WRI). 2010. "Climate Analysis Indicator Tool" web site. http://cait.wri.org/ (accessed September 20, 2010).

Wolf Creek Work Group, in association with CDOW, BLM, and USFWS. 2001. A Cooperative Plan for Black-footed Ferret Reintroduction and Management. Wolf Creek and Coyote Basin Management Areas, Moffat and Rio Blanco Counties, CO.

Woodland, J. 1985. Colorado's Little Fish. A Guide to the Minnows and Other Lesser Known Fishes in the State of Colorado. Colorado Division of Wildlife, Denver, CO.

Wyoming Wildlife Consultants. 2009. Greater sage-grouse winter habitat selection relative to natural gas field infrastructure in northern portions of the Pinedale Anticline project area, Sublette County, Wyoming. Annual Report. Pinedale, WY. 17pp.