BLM

Summary of the Analysis of the Management Situation for the Lander Resource Management Plan Revision

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June 30, 2009

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U.S. Department of the Interior
Bureau of Land Management
Lander Field Office, Wyoming

June 30, 2009

Mission Statement

It is the mission of the Bureau of land Management (BLM), an agency of the Department of the Interior, to manage BLM-administered lands and resources in a manner that best serves the needs of the American people. Management is based upon the principals of multiple use and sustained yield while taking into account the long-term needs of future generations for renewable and nonrenewable resources.

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Acronyms and Abbreviations

°C	Degrees Centigrade
°F	Degrees Fahrenheit
ACEC	Area Of Critical Environmental Concern
AML	Abandoned Mine Land
AMP	Allotment Management Plan
AMR	Appropriate Management Response
AMS	Analysis of the Management Situation
ANC	Acid Neutralizing Capacity
APD	Application for Permit to Drill
APHIS	Animal and Plant Health Inspection Service
AQD	Air Quality Division
ARS	Agricultural Resource Service
AUM	Animal Unit Month
BBLS	Barrels
BBO	Billion Barrels of Oil
BEA	United States Bureau of Economic Analysis
BLM	Bureau of Land Management
BMP	Best Management Practice
BOR	Bureau of Reclamation
CAA	Clean Air Act
CASTNet	Clean Air Status and Trends Network
CBNG	Coalbed Natural Gas
CFR	Code of Federal Regulations
cfs	Cubic Feet Per Second
CO	Carbon Monoxide
CO_2	Carbon Dioxide
DEQ	Department of Environmental Quality
DLE	Desert Land Entry
DOI	Department of the Interior
Dv	Deciview
EAC	Early Action Compact
EIS	Environmental Impact Statement
EPA	United States Environmental Protection Agency
ERMA	Extensive Recreation Management Area
ES&R plan	Emergency Stabilization and Rehabilitation
ESA	Endangered Species Act
FCRPA	The Federal Cave Resources Protection Act
FLPMA	Federal Land Policy and Management Act
FMP	Fire Management Plan
FMU	Fire Management Units
FUDS	Formerly Used Defense Sites
GIS	Geographic Information System
H_2S	Hydrogen Sulfide
H_2SO_4	Sulfuric Acid
HAPs	Hazardous Air Pollutants
HMA	Herd Management Area
HMP	Habitat Management Plan
HNO_3	Nitric Acid
IM	Instruction Memorandum
IMPROVE	Interagency Monitoring of Protected Visual Environments
ISR	In Situ Recovery
Kg/ha	Kilograms Per Hectare
LAU	Lynx Analysis Unit
LOC	Levels of Concern
mm	Millimeter
MMBF	Million Board Feet
MU	Management Unit
NAAQS	National Ambient Air Quality Standards
NADP	National Atmospheric Deposition Program
NEPA	National Environmental Policy Act
NH_4^+	Ammonium
NHPA	National Historic Preservation Act
NHT	National Historic Trail
NNL	National Natural Landmark
NOI	Notice of Intent
NO_2	Nitrogen Dioxide
NO_3^-	Nitrate
NO_X	Nitrogen Oxides
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSO	No Surface Occupancy
O_3	Ozone
OHV	Off-Highway Vehicle
Pb	Lead
PFC	Proper Functioning Condition
pH	Potential of Hydrogen
PM	Particulate Matter
PPB	Parts Per Billion
PSD	Prevention of Significant Deterioration
R&PP	Recreation And Public Purposes
RFD	Reasonable Foreseeable Development
RMP	Resource Management Plan
RMZ	Recreation Management Zone
ROD	Record Of Decision
ROS	Recreation Opportunity Spectrum

ROW	Right-of-Way
S&Gs	Standards and Guidelines
SHR	Standards for Healthy Rangelands
SIP	State Implementation Plan
SLAMS	State and Local Air Monitoring Stations
SO_2	Sulfur Dioxide
SO_4^-	Sulfate
SRMA	Special Recreation Management Area
SRP	Special Recreation Permit
SVR	Standard Visual Range
T&E	Threatened and Endangered
tcf	Trillion Cubic Feet
TCP	Traditional Cultural Property
TMDL	Total Maximum Daily Load
U.S.	United States
U.S.C.	United States Code
U_3O_8	Triuranium Octaoxide
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VOCs	Volatile Organic Compounds
VRM	Visual Resource Management
WAAQS	Wyoming Ambient Air Quality Standards
WARMS	Wyoming Air Resources Monitoring System
WGFD	Wyoming Game and Fish Department
WMA	Weed Management Area
WRIR	Wind River Indian Reservation
WSA	Wilderness Study Area
WSR	Wild & Scenic River
WUI	Wildland-Urban Interface
WYPDES	Wyoming Pollutant Discharge Elimination System
µeq/L	Micro-equivalent Per liter
$\mu g/m^3$	Microgram Per Cubic Meter

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1.0 INTRODUCTION

The United States (U.S.) Department of the Interior (DOI), Bureau of Land Management (BLM) issued a Notice of Intent on February 13, 2007, to prepare the Lander Resource Management Plan (RMP) Revision and associated Environmental Impact Statement (EIS). The Lander RMP was last revised in 1987 (the "existing plan"), although maintenance actions have occurred. Two substantial modifications have been instituted through programmatic changes: the 1994 Wyoming Standards for Healthy Rangelands (SHR) and the 2005 Wind Energy Programmatic Record of Decision (ROD). Programmatic changes were also made by the Geothermal Energy ROD (December, 2008) and the Westwide Energy Corridor ROD (January, 2009) but these have very little impact because of the area's low potential for geothermal energy and the energy corridor only clips the northeastern corner of the planning area.

The 1987 plan is now out of date because of changing circumstances, new information, and new, more modern planning requirements. Thus, a new RMP is necessary to meet the need for current and future multiple-use management of the public lands.

The RMP and EIS will address management for BLM-administered lands including federal surface lands (see Map 1) and federal mineral estate (see Map 2) in the planning area (maps are included in Appendix A). The planning area includes all of Fremont County and small portions of Natrona, Carbon, Sweetwater, Hot Springs, and Teton counties. (There are no BLM-administered lands in Teton County, although a small portion is included in the planning area.) The new REVISIONwill establish broad-scale desired conditions (goals and objectives) and allowable uses and actions anticipated to achieve the desired outcomes.

This document addresses the current management situation and is the foundation for the alternatives development process. The line numbers have been added to facilitate comments.

1.1 Purpose of the Summary of the Analysis of the Management Situation

The BLM prepares a summary of the AMS (or SAMS) to analyze available resource inventory data and other information to characterize the resources undergoing analysis, portray the existing management situation, and identify management opportunities to respond to identified issues. Consistent with multiple use principles, the SAMS provides the basis for formulating a reasonable range of alternatives (43 Code of Federal Regulations [CFR] 1610.4-4).

The SAMS is intended to describe current conditions and trends of the resources and the resource uses/activities in the planning area. Sufficient detail is provided to create a platform for resolving planning issues through the development of alternatives.

The SAMS addresses the issues relevant to resource management; it is not intended to be an exhaustive review of everything known about the resources and uses/activities in the planning area. SAMS will be integrated into the subsequent RMP and EIS as part of the alternatives and affected environment analysis.

Alternatives presented in the RMP and EIS will draw on the management opportunities identified in this document. Each alternative will include desired outcomes (goals and objectives), and the allowable uses and actions anticipated to achieve those outcomes.

The BLM Planning Process

- Prepare Scoping Report and AMS
  - Refine issues and characterize management situation
  - Develop planning criteria and identify planning opportunities
- Prepare Draft RMP and EIS
  - Refine issues, alternatives, and impact analysis input
  - 90 day comment period
- Prepare Proposed RMP and Final EIS
  - Develop implementation and monitoring plan for preferred alternative
  - 30-day protest period and 60-day governor's consistency review
  - Respond to public comments and protests
- Prepare ROD and Approved RMP
  - Publish Approved RMP
  - Implement, monitor, and evaluate

Overview of the BLM Planning Process

The process for the development, approval, maintenance, and amendment or revision of RMPs is initiated under the authority of Section 202(f) of the Federal Land Policy and Management Act (FLPMA) and Section 202(c) of the National Environmental Policy Act (NEPA). RMP revisions must comply with FLPMA, NEPA, BLM H-1601-1 Land Use Planning Handbook, "Appendix C: Program-Specific and Resource-Specific Decision Guidance Requirements" for affected resource programs, the 2008 NEPA Handbook (H-1790-1), and all other applicable BLM policies and guidance.

The overall objective of these planning efforts is to provide a contemporary context and framework for the timely revision of existing management decisions and their associated resource allocations. These planning efforts are collaborative and community-based.

The RMP represents the first tier of the two-tiered BLM planning process: the land use planning aspect. The RMP addresses the BLM-administered public lands in the planning area to determine the allocation of resources and the general future management direction for land uses. In turn, the RMP guides the second tier of the planning process, the level of implementation and daily operations.

Implementation-level planning extends the decisions of the RMP into site-specific management for smaller geographic units of public lands such as livestock grazing allotment and habitat management plans. Through these plans, the BLM issues various land and resource use authorizations, identifies specific mitigation needs, and develops and implements actions. All

management direction or actions developed as part of the BLM planning process are subject to valid existing rights such as leases, permits, and rights-of-way.

1.2 General Description of the Planning Area, Geographic Scope, and Resource/Programs

This effort will address lands in west/central Wyoming (Figure 1-1) managed by the Lander Field Office of the BLM (LFO) including approximately 2.4 million acres of BLM-administered federal surface lands and an additional 2.8 million acres are BLM-administered federal mineral estate (Table 1-1). The lands managed by the LFO are identified on Map 1-

The BLM has a fiduciary trust responsibility for the management of minerals on the Wind River Indian Reservation (WRIR). The BLM does not make land management decisions for the WRIR and duties associated with trust responsibilities are conducted independent of the provisions of the Lander RMP. Information obtained and used by the BLM pursuant to its exercise of duties associated with trust responsibility is considered proprietary to the WRIR and treated as confidential by the BLM.

Information in this document regarding the WRIR including mineral resource development was obtained from publicly available sources and not from proprietary materials.

Management prescriptions and resource plans developed in the RMP will apply only to lands in federal management and do not apply to lands that are in nonfederal surface ownership.

An “in between” situation arises for split estate lands, in which subsurface minerals are federally owned but the surface land is owned by a private party or the State of Wyoming. Management prescriptions for federal minerals may impact private surface ownership, particularly with regard to methods of mineral extractions.

Figure 1-1. Lander Field Office Planning Area

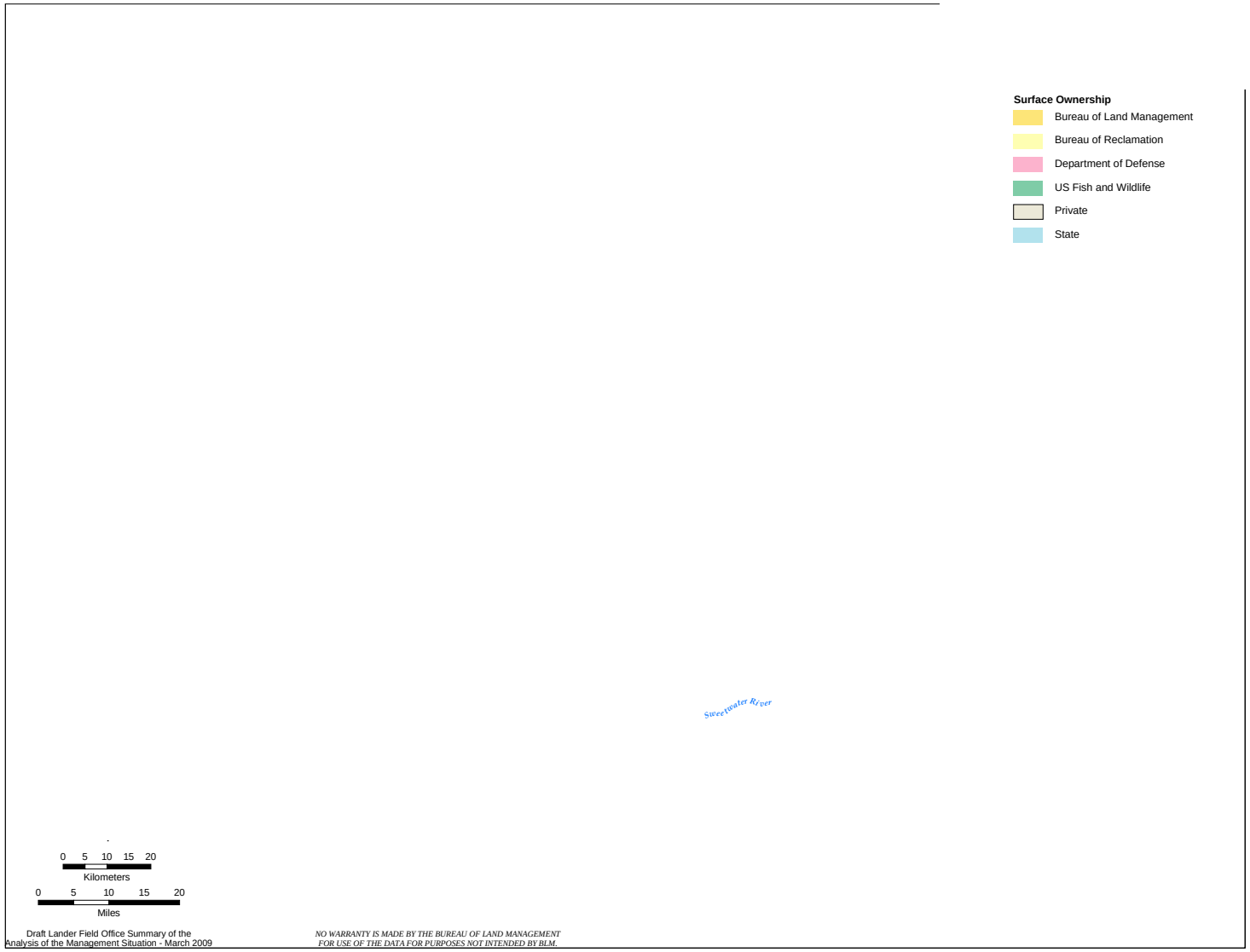


Table 1-1 provides information of the federal ownership interests in the planning area. (Although the boundaries of the field office include lands in Teton County, Teton will not be analyzed except for possible indirect and cumulative impacts since there are no lands administered by the BLM in Teton County.) Similarly, although the LFO has some administrative or processing responsibilities for mineral estate in the United States Forest Service (USFS) Shoshone National Forest, the planning decisions for this area are made by the USFS and are not governed by the existing or proposed revision. Accordingly, those acres are not included in further analysis except for possible indirect and cumulative impacts.

Table 1-1. BLM-Administered Surface Lands and Federal Mineral Estate within the Lander Planning Area

County	BLM-Administered Surface (acres)	Federal Mineral Estate[1] (acres)
Carbon	38,406	41,483
Fremont	1,933,364	2,280,246
Hot Springs	1,779	2,796
Natrona	297,991	364,256
Sweetwater	122,670	119,407
Total	2,394,210	2,808,188

[1] The acreages listed for BLM-administered federal mineral estate do not include USFS lands.

Resources, resource uses, and topics discussed in this SAMS are listed in Table 1-2. The resources and resource uses are grouped into eight broad categories and will be presented in these categories throughout this document and carried through development of the RMP and EIS. The broad categories include:

1. Physical Resources
2. Mineral Resources
3. Fire and Fuels Management
4. Biological Resources
5. Heritage and Visual Resources
6. Land Resources
7. Special Designations
8. Socioeconomic Resources

Table 1-2. Resources, Resource Uses, and Topics Discussed in this Summary of the AMS

Resources	Resource Uses	Special Designations	Social and Economic
Physical Resources: Air Quality Geologic Resources Soil Water Resources Cave and Karst Resources Lands with Wilderness Characteristics **Fire and Fuels Management** Unplanned/Wildland Fire Planned/Prescribed Fire Stabilization and Rehabilitation **Biological Resources** Vegetation - Forests, Woodlands, and Aspen Communities Vegetation - Grasslands and Shrublands Riparian/Wetland Resources Invasive Species and Pest Management Fish Wildlife Special Status Species Wild Horses **Heritage and Visual Resources** Cultural Resources Historic Trails Paleontological Resources Visual Resources	**Minerals:** Locatable Leasable Coal Leasable Geothermal Leasable Oil and Gas Leasable Oil Shale Leasable Other Solids Salable **Land Resources:** Lands and Realty Renewable Energy ROW and Corridors Trails and Travel Management Recreation Livestock Grazing **Biological Resources:** Forestry and Woodland Products	**Special Designations:** Congressional Designations of Historic Trails Congressional Designations of scenic trails Areas of Critical Environmental Concern Administrative Designations including Wild and Scenic Rivers, Wilderness Study Areas, Scenic or Back Country Byways, and wild horse ranges	**Social and Economic:** Social and Economic Conditions Health and Safety Environmental Justice Tribal Treaty Rights

1.3 Key Findings

This section presents key findings including issues and concerns expressed by the public and/or identified by the BLM.

Water and Air Quality, Soils, Climate Change, Cave and Karst, and non-WSAs with wilderness characteristics.

- Water and air quality are important concerns; design features should minimize any negative effects to water and air quality from land-use activities. The impacts of produced water need to be considered both in terms of the water quality and quantity.
- State of Wyoming permitted surface discharge of groundwater has caused resource problems such as erosion, salinization, and the introduction of elements, like selenium, at toxic concentrations into the environment. The introduction of water into the arid and semiarid regions can change use patterns of wild horses and wildlife and provide an ideal habitat for annual and noxious weeds.

- Air quality should be prioritized in areas of required high air quality such as Wilderness Study Areas (WSAs) and Wilderness Areas or where necessary to meet some other standard. There is a need for a region-wide air quality analysis to establish background condition. Air pollutant emissions from permitted activities need to be addressed.
- Changing climate, whether short or long term, impacts resources and uses; approaches for dealing with these changes must be evaluated.
- BLM authorized activity both contributes to the emission of GHG and influences carbon sequestration. The role of authorized activity in climate change should be addressed.
- Completion of inventories for those portions of the planning area in Sweetwater, Carbon, and Hot Springs Counties that do not yet have any soil survey information is needed; portions of the old Lander Area Soil Survey are quite broad and are not of much value for project-scale work. Improved survey information is needed.
- The surveys do not address soil health or current condition. There is no current Ecological Site Inventory. Better soil survey information is needed. Soil is one of the indicators for Standards for Healthy Rangelands (SHR) and especially important because much of the soil in the planning area has low reclamation potential.
- Reclamation success has been unacceptable as a whole. The revision should identify management for previously disturbed soils and new disturbances.
- Because of all of the issues associated with reclamation, limiting the creation of new disturbance, using new technologies as they become available so as to limit the amount of disturbance, and more carefully assessing reclamation success are needed.

Cave and Karst:

- No cave and karst resources have been identified as meeting the requirements for special management in accordance with federal law. The planning area has the potential for cave and karst resources and would need to identify management if appropriate resources are identified in the future.

Wilderness Characteristics

- A citizens' inventory and proposal for areas with wilderness characteristics and a description of special places have been received. The revision will establish allowable use decisions and management direction for all lands managed for wilderness character and for these special places.

- The inventory for areas with wilderness characteristics was done as part of the identification of WSAs. The inventory needs to be verified as current in light of the passage of time since the inventory.

Mineral and Energy Resources

- The 1987 RMP did not analyze the level of oil and gas activity that has occurred or is planned for the future in part because of improvements in development technology. Management for oil and gas activity needs to be evaluated for future development activities. The revision should identified areas as suitable, not suitable, or restricted for fluid minerals development activity (oil, gas and coal-bed natural gas.) Changes to existing designations should be made if needed.
- Scoping comments identified the need for controlling the impact of new development as it relates to socio-economics both in terms of not overwhelming the local economy and also for supporting its financial contributions to state and local government.
- Conflicts between development of mineral resources and other land and resource uses and values should be considered. Principal issues will include how to mitigate disruptive activities and human presence:
    - In fish habitat, big game crucial habitat (winter range and birthing areas), threatened, endangered (T&E), or sensitive species habitat such as greater sage-grouse, mountain plovers, and other important wildlife species habitats (e.g., raptors, migratory birds);
    - Where WYPDES discharge permits and evaporation ponds exist and are proposed.
    - On recreation values, National Historic and Scenic Trails, Regionally Significant Historic Trails, Scenic Trails, forage uses, air quality, sensitive vegetation types, and sensitive watersheds.
    - On livestock grazing, particularly with cumulative loss of vegetation
- Appropriate operating conditions should be developed for leasing of phosphate and other similar resources. Areas that should be closed to leasing because of resource conflicts should be identified.
- The revision should determine potential locatable mineral withdrawals where resource conflicts exist. (Withdrawal is actually a realty action.)

Fire and Fuels Management

- A full suite of management tools including the use of wildland and prescribed fire as well as mechanical and chemical treatment methods to achieve identified resource objectives and the reduction of dangerous accumulations of fuels.
- Increasing fire suppression efforts in intact greater sage-grouse habitat and increasing rehabilitation efforts in burned areas should be considered.
- Watershed protection through fires and fuels management should be examined.
- Therevision should manage vegetation to minimize the fire risk in the Wildland-Urban Interface.

Vegetation

- Reclamation goals and standards for success need to consider all the functions of vegetation and not just soil stabilization. The 1987 RMP's assumption that reclamation to pre-disturbance vegetative condition within three years to five years was an error. Soil stability is scarcely achieved in that time if the reclamation is successful; often it is not. Return to pre-disturbance habitat is rarely achieved, at least within decades.
- The 1987 RMP approach to timber resources as commodity production is dated. Forest resources management practices and areas suitable for timber or special forest product sales to improve forest health should be identified.
- A workable, science-based plan for addressing the impacts to forest health from pine beetle infestation and other pests with their potential impacts on wildlife habitat, fuels buildup, and carbon sequestration must be a part of the revision.
- A long-term vegetative treatment plan describing what types of vegetation will be treated and what treatment techniques can be used to reach defined objectives. This plan should identify whether areas exist that require vegetative manipulation (such as mechanical, and chemical treatments) to enhance rangeland health. Important vegetation management areas such as bighorn sheep habitat should be identified.
- There is no current Ecological Site Inventory. Until one is completed, the vegetative communities should be managed in accordance with the NRCS Ecological Site Guides. The SRH should be utilized to identify current vegetation health, and in conjunction with monitoring data identify specific management goals and prescriptions to be implemented to achieve healthy vegetation community standards
- Riparian-wetland areas (RWA) are an important component of healthy vegetation communities and management to protect RWA is critical to achieving SHR.

- Cool season bunchgrasses such as needle and thread, bluebunch wheatgrass, and Indian ricegrass are important because they provide the largest potential herbaceous production in sagebrush habitat. Consequently they offer the most forage for herbivores, and the most hiding cover for sage-grouse. Managing grazing for the plant growth requirements of these species is critical. These plants are vulnerable to grazing from approximately mid May to mid June when they are exchanging nutrients between the roots and the leaves. Grazing must be managed to prevent repeatedly interrupting this exchange by controlling the timing of grazing or the utilization levels. When grazing is not adequately managed, more grazing resistant species such as bluegrasses, threadleaf sedge, rhizomatous wheatgrass and blue grama will replace the cool season bunchgrass in the landscape. Once this transition occurs, the more grazing resistant species tend to fully occupy the site. As a result, there are no open niches to exploit, and it is unlikely that cool season bunchgrasses re-emerge, even if carefully considered grazing management practices are implement after the transition. Maintenance of existing stands that feature cool season bunchgrass is perhaps the most important vegetation management objective in the field office.

Invasive Species

- Invasive weeds have adverse economic impacts and the potential of changing the planning area in profound ways. The LFO's strong cooperative relationship with local weed and pest officials is a key to weed control.

- Invasive species infestations have expanded with the increase in surface-disturbing activities and drought and erosion. Some noxious weeds have moved into new areas (e.g. leafy spurge into the Government Draw area.

- The best ways to implement programmatic noxious weed management strategies should be identified, including new techniques, technologies, bio-controls, and herbicides. Periodic inventory and monitoring are essential. Integrated pest management needs to be a part of all management decisions.

Fish

- Fish habitat is limited on public lands and land use decisions need to protect existing fisheries. The revision needs to consider impacts to downstream habitats.

- Management decisions should ensure that aquatic/riparian areas meet the SHR including maintaining water quality for fish habitat.

- Management strategies are needed to prevent the infestation of aquatic habitat by invasive species.

Wildlife

- Impacts at the watershed or ecosystem level from management actions need to be evaluated as many wildlife species require large areas to meet their life cycle or seasonal requirements. The revision should consider Wyoming Game and Fish Department's existing and desired population objectives as well as the appropriate actions/use restrictions needed to maintain populations and habitat conditions.

- Hunting, fishing, and trapping are important uses of the public lands and are substantially impacted by BLM management strategies. Executive Order 13443 directs the BLM to expand and enhance hunting opportunities and the management of game species and their habitat. The hunting aspect of this IM is addressed in recreation but the support of habitat is in the wildlife program.

- Fences are found throughout the planning area. The fences that are not compatible with wildlife movement or are no longer needed should be identified and prioritized for removal and modification.

- Priority habitats and areas with potential for habitat enhancement should be identified and management prescriptions put in place for their protection and improvement. Lands within existing ACECs offer some of the area's best wildlife habitat. Management decisions should ensure these habitats remain intact and wildlife populations dependent on these habitats are protected.

- Land use decisions need to consider the impacts of actions that would fragment habitats and identify opportunities to reconnect fragmented habitat.

- RWA support the greatest diversity of wildlife species and actions that at least maintain and potentially improve RWA should be a focus when making land use allocations.

Special Status Species

- Protection of habitats that support special status species habitat need to be addressed in making land use allocations. Areas where other resource activities may conflict with special status species and their habitat requirements need to be identified.

- Greater sage-grouse is identified as a very high-profile, sensitive species that is a candidate for listing under the Endangered Species Act (ESA). As an indicator species, greater sage-grouse has particular importance for other sagebrush obligate species. The economic implications of listing of the sage-grouse are profound and should not be

minimized. Appropriate sage-grouse management including preventing fragmentation and loss, restoring degraded or de-fragmenting habitat, and making standard lease stipulations be in accordance with scientific information will address the need to prevent listing the sage-grouse as a T&E species.

Wild Horses

- Management actions for the seven Herd Management Areas (HMAs) should indicate whether rotational livestock grazing should be implemented; whether foaling or seasonal restrictions are appropriate; whether adjustments to appropriate management level (within the range established by the Consent Decree) or HMA boundaries are warranted; and whether habitat and water distribution could be improved, and genetic diversity is maintained or improved.
- Wild horse viewing and adoption are quite popular in some areas. Management actions should indicate where visitor interpretive sites and education are needed, why they are needed, what customers are to be served, and the recreational outcomes to be realized as well as how the sites are going to be maintained in the future.
- Appropriate management levels were developed using monitoring data. Funding for wild horse gathers and population controls have generally kept pace with the need on a local level, with roundups occurring every 2-4 years. Without these controls wild horse populations would expand to other areas outside the HMAs.

Riparian-Wetland Resources

- The current RMP did not originally emphasize riparian-wetland areas (RWA) management; the SHR changed this focus.
- RWA not in Proper Functioning Condition (PFC) should have management changes to make progress towards PFC; areas in PFC should be maintained or improved.
- Negative impacts to RWA need to be avoided and improvements to RWA considered in all authorized activities. Livestock grazing management is an important tool for ensuring RWA health but all management actions need to be evaluated, including recreation and mineral development.

Cultural Resources

- New historic properties such as sites eligible for listing in the National Register of Historic Places (NRHP) have been identified. The Revision should determine if such areas require special designation/site-specific use restrictions and if they should be designated “heritage areas” with appropriate prescriptions.

- Efforts to plan for the discovery and management of spiritual or traditional cultural properties should be continued and enhanced. Procedures to deal with discoveries of burials or other sacred properties have been developed, but should be made more apparent to land users. For already known spiritual or traditional properties (e.g. petroglyphs, medicine wheels, etc.), the immediate area around these properties could be withdrawn from mineral development and controlled surface use implemented to protect them from adverse impacts or otherwise protected.

- Cultural resources provide a major source of public education. Management actions should identify how and where interpretation will be used as an educational tool to increase the public's awareness and appreciation of the resources.

- Protection standards for cultural resources are not adequate. Unique cultural resources that require special management to protect their values may not receive it under regular NHPA protection standards. These unique cultural resources include some historic trails, historic sites, spiritual/sacred/traditional cultural properties, and some unique prehistoric districts. Those kinds of resources may require preservation of their natural or historic settings beyond ¼ mile, or they may require special management to deal with unique scientific qualities; regular NHPA measures are usually not be adequate to attain these goals.

- Protections for regionally important trails and early highways need to be implemented. These cultural resources are significant historic resources and the NHPA requires that mitigation measures be instituted. Present protections are not well-defined resulting in haphazard and inconsistent management. Improved prescriptions will streamline review of proposals for surface-disturbing activities, resources, and uses.

Paleontological Resources

- Protections for paleontological resources are not adequate. Recent changes in laws and guidelines have strengthened protections for paleontological resources, but the current RMP does not reflect this. To be current with these new laws and guidelines, the revision should be updated with respect to paleontological resources.

- The revision should address how the BLM will implement the Potential Fossil Yield Classification system during proposed activity reviews. It should also consider whether paleontological overview reports (large-scale ground surveys) will be required in scientifically significant areas and whether the BLM would participate in paleontology projects aimed at increasing educational activities. The importance of the paleontological resources was not understood when the current plan was written.

Visual Resources

- The Visual Resource Management (VRM) inventory and classifications in the planning area are updated. The RMP VRM allocations do not accurately reflect the current resource situation or guidance (Class V is no longer recognized, for example.) The inventory is being conducted in accordance with current guidance and will be a consideration during the land use planning process.
- Adjacent field offices VRM allocations need to be considered while conducting land use allocations in the new LFO RMP.
- Conducting visual mitigation on a project by project basis is ineffective. Protection of important scenic resources needs to be accomplished through allowable use decisions in VRM classes 1-3.
- Since the VRM guidance was written in 1987, the management of visual resources has changed substantially. Activities such as wind energy development and communication sites represent an extreme challenge in visual resource management. The revised REVISIONshould consider methods (restrictions, mitigation, thresholds etc) to reduce the visual impacts from activities with extreme height values.

Lands and Realty

- The criteria for disposal and acquisition need to be updated, and identification of the suitability of lands for disposal under various authorities needs to be assessed.
- Identification of areas appropriate for mineral withdrawal to protect other resources and uses is needed.
- Occupancy trespass is an issue in the planning area; identification of the correct strategy to address trespass is needed.
- Acquiring land through the Land Conservation Fund need to be addressed.
- The public has identified areas in which access to public lands should be improved. The revision must identify opportunities to improve access.

Renewable Energy

- The importance of renewable energy and the role of public lands in meeting this need is a mandate that must be addressed in the revision, including what types of renewable energy resources could be proposed and developed and where such development will be excluded due to conflicting resource uses or values.

Rights-of-Way and Corridors

- The Revision needs to assess whether previously identified avoidance zones are still valid, consider modification of existing corridors as appropriate, and incorporate corridors to tie in with the West-Wide Energy Corridor Programmatic ROD. Areas to be closed or avoided in ROW decisions should be identified.
- The revision cannot anticipate all future demand for ROWs, so the appropriate planning mechanism should serve as guidance for the values and interests to be considered.
- ROWs need to consider the Reasonable Foreseeable Development (RFD) scenario for oil and gas development and wind energy and ensure that reasonable transmission capacity is available to meet future needs while not negatively impact other resources.
- All ROWs need to be evaluated to determine if they are still needed and being properly utilized. To the extent that ROWs fragment habitation or result in vegetation loss, soil erosion or other resource damage, the ROWs should be considered for abandonment, closure or non-renewal.

Trails and Travel Management

- The use of and participation in motorized, mechanized, and non-motorized travel is increasing. In addition, equipment has been developed that was not considered in the existing RMP. This REVISIONwill develop a balanced approach to travel and transportation management that adaptively: protects natural and cultural resources, provides motorized and non-motorized recreation opportunities, reduces user conflicts, enforces route designations and closures, and improves public access.
- The use of OHVs as a tool in commercial enterprises (livestock grazing, mineral development, and ROW actions) is increasing and needs to be managed as part of the permitted activities.
- The road network needs to be examined to determine if appropriate public access is being provided and also to identify roads that are not needed or require improvement or removal to prevent resource damage.

Recreation

- Existing Special Recreation Management Areas (SRMAs) were established under dated planning guidance. These SRMAs need to be reviewed and revised as necessary to align with the new recreation and visitor services planning guidance. The current size of these areas may increase, decrease, or stay the same based on this review. More detailed management will also be developed to guide future planning decisions.

- A need exists to assess customer demand and available supply to determine if additional SRMAs should be established. Detailed management in these areas will be developed in order to guide future planning decisions in these important recreation areas.
- In order to ensure protection of recreation settings and outcomes BLM will establish allowable use decisions to support SRMA management.
- This revision will develop management prescriptions to address increased recreational value and use of public lands adjacent to communities.
- Areas not within SRMAs need objectives focused on resource protection, ensuring human health and safety, and reducing resource use/user conflict. These objectives will guide future management in a direction that ensures BLM's minimum caretaking duties are accomplished through actions that are not cost prohibited or labor intensive. BLM will develop management actions in the areas where immediate action is needed to reach these objectives and manage adaptively through the life of the revision to ensure these objectives are reached across the planning area.
- The REVISIONneeds to consider management actions to implement the Executive Order entitled Facilitation of Hunting Heritage and Wildlife Conservation.

Livestock Grazing

- The need exists to set aside areas of public lands as "forage reserves." Such reserves provide an opportunity to rest pastures that need respite or deferment due to vegetative treatments, mineral activities, or natural disturbances.
- A few parcels are not administered within a grazing allotment. Other allotments have significant values for other resources, such as for wildlife and recreation. Other rangelands have had vegetation negatively impacted by weed infestation and mineral development or are in such low precipitation zones that there is unreliable forage. These parcels should be identified in the Revision as closed to grazing.
- Achieving SHR through investments in physical infrastructure is being challenged and often constitutes a contentious issue during the development of Allotment Management Plans. The revision should consider the effectiveness and need of this infrastructure to achieve SHR. Additionally, the revision needs to reflect how increased or restricted levels of infrastructure might affect authorized livestock use levels, rangeland suitability/capability, as well as other resource(s) and uses.
- The revision needs to address implementation of best grazing management practices through new or existing projects.

- The revision should identify how livestock grazing can assist meeting other resource objectives such as water quality or wildlife forage and avoiding resource conflicts.
- The REVISIONshould look at the current categorization of allotments and update allotment categorization where warranted. Some allotments may change categories; however, resource conflicts, uses and values may warrant keeping an allotment in a specific category even if improvement is shown on the ground.
- Increasing mineral development impacts vegetation and available forage for livestock grazing. The revision needs to identify whether livestock use and/or grazing management may need to be adjusted because of the increasing loss of forage due to market driven development, and the slow reclamation success in some disturbed areas.
- Degraded riparian-wetland conditions have been identified as a major problem nationwide. The SHR were adopted to emphasize the importance of rangeland health in BLM management. Many of the allotments are not making adequate progress towards improving rangeland health, particularly riparian-wetlands conditions, or have not been assessed. This condition is true in some allotments with and without AMPs. The revision must examine the strategies used to make progress towards meeting the SHR.
- The revision must determine what amount of rangeland improvements should be utilized in future grazing allocations.
- Staff time and funding for monitoring are inadequate. Since increased funding is unlikely, rangeland management needs to address making progress towards meeting the SHR in the face of limited on-the-ground staffing.
- Authorized Animal Unit Months (AUMs) were predicated on the standard 1,000 pound cow and her calf. Larger cows, weighing from 1,200 to 1,400 pounds and calves which are older when turned out to graze on public lands consume proportionately more forage because of the larger size. The REVISIONshould consider if impacts of increased forage by larger cattle on vegetation are adequately understood through monitoring.

Special Designations and Other Management Areas

- Congressionally designated National Scenic and Historic Trails are venues for public education, tourism, and recreation, and are part of the National Landscape Conservation System, the “crown jewel” of the BLM lands system. Management should be focused on appropriate management of the Trails in consideration of other resources and uses. Current management is either inadequate or absent. For example, the current REVISIONspecifies a narrow visual protection zone along the NHTs, which has proven to be inadequate to maintain the historic settings that contribute to their

significance. The CDNST is minimally addressed in the current RMP. RMP sections for all 5 congressionally designated trails do not follow Land Use Planning Handbook Guidance.

- A need exists to identify the best way to describe and define the landscape settings in which the integrity of the Trails and associated properties will be maintained. The revision needs to develop and incorporate guidelines to meet these landscape setting objectives and outline mitigation measures that could be applied when landscape integrity is threatened.
- BLM needs to ensure future management of the NHT, CDNST, and associated landscape is consistent with the National Trails Act and the NHT comprehensive plan.
- Current procedures for dealing with cultural resources and the Trails, while nominally adequate regarding Section 106 compliance, are cumbersome and subject to variable interpretation. The ¼-mile buffer established around historic trails has been demonstrated to be sometimes inadequate to protect segments of historic trails for which viewshed is an important component in site significance. The revision should specify how to minimize visual intrusions along historic, prehistoric, and historic Native American trails, as well as in other Native American respected places.
- There are unique areas or sensitive lands and resources in the planning area that meet the criteria for protection and management under special designations. Nine areas of critical environmental concern (ACECs) are identified in the existing RMP. Additional areas have been proposed through both external and internal nominations. The implications of the official nomination or designation of certain areas need to be considered as part of the planning review.
- Management practices and restrictions for existing ACECs need to be evaluated for efficacy and need, and the implications of any additional proposed ACECs (e.g., for sage grouse habitat, bighorn sheep, visual resources, or paleontological resources) should be considered. Proposed special designations should be considered with an emphasis placed on areas with multiple resources or high areas of conflict. Areas of special importance and the management to protect them should be identified.
- Population growth, expanded mineral development, and other resources uses have the potential to impact resources and may mandate special management to avoid or limit resource damage. The threats to resources must be identified and appropriate management prescriptions adopted to prevent potentially irreversible damage.

- The CDNST currently has no management measures in place to guide management of the trail and associated scenery. The revision will develop a coordinated plan to address the issues associated with the National Landscape Conservation System resource. Management issues to be addressed include recreation use and visitor services as well as allowable uses around, on, and within the viewshed of the Trail.

- The level of development and potential for impacts to important resources far exceeds what was analyzed in the 1987 RMP. Both the need for and the risk from uses such as OHVs was not considered. Utility level wind energy generation was not considered. The expanded demand for transportation and transmission was not anticipated. As a result, the 1987 RMP did not identify areas as ACECs that are now considered to be in conflict with more modern use. These areas and appropriate management need to be considered in light of current and anticipated use.

Wild and Scenic Rivers

- An inventory has been completed on all water courses within the planning area to determine eligibility and suitability for Wild & Scenic River designation. The RMP will be used as a venue to provide public review and input on the findings of the inventory.

- As part of this REVISIONprocess BLM will also assess water course suitability and document the tentative classification of the appropriate segment(s) (wild, scenic, and/or recreational). This REVISIONwill establish interim management direction for all watercourses tentatively classified as wild, scenic, and/or recreational.

- The REVISIONshould also consider special management of eligible segments that are not currently considered suitable because of ownership patterns or withdrawals.

Wilderness Study Areas

- The field offices should identify site-specific goals and protection measures to insure the continuation of wilderness characteristics within WSAs while the recommendations are pending before Congress; appropriate management should also be considered in the event the areas are not protected as Wilderness.

Socioeconomic Resources

- Communities in the planning area are rural in nature, and their populations depend on retirement and investment income. They are both directly and indirectly affected by public land management considerations and decisions. The revision needs to consider how changes in management practices can maintain/enhance socioeconomic conditions and stability including the effects of land use and tourism on rural lifestyles. How can

the BLM manage mineral and other development while avoiding the loss of amenities and tradition that contribute to the income and custom of the local community?

- The revision should provide for the fair treatment and meaningful involvement of all people regardless of race, color national origin, or income with respect to the development, implementation, and enforcement of alternatives and policies. The WRIR comprises a significant portion of Fremont County and is the home of a very sizable population of Native Americans with a higher poverty rate than the rest of the area.

- State and local governments derive a considerable portion of their revenue from development of leasable minerals. The REVISIONmust be mindful of the economic contribution of oil and gas in particular to national, state and local governments as well as to those whose income is derived from mineral activities.

- Intense mineral development, particularly if the ramp up is very fast, has documented impacts to the social fabric of the community. This phenomenon has been observed repeatedly in Wyoming ("boom and bust") and can result in increased crime, social disruption, and impacts that overwhelm community infrastructure (often called the Gillette Syndrome. The revision must focus on the potential impacts to the communities in which the increased development will occur.

Health and Safety

- Currently health and safety concerns are a product of abandoned mine lands and hydrogen sulfide production within the field office. Existing laws and policy are adequate to address safety concerns within the planning area.

- West Nile virus is a threat to human health and safety (as well as to wildlife such as sage-grouse and horses). BLM management must focus on preventing the creation of habitat that encourages the spread of West Nile virus.

Environmental Justice

- The Revision needs to address the possibility that changes to current resource management activities would have disproportionately high and adverse human health or environmental effects on the minority, low-income, or tribal communities in the planning area.

Tribal Spiritual, Sacred, and Traditional Sites

- The revision should look at protections and management of the Tribal Spiritual, Sacred, and Traditional Sites. When the 1987 RMP was approved, these laws, executive orders, regulations, and manual guidance were mostly non-existent, and the revision needs to reflect current direction.

2. AREA PROFILE

This chapter provides an overview of the resources, resource uses, special designations, and social and economic features of the planning area. Each *resource* is characterized by indicators (used to assess the condition of the resource); current conditions (which describes the existing conditions of the resource); trends (which describes the direction of change between the present and some point in the past); and forecasts (which predicts the change in the condition of the resource given current management and opportunities for change.) *Resource uses* and *social and economic features* are characterized in terms of current conditions, trends, and forecasts. *Special designations* are characterized in terms of current conditions and areas being considered for future designation. This chapter is the basis of the affected environment section of the EIS.

The data contained are current as of the times of preparation. In some cases, new data may have become available. Where possible, the latest data are used but constant revision is not feasible and is covered by the trends and forecasts sections.

2.1 Physical Resources

2.1.1 Air Quality

The BLM's air resources program includes assessment of climate and air quality. Climate includes evaluation of existing climate, a qualitative description of climate change, and analysis of potential effects of climate change on BLM lands. Air quality includes air quality management, inter-agency coordination and cooperation, smoke abatement for prescribed fire, and air quality impact assessment. The BLM is mandated to consider and incorporate climate and air quality into multiple-use programs to manage the public lands in a manner which will protect or improve air quality.

2.1.1.1 Regional Context

The planning area lies within the regional geologic provinces of the Wyoming plains and Rocky Mountains. Mountainous areas are classified as sub-alpine and some alpine. Alpine climate is characterized by large variations in local temperature, precipitation, snowfall etc., depending on altitude and topography, but is generally a similar but cooler version of the nearby steppe climate (Trewartha and Horn 1980; Bailey, 1995; Curtis, 2004). Temperature and precipitation vary as a function of several factors, including season, time of day, slope, aspect and elevation.

Lander and Riverton are at elevations of 5,354 and 5,577 feet respectively; both are near the center of the planning area. Meteorological data available for Lander from 1948 through 2007 forms the basis of the climate characterization below; information from other locations will be included in the affected environment references.

2.1.1.2 Resource Characterization

Indicators

Climate indicators are time and amount of precipitation, wind, time and patterns of temperature. Air pollutant indicators are criteria air pollutants, hazardous air pollutants (HAPs), Prevention of Significant Deterioration (PSD) program, visibility impairments, and atmospheric deposition.

Criteria Air Pollutants:

Wyoming has set Ambient Air Quality Standards (WAAQS) for criteria pollutants concentrations; these must be at least as restrictive as national standards set by the EPA. Concentrations of air pollutants greater than the national standards represent a risk to human health, that by law, require that public safeguards be implemented. Criteria pollutants include carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10}, $PM_{2.5}$), sulfur dioxide (SO_2) and lead (Pb).

Hazardous Air Pollutants: There are a wide variety of hazardous air pollutants including benzene, toluene, and formaldehyde. Although HAPs do not have federal air quality standards (there do exist 'exposure thresholds'), some states have established "significance thresholds" to evaluate human exposure for potential chronic inhalation illness and cancer risks.

Prevention of Significant Deterioration:

The Prevention of Significant Deterioration (PSD) program of the Clean Air Act (CAA) ensures that air quality in areas with clean air does not significantly deteriorate, while maintaining an allowable margin for future industrial growth. Under PSD, each area is classified by the air quality in that region according to the following system:

- *PSD Class I Areas:* Areas with pristine air quality, such as wilderness areas, national parks and Native American Indian reservations, are accorded the strictest protection. Only very small incremental increases in pollutant concentration are allowed in order to maintain the high air quality in these areas.

- *PSD Class II Areas:* Essentially, all areas that are not designated Class I are designated Class II. Moderate incremental increases in pollutant concentration are allowed, although the concentrations are not allowed to reach the concentrations set by Wyoming and Federal standards (WAAQS and NAAQS).
- *PSD Class III Areas:* No areas have yet been designated Class III.

Visibility:

Visibility is described by perceived changes in visibility. To estimate potential visibility impairment, monitored aerosol concentrations are used to reconstruct visibility conditions for each day monitored. These daily values are then ranked from clearest to haziest and divided into three categories: the average visibility for all days, the 20 percent clearest, and the 20 percent with the worst visibility or haziest.

The Interagency Monitoring of Protected Visual Environments (IMPROVE) network has measured visibility in national parks and wilderness areas (which are managed as high visual quality Class I and II areas by the federal Visual Resource Management [VRM] program) in the United States since the 1980; six of these stations are in Wyoming.

Atmospheric Deposition:

Atmospheric deposition refers to the processes by which air pollutants are removed from the atmosphere and deposited in terrestrial and aquatic ecosystems; it is reported as the mass of material deposited on an area (kilograms per hectare [kg/ha]). Air pollutants are deposited by wet deposition (in effect 'scrubbed' out of the lower atmosphere by precipitation) and dry deposition (gravitational settling of particles and adherence of gaseous pollutants to soil, water, and vegetation).

Current Condition

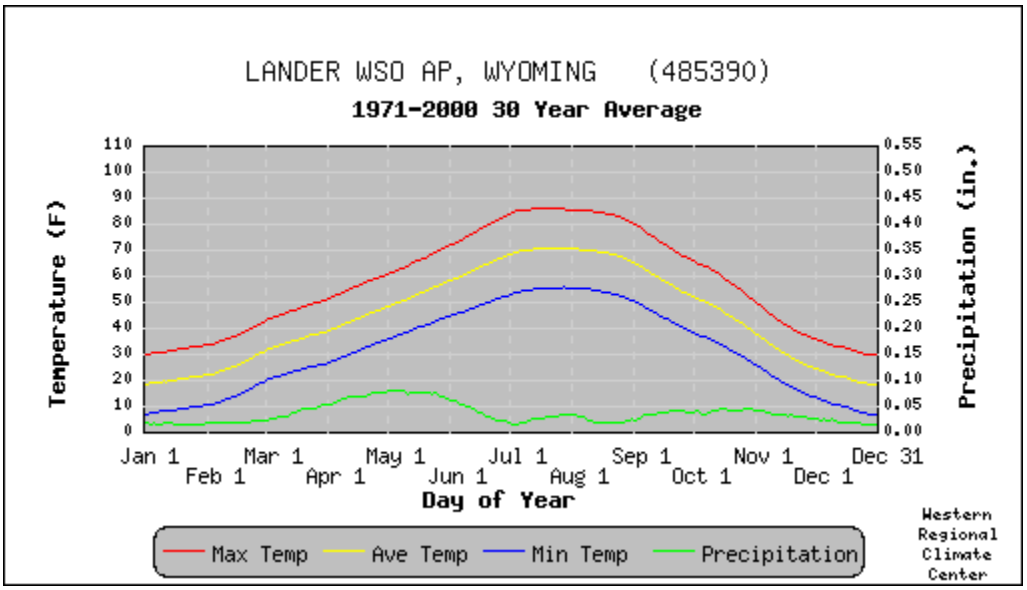
Climate

The climis designated as a combination of Intermountain Semi-desert and Southern Rocky Mountain Steppe. Summers are generally hot and short, and winters long and cold. Precipitation has historically been low, though greater at higher elevations, and distributed across the year, with the exception of the drier summer months. Wind speeds are variable but strong, which assists in the dispersal of air borne pollutants.

Figure 2-1 illustrates the general climate in Lander, showing long term monthly averages of temperature and precipitation as recorded at the Lander Airport. While there is considerable variation in temperature and precipitation throughout the planning area, the

relative relationships of temperature and precipitation throughout the year are similar in most areas.

Figure 2-1. Lander Temperature and Precipitation 1971-2000



Data is smoothed using a 29 day running average.

- Max Temp is the average of all daily maximum temperatures recorded for the day 1971-2000

- Ave Temp is the average of all daily average temperatures recorded for the day 1971-2000

- Min. Temp. is the average of all daily minimum temperatures recorded for the day 1971- 2000.

- Precipitation is the average of all daily total precipitation recorded for the day 1971 and 2000.

Early freezes in the fall and late in the spring are characteristic. This results in long winters and short growing seasons. The average frost-free period is 90 - 110 days, with possibly an additional 20 days more in the lower than 9” precipitation zones and 20 - 30 days less than this figure in the mountains. The following freeze dates for spring and fall have been taken from the USDA NRCS Soil Survey of Fremont County, East Part and the Dubois Area (USDA NRCS, 1993.) Updated survey information may be available.

Table 2-1. Frost Free Growing Seasons Average Freeze Dates Five-Years in Ten

Location	Last Freeze Date	First Freeze Date
South Pass	June 26	August as
Muddy Gap	May 29	September 16
Sand Draw	May 22	September 18
Dubois	June 17	August 27
Boysen Dam	May 6	October 5
Lander	May 31	September 14

Long-term average annual precipitation varies from less than 5” in the area north of the town of Shoshoni, to 20” or more in the mountainous country near Dubois. Away from

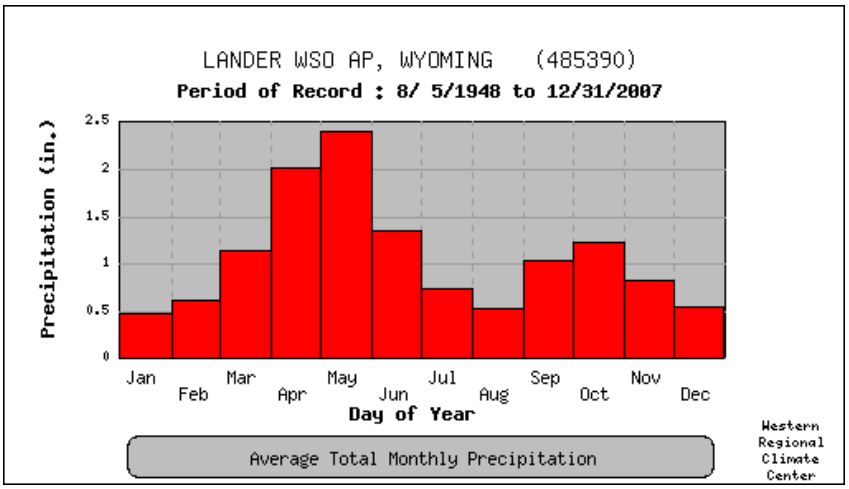
the truly arid country north of Shoshoni, most of the annual precipitation occurs as snow. As a rule, the highest elevations in the mountains receive the greatest amounts of precipitation and the lowest elevations the least. The table below presents NOAA long-term precipitation data for representative locations:

Table 2-2. Average Annual Precipitation

Location	Inches of Total Precipitation (inches of snow)
South Pass	13.31 (119.43)
Muddy Gap	9.90 (50.81)
Sand Draw	9.59 (52.75)
Dubois	8.84 (41.68)
Boysen Dam	9.03 (13.68)
Lander	12.85 (98.76)

In most areas, there is a peak period occurring in the spring and a secondary peak occurring in the fall. The following graph of Lander's monthly average precipitation shows the April-May-June and mid-September to mid-November peaks.

Figure 2-2. Monthly Average Total Precipitation.



The planning area is very sunny, from 60 percent of the possible amount during the winter to about 75 percent during the summer. Mountain areas receive less, and in the winter-time the estimated amount over the mountains is about 45 percent. Because the altitude provides less atmosphere for the sun's rays to penetrate and because of the

very small amount of fog, haze, and smoke, the intensity of sunshine in unusually high. The average relative humidity is quite low which, with the high percentage of sunshine, and rather high winds all contribute to a high rate of evaporation. The overall average amount of evaporation range is from 30 to about 50 inches. (Curtis, 2004)

Although Wyoming is windy and ranks 1st in the US with an annual average wind speed of 12.9 mph, Lander and much of the Wind River Basin have average daily wind speeds of about half the state's average and rated moderate for wind energy potential. Wind at specific locations will be identified in the affected environment where needed.

Air Quality

Air quality in the planning area is considered to be very good; however, complete data are not available for all criteria air pollutants. (A new measuring station is being established in the Frenchie Creek area and data should be available within the next two years.) The State of Wyoming has used monitoring to determine that the planning area is in compliance with WAAQS and the NAAQS standards. Background NAAQS and WAAQS concentrations of criteria air pollutants are shown in Table 2-3.

The State of Wyoming has monitored fine particulate matter in the planning area since 2001. PM_{10} concentration data collected from 2001 through 2007 indicate that annual PM_{10} means are well below the WAAQS. These monitoring efforts can be found at: http://www.epa.gov/air/data/repsst.html?st~WY~Wyoming.

Table 2-3. Concentrations of Criteria Air Pollutants and Background Air Quality for the Lander Planning Area

(NAAQS and WAAQS data source: EPA and WYDEQ respectively)

Pollutant	Averaging Time	NAAQS ($\mu g/m^3$)	WAAQS ($\mu g/m^3$)	Background ($\mu g/m^3$)	Data Source Information
Carbon Monoxide (CO)	1 hour[1]	40,000	40,000	1,979	Data collected from Yellowstone NP, WY near 'Old Faithful' geyser during 2005.
	8 hour[1]	10,000	10,000	931	
Nitrogen Dioxide (NO_2)	Annual (Arithmetic Mean)	100	100	3.4	Thunder Basin National Grassland
Ozone (O_3)	1 hour[2]	235	235	169	

Table 2-3. Concentrations of Criteria Air Pollutants and Background Air Quality for the Lander Planning Area

(NAAQS and WAAQS data source: EPA and WYDEQ respectively)

	8 hour[3]	157	157	141.3	
Particulate Matter (PM_{10})[8]	24 hour[4]	150	150	N/A	Wyoming Department of Environmental Quality (DEQ), State and Local Air Monitoring Station (SLAMs)
	Annual (Arithmetic Mean)[5]	Revoked Dec. 2006	50	16.1[9] 18.6[10]	
Particulate Matter ($PM_{2.5}$)[8]	24 hour[6]	35	65	11[11] 3.9[12]	DEQ SLAMs
	Annual[7]	15	15	3.3[11] 7.5[13]	
Sulfur Dioxide (SO_2)	3 hour[1]	1300	695	93	Data collected at the Lost Cabin Gas Plant – preconstruction monitoring in Fremont County, WY 1986-1987.
	24 hour[1]	365	260	32	
	Annual (Arith. Mean)	80	60	4	

1 Not to be exceeded more than once per year
2 The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 235 ug/m^3 is < 1. As of 2005 EPA revoked the 1-hour ozone standard in all areas except the fourteen 8-hour ozone non-attainment Early Action Compact (EAC) Areas.
3 To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 157 ug/m^3.
4 Not to be exceeded more than once per year on average over 3 years.
5 Due to no linking of health problems to long-term exposure to coarse particle pollution, the agency revoked the annual PM_{10} standard in 2006.
6 To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m^3 (effective December 17, 2006).
7 To attain this standard, the 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m^3
8 Data collected by WDEQ-AQD at Emerson Building, Cheyenne, Wyoming, Year 2001, second highest 24-hour concentrations. These data were determined by WDEQ-AQD to be the most representative co-located PM10 and PM2.5 data available.
9 Data obtained from Cody, WY. DEQ SLAMS 2007
10 Data obtained from Gillette, WY DEQ SLAMS 2006
11 Antelope Site, Converse County, WY DEQ SLAMS 2004
12 Antelope Site, Converse County, WY DEQ SLAMS 2006
13 Lander, Freemont County, WY DEQ SLAMS 2007

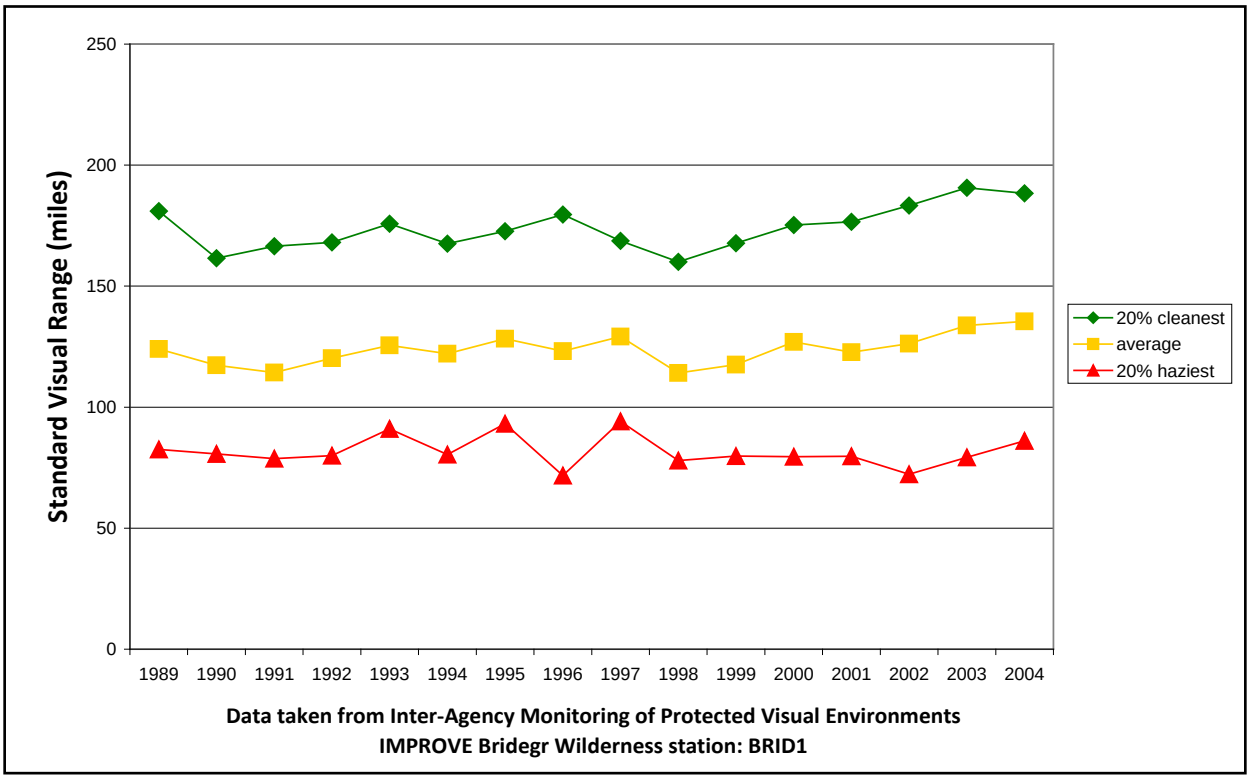
Trends.

Pollutant Concentrations:

PM_{10} and $PM_{2.5}$ (particulate matter less than 10 and 2.5 microns in diameter) data collected from 2001 through 2007 at the State and Local Air Monitoring Station (SLAMS) located in Lander. Particulate matter standards have not been exceeded for PM_{10} and $PM_{2.5}$ and are on a somewhat downward trend. Particulate concentration is reported in units of micrograms per cubic meter (µg/m3) or parts per billion (ppb).

Visibility There are two national parks and five Wilderness Areas within 150 miles of the planning area; the Wind River Indian Reservation (WRIR) is in the planning area. (The WRIR has not chosen, as yet, to identify itself as a PSD Class I area, although this is being considered. Since the WRIR is authorized to make this decision at any time, it is being identified here as a Class I area.) Data from the Bridger Wilderness are used because it is upwind of the planning area. Trend analysis of Bridger Wilderness visibility data reveals no significant worsening of visibility from 1989 through 2004.

Figure 2-3. Annual Visibility in the Bridger Wilderness, 1989 to 2004

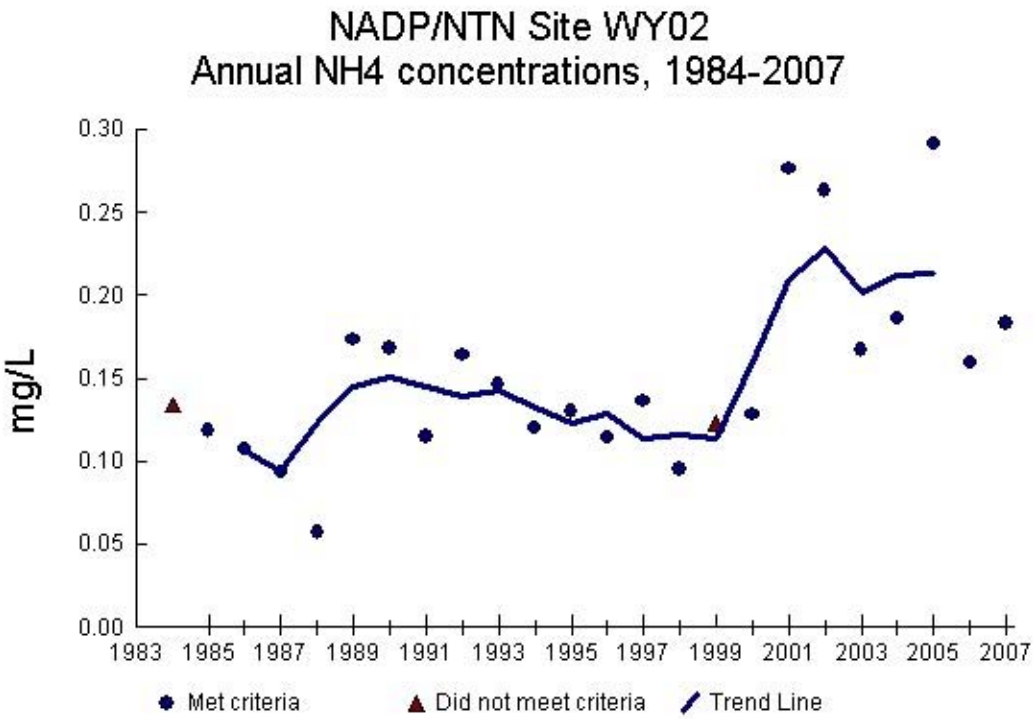


Atmospheric Deposition

For this air quality analysis, wet deposition was measured by analyzing the chemical composition of rain and snow at the National Atmospheric Deposition Program site in

the Sinks Canyon. Figure 2-4 shows the NH4 (ammonium) as measured in Sinks Canyon. Ammonium is a component of acid rain and has been generally increasing since 1999.

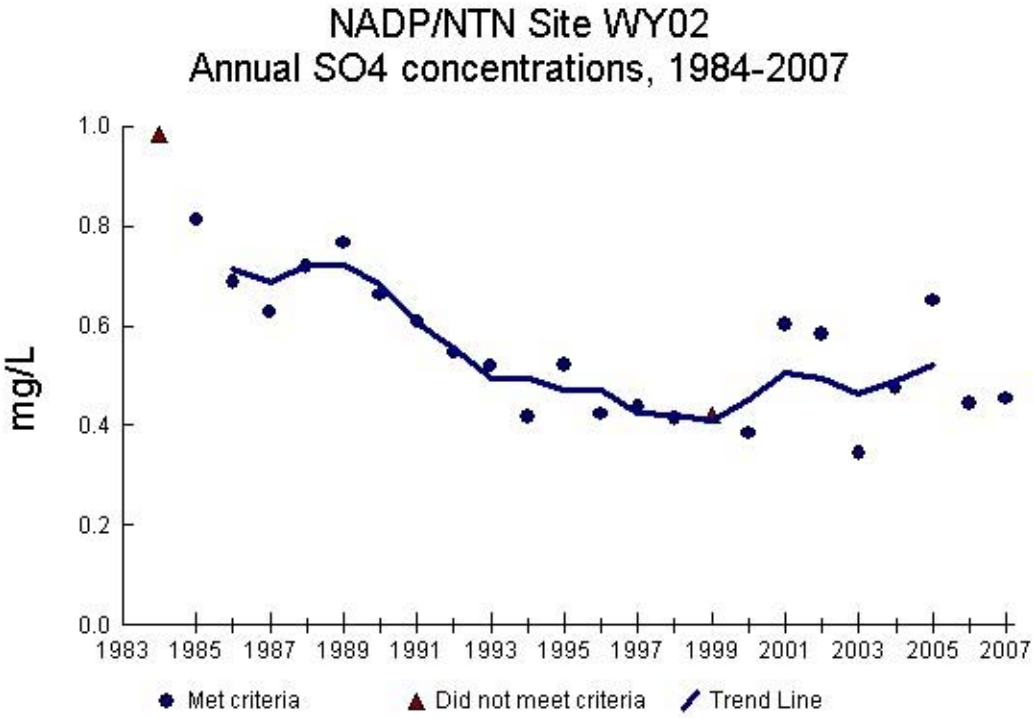
Figure 2-4. NADP Sinks Canyon Site Annual NH4 Concentrations 1984-2007



Source: http://nadp.sws.uiuc.edu/trends

The Sinks Canyon NADP station also measures sulfate another component of atmospheric deposition. Figure 2-5 shows SO4 concentrations for the same period as ammonium.

Figure 2-5. Sulfate Concentrations in Sinks Canyon



Source: http://nadp.sws.uiuc.edu/trends

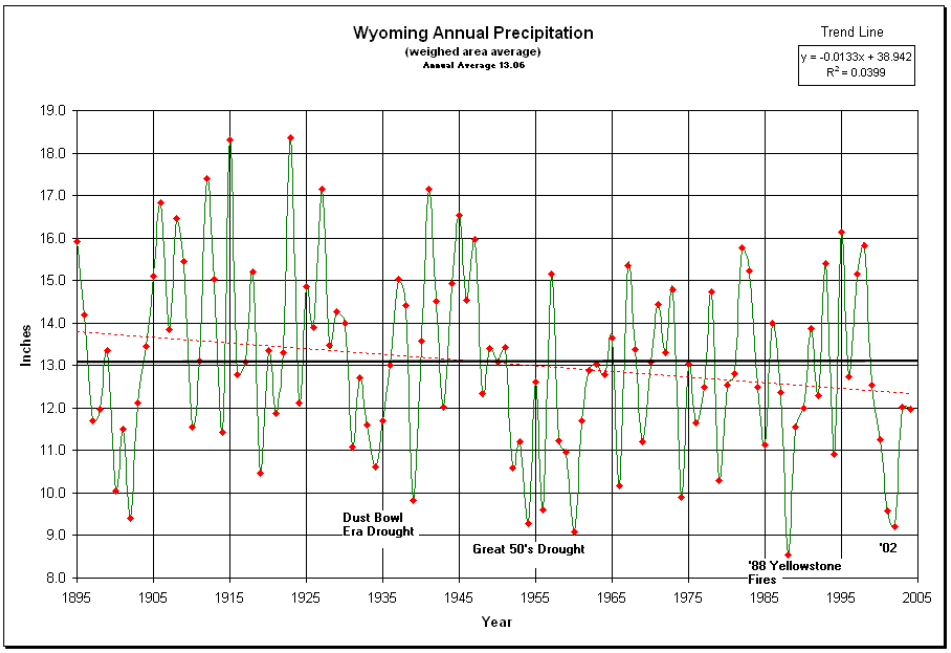
Hazardous Air Pollutants

Existing sources of HAPs include fossil fuel combustion that emits HAPs such as formaldehyde, and oil and gas operations that emit volatile organic compounds (VOCs) and may emit hydrogen sulfide (H_2S). There are no measurements of HAPs being made in the planning area and consequently no current data or trends. As full field oil and gas development proceeds, HAPs will be studied against a measured backgound condition.

Climate Trends

Figure 2-6 depicts the trend in state-wide precipitation since 1945 has been drier when compared to the fifty years prior to that. The decrease has been nearly one and a half inches since 1895. The graph below shows the trend for the period from 1895 through 2004. Also of note are the wide swings in precipitation with no consistency in pattern or predictability from one year to the next.

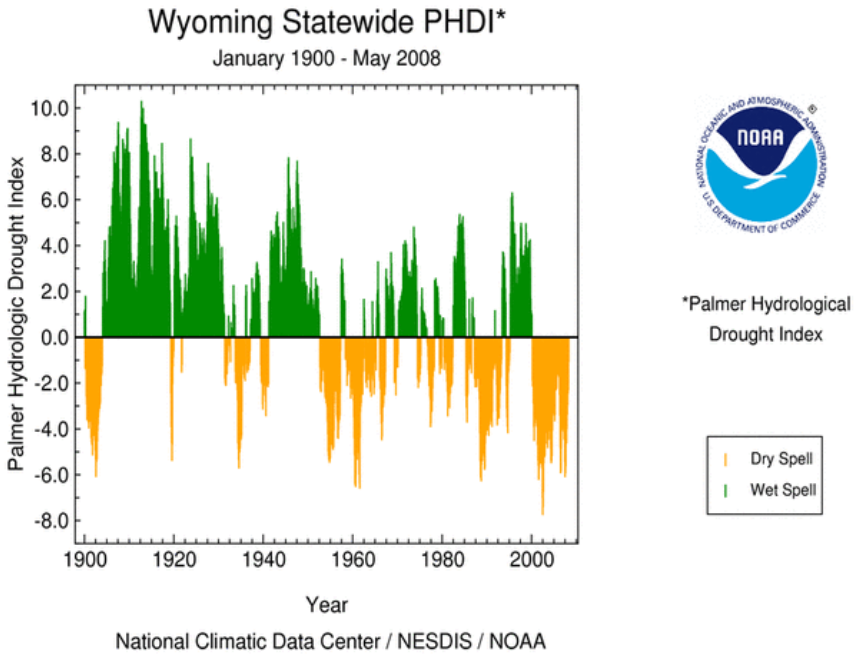
Figure 2-6. Wyoming Annual Precipitation (1895-2004)



(Source: Curtis, 2004)

Drought also varies but with a lag in for recovery from earlier drought:

Figure 2-7. Palmer Hydrologic Drought Index



The effects of the drought that began in the 1999 to 2000 period were most pronounced by 2003. Native vegetation production was substantially decreased and resulted in a reduction in permitted livestock grazing. 2008 and 2009 showed wetter than normal conditions but not yet a recovery from drought.

Forecasts

Air Quality

Air quality is good and has historically been some of the best air quality in the nation. However, because the EPA and Wyoming DEQ are continually reassessing air quality standards (for example, national 8 hour average ozone standards were strengthened in 2008), compliance may be harder to achieve in the future. Management for the control of pollutants will become more challenging as development increases in the future.

Climate Change

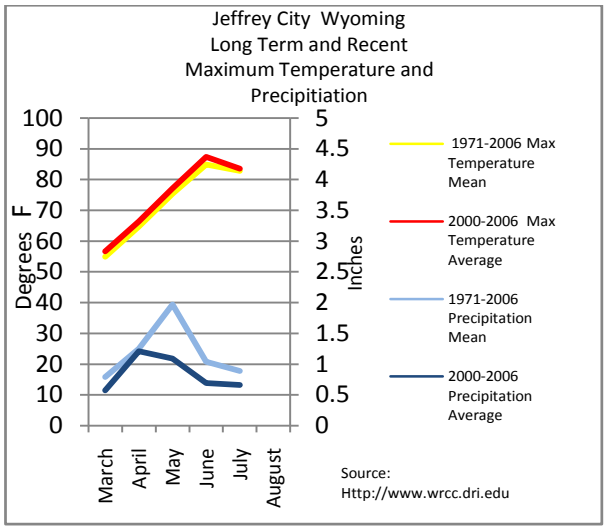
On-going scientific research has identified the potential impacts of Greenhouse Gas (GHG) emissions (which include carbon dioxide [CO_2]; methane [CH_4]; nitrous oxide [N_2O]; and water vapor) on global climate. Through complex interactions at global scales, these GHG emissions cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia, recent industrialization and burning of carbon sources have caused CO_2 and other GHG to increase dramatically globally, and are likely to contribute to overall climatic change. Increasing CO_2 concentrations may also lead to preferential fertilization and growth of specific plant species.

In 2001, the Intergovernmental Panel on Climate Change (IPCC) pointed out that by the year 2100 global average surface temperatures could increase 1.4 to 5.8°C (2.5 to 10.4°F) above 1990 levels (IPCC 2001). The National Academy of Sciences (NAS) has confirmed these findings, but also indicated that there are uncertainties regarding how climate change may affect different regions (NAS 2006). Computer model forecasts indicate that increases in temperature will not be evenly or equally distributed, but are likely to be accentuated at higher latitudes. Warming during the winter months is expected to be greater than during the summer, and increases in daily minimum temperatures are more likely than increases in daily maximum temperatures.

The lack of scientific tools (models with sufficient spatial and temporal resolution) to forecast climate change at even regional scales limits the ability to quantify potential future impacts at these scales. Although modeling the future is imprecise, current data show measurable changes. Jeffrey City is located in the central portion of the planning

area, in a 10 - 14" precipitation zone. Below are plotted the temperatures and precipitation for Jeffrey City during the period 2000 through 2006. As can be seen, temperatures for this period have been one to three degrees higher and critical spring precipitation has been consistently below the 1971 -2006 long term average.

Figure 2-8. Long-Term and Recent Maximum Temperature and Precipitation Data



Another marker of changing climate in the planning area is the shrinkage of the Wind River glaciers. The Wind River Range is host to 63 glaciers, including 7 of the 10 largest glaciers in the American Rocky Mountains (Bonney, 1987). The glaciers on the eastern side of the continental divide are part of the hydrological system of the planning area and are substantial contributors to surface water flow in the summer months. While these glaciers have been decreasing in thickness since the 1930s (Pochop, 1990), since 1990, the loss has been both in area and volume. Researchers estimate that the glaciers may disappear within 20 years if retreat continues to occur at the rates observed during this century. This belief has contributed to a sense of urgency among the scientists who wish to obtain ice cores for research purposes before the glaciers melt completely (Schuster, 2000). See http://waterplan.state.wy.us/plan/bighorn/techmemos/glaciers.html.

Key Features

Key features are the Criteria Air Pollutants, HAPs and measurable markers of changing climate such as precipitation, temperature and glacial reteat.

2.1.2 Geologic Resources

2.1.2.1 Regional Context

The area lies within the regional geologic provinces of the Wyoming plains and Rocky Mountains. Igneous, metamorphic and sedimentary rocks of all geologic periods, except the Silurian, are present and represent a time span from 3 billion years to the very recent - 10,000 years before the present. The setting is one of basin, separated and surrounded by mountain ranges including the Owl Creek, Washakie, Absaroka, Wind River, Granite, and Rattlesnake. Basins include most of the Wind River, and the northern portion of the Great Divide Basin (GDB) (Map 3). The majority is in the Wind River Basin, with less than 150,000 acres in the GDB; these are also the oil and gas basins.

The geologic setting contributes to the formation of numerous important geologic resources such as Red Canyon, Beaver Rim, Lander Slope and Table Mountain, Sweetwater Canyon, and Sweetwater Rocks, as well as unique geologic settings responsible for hosting certain mineral resource types and occurrences such as oil and gas, hard rock and placer gold, uranium, phosphate, and bentonite.

2.1.2.2 Resource Characterization

Indicators

Indicators for geologic resources include number of acres protected and aesthetic measures of condition. These geologic resources contribute to educational, scientific, and visual values. Visual values are discussed in the visual resources section.

Other geologic indicators include deposits or occurrences of mineral resources found in formations within the planning area that include the presence of locatable, leasable, and salable minerals. The quantity and associated acreage of mining plans and notices, mineral material sales and solid mineral prospecting permits and leases are an index to these indicators. The minerals section of this AMS provides additional information.

Current Condition

Currently, geologic resources (as natural baseline resources) are seeing more impacts due to increased surface disturbance related directly and indirectly to (1) increased mineral development (of leasable, salable, and locatable minerals), (2) paleontological resources excavation, and (3) to other surface disturbances such as new roads, or off-highway vehicle (OHV) use.

Geologic resources related to unique geologic features are largely intact from a visual standpoint but in some cases are threatened due to increased development (e.g., Lander Slope, Red Canyon). Geologic resources related to mineral deposits found in formations within the planning area are either intact, under exploration or mining pressure, or under consideration for active reclamation under the Abandoned Mining Lands program.

Current conditions in the Gas Hills, Bison Basin and Crooks Gap Uranium Districts (Map 4) range from on-going open pit reclamation, exploration drilling associated with 16 notices and plans, and several proposals for new *in situ* leach uranium mines. Former uranium mill site lands are removed from mineral entry as the withdrawal process is completed for the purpose of transfer to the US Department of Energy for long-term management. These tailings have radiation levels that exceed public health standards and are denuded of vegetation although contoured to prevent surface water contamination.

The South Pass/Atlantic City Mining District has seen no increase in mining related activities over the last planning cycle but continues to experience impacts to the geologic resource from several hundred visitors engaged in casual use mining activity (surface panning and sluicing) and 13 mining exploration plans and notices. Bentonite exploration is ongoing, targeting certain beds contained in the Cretaceous Mowry and Frontier Formations. One bentonite mine has been permitted but has not yet begin operations.

Minerals material sales occur throughout in the planning area due to the wide-spread occurrence of alluvial material at land surface, and abundant outcrops of granite, shale, and limestone used in various construction projects.

The Mineral Occurrence Report has an extensive discussion of the stratigraphy of the geological resources in the planning area. Certain of these formations have particular significance because they are the location of much of the commercially important minerals or because of their contribution to the visual resources in the area. These formations are described in summary form under Key Features.

Trends

Large-scale geologic processes are constantly changing across the geologic landscape. These processes operate over extended periods and are not subject to analysis as "trends" more appropriate for other resources operating on a human time scale. Knowledge of the geology of the planning area improves with mineral exploration, prospecting, and testing. The degree and direction of change to geology due to the weathering process would be imperceptible over the life of a land use plan.

Mining activities would tend to change the character of the surface over the short term, but over the long term if reclaimed, some disturbed areas are returned to the greatest extent possible to the pre-existing slope and vegetative cover. Mining activities will contribute to depletion of economically recoverable mineral resources such as uranium, gold, salables such as sand and gravel, and will result in impacts to visual values from increased development. Open pit mining will never be re-vegetated or reclaimed.

The general trend is a steadily increasing amount of overall surface disturbance and associated downstream sedimentation, with increasing potential to impact important geological resources that provide scenic, scientific, economic (mineral) or other types of public benefit. This upward trend has not been quantified.

Forecasts

Management decisions made by the BLM will likely not affect the large-scale geologic processes occurring in the basin and surrounding areas. However, the management decisions could affect the aesthetic quality of unique geologic features and both the quality and quantity of mineral deposits available for exploitation.

As more easily exploited mineral resources are depleted elsewhere, industry may turn to resources such as uranium, phosphate or bentonite which generally occur at low to medium grades in the planning area. Exploration associated with a gold deposit in the Rattlesnake Hills may result in an open-pit gold mine.

South Pass/Atlantic City mining/exploration activity is expected to remain flat or slightly increase due to improvements in the South Pass State Park which showcases the area's mining history with tours, restored mining fixtures, and gold panning demonstrations.

Major agents of change include the world-wide energy markets which affect price and therefore industry decisions with respect to exploration and mining expenditures. Other agents of change include management decisions to withdraw mineral lands to protect other valuable resources, or unique geologic features themselves.

Key Features

The features are Beaver Rim, Granite Mountains, Red Canyon, Lander Slope and Table Mountain, Sweetwater Rocks and the Sweetwater Canyon.

Key features which are indexed by mineral resources include the Gas Hills and Crooks Gap uranium districts, the South Pass/Atlantic City gold mining district, the Lander phosphate field, and the Mowry/Frontier bentonite beds, all of which are predicated upon unique geologic conditions for their occurrence.

2.1.3 Soil Resources

2.1.3.1 Regional Context

The soils of the Wind River and North Platte/Sweetwater River watersheds, and Great Divide Basin, are typical for those of high, semiarid, cold deserts. The majority of the soils are located within the Wind River and Sweetwater River watersheds with approximately 6% occurring in the Great Divide Basin.

2.1.3.2 Resource Characterization

Indicators

Soil properties and formation vary by location but such variances are not random and are a product of five factors: parent material; biota (plant & animal); topography; climate; and time.

Indicators are rangeland health indicators (BLM Technical Reference 1734-6, version 4 – 2005) that apply to the soil/site stability, hydrologic function, and biotic integrity. These indicators are expressed as a degree of departure from the ecological site description or established reference area. Indicators for soils/site stability include:

- Rills (naturally occurring rather than accelerated formation)
- Water flow patterns (length, obstructions, coverage, and continuity)
- Pedestals and/or terracettes (height & level of occurrence)
- Bare ground (amount & distribution)
- Gullies (naturally ccurring rather than accelerated formation and severity)
- Wind-scoured, blowouts, and/or deposition areas (level of occurrence, deposition rate, size of accumulation areas)
- Soil surface resistance to erosion (presence of litter, organic matter content, physical/chemical/biological crusts, micro-topography, vegetation cover)
- Soil surface loss or degradation (organic matter content, surface structure)
- Compaction layer (presence or absence of compaction layer, depth, level of restriction reated by compaction layer)

These indicators the susceptibility of a site to wind and water erosion as well as indicate limited water infiltration, nutrient cycling, and native plant production. As vegetation health declines so does the soil/site stability. Deterioration of healthy plant communities (diversity/cover, native perennials versus non-native annuals) and loss of adequate litter contribute to increased bare ground and loss of organic matter in soils, compound-

ing the deterioration of plant community health and further contributing to soil loss to erosion, and degradation of the soil structure.

These soil indicators are considered in determining whether Standard 1 of the 1997 Wyoming Standards for Healthy Rangelands (SHR) is being met. Standard 1 provides:

"Within the potential of the ecological site (soil type, landform, climate and geology) soils are stable and allow for water infiltration to provide for optimal plant growth and minimal surface runoff." SHR indicators include: Plant community composition and distribution relative to infiltration and runoff; litter amount; functional/structural groups; plant mortality and decadence; vegetative annual production; invasive plants; and reproductive capability of perennial plants.

Plant litter is important to maintain soil organic matter levels that hold nutrients and moisture essential for growth. Both surface litter and the annual, natural loss/replacement of roots below ground are important to maintain soil fertility, facilitating rates of water infiltration, and mitigating natural soil erosion losses.

Soil fertility should be recognizable through the presence/absence of optimal vegetation growth on a particular ecological site. For soils supporting sparsely vegetated ecological sites (USDA 1993) physical and biological crusts can play an important role in holding the soil surface together through the network of microscopic filaments produced by cyanobacteria, or blue-green algae, in the top few millimeters of soil surface between plants, even though such areas are barren in appearance.

Current Condition

The current condition of soil resources varies greatly. Relatively undisturbed areas can be still be found and are lightly used by livestock due to slope steepness or distance from water. Many of the soils are in good condition and capable of producing forage for wildlife and livestock, maintaining watershed integrity, and recovering from impacts associated with surface-disturbing activities. However, other localized areas have been impacted by historic livestock overgrazing, drought events, extensive soil erosion, mineral development activities, ROWs, OHV use, timber harvesting and rangeland improvements. Soil health largely is a product of land management practice.

Modern reconnaissance-level soil surveys cover most of the planning area: USDA NRCS Cooperative Soil Surveys of Fremont County East and the Dubois Area Soil Survey of 1993; Natrona County Soil Survey of 1997; and Lander Area Soil Survey of 1981. The Lander Area survey is old and the mapping is quite broad on the public lands; this soil survey is in the process of being updated. Those portions of the planning area in Sweetwater and Carbon Counties do not have soil survey coverage. A comprehensive

survey of soil/site stability and health has not been conducted. Reconnaissance-level soil surveys do not routinely map or note eroded phases of soil series.

Existing surveys provide data as to the susceptibility of the soils to the erosive forces of wind and water (Maps 5 and 6). The most restrictive rating for the soil component was used in the creation of these maps; in other words, if a soil map unit contained 50 percent of a soil rated as slight for wind erosion and 35 percent of another soil rated as severe the whole map unit is rated as severe. Thus, these maps provide only a general guide to oil capacity; each project must be considered on a site-specific basis.

In a semi arid climate with cyclical drought and unreliable precipitation, impact to vegetation is difficult to monitor. BLM does some soil limited health and monitoring including PFC inventories, livestock grazing compliance with HRS, project inspection reports, and analysis of reclamation success to release bonds. These impacts are discussed in the respective sections. Two ongoing EISs will look at existing surface disturbance in the Beaver Creek and the GMI project areas. Data from these areas cannot be extrapolated for the planning area, however, since they are not representative. The cost to undertake such an inventory on a field office wide basis would be prohibitive.

There are some observed soil problems in **localized areas**: soil salinization has resulted from the deposition of salts through capillary activity from surface disposal of produced water containing high levels of salts; topsoil has eroded from overgrazing by as much as 70% (Technical Review Team, 2005); topsoil has been mixed with subsoils reducing reclamation potential; OHV use has not followed travel management; the spread of invasives has reduced soil stability and health; and final reclamation is limited to soil stability and not habitat restoration.

The impact of the increase in mineral development are expected to be mitigated to some degree by the Wyoming DEQ's Storm Water Discharge Permitting requirements, which impose sediment control, spill containment planning, monitoring, and eventual reclamation of disturbed areas. Within the last few years, the storm water discharge requirements have been required for most surface-disturbing activities greater than one acre in size. The BLM must require its authorized activities to comply with the Wyoming DEQ's Storm Water Program; the specific mechanism for ensuring compliance has never been addressed. Storm water discharge permit requirements have significantly reduced the impact from erosion from major surface-disturbing activities. Its goal, however, is soil stabilization and not a return to pre-disturbance habitat. As in most permitted activities, impacts to soil would be better understood and controlled if additional staff resources were available for monitoring the success of reclamation.

Livestock grazing is the most widespread use that the BLM authorizes; 97 percent of the planning area is open to livestock grazing. Associated with this use are water developments that are subject to livestock overgrazing and soil compaction in the immediate area. Typically, impacted areas range in size from one-half to about five acres. (http://www.wrds.uwyo.edu/sco/drought/drought.html) Mineral supplementation areas vary by year. Areas with continual mineral supplementation often exhibit changes in soil chemistry. Appendix F has the equations developed by the BLM to determine impacts from rangeland developments.

Heavy utilization of vegetation by livestock in riparian zones has resulted in soil compaction in the nearby transition zones to the uplands, and in the form of hummocks within the riparian zone. Fence lines are trafficked more than other upland areas due to livestock trailing. Many upland areas exhibit the necessary attributes of proper rangeland health. This condition generally results from their slope and distance from water. These impacts are discussed further in other sections.

Wildlife use, particularly of winter shrub habitat by browsing species, can have impacts over time where the highly utilized shrub communities become decadent and of less value to the species that depend on them. These plant communities are then prone to invasion by weedy species and accelerated erosion and soil fertility losses.

BLM is currently studying the impacts of wild horses in riparian areas where wild horses congregate and impacts to both vegetation and riparian areas are being studied. However, wild horses are found in identified management areas whereas degraded riparian conditions are found throughout the planning area, including those allotments on which there are no wild horses. This data will be available for impact analysis.

Weed infestations force out native vegetation and replace it with weedy plants that provide inferior protection to the soil surface. Weed species typically do not have root systems adequate to stabilize soils and sites dominated with weeds are often subject to accelerated erosion. Many scientific research findings link accelerated erosion rates and invasive, monotypic weed infestations (Lacey et al. 1989). Hirsch and Leitch (1996) found knapweed infestation induced higher levels of soil erosion. Drought conditions can favor the establishment of weedy species over stressed native vegetation.

Trends

The ability of the soil to withstand erosion caused by wind or water depends directly on the vegetative cover, physical/biological soil crusts, and topography. Vegetative cover is

also the greatest variable affecting soil erosion that land managers have control over. Soil erosion will accelerate significantly once a threshold of loss of healthy vegetative cover has been exceeded. Vegetation cover has steadily decreased over time in localized areas as a result of increased surface disturbing activities.

- On a landscape scale, vegetation cover has varied from year to year, but has decreased incrementally due to 10 years of drought. Generally, rangeland soils have thin topsoil, are low in organic matter, and are susceptible to accelerated erosion and lower vegetative production due to lost soil nutrients, weed invasion, and excessive amounts of bare ground.
- Erosion is also episodic, in that it does not happen uniformly over time. Large precipitation events, strong winds during drought periods, and high flow events can remove large amounts of soil accumulation in a single event.
- Mineral development which are increasing contribute to soil disturbance
- Interest in alternative energy development, communication sites and ROWs has increased and is expected to continue in the future.
- It is likely that negative impacts to soil from weed infestation will increase, although that is dependent on other factors such as soil disturbance and climatic conditions. Drought conditions can favor the establishment of weedy species over stressed native vegetation.
- Wildland fires are increasing in size, intensity, and frequency. All indications are that this trend will continue. Larger fires lead to increased soil erosion and a shifting from native herbaceous communities to communities dominated by cheatgrass and annual weed species. Species such as cheatgrass and Russian thistle are known to change the fire regime to favor a fire cycle of more frequent and intense fires. In the event this trend continues, these plant communities would facilitate further soil loss.
- Harvesting of timber is decreasing, so negative impacts to soil will decrease.
- Recreational uses that negatively impact soil such as inappropriate OHV use seems to have increased in certain areas such as Government Draw and the Dubois Badlands.

Forecasts

The above-discussed trends are likely to continue. In addition:

- Interest in moving livestock grazing from riparian areas may result in new water developments and fences with resulting increases in soil compaction around new water developments and fence lines. Dispersion of livestock would have a positive influence on soils within riparian areas, allowing bank stabilization, recovery and trend toward greater riparian obligate species diversity, and would limit the compaction layers associated with hummocking and the transition zones associated with movement to and from riparian areas. On a long term basis, improved riparian-wetlands result in improvements to the soil but only so long as the wetlands system is protected from livestock overgrazing.
- The decrease in timbering does not consider pine beetle kill management or the interest in biomass as a renewable energy resource; both will likely increase. With less cutting to manage stands for the growing of new trees, acreage occupied by old dead trees will increase, causing more frequent and intense wildland fires with more post-fire soil erosion unless stabilization is successful.
- The stormwater permitting is likely to lessen the impacts of soil disturbance.
- Interest in alternative energy will increase with substantial impacts to soil.
- Recreational demand for developed campgrounds, access and parking at rock climbing areas, and mountain biking trail heads is expected to increase.
- Major flood events often follow droughts. With decreased vegetative cover, soils dry hard and form crust at the surface. This, along with a general absence of roots to aid in transmitting water from the soil surface into the soil profile, leads to reduced infiltration rates so that runoff from average precipitation events creates abnormally large runoff amounts. Increased flood frequency and size will lead to more soil erosion.
- With arid and semi-arid moisture regimes covering much of the planning area, once topsoil loss occurs it can be irretrievable, or very slow to rebuild. Site-specific mitigation practices, including timely reclamation, must be designed to minimize soil erosion and protect long-term soil productivity.
- Analytical methods for erosion prediction employing GIS analysis will lead to improvements analyzing potential impacts to soil resources. Utilizing GIS mapping tools in conjunction with field observations will help BLM in identifying potential soil resource conflicts.

Climate Change

The impacts of climate change can be expected to be similar to the impacts due to periodic drought without a recovery period or return of productivity to normal times.

Key Features

Key features for soil resources are drought and vegetative health as well as all activities that can limit the soil's ability to hold and drain water and resist erosion. A substantial portion of the planning area consists of soils with low reclamation potential. Such conditions make re-vegetation following soil disturbing activities difficult.

2.1.4 Water Resources

This section characterizes surface water and groundwater resources and describes water use and current water management practices in the planning area.

2.1.4.1 Regional Context

Surface Water

The source of surface water is precipitation. Map 7 shows the different zones based on average annual precipitation. There are three major hydrologic basins (Map 7-A):

- The largest of these is the Wind River Basin, a subdivision of the Yellowstone River Basin, which is a subdivision of the Missouri River Basin.
- The second largest major river basin is the North Platte River, of which the Sweetwater River is a tributary. This watershed covers most of the area on top of the Beaver Rim escarpment; it flows east to Pathfinder Reservoir on the North Platte River. A minor area in Natrona County drains directly to the North Platte River. The North Platte River ultimately flows east to the Missouri River.
- The third major hydrologic basin, the Great Divide Basin, is found in the southern part of the area. This is a hydrologically closed basin in Wyoming's Red Desert region that does not drain to either the Pacific or Atlantic Oceans.

In addition, a ½-mile stretch of Wallace Creek in the Rattlesnake Hills drains to the Powder River, a tributary to the Yellowstone River which flows to the Missouri River. Also, near Dubois, Fish Creek drains about 30 square miles of non-BLM lands in the planning area to the west. Fish Creek flows to the Gros Ventre River, which meets the Snake River near Jackson, which flows to the Columbia River and into the Pacific Ocean.

Groundwater

In a regional sense, the United States can be divided into numerous groundwater provinces (Meinzer, 1923; McGuinness, 1963). Such classifications lead to categorizing the greater planning area under the Unglaciated Central Region. This region encompasses a large area of the interior United States and in general is underlain by level or gently tilted and folded sedimentary rocks ranging in age from Paleozoic to middle Tertiary (Fetter, 1980). The land area encompasses plains and plateaus and is gently rolling to sharply dissected.

2.1.4.2 Resource Characterization

Natural processes and human actions influence the chemical, physical, and biological characteristics of water. Indicators of water quality include:

- Chemical characteristics (e.g., pH, conductivity, dissolved oxygen);
- Physical characteristics (e.g., sediment, temperature, color); and
- Biological characteristics (e.g., macro- and micro-invertebrates, fecal coliform, and plant and animal species).

Water quality is measured by compliance with the Clean Water Act 33 USC 1215 et seq. (CWA) which requires that water quality be maintained or improved for outstanding (Class 1) and most of the high-quality (Class 2) waters. All other waters must be maintained against degradation and are monitored to determine if the water quality meets the requirements for the class into which Wyoming has assigned the waterbody. Class 2AB waters, for example, support game fish (WEQD, 2008). Water quality is evaluated to see if it supports the use identified for that class of water. Meeting this “use support” is an indicator of water quality.

Two additional indicators for water quality are point source and nonpoint source pollution. Point source pollution is water pollution that is issued from a discrete location such as a pipe, tank, pit, or ditch. Nonpoint source pollution is pollution arising from an ill-defined and diffuse source, such as runoff from cultivated fields or grazed land.

Indicators for groundwater:

Similar to surface water, natural processes and human actions influence the chemical, physical, and biological characteristics of ground water. Groundwater quality is related to the chemical composition of the rocks composing the geologic units through which the water travels. Water temperature, the duration of contact with the rocks, and the rate of movement of the water also will affect the chemical quality of groundwater (Plafcan et al., 1995).

Groundwater quality indicators refer to biological, chemical, and physical characteristics of a water sample relative to a standard defined for drinking water or class of water use. Indicators of groundwater quality include, but are not limited to:

- Chemical characteristics (e.g., pH, conductivity, dissolved oxygen, hardness);
- Physical characteristics (e.g., temperature, taste, color); and
- Biological characteristics (e.g., fecal coliform, nitrates).

With respect to groundwater supplies for domestic, industrial, livestock and other consumptive uses, indicators include availability or functioning condition of recharge zones and the rate or amount of recharge (e.g., climatic factors affecting precipitation). These factors, along with natural hydraulic properties, directly impact aquifer pressure head or water table elevation, and therefore, water levels in wells or springs.

Current Condition

Surface Water

Watersheds consist almost entirely of semiarid rangelands with fewer acreages of alpine and high elevation forest land. Because annual evaporation rates exceed annual precipitation, a water deficit exists on these rangelands. There are few perennial streams and discharge from many streams is largely intermittent, flowing for several months as a result of annual snowmelt, and ephemeral, in direct response to precipitation events. Most of the precipitation is lost through evapotranspiration and sublimation instead of creating runoff or recharging groundwater aquifers (Leopold, 1960).

Section 305(b)of the CWA requires a biennial report from the state that presents a summary of the water quality conditions. Included in this report is the CWA Section 303(d) List, which lists those waters of the state that have been found to have impaired water quality and require a total maximum daily load (TMDL) allocation. Table 2-4 lists the waters in the planning area requiring TMDLs.

Table 2-4. List of Waters Requiring TMDLs

Water Body Name	Location	Use Not Supported	Cause of Impairment
Popo Agie Middle Fork (TMDL Date 2010)	Undetermined distances upstream and 4 mi. downstream of Lander.	Recreation	Fecal Coliform
Poison Creek (TMDL Date Priority - Low) This rating indicates TMDLs will not be completed within the next four years.	From Boysen Reservoir upstream an undetermined distance.	Recreation	Fecal Coliform
Crooks Creek (TMDL date 2008)	From T28N, R92W Sec. 18 SWNE undetermined distance downstream.	Aquatic Life, Cold Water Fish	Oil and Grease

Source: Wyoming 2006 305(b) Report

The major river drainages (Map 7-A) are divided into sub-basins (Map 8) with the uses, issues and management plans identified in Table 2-10.

Wind River Basin (WRB)

Water quality, as is true for any river basin, is strongly influenced by geology and terrain. Natural water quality characteristics of streams coming off the Wind River Range are generally good, but water quality gradually changes as streams flow across the basin due to natural erosion and stream processes increasing sediment and total dissolved solids loads. Accelerated erosion, irrigated agriculture runoff, discharge from oil and gas development, other dischargers, and other human activities have the potential to degrade the water quality further (USGS 1956; USGS 1999).

North Platte River

- The Pathfinder-Seminoe Sub-basin includes those areas which drain into the North Platte River or its reservoirs between Pathfinder dam and the head of Seminoe Reservoir.
- Sweetwater Sub-basin's headwaters are in the South Pass area of the southern Wind River Mountains. The Sweetwater River is designed by the WDEQ as a Class 1 water above Alkali Creek; this is the only waterbody on BLM administered lands in the planning area. Class 1 waters are afforded special anti-degradation requirementsLand uses in this sub-basin include grazing, irrigated hay production, and mineral development.

Table 2-5 summarizes the Sub-basins (Map 8) and some of the water quality issues associated with them with information from the 2006 305b report.

Table 2-5. Sub-basins in the Planning Area

Basin	Location	Uses	Status	Plan
Upper Wind Sub-basin (HUC-10080001)	Shoshone National Forest in the Dubois area.	Livestock grazing, irrigated agriculture, recreation, limited logging.	Fecal coliform; erosion; needed improvement for recreation and fishing; habitat degradation of Brooks Lake Creek	USFS SNF and DCCD have watershed improvement plans; DCCD will do further monitoring.
Little Wind Sub-basin (HUC 10080002)	Drainage into Little Wind River.	Livestock grazing, irrigated agriculture, oil and gas	Degradation along Beaver Creek and fecal coliform	WDEQ is monitoring; BLM data shows improvement.
Popo Agie Sub-basin (HUC 10080003)	Headwaters in Shoshone National Forest	Agriculture (96% of use), livestock grazing, recreation, residential. Lander municipal water source.	Fecal coliform (livestock grazing, septic systems)	PACD has a watershed plan to identify pollution sources and remedy. Squaw and Baldwin Creek drainage rehabilitation successful.
Muskrat Creek Sub-basin (HUC 10080004	South Gas Hills east of Riverton	Livestock grazing, oil and gas, uranium.	AML remediation	LWRCD has established a monitoring location and plan
Lower Wind Sub-basin (HUC 10080005)	Wing shaped with Muddy and Fivemile Creeeks on west of Boysen and Poison Creek on east.	Livestock grazing, oil and gas	Fecal coliform	LWRCD has submitted data to WDEQ and is awaiting a plan
Badwater Creek Sub-basin (HUC 10080006)	Northeast side of Bosyen Re-	Livestock grazing and oil and gas in	AML remediation; limited water data	It appears that large amounts of

	servoir	Lysite/Lost Cabin area.		sediment are transported to Boysen during runoff events.
Nowood Sub-basin (HUC 10080008)	Headwaters are on south-western side of the Big Horn Mountains	Livestock grazing, irrigated agriculture and oil and gas. Small amount of bentonite.	Fecal coliform, including untreated human sewage	Washakie County CD is monitoring and remediating. South Big Horn CD is monitoring Paintrock Creek.
North Platte-Seminoe Sub-basin (HUC 10180003)	Drainage between Pathfinder Dam and Seminoe Reservoir	Livestock grazing, irrigated hay, coal mining and recreation	None identified	
Sweetwater Sub-basin (HUC 10180006)	Headwaters in the South Pass are draining to the Platte	Livestock grazing, irrigated hay, mining including uranium, oil and gas and recreation	>100 AML sites have been remediated; more remain. Mercury in Willow Creek, oil in Crooks Creek.	Additional monitoring and TMDLs.
South Fork Powder Sub-basin (HUC 10090203)	Natrona County, extending to the Waltman area	Grazing and oil and gas (and possible other minerals)	BLM manages less than 300 acres in this basin	
Great Divide Basin (HUC 10)	Red Desert in south of planning area.	Mostly intermittent and ephemeral reaches.	None identified	Impacts from uranium and oil and gas need to be considered.

Source: WDEQ 305(b), 2006; DCCD 2004; PACD 2005; WRCD 2006

Current Condition

Groundwater

Groundwater occurs under both artesian and water table (atmospheric) pressure conditions. For the purposes of this section, an aquifer is a groundwater resource that is represented as

water contained in the pore space of geologic media in such quality and quantity that it may be readily available for use by springs or wells.

Groundwater resources primarily occur in unconsolidated deposits of Quaternary age consisting of floodplain alluvium, the Tertiary Wind River Formation, and older Mesozoic, Paleozoic, and Precambrian rocks (Plafcan et al. 1995).

The Wind River Formation is the most extensive water bearing unit occurring at land surface and contains groundwater under both unconfined and artesian conditions (Plafcan et al., 1995). In the older Mesozoic and Paleozoic rocks, aquifers can be present where hosted by permeable sandstones, or fractured carbonates. These groundwater bearing units yield water under confined (artesian) conditions except where such water-bearing zones daylight at surface along outcrops or faults.

Confining units include numerous siltstones and thick shales and mudstones. Groundwater under unconfined (atmospheric) conditions also occurs in water table aquifers such as those occurring in alluvium and windblown sand deposits (Whitcomb and Lowry, 1968), and in aforementioned outcrop areas of otherwise artesian aquifers.

According to Plafcan et al. (1995), geologic units in Fremont County are recharged by one or a combination of the following sources: (1) precipitation that infiltrates the geologic unit in its outcrop area, (2) infiltration of surface water, (3) infiltration of irrigation water, and (4) leakage from another geologic unit either from above or below. Almost all of the geologic units are recharged to some degree by precipitation.

Surficial unconsolidated aquifers

Surficial unconsolidated aquifers generally consist of glacial, stream and terrace sediments (alluvium) along flood plains of rivers and streams and surficial windblown sand deposits. Recharge to shallower aquifers takes place through direct infiltration (rainfall, snowmelt, irrigation), and leakage through adjacent water-bearing zones. Discharge takes places through springs, baseflow contributions to streams and rivers during losing periods, and withdrawal through shallow wells. According to Plafcan et al. (1995), the surficial unconsolidated aquifer system is the second-most developed aquifer system (ranking behind the Wind River Formation), although its occurrence is limited to areas near streams and therefore disconnected areally.

Table 2-6 presents characteristics of surficial unconsolidated aquifers. In the planning area the alluvial deposits are represented mainly by the Wind River, Popo Agie, and Sweetwater rivers and their tributaries.

Table 2-6. Uppermost Unconsolidated Water-Bearing Formations and their Characteristics.

Description/Formation	Lithology and distribution	Aquifer characteristics
Alluvial deposits	0 to 65 ft in thickness, unconsolidated sand, clay, and gravel. Includes terrace, floodplain, and pediment deposits along major streams.	Yields small to large supplies of water to wells where deposits are porous and permeable. Water quality is susceptible to impacts (e.g., high salinity) caused by agricultural practices (livestock and irrigation)
Windblown sand	Present in northeastern part of the Lander Planning Area, consisting of a 0 to 40 ft thickness of unconsolidated fine to very fine sand.	Yields small supplies of water suitable for stock or domestic use. It is considered an important source of water in areas underlain by Cody Shale.

Source: Whitcomb and Lowry (1968).

Windblown sand deposits primarily are present between Riverton and Moneta, along Poison and Muskrat Creeks where they are an important source of small quantities of groundwater (Whitcomb and Lowry, 1968). While such yields are small, the water quality is good, being derived mainly from local precipitation. One spring that issued from dune sand and loess here was inventoried on August 1991 with a measured discharge of 28 gpm, which is adequate for domestic or stock supplies. (Plafcan et al., 1995).

Water quality in surficial alluvial aquifers can differ markedly in comparison to other types of groundwater systems depending on the source and amount of recharge, the composition of the porous medium, and anthropogenic factors present in the area. Water quality also commonly fluctuates seasonally in alluvial aquifers due to the amount of influence from direct precipitation and runoff. It shall also be noted that surficial unconsolidated aquifers are most at risk from degradation due to the cumulative impacts of domestic, industrial, agricultural, stock-raising, and storm water disposal practices, all of which affect water quality to some degree.

Water quality data for the surficial unconsolidated aquifers are limited with the most recent groundwater quality data collected in 1995 (Plafcan et al.,1995). These data were obtained from 47 wells completed in Quaternary deposits throughout Fremont County. Thirty-three wells were completed in alluvium and colluvium and 10 were completed in terrace deposits. The remaining four wells were completed in glacial, landslide, or eolian sand deposits. Groundwater from alluvial and colluvial deposits within Fremont County has total dissolved solids (TDS) ranging from 141 to 1,430 mg/L. Generally, concentrations of total dissolved solids are lower in the upstream floodplain deposits than in the deposits further downstream. Most of the groundwater samples are classified as calcium carbonate type waters in upper reaches of

the floodplain and change to sodium-calcium carbonate-sulfate type waters with moderate to very high hardness further downstream.

Upper Regional Aquifer System

According to Hamerlinck and Arneson (1998), three regional hydrologic units can be defined within the WRB, and therefore, through the majority of the planning area. Hydrologic units are defined as regional stratigraphically adjacent formations with similar hydraulic properties and recharge/discharge characteristics. They can function as regional aquifers systems or regional aquitards even while they may be lithologically dissimilar. Recharge to shallow hydrologic units occurs over large areas in response to direct infiltration or leakage from adjacent water bearing zones, recharge to deeper units is often significant where mountain uplift has exposed these units on the margins of the WRB, or where geologic structures are present (e.g., Rogers Mountain Anticline, Dutton Anticline, Rattlesnake Hills Anticline).

The uppermost hydrologic unit would be represented by Tertiary (e.g., Wind River Formation (WRF)) through uppermost Cretaceous rocks (e.g. Lance Formation) or equivalents where present. Table 2-7 presents characteristics of water-bearing formations as described by Whitcomb and Lowry (1968) which may be included in the uppermost hydrologic unit as defined by Hamerlinck and Arneson (1998).

Principal among these water bearing units in terms of exploitation are the WRF throughout the upper two thirds of the planning areaand the Split Rock Formation (SRF) aquifer system (aka Arikaree) in the south third of the planning area. The SRF contains water under unconfined (water table) conditions for the most part with depth to water being governed by topography (Whitcomb and Lowry ,1968). Past studies have indicated well depths ranging from 65 to 1080 ft below land surface (ft bls). Depth to water data collected for a study released in 1968 indicated a range of 12 - 220 ft bls (Whitcomb and Lowry, 1968), while more recent data indicated water levels ranging from 24 -94 feet below land surface (Plafcan et al., 1995).

Table 2-7A. Description of Water Bearing Formations in the Uppermost Regional Hydrologic Unit.

Description/Formation	Lithology and distribution	Aquifer characteristics
Moonstone Formation	Present only in the Granite Mountains area, consisting of a 0 to 1350 ft thickness of soft claystone, shale, and tuffaceous sandstone containing some interbedded limestone, conglomerate, and pumicite.	Yields small quantity of water to many stock and domestic wells, large supplies could be obtained where saturated thicknesses are great or where permeability is enhanced by fractures. Water quality is generally good.
Split Rock Formation ("Arikaree")	Present in southeastern portion of the Lander Planning Area, consisting of 0 to 2700 ft thick cemented sandstone, containing lesser amounts of conglomerate, claystone, limestone, tuff, and pumicite.	
White River Formation	Present in the southern portion of the Lander Planning Area, consisting of 0 to 650 ft thickness of Bentonitic and tuffaceous mudstone with lenses of arkose and conglomerate, and beds of tuff.	
Wagon Bed Formation	Present in the southern portion of the Lander Planning Area, consisting of 0 to 700 ft of bentonitic mudstone, locally tuffaceous, zeolitic mudstone and sandstone in persistent beds, volcanoclastics and conglomerates.	Probably would yield at least small quantity of water and possible larger supplies from sandstone and conglomerate beds.
Wasatch/Battle Spring Formation	Present in Great Divide Basin area of portion of the Lander Planning Area, consisting of large boulders in a soft sandstone and shale matrix.	Known to yield only amounts of water. However, large yields may be possible. Quality of water likely good.
Wind River and Indian Meadows Formations	Present at land surface throughout majority of Lander Planning Area, consisting of 0 to 8000 ft of interbedded siltstone, and sandstone and conglomerate containing some carbonaceous shale and thin coal seams.	Large supplies have been developed in the Riverton and Gas Hills area, and could be developed elsewhere especially along the margins of the Wind River Basin. Yields small quantities to numerous and widely distributed stock and domestic wells. The quality of the water ranges from unfit for stock to good to domestic uses.
Fort Union Formation	Consists of 0 to 8000 ft of conglomerate, sandstone, shale and carbonaceous shale in lower part grading to very fine grained clastics and upper part. Present at depth throughout the majority of the Lander Planning Area.	Sandstones yield small supplies of water that is generally unsuitable for domestic use and may be marginal for stock.

Lance Formation	Sandstone interbedded with light-to-dark gray carbonaceous shale and thin coal beds. Coarse intervals present at formation base.	Sandstones yield small supplies of water that is generally unsuitable for domestic use and may be marginal for stock.

Source: Hamerlinck and Arneson (1998); Whitcomb and Lowry (1968).

According to Plafcan et al., 1995, the largest number of documented well completions is in the WRF, making it an important source of groundwater and the most areally extensive water bearing surficial formation in the planning area. Its water bearing characteristics are variable throughout the planning area, occurring under both confined (artesian) and unconfined (water table) conditions (Plafcan et al., 1995). In general, well yields vary from greater than 300 gpm, in wells in the Riverton and Gas Hills area constructed for irrigation, industrial, and public supply purposes, to less than 50 gpm in wells developed for livestock and domestic purposes (Plafcan et al., 1995). Richter (1981) reported a maximum yield of 3,000 gpm from a well completed in the WRF.

The water chemistry of the WRF within the north-central portion of Fremont County was evaluated by Plafcan et al. (1995) based on chemical analyses of water quality samples from 95 wells completed at depths ranging from 35 feet to over 700 feet bls. The water chemistry of the WRF is quite variable due to its variable lithology, permeability, recharge conditions, and land use. 15). Dissolved-solids concentrations of water samples from these wells and springs ranged from 248 to 5,110 mg/L, and some samples contained variable amounts of dissolved metals and radiochemical constituents such as radium-226 and uranium. One sample contained a detectable level of two of the selected pesticides-2,4-D and dicamba.

Regional Aquitard

Below the uppermost hydrologic unit is a thick sequence of Cretaceous age fine-grained rocks of marine origin such as shales, mudstones (e.g., Cody Shale) which comprise a regional aquitard or confining layer. This aquitard isolates the upper aquifer system from the lower aquifer system which is represented by lower Cretaceous to Paleozoic rocks. Table 2-7 presents characteristics of regionally confining formations as described by Whitcomb and Lowry (1968) which in general correspond to the regional aquitard hydrologic unit as defined by Hamerlinck and Arneson (1998).

Table 2-7B. Geologic Formations Comprising the Regional Aquitard.

Description/Formation	Lithology and distribution	Aquifer characteristics
Meeteetse/Lewis Shale	Sandstone, siltstone, shale carbonaceous shale, claystone and coal.	Sandstones yield small supplies of water that is generally unsuitable for domestic use and may be marginal for stock.
Mesaverde Formation	Consists of 0 to 1575 ft of Sandstone, shale, siltstone, carbonaceous shale, and coal.	
Cody/Niobrara Shale	Consists of 3000 to 5000 ft thickness of shale with minor sandstone interbeds.	Not a source of groundwater. Forms a regional aquitard throughout the Lander Planning Area.
Frontier Formation	Consists of 600-1040 ft of lenticular sandstones interbedded with shale.	Yields small quantities of generally poor quality water although some supplies are usable for domestic use.
Mowry Shale	Consists of several hundred feet of hard, thin-bedded, siliceous bentonitic shale.	Not a source of groundwater.
Muddy Sandstone	Consists of 0-150 ft thick coarse-grained sandstone.	Known to locally yield small supplies of water suitable for stock.
Thermopolis Shale	Consists of several hundred feet of hard, thin-bedded, siliceous bentonitic shale.	Not a source of groundwater.

Source: Hamerlinck and Arneson (1998); Whitcomb and Lowry (1968).

Lower Regional Aquifer System

Below the regional aquitard layer is a series of Jurassic through Permian age formations which locally contain permeable zones which can yield appreciable amounts of groundwater. These units do not always contain water-bearing zones that are regionally extensive and can include leaky confining units and aquitards. These formations provide a transition from the aquitard layer to the lower hydrologic unit. Dissolved solids in groundwater from upper Mesozoic rocks in Fremont County generally range between 280 and 6,000 mg/L, but may be higher when associated with oil field produced water. Table 2-8 presents descriptions (Whitcomb and Lowry, 1968) of these transitional hydrologic units as defined by Hamerlinck and Arneson (1998).

Table 2-8A. Transitional Hydrologic Unit Formations

Description/Formation	Lithology and distribution	Aquifer characteristics
Cloverly and Morrison Formations	Consists of 200 to 700 ft of Sandstone, siltstone, and shale in upper part; claystone and medium-to-coarse-grained sandstone in lower	Yields small to moderate quantities of water suitable for domestic use near outcrops. Mineralization of water increase with distance from outcrops.
Sundance Formation	Consists of 300-435 ft of shale, siltstone, sandstone, and limestone.	
Gypsum Springs Formation	Consists of 0 to 230 ft of dolomite, limestone, gypsum and siltstone.	Not known to be a source of groundwater. Any yieldable water would likely be of poor quality.
Nugget Sandstone	Consists of 0 to 425 ft of fine-to-medium grained, well-sorted sandstone	Little water bearing data is available, but probably would yield satisfactory amounts of water for domestic or stock use based upon surface outcrop characteristics.
Chugwater Group	Siltstone, sandstone, and shale, Limestone (Alcova Limestone Member)	Yields small amounts of good quality water in and near outcrops.
Dinwoody Formation	Consists of 10 to 155 ft of fine-grained sandstone in western part of Lander Planning Area grading eastward to upper part of Goose Egg Formation- which consists of 0 to 300 ft of shale and siltstone interbedded with limestone	
Phosphoria/Park City/Lower Goose Egg Formations	Interbedded dolomite, chert, limestone, siltstone, and sandstone, commonly containing intervals of phosphate bearing minerals	Probably would yield small amounts of mineralized poor quality water

Source: Hamerlinck and Arneson (1998); Whitcomb and Lowry ,1968)

Below the transitional units, the lower hydrologic unit includes a series of carbonate and sandstone aquifers of great water yielding capacity. According to Hamerlinck and Arneson (1998), reported transmissivities for the lower hydrologic unit typically range from 1,000 to 60,000 gpd/ft. Plafcan et al., (1995) report that most wells completed in the Tensleep or Madison aquifers are located in or near the outcrop area. Of the wells inventoried, well depths in the Tensleep ranged from 450 to 6590 ft bls, with some wells displaying flowing artesian or near flowing conditions. Table 2-9 presents the main water bearing formation sin the lower hydrologic unit.

Table 2-8B. Characteristics of Water Bearing Formations Included in the Lower Hydrologic Unit.

Description/Formation	Lithology and distribution	Aquifer characteristics
Tensleep Sandstone	Consists of 200 to 600 ft of medium-grained well-sorted sandstone. Present throughout the Lander Planning Area.	Excellent aquifer yielding water under artesian to flowing artesian conditions near range front. Well yield increased quantities where fractured. Water quality decreases away from recharge area (with distance from range front).
Amsden Formation	Consists of 100 to 250 ft of limestone, dolomite and shale interbedded with minor sandstone underlain by basal sandstone unit (Darwin Sandstone)	Water bearing properties are not well known. Quality and Quantity may be sufficient to supply domestic needs, but well completion depth required would likely be cost prohibitive in most places.
Madison Limestone	Consists of 300 to 700 ft of massive to thin-bedded limestone, containing some thin beds of chert and shale near the top. Present throughout the area.	Potentially voluminous producer where extensive fracturing and cavities are known to occur. Water quality data is sparse. Completion may be cost prohibitive basin-ward.
Darby Formation	Consists of 20 to 190 ft of dolomite, siltstone, sandstone and shale.	Known fetid odor when rock is broken- may indicate water quality issues. Would likely yield sufficient quantities of water at least for stock use, but depth to completion may be cost prohibitive basin-ward.
Bighorn Dolomite	Consists of up 0 to 300 ft of dolomite with thin basal sandstone unit (Lander Sandstone)	Potentially voluminous producer where extensive fracturing and cavities are known to occur. Water quality data is sparse. Depth to completion may be cost prohibitive basin-ward.
Gallatin Limestone	Consists of resistant limestone beds interbedded with shaly units	Water quality data is sparse. Depth to completion may be cost prohibitive basin-ward.
Gros Ventre Formation	Consists of up to 700 ft of interbedded shale, limestone, and micaceous sandy shale.	Water bearing characteristics are largely unknown. Lithology suggests poor source of water. Depth to completion may be cost prohibitive
Flathead Sandstone	Consists of about 200 ft of fine to coarse-grain sandstone with conglomeritic basal unit.	May be good source of groundwater where weathered or fractured, yielding high quality water near outcrops. Depth to completion may be cost prohibitive basin-ward.
Pre-Cambrian	Granitic crystalline rocks, Metamorphic rocks	Yields good quality water in sufficient quantity where fractured or weathered. Only cost-effective near outcrops.

Source: Hamerlinck and Arneson (1998); Whitcomb and Lowry (1998).

Where significant karst has developed (as in the upper Madison limestone in the Sinks Canyon area) or where interconnected fractures are present, yields are reported as high as 2000 gpm. Based on Plafcan and Others (1995) inventory, Madison aquifer well depths range from 1,400 to 4,210 ft bls with some wells flowing at land surface.

Certain older and deeper formations, such as the Phosphoria and Tensleep, may be used to a limited extent as supplies of groundwater and have suitable groundwater characteristics; however, they generally occur below economical drilling depths in most of the WRB. Measured TDS in groundwater contained in Paleozoic formations generally ranges between 300 to 3,000 mg/L, but Permian rocks have been known to have groundwater with dissolved solids over 10,000 mg/L (Plafcan et al., 1995).

Current conditions with respect to groundwater supply appear to be adequate for most anticipated on the public lands managed by the BLM (e.g., mineral exploration, stock watering). Although climatic conditions resulting in periods of below average precipitation would be expected to impact groundwater levels, a shortage in available water at the current rate of consumption is not apparent at the present.

Groundwater current conditions with respect to water quality are generally good with degraded conditions apparent in localized areas due to natural conditions related to the aquifer porous medium (e.g., hardness, radioactive solutes, selenium), land use (domestic leach fields, livestock waste, agricultural, wildlife), and reduced recharge due to factors such as drought or development over recharge zones. The materials used for oil and gas “fracking” are by law not considered as pollutants so impacts from oil and gas are not evaluated in assessing groundwater condition.

Shallow unconsolidated aquifer ground water

Data presented by Plafcan et al., (1995) indicated that samples obtained from shallow unconsolidated aquifers represented by Quaternary-age alluvium, colluvium, terrace deposits, glacial deposits, and dune sand and loess deposits, contained water quality parameters mostly within acceptable limits and no samples contained detectable quantities of selected pesticides. However, dissolved-solids concentrations of 32 water samples from the alluvium and colluvium ranged from 141 to 1,430 mg/L and dissolved-solids concentrations of ten water samples from terrace deposits ranged from 293 to 1,670 mg/L. For comparison, the secondary maximum contaminant level (SMCL) set by the EPA for dissolved-solids concentration in drinking water supplies is 500 mg/L.

One localized study by Bartos et al. (2008) demonstrated the effect land use has on shallow groundwater quality in unsewered areas of low-density development. This study focused on

three areas in the intermountain west, one of which was near Lander. Ten wells were installed in two general areas, one north of Lander along the flood plain of the North Fork of the Popo Agie River and the other along the flood plain of the Middle Fork of the Popo Agie River between Sinks Canyon and the Town of Lander. Land use and land cover in the North Fork area generally consists of wetlands, pasture/hay, and occasional row crops, while land use and land cover along the Middle Fork area consists of shrubland/grassland, forested land, wetlands, pasture/hay, and occasional crops. Water levels in these areas ranged from less than a foot to almost seven feet below land surface. Bartos et al. (2008) stated that recharge to the shallow groundwater is not only from areal infiltration by also from infiltration of unlined irrigation canals and ditches, water applied to cropland, hayfields and gardens, and leakage from domestic septic systems.

According to Bartos while effects of human activities on shallow groundwater quality were indicated in the study area, shallow groundwater is suitable for most uses without treatment, and effects from human activities (i.e., groundwater contamination) generally were minimal and limited in areal extent at the time of sampling (year 2001).

Upper regional hydrologic units

Plafcan et al. (1995) presented data for groundwater quality in Fremont County from the uppermost regional aquifer represented by Tertiary-age formations. These data, obtained from over 115 samples taken from wells and springs, showed that samples obtained from Miocene-age formations (e.g., Split Rock Formation) and the Oligocene-age White River Formation did not exceed the 500 mg/L SMCL for dissolved-solids. However, radium-226 and uranium was detected at low levels in the one White River Formation sample analysed for those constituents. Samples from the Eocene Wagon Bed Formation indicated dissolved-solids concentrations just above the SMCL at 572 mg/L, and radium-226 and uranium were also detected at low levels in one sample.

In comparison, ground water in the Wind River Formation was significant lower in quality as measured in 80 samples that contained dissolved-solids concentrations ranging from 248 to 5,110 mg/L. In addition, one sample contained selenium at a concentration of 58 mg/L, which is above the MCL set by the USEPA. One sample of seven contained detectable radium-226 and uranium, and one sample of 10 contained detectable levels of two selected pesticides.

Regional Aquitard and Transitional hydrologic units

Samples from Mesozoic rocks, which are included in the regional aquitard, generally indicated low water quality (Plafcan et al. (1995). All water samples collected from wells completed in the Cody Shale and Frontier Formation had dissolved-solids concentrations from one half to about 14 times greater than the SMCL of 500 mg/L set by the EPA. Water quality from wells and springs tapping water from the Cloverly and Chugwater formations was generally better, with

dissolved-solids concentrations ranging from about 400 to 1500 mg/L. Dissolved-solids concentrations in 10 samples obtained from wells and springs in the Phosphoria Formation ranged from 215 to 3,690 mg/L.

Lower Hydrologic Unit

Eleven samples obtained from wells and springs issuing from the Tensleep Sandstone indicated dissolved-solids concentrations ranging from 196 to 1,410 mg/L., while samples from the Madison Limestone ranged from 188 to 920 mg/L. Ten groundwater samples obtained from springs emanating from Precambrian rocks showed dissolved-solids concentrations ranging from 81 to 714 mg/L. The water samples these rocks had the lowest average concentration of dissolved solids of any other water-bearing unit for which five or more samples were collected.

Trends

Surface Water Trends: Quantity

Inflows to the major reservoirs at the area's boundaries are gauges of the impact from drought conditions beginning in 1999 to 2000. The harvest of water from the Wind River watershed at Boysen Dam can be used to index the capabilities and ultimate outputs from the BLM-administered public lands in this basin. Table 2-9 compares the historic data with post 2000 averages. As shown, water supply downstream and power generation at Boysen Dam were reduced to nearly one-third of previous years.

Table 2-9. Comparison of Historical and Recent Inflow at Boysen Reservoir

Period	Average Inflow in acre feet
1970-1999	1,094,100
2000-2006	570,500

Source: Bureau of Reclamation (http://www.usbr.gov/dataweb/dams/wyo1299.htm)

The reduction by almost 47 percent is similar to the reduction in flow as measured on the Sweetwater River as presented in Table 2-10. As shown, mean monthly flows for the months of May and June (peak discharge) and September (end of the water year) are down roughly one-half to one-third.

Table 2-10. Comparison of Historical and Recent Flows in the Sweetwater River

Period	Mean Annual Flow Measures (Cubic Feet/Second)		
	Peak Maximum Flow (May)	Peak Maximum Flow (June)	Minimum Flow (Sept.)
1914-2001	413	391	29.8
2001	133	36.5	13.1

Source: USGS Stream Gage (http://pubs.usgs.gov/wdr/WDR_WY_01/pdf/WDR_WY_01_1.pdf)

Impacts on water quantity are primarily a function of agricultural use, making up 97% of usage, and not population size. Fremont County had a significant population decrease from a high in 1980. Since 1990, however, population has grown steadily until almost reaching the past 1980-level by 2006. While this population increase undoubtedly has impacted domestic water usage, it has little impact on overall water use. All irrigation water rights have already been allocated.

Surface Water Trends – Quality

The sub-basin summaries in Table 2-5 provide trend information where that information is available. In general, as water levels have dropped due to the drought this decade, such parameters as water temperature, total dissolved solids, dissolved oxygen, and others factors typically become unfavorable to supporting the designated biological and recreational uses assigned. This downward trend needs to be addressed as BLM authorizes activities, including in designing project features and in requiring mitigation and seeking opportunities to reclaim earlier causes of water impacts.

Groundwater Trends:

The State of Wyoming authorizes water wells. It is unusual (less than once per year) for a BLM authorized oil and gas operation to require drilling a water well on public lands although the operators may contract with private sources of water as part of drilling operations (S. Cerovski, 2009). However, ground water wells are almost always a required component of uranium exploration activity in order to supply make-up water for drilling operations. Groundwater for these operations are typically supplied from existing wells from previous uranium exploration activities, converted oil and gas wells, or in some cases, new purpose-built water wells drilled onsite by the uranium exploration operator. Generally impacts from these types of wells are limited because of the relatively small amounts of ground water required for exploration operations. However, improperly completed or abandoned water wells or monitor wells can contri-

bute to degraded ground water quality where waters of differing quality are allowed to communicate through the borehole.

Produced water from oil and gas operations is a disposal issue, not an impact on water quantity since these wells do not produce from aquifers meeting the standards of US drinking water. The Madison Formation, for example, contains potentially potable water but has been deemed by the EPA to be too deep to be considered a potential drinking water source. (Cerovski, 2009). Thus, while oil and gas development is likely to increase, there will likely be no appreciable impact on groundwater quality or quantity. A modification of the Clean Drinking Water Act might include consideration of fracking chemicals; currently these are not monitored directly.

According to Plafcan, et al. (1995), the most recent usage data for Fremont County (covering most of the planning area) was compiled by the USGSurvey in 1990. These data are presented in Table 2-11; it is likely that these data understate current use.

Table 2-11. Estimated Ground water Use in 1990 in Fremont County

Use category	Estimate in million gallons per day
Irrigation	0.0
Public Supply	2.5
Mining	1.7
Domestic	1.1
Livestock	0.2
Industrial	0.3
Commercial	0.1
Total	5.9

Source: Plafcan and Others, 1995

In order to understand trends related to groundwater use and to better plan for the future, long-term water level data from wells and flow rates from springs are critical. However, historical groundwater level data for the planning area on a regional basis is either non-existent or limited for the most part to surficial alluvial aquifer.

Forecasts

Surface Water: As most of this area is semiarid, water is always the key to vegetation production and animal distribution. The forecast is for more demand for water both to increase livestock grazing options and because of anticipated increases in mineral development and recreation.

Cities such as Lander that rely on surface water for a significant percentage of domestic water also face increasing water demands that corresponds to increases in local urban populations and industrial development. The fastest growing population segment locally is that of the small acreage, 2 to 40 acres, rural ranchette, or ex-urban, landowner. Subdivision development of former ranch land, especially in the Dubois area and on the Lander Slope, is occurring at historically high levels. Small subdivision water systems, cisterns, and individual wells supply their domestic water needs.

Since the major consumer of water is irrigated agriculture on privately owned lands, increases in population are not expected to be a significant component of changes in water usage. (There is no irrigation of BLM administered lands for agricultural use.) Wyoming does not currently collect data for agricultural use of water in relation to drought years although a study of the Sweetwater River Basin is expected to be completed in 2009 that may address this issue. Moreover, water usage may not be calculated with sufficient detail to capture changes (Conversation with John Wade of the Wyoming Water Development Commission, 2009).

Water quality is expected to decrease because of increased development of all types. Development almost always results in disturbance of soil which can cause erosion and loss of ability to sustain vegetative cover. As invasive species become established and native vegetation is outcompeted, water infiltration into the soil is reduced.

While the BLM's preferred method of discharge of produced water is reinjection, the State of Wyoming permits point source discharge, such as in the Gun Barrel Unit, where water containing high levels of selenium is being discharged pursuant to NPDES permits which have caused soil erosion. (BLM is working with the operator to decrease the soil erosion resulting from the State authorized discharge.)

Increased mineral drilling activitiesmay use groundwater in the drilling process lowering water tables or may introduce petroleum drilling products into ground water. If surface water is used for such industrial purposes it will not be available for others like irrigation or maintaining suitable fisheries habitat. In addition, ISL uranium mining operations consume ground water as approximately ten percent of all water pumped from subsurface mine units is typically bled to surface impoundments where it is allowed to evaporate.

Adverse impacts to soil and vegetation resources, discussed below, are likely to have negative impacts on water quality. Maintaining proper vegetative cover and sustaining healthy root systems optimizes a soil's water infiltration capability.

As precipitation patterns change (below normal snowfall, earlier snow melts, significant losses from sublimination before melting, etc) and as glaciers in the Wind River Mountains recede, annual spring runoff will occur sooner and could have smaller discharges. This will result in lower, or in some cases no, natural flows in the late spring, summer, and fall periods. The lower levels of water will result in degradation of water quality including warming, loss of high flows needed to flush pollutants, increased sedimentation, and degradation or loss of habitats.

Improved water disposal, riparian exclosures, aggressive reclamation activities, diligent compliance with WDEQ Stormwater permitting requirements, and grazing systems designed for light use and the incorporation of rest would help to mitigate this downward trend, as would mitigation projects that improve riparian-wetlands degraded by earlier activities.

Climate Change:

Climate change models forecast that precipitation in the northern Rocky Mountains will be only slightly less but will come more often as rain and more often as storm events leading to storm related run-off rather than the steady precipitation that can be absorbed into the soil. This scenario can be expected to lead to more rill and gully erosion.

Key Features

Surface Water:

Listing on the 305(b) Report is a key feature. In 2006 there were three streams listed:

1) Crook's Creek: Oil in the sediment on private land near Jeffrey City from an unknown source. High-priority scheduled for TMDL development.

2) Poison Creek for fecal coliform bacteria from below the town of Shoshoni to Boysen Reservoir. The Lower Wind River Conservation District is developing a watershed plan so it is a 'low' priority for TMDL development.

3) The Middle Fork of the Popo Agie River near Lander is listed because of fecal coliform. Low priority for TMDL development because the Popo Agie Conservation District has developed a watershed plan to identify sources of fecal contamination and voluntarily remediate them.

Sole source domestic water supply is a key feature. The City of Lander obtains most of its domestic water needs from the Middle Fork of the Popo Agie River. Authorized activities here will require an extra level of scrutiny to assure that water quality is not compromised (PACD, 2005). Other municipal sources of water are currently being considered including deep wells targeting Paleozoic formations in the Middle Fork watershed. These wells when fully developed will provide additional sources of water in low-runoff years or supplement the surface water supply.

Special designations are key features:

- The Sweetwater River is the only waterbody classified by DEQ as a Class 1 water quality stream that flows through BLM-administered public lands in the planning area. This designation begins at the Sweetwater River's confluence with Alkali Creek, south of Sweetwater Station, and proceeds upstream to its source on the western slope of the southern Wind River Mountains.
- The canyons of the Sweetwater River and Baldwin Creek have been noted as eligible for designation as WSRs.
- There are instream flow designations for fisheries protection on portions of the Wind River by Dubois, the Little Popo Agie River, and the Sweetwater River requiring special/ongoing management.

Limitations on the depletion of Platte River water to protect downstream T&E species.

Ground water:

Increasing interest in ISL uranium mining is a key feature for groundwater as it has the potential to negatively impact water quality. WDEQ does not allow the water quality to be degraded below the level required for that classification but does not require that the water quality return to its pre-disturbance condition. ISL uranium mining operations consume ground water as approximately ten percent of all water pumped from subsurface mine units is typically bled to surface impoundments where it is allowed to evaporate. A significant concentration of these operations in areas of the planning area with limited recharge would be expected to lower head upper regional hydrologic units, such as the Wind River or Battle Springs Formations.

Oil and gas operations have the potential to impact groundwater quality. In general, however, safeguards such as casing design and selection of injection well receiving horizons are protective of groundwater quality. The recent interest in CBNG development is expected to impact the amount or the configuration of groundwater supplies through the withdrawal of groundwater and the subsequent reinjection to other aquifers or direct discharge to the land surface.

2.1.5 Cave and Karst Resources

A cave is defined as any naturally occurring void, cavity, or system of interconnected passages occurring beneath the surface of the earth or within a cliff or ledge large enough to permit an individual to enter, whether or not the entrance is naturally formed or human-made (Federal Cave Resources Protection Act [FCRPA], Sec. 3(1)). Cave resources are fragile due to their association with other resources such as groundwater systems and biological communities or because of their geophysical makeup. They are also nonrenewable resources due to paleontological and archeological deposits, speleothems (formations inside caves), and biological resources. Caves are often habitat for bats which may include sensitive species.

2.1.5.1 Regional Context

The planning area contains karst resources including sink holes and karst topography, a landscape shaped by the dissolution of soluble bedrock, usually limestone, by the weak solution of carbonic acid found in underground water. When limestone interacts with underground water, the water dissolves the limestone to form karst topography. The underground water can carve out channels and caves that are susceptible to collapse from the surface. When enough limestone has eroded from underground, a sinkhole may develop.

Karst topography can contribute to water quality issues. Rainwater quickly drains through crevices in the limestone into the ground without the filtering process normally provided by soil. This process can accommodate a fast transmission of surface contaminants to drain through to groundwater or nearby streams, without the filtering that would normally occur. The same process could provide leaching from septic tanks to transfer sewage directly into underground channels.

2.1.5.2 Resource Characterization

Indicators

Under FCRPA, a cave is considered significant if it meets one or more of the following six criteria:

Biota – The cave serves as seasonal or year-long habitat for organisms or animals, or contains species or subspecies of flora or fauna native to caves, or is sensitive to disruption, or are found on state or federal Sensitive or T&E lists.

Cultural – The cave contains historic or archeological resources included in or eligible for inclusion in the NRHP because of its research importance for history or prehistory, its historical association, or other historical or traditional significance.

Geological/Mineralogical/Paleontological – The cave possesses one or more geologic or mineralogical features that are fragile or exhibit interesting formations.

Hydrologic – The cave is part of a hydrologic system or contains water important to humans, biota, or development of cave resources.

Recreational – The cave provides recreational opportunities or scenic values.

Educational or Scientific – The resource offers opportunities for educational or scientific use or is in a virtually pristine state, lacking evidence of contemporary human disturbance or impact, or the length, height, volume, total depth, or similar measurements are notable (43 CFR Part 37).

Specific indicators may include the presence of indicator species, the amount of ground disturbance, water quality, and the amount and type of recreational use.

Current Condition

No significant caves have been identified within the planning area; however, no survey has been made. Known locations where natural caves occur within the planning area include: Sinks Canyon, Baldwin Creek Canyon, Popo Agie Canyon, North Fork Canyon, Sawmill Canyon, and around portions of the Beaver Creek drainage.

The Sinks in Sinks Canyon State Park (within yards of and downstream of BLM-administered land) is one of the best known sinks in the area. The disappearance of the Popo Agie in the Sinks is typical of a karst river. The Popo Agie River flows into a cave formation in Madison Limestone and then rises again ½ mile down the canyon into a pool. Dyed river water at the sink took two hours to reach the rise downstream.

Other sinkholes are known to exist such as the sinkhole on Auer Ranch on Beaver Creek and at a location south of the hot spring as well as in Dubois, near the airport. No formal inventory of karst resources has been undertaken in the planning area.

While not a natural cave for purposes of the FCRPA, the planning area (especially in the South Pass Mining District) contains extensive human-made caves in the form of old and generally abandoned mines. Many of these are being managed under the AML program (see Health and Safety). Many of the mines have been closed to public access but with the type of “bat friendly” grates that protect the mines as the same kind of habitat as natural caves. Several caves are used by bats, including some BLM Sensitive Species.

Trends

Quantitative and qualitative trend data for cave resources are not available. Recreational cavers or spelunkers generally keep their discovery of cave and karst resources secret to prevent overuse or damage by the public. Animal and human visitations into caves, even by careful cavers, affect these resources to some degree. There is no current plan to inventory cave and karst resources.

Forecasts

Predicting changes given current management is not possible. The potential for additional cave discoveries is moderate considering the abundance of karst topography.

Key Features

Known locations where natural caves occur include: Sinks Canyon, Baldwin Creek Canyon, Popo Agie Canyon, North Fork Canyon, Sawmill Canyon, and portions of the Beaver Creek drainage.

2.2 Mineral and Energy Resources

Minerals are classified into three main categories: locatable minerals (e.g., metals, bentonite, and gemstones), leasable minerals (e.g., oil, gas, and coal), and salable minerals (e.g., sand, gravel, pumice, pumicite, cinders, clay, and other common varieties of stone). This categorization has basis derived from several laws, beginning with the General Mining Law of 1872 (as amended), which allows for the location of lode and placer mining claims as well as a prescription for patents.

In addition to the *General Mining Law of 1872*, an assortment of laws governs mineral activity:

Mineral Leasing Act of 1920 (as amended). Under this federal law, the BLM issues leases for developing deposits of coal, phosphates, petroleum, natural gas and other hydrocarbons and sodium on public domain lands and lands having federal reserved minerals.

Materials Act of 1947. Under this federal law, the BLM (under rules and regulations prescribed by the Secretary of the Interior) is authorized to dispose of mineral and vegetative materials through a contract or a free-use permit. These materials commonly include the salable minerals such as sand and gravel, pumice, pumicite, cinders, clay, petrified wood, and other common varieties of stone, and vegetative materials including but not limited to yucca, manzanita, mesquite, cactus, and timber or other forest products) on public lands of the U.S.

Mineral Leasing Act for Acquired Lands of 1947 (as amended). This federal law states that the leasing of all deposits of coal, phosphate, oil, oil shale, gas, sodium, potassium, and sulfur which

are owned by the U.S. on lands legally acquired by the U.S. may be leased under the same conditions as contained in the leasing provisions of the federal mineral leasing system.

The Geothermal Steam Act of 1970 (as amended). This law authorized the rights to develop and utilize geothermal resources in land subject to these regulations under the federal leasing laws. The BLM and the USFS have prepared a joint Programmatic Rod for the expedited leasing of BLM- and USFS-administered lands with high potential for geothermal resources.

Mining and Minerals Policy Act of 1970. This law declares that it is the federal to foster and encourage private enterprise in the development of a stable domestic minerals industry and the orderly and economic development of domestic mineral resources.

Classification of Minerals

Occurrence Potential

The mineral resource potential of the planning area is classified using the system outlined in BLM Manual 3031. Under this system, occurrence potential ratings are strictly based on the geologic likelihood of the mineral to be present in the area and do not address the economic feasibility of development of the resource. These ratings address the accumulation of mineral resources and certainty of data. Mineral occurrence potential refers to the potential of the mineral to occur at a specific location or geologic environment.

The certainty level refers to the quality of data that is available to determine the occurrence of a particular mineral resource. In other words, an area may exhibit characteristics judged as favorable for an occurrence of a particular mineral resource. The level of certainty would be predicated upon the nature and extent of the evidence for occurrence actually being present (e.g., sample results, geologic mapping, or direct knowledge of geologic processes or genesis).

Development Potential

The potential for development of each mineral resource is projected for the life of the RMP, which is estimated to be 20 years, and is rated as high, moderate, or low. The likelihood for development is based on communication with industry experts and government officials familiar with the specific resources, current or past activities, as well as considerations such as mineral occurrence potential, historic development, commodity price and demand, and other factors. The projected development may be directly affected by planning decisions that restrict or preclude mineral exploration and/or development activity. The development rating is also affected by the ownership status of the land in which the commodity is found. Resources found in National Parks, National Monuments, Recreational Areas, Wilderness Areas, and WSAs are generally not available for mineral development, except in a few areas where there may be valid existing rights. For that reason, these areas are considered to have a low development potential.

2.2.1 Locatable Minerals

Locatable minerals (metallic and nonmetallic) are those that are open to mining claim location under the General Mining Law of 1872. Public lands that are not withdrawn from mineral activity are available. Unlike other mineral resources such as leasable (e.g., oil and gas) or salable minerals (e.g., sand and gravel), withdrawal of land is the only management prescription available for controlling where locatable mineral development can occur. While the surface management regulations contained in 43 CFR 3809 give the BLM opportunity to manage the surface to prevent unnecessary or undue degradation, surface disturbing activities affecting less than five acres are classified as notice-level operations and do not require BLM authorization. However, regardless of the amount of surface disturbance, the BLM may apply various mitigations and restrictions such as seasonal closures for wildlife, or archaeological stipulations in order to prevent unnecessary or undue degradation. Such management prescriptions cannot materially interfere with the claimant's right to mine or explore for minerals.

Locatable minerals include uranium, bentonite, gemstones and lapidary materials (e.g., Wyoming jade, opal, and agate), precious metals, and base and other metals. There is no known economically recoverable gypsum in the planning area. While gypsum is present in the Gypsum Spring and Dinwoody Formations there are no known occurrences that are currently economic.

2.2.1.1 Resource Characterization

Current Condition

The current level of authorized mineral exploration notice and plans of operations are presented in Table 2-12. Because surface disturbance beyond casual use cannot legally occur without filing a notice or possessing an approved plan of operations, the activity tabulated in Table 2-12 indexes current conditions.

Table 2-12. Mining Notices and Plans as of End of 2008

Commodity	No. of Notices	No. of Plans of operation	Acres of Disturbed area[5]
Bentonite	4	1	121
Gemstones and lapidary material[1]	1	0	4.5
Gold, lode[2]	4	7	13.7
Uranium[3]	17	1	91.1
Rare Earths[4]	1	0	0.02
Zeolites[4]	1	0	1

1. Includes diamonds, rubies, sapphires, emeralds, jade, opal, and other precious and semi-precious stones.
2. Does not include five plans with a pending status for an additional 27.7 acres.
3. Includes four projects which are partially located in the planning area but are administered out of the Rawlins Field office. Does not include two pending notices, three plans, and the Gas Hills ISL plan modification, all totaling an additional 1367.5 acres of disturbance.
4. These cases are actually pending.
5. Actual claim block or project areas are much larger, some over 1,000 acres.

Source: BLM, LR2000 Database, February, 2009

Uranium

Fremont County has accounted for more than 26,000,000 tons of uranium ore since uranium mining began in the 1950s and presently ranks second in the state for total uranium produced. At present, there are no operating uranium mines in the planning area. All producing mines have been closed since the early 1980s. Of the mines which began reclamation, the majority of the activity is being conducted by the Abandoned Mine Lands (AML) program due to a variety of reasons, including bankruptcy of mine operators, insufficient bond to carry out reclamation, or that many operations were initiated long before reclamation and bonding were required.

There are three major uranium mining districts: Gas Hills, Crooks Gap (including Green and Crooks mountains), and Bison Basin (see Map 4). Mining in the Gas Hills area was predominantly open-pit method. In the Crooks Gap area, both open-pit and underground mining occurred. The Bison Basin operation was *in situ* recovery methods. There are several other known occurrences of uranium , some of which produced small volumes of ore.

At one time there were many uranium milling facilities in operation; all but one are undergoing or have been decommissioned. The remaining conventional uranium mill, the Sweetwater Mill, is located just south of the planning area border about 45 miles northwest of Rawlins. This mill is one of only six conventional mills left in the U.S., the only conventional mill left in Wyoming, and has been on standby status since 1983. The U.S. Nuclear Regulatory Commission that lands used for mill sites, processing, and the storage of processing waste (tailings) be transferred to the Department of Energy for long-term monitoring and oversight due to radioactivity levels in

the tailings. There are several former mill sites for which this process is underway (Table 2-13). While uranium mines are contoured and reclaimed to prevent migration of radioactive materials, the mines will not support vegetation and remain highly visible on the landscape.

Table 2-13. Lands under Segregation at Uranium Mill Sites

Mill site	Township/ Range	Section(s)	Acreage[1]
Western Nuclear - Split Rock Mill (WYW172386)	T. 29 N., R. 91 W	Sec. 6, lots 8 through 13, incl., E1/2SE1/4;	749.09
	T. 29 N., R. 92 W	Sec. 1, lots 1 and 2, S1/2NE1/4, SE1/4SE1/4; Sec. 2, SE1/4SW1/4, SW1/4SE1/4; Sec. 11, NW1/4NE1/4, NE1/4NW1/4; Sec. 12, W1/2NE1/4.	
Pathfinder - Lucky Mac Mill (WYW161764)	T. 33 N., R. 90 W	Sec. 9, lots 1 and 2, and NE1/4SE1/4; Sec. 10, lots 1 through 3, inclusive, NW1/4, W1/2SE1/4, and that unpatented portion of Mineral Survey No. 644 lying within sec.10; Sec. 15, lots 1 through 8, inclusive, S1/2NE1/4, NW1/4NE1/4, N1/2SE1/4, SE1/4SE1/4, and those unpatented portions of Mineral Survey Nos. 587 and 644 lying within sec. 15; Sec. 21, E1/2NE1/4, and NE1/4SE1/4; Sec. 22, lots 1 through 4, inclusive, NE1/4NE1/4, and those unpatented portions of Mineral Survey Nos. 582, 584, and 587 lying within the N1/2, NW1/4SW1/4 and N1/2SE1/4.	1,091
Umetco – East Gas Hills Mill (WYW164606)	T. 33 N., R. 89 W	Sec. 9, SE1/4; Sec. 10, S1/2; Sec. 15, N1/2, SE1/4SE1/4; Sec. 21, NE1/4; and Sec. 22, N1/2.	1,320

1. Values shown are for public surface only. Source: LR2000 Database, February 2009

Recently, interest in uranium has risen with increasing commodity prices centered in the three historic uranium districts as well as other outlying areas. As presented earlier in Table 2-12, there are currently 17 notices and one approved plans of operation for uranium which include lands that occur in the planning area. In addition, there are two pending notices and three pending plans of operation which are in various states of preparation by the proponent, or are currently under analysis under the NEPA process. Additional information, including formations in which uranium is found is provided in the Mineral Occurrence Report.

Gas Hills

Table 2-14 presents current activity in the Gas Hills district and includes the project size based on the size of the associated claim block. There are currently five notices and one plan of operations in various states of progress in the Gas Hills. The Gas Hills ISL project was approved for exploration 10 years ago, but is now under plan modification and must be reanalyzed under the NEPA process before it can continue to proceed.

Table 2-14. Uranium Project Size in Acres in Gas Hills Uranium District

Project	Case file No.	Project size (acres)[1]	3809 Type	Status
South Black mountain	WYW-168087	3,566	Notice	Pending, pre-disturbance standby
Jeep	WYW-167989	3,322	Notice	exploration
George-Ver	WYW-168028	1,631	Notice	exploration
Gas Hills ISL	WYW-140590	8,495	Plan	Pre-mine NEPA planning, extensive exploration has occurred.
Gas Hills DN264	WYW-168071	718	Notice	Exploration
Rock Hill	WYW-168109	1,210	Notice	Pending, pre-disturbance standby
Totals		18,942		

1. Project size as submitted by proponent, often conforming to outer dimensions of claim block.

Source: BLM, LR2000 Database, March, 2009.

Crooks Gap

Table 2-15 presents current uranium activity in the Crook Gap and includes the project size based on the size of the associated claim block. There are currently five notices and two pending plans of operation in various states of progress in the Crooks Gap area. Also of mention is the Sheep Mountain mine on Green Mountain which had been a former producer. The current owners have moved this project from reclamation status to standby status in anticipation of a possible restart to take advantage of recent market conditions.

Table 2-15. Uranium Project Size in Acres in Crooks Gap Uranium District

Project	Case file No.	Project size (acres)[1]	3809 Type	Status
Antelope Project[2]	WYW-168039	10,663	Notice	Exploration
JAB Project[2]	WYW-168001	3,983	Notice	Exploration
Jab – Antelope	WYW-168113	14,646	Plan	Pending, pre-mine NEPA planning
Green Mountain Thrust	WYW-168062	4,252	Plan	Pre-disturbance standby
Desert View/Big Eagle II	WYW-168009	742	Notice	Exploration, reclamation
LC North[4]	WYW-167039	9,227 (5,120)	Notice	Exploration, pre-mine planning
Lost Creek ISL	WYW-167164	6,432 (1,448)	Notice	Exploration, pre-mine planning
Totals		26,218		

1. Project size as submitted by proponent, often conforming to outer dimensions of claim block.

2. Projects are in the process of being combined into plan of operations WYW-168113. Acreage is counted once.

3. Administered by Rawlins Field Office, acreage shown in parentheses is portion of lands within LFO planning area.

Source: BLM LR2000 Database, March, 2009.

Bison – Great Divide Basin

Table 2-16 presents current activity in the Bison – Great Divide Basin area and includes the project size based on the size of the associated claim block. There are currently three notices and one pending plan of operation in various states of progress in this area. Also of mention is the West Alkali ISL project which is located on the same ore body as former Bison Basin ISL mine that actually produced in the early 1980s. The Greater Bison Basin project boundary completely encompasses the West Alkali ISL project area.

Table 2-16. Uranium Project Size in Acres in Bison – Great Divide Basin Uranium District

Project	Case file No.	Project size (acres)[1]	3809 Type	Status
West Alkali ISR[2]	WYW-168018	646	Notice	Exploration, pre-mine NEPA planning
Greater Bison Basin[2]	WYW168095	8,587	Plan	Pending, pre-mine NEPA planning
CR Trend[3]	WYW-167061	10,859 (640)	Notice	Exploration
Cyclone Rim[3]	WYW-166730	3,507 (3,200)	Notice	Exploration
Totals		12,427		

1. Project size as submitted by proponent, often conforming to outer dimensions of claim block.
2. West Alkali ISL is completely enclosed in Greater Bison Basin Project. Acreage is counted once.
3. Administered by Rawlins Field Office, acreage shown in parentheses is portion within LFO planning area

[1]Source: LR2000 Database, March, 2009.

The vast majority of the current activity is ISL rather than open-pit methods. ISL does not avoid the need for reclamation since the density of the wells requires a complete removal of vegetation which must be restored following mining operations. Much of the identified uranium areas also have soils with low reclamation potential. ISL also introduces the possibility of degraded water quality. ISL operators are required to monitor existing groundwater quality prior to initiating mining. Once mining has ceased, water quality is theoretically required to be returned to the quality present prior to operations. In practice, achieving pre-mining water quality has not been possible and operators have been released from their bond if the water quality is within the range of quality for that class of groundwater affected by the operations.

Bentonite

Bentonite is sodium montmorillonite clay which possesses swelling and adsorbent properties that make it useful for a variety of applications. It is increasingly used to form impermeable liners for water disposal ponds. As of mid-2008, there was no commercial production of bentonite; however, there have been periods of exploration. As presented earlier in Table 2-12, there are currently five notices and one approved plan of operations. In 2007, property in the Lysite area that had been staked in the past and later abandoned was re-staked and drilled to obtain subsurface data regarding grade and thickness. In addition, a company is slated to begin mining bentonite in the Gas Hills area in 2009.

Gemstones and Lapidary Materials

The area has a long history of mining gemstones such as opal, jade, and agates, in particular a variety known as Sweetwater Agate. Most activity today is of interest to hobbyists. There are a small number of gemstone mining claims. Other reported occurrences of gemstone and other lapidary materials include locations for petrified wood, garnet, beryl, tourmaline, aquamarine, sapphire, and ruby (Sutherland 1990). Collection of petrified wood is a popular pastime. Petrified wood is treated as a mineral material and specimens less than 250 pounds may be collected free of charge provided they are used for noncommercial purposes. The daily limit for free use is 25 pounds of material, plus one piece, and collectors are limited to a maximum annual amount of 250 pounds.

Precious Metals

Mining operations for precious metallic ores has a long and varied history. The most well known district is the South Pass - Atlantic City area. Metals mining districts of lesser prominence include the Lewiston District, the Granite and Copper Mountains, and various placers on streams mostly sourced in the Wind River Range (Hausel, 1989). Currently, most of the activity is recreational in nature. Table 2-12 shows that there are currently two notices and seven approved plans of operations. In addition, there are five pending plan of operations. The high number of pending plans is due to proponents losing interest in the proposal or being unable to obtain bonding. Most precious metal notices are for in the South Pass – Atlantic City - Lewiston area; one notice and plan of operations is in the Rattlesnake Hills.

Mining operations for gold in the past have been focused in the following areas:

South Pass – Atlantic City area

The South Pass – Atlantic City District lies along the northwestern flank of the South Pass Precambrian greenstone belt and has been Wyoming's most prolific source of gold and iron ore (Hausel 1989). Gold was discovered here in the 1860s, touching off a gold rush in 1867 which resulted in over 1000 inhabitants settling in South Pass City. By 1872, only a few hundred people remain and the boom was over. Historically, approximately 50 mines were in operation at one point or another. Most gold mining efforts in the district met with disappointment though several did produce for a number of years.

The Lewiston District

The Lewiston District is related both spatially and genetically to the style of ore deposits in the South Pass - Atlantic City District. Production figures include approximately 21,000 ounces of gold apparently extracted from the Bullion Mine. Though the district is smaller and less gold was taken out, reports of grade appear to run somewhat higher. Placers were also productive

and occur along Strawberry Creek and at Wilson Bar on the Sweetwater River; however production figures are not generally available.

Copper Mountain

Principal historical mines at Copper Mountain include the DePass mine and the Gold Nugget mine which had little production. The DePass mine area is mineralized with gold, silver, and copper, and shipped at least 568,000 pounds of mill concentrates for smelting.

Granite Mountains/Rattlesnake Hills

Significant gold anomalies were discovered in the Rattlesnake Hills area by the Wyoming Geological Survey in 1981. Increased interest in the region began with a limited surface and drilling program carried out between 1983 and 1987, and again in 1993 to 1995. This activity led to several discoveries, including a large-tonnage, low-grade deposit that has potential to host more than one million ounces of gold (WSGS 2002).

The potential uncovered thus far in the Rattlesnake Hills district has resulted in a third company optioning on approximately 2,600 acres of claims. This company filed a mining notice of intent and commenced a drilling program in the summer of 2008. In a news release in December 2008, the company announced that a large halo of gold mineralization was found. It is believed that the mineralization is open to depth, and only a small proportion of the deposit has so far been tested. In 2009, a plan of operations was received to expand the drilling program.

<u>Base and Other Metals</u>

Base metals include any of the more common and more chemically active metal elements that are usually found in mineral form as complex with other elements (e.g., as a salt), rather than as native mineral. Such metals include copper, lead, zinc, molybdenum, iron, and tungsten. Significant areas bearing base metal deposits largely overlay the same areas identified earlier for precious metal resources including the Depass District at Copper Mountain, Tin Cup District in the northwest Granite Mountains, the Rattlesnake Hills, and the South Pass Greenstone Belt.

Of special mention is the Atlantic City Iron Mine, which arguably is perhaps the most commercially successful of the mining ventures in the South Pass - Atlantic City District. U.S. Steel Corporation operated the mine from 1962 until 1983, and recovered more than 90 million tons of taconite before selling the mine to another company that subsequently shut the mine down shortly thereafter due to economic factors. The open pit was developed in banded iron formation of the Precambrian Goldman Meadows Formation (Hausel 1991). The mine is immediately adjacent to the main route from Rock Springs to Lander. Some interest in this mine has recently been expressed, as in other historical base metal operations.

As the name implies, the Copper Mountain region of the Owl Creek Mountains is known for hosting copper-rich mineral deposits; iron, tungsten, and lithium have been reported. Tungsten was actually produced in the district during World War II in addition to some copper. In the late 1980s, the U.S. Bureau of Mines evaluated pegmatites and granitic rocks on the south side of Copper Mountain primarily for the strategic metals tantalum, columbium, and beryllium.

Trends

Uranium

Since the 1980s, there has been little mining as market conditions did not support commercial activity. New exploration activities on Green Mountain occurred through the 1990s with the development, cancellation, and reclamation of the Jackpot Mine, and other exploration drilling as recent as 2008. Some mining developments such as Big Eagle and Sheep Mountain mines on Green Mountain attempted to enter interim management to wait for better market conditions but eventually most began reclamation activities. The proposals for uranium activity are described in the Mineral Occurrence Report. It is not possible to forecast any scale of mining as ISL mining is a capital-intensive activity and price fluctuations are unpredictable.

Uranium prices reached an all-time low in 2001, selling at just $7 per pound of triuranium octoxide (U3O8). The price peaked above $130 per pound in 2007 and as of December, 2008 was at about $55 per pound, trending downwards. Uranium activity generally follows the market trends. Increased interest in uranium is in part a result of its utility as an alternative to coal for powering electrical generators. Although no new nuclear reactors have been built in the United States in the past several decades, the NRC had received 17 applications to build 26 reactors as of March, 2009, and expected to receive at least 7 more by the end of 2010. (Testimony of NRC Chairman Dale Klein to the Senate Energy and Natural Resources as reported by Reuters on March 18, 2009.) Global demand for uranium is also expected to increase.

Bentonite

Wyoming bentonite production rose from 1,141 tons in 1927, to more than 4.5 million tons in 2006. It is not possible to discern a trend from the low level of existing activity, particularly before the most recent expressed interest translates into actual production.

Gemstones and Lapidary Material

Deposits of opal are still relatively unexplored and there is likely more to be discovered. As of 2008, there are two mining notices of intent for these deposits. Currently there are no authorized mining operations for jade though there are numerous claimants still holding valid claims.

Precious Metals

Given the current high price of gold (approximately $980 per ounce as of late February 2009), continued interest in developing precious metals resources world-wide is expected. However, technology and market conditions dictate that profitable precious metal ventures are mined by large tonnage, open pit methods, rather than underground shaft and tunnel methods such as that seen in the Copper Mountain and South Pass – Atlantic City – Lewiston Districts.

The number of small exploration notices in the South Pass – Atlantic City – Lewiston Districts, have fallen in the last 20 years, as older miners have retired and surface management and bonding regulations have potentially added too much complexity or financial responsibility in comparison to potential investment return. Recreational activity appears somewhat higher than in the past, probably due to better national promotion by prospector clubs, and the acquisition of claims for member use.

Base and Other Metals

Due to the lack of any significant activity in the historical or recent past, there is insufficient information available to adequately form a basis for trend analysis for base and other metals. Interest in these metals is a function of commodity prices.

Forecasts

Uranium

The information regarding commercially viable uranium is proprietary and not available to the BLM. Industry has expressed informally that considering the current prices may not be sufficient to support *in situ* leaching operations. However, it is expected that a limited number of the prospects currently under development will eventually be permitted as ISL mines; little if any open-pit mine activity is expected due to the high cost of development and reclamation in comparison to the readily available ISL prospects. On a longer term outlook, locatable mineral activity with respect to uranium is projected to continue on current levels or possible see a moderate increase as hydrocarbon-based sources of energy give way to alternate fuels such as uranium. Table 2-17 presents estimates of world-wide demand. Depending on the planning area's share of market demand, future conditions appear favorable for increase.

Table 2-17. Summary of World-Wide Uranium Demand

Uranium demand case	Requirements in cumulative requirements Year 2050 (tons U)	Cumulative requirements, Year 2000 to 2050 (tons U)	Market-based production requirements to 2050 (tons U)
Low	52,000	3,390,000	1,917,990
Middle	177,000	5,394,100	4,158,280
High	283,000	7,577,300	6,406,190

Source: IAEA (2001)

Bentonite

Based on recent interest, the market factors (grade, proximity to transportation or processing facilities) and the depletion of higher grade deposits elsewhere, BLM expects near-term bentonite mining activity. Resource estimates indicate that enough bentonite will be mined to support two processing facilities (about 40 million tons). As additional higher grade supplies are depleted elsewhere in the region, industry may soon begin to develop the lower grade bentonite resource in the planning area at a faster pace for uses such as pet litter. Chemical activation methods can also improve the quality of bentonite for a wider variety of uses.

Though use of bentonite was negatively impacted by the slowing of the U.S. economy and the decrease in housing starts in the mid-2000s, bentonite sales increased due to the strong demand from the drilling mud market. A declining U.S. dollar probably contributed to the slight increase in exports and a decline in imports in 2007. The future market for drilling mud is dependent upon future oil and gas activities. Domestic production statistics are presented in Table 2-18. These data indicate that domestic production has been steadily increasing although domestic demand has remained fairly stable, indicating that the difference is made up as increasing amounts of export, as expected.

Table 2-18. Domestic Bentonite Production Statistics 2003 – 2007

Metric	2003 (metric tons)	2004 (metric tons)	2005 (metric tons)	2006 (metric tons)	2007 (metric tons)
Production	3770	4550	4710	4940	5070
Export	721	915	847	1270	1460
Apparent consumption	3049	3635	3863	3670	3610

Source: USGS (2008).

Gemstones and Lapidary Material

Activity related to gemstones and Lapidary Material are anticipated to continue at a recreational level. Based on the recent history of jade and opal activity, the BLM expects periodic recurring interest in developing claims on a case-by-case basis at a rate of one notice-level operation every two years or so. Similar activity is expected for agate.

Precious Metals

Most of the precious metal mines at South Pass – Atlantic City - Lewiston districts are now undergoing AML reclamatiom. Several properties are still privately owned and remain open to operation at little more than a hobbyist's level. It is expected that the filing of small exploration notices at the hobbyist level in the South Pass – Atlantic City – Lewiston Districts is expected to continue at levels comparable to the recent past. Casual use gold panning and sluicing is expected to continue at the rate of several hundred visitors per year. Unless the market conditions that favor large tonnage open-pit gold mining change, the historical mining activity by shaft and tunnel methods in the planning area is not expected to return.

Exploration is expected to continue at the Rattlesnake Hills, with over 51,000 lineal ft of core drilling planned for 2009. Data obtained from these efforts will determine whether continued exploration is warranted and/or whether sufficient reserves are available for mining.

Base and Other Metals

Other than the former South Pass Atlantic City Mine, there has been little interest in base metal deposits in the recent past.

Key Features

Areas of high potential for the use of locatable minerals are tabulated in Table 2-19.

- The keystone locatable mineral resource, historically, at present, and the future remains the roll-front uranium deposits in the Gas Hills, Crooks Gap and Bison Basin Districts.
- Gold also has importance historically, and at present recreationally in the South Pass - Atlantic City – Lewiston Mining Districts. In addition, potential commercial grades in the Rattlesnake Hills have recently gained interest.
- Gemstone and other lapidary materials such as jade, agate, and opal have a long history, particularly in the Sweetwater Rocks region.
- To date, bentonite has generated insufficient interest for taking a key position in the area's economy. As deposits of high-grade bentonite are depleted elsewhere, the relative abundance of low grade deposits in the planning area and increased research into chemical activation method may result in favorable economics for development.

Table 2-19. Locatable Minerals – Key Features

Area	Commodity	Occurrence
Gas Hills	Uranium, ISL & conventional	Roll Front deposits in Tertiary sediments
Crooks Gap	Uranium, ISL	Roll Front deposits in Tertiary sediments
Bison Basin – Great Divide Basin	Uranium, ISL	Roll Front deposits in Tertiary sediments
South Pass - Atlantic City – Lewiston	Gold (recreational or hobbyist), iron	Veins and shears in in Precambrian metamorphic rocks, placers
Rattlesnake Hills	Gold, open pit	Associated with high-level intrusives and volcanic plugs.
Planning Area wide	Bentonite exploration, mining	Mowry Formation on geologic structures
Granite Mountains, Sweetwater rocks	Jade and agate	Pendants in Precambrian granite, float in alluvium
Cedar Rim	Opal	Silicified beds in Tertiary sediments

2.2.2 Leasable Coal

2.2.2.1 Resource Characterization

Current Condition

The most widespread coal-bearing rocks in Wyoming are Cretaceous in age and usually crop out at the surface in narrow bands of upturned rocks along the margins of structural basins and uplifted areas. Coal-bearing formations contain numerous coal seams separated from one another by as little as a few inches of shale or claystone to hundreds of feet of rock that may vary from coarse sandstone to siltstone, claystones and shales (Rieke and Kirr 1985).

In general, coal mining activity was significant only in the early part of the last century. According to Woodruff and Winchester (1910), coal occurrence in the Wind River Basin (WRB) is generally categorized into seven coal fields and regions: Muddy Creek, Pilot Butte , Hudson (Lander), Beaver Creek, Big Sand Draw, Alkali Butte, and the Arminto. The major deposits of these fields are found in the Mesaverde and Meeteetse Formations along the WRB perimeter (Rieke and Kirr 1985). The Muddy Creek and the Pilot Butte fields are located on the WRIR.

The WRB coal resource (Figure 4 from RFD) is large, and most is contained in thick deposits lying at depths greater than 11,000 feet within the basin (Rieke and Kirr 1985). However, most available resource calculations were restricted to surface outcrops along strike of the beds and extending only for a short distance down-dip. Based on available estimates, total original coal resources (two and a half feet or greater in thickness) in the WRB is over 1025.79 million tons (Glass and Roberts 1978). These data are presented by coal field in Table 2-20.

Table 2-20. Coal Resources and Reserve Base for the Wind River Basin by Field

Wind River Basin Coal Field	Coal Resource (million tons)[1]	Remaining Reserve Base (million tons)
Alkali Butte coal	166.74	34.53
Arminto coal field	176.86	26.97
Beaver Creek coal field	507.47	0
Big Sand Draw coal field	71.83	13.82
Hudson coal field	58.97	7.46
Muddy Creek coal field	43.56	17.93
Pilot Butte coal field	0.36	0
Totals	1,025.79	100.71

Source: Glass and Roberts 1978

Trends

Recorded coal mining in the WRB (and therefore the planning area more or less) dates back to 1870 (Woodruff and Winchester 1910). Approximately 58 coal mines are known to have been operated. Although coal mining activity has had a significant history, production in the planning area was insignificant compared to the historical production of the State of Wyoming. In its best year (1920), coal from the WRB only accounted for 3 percent of the total annual production of the state. The 3,982,378 tons of coal production recorded for the WRB accounts for only 0.7 percent of cumulative production for the state through 1977. Annual production in the planning area declined after 1927, due reportedly to the remoteness of the WRB and increased competition from larger Wyoming coal fields (Glass and Roberts 1978). The Muddy Creek coal field was responsible for the only coal mined in the WRB after 1966. Located on the WRIR, the Muddy Creek strip mine accounted for only 85 tons in 1973, and has been inactive since.

Forecasts

Traditionally the largest problem facing coal mining in the WRB has been the lack of nearby markets (Glass and Roberts 1978). In addition, the geology of coal occurrence in the WRB (steep dips, thin beds, etc.) also decreases economic viability. Fort Union coal, for example, is not economically minable today because the thick deposits are found

only in the deep parts of the WRB, and they are not high enough in quality (based on comparable Tertiary coal quality) to warrant development of large underground mines (Flores and Keighin 1999).

Demand for low sulfur coal is not enough to offset the obstacles to development in the WRB because thin coals, conducive only to deep mining, cannot compete with surface mines on thick coalbeds (Glass and Roberts 1978). The only known strippable coal resources are located in the Wilton coalbed of the Muddy Creek field and the Signor coalbed of the Alkali Butte field. Combined, they total an estimated one million tons of strippable coal (Rieke and Kirr 1985).

Key Features

Prior to the update of a land use plan, a Call for Coal and Other Resource Information is made to formally solicit indications of interest on coal resource development potential and on other resources which may be affected by coal development. At the onset of this BLM land use planning process, BLM determined that the planning area does not contain coal resources sufficient to be viable as an economic activity to follow the "Coal Call" procedures. If interest to develop coal resources is received in the future, an EIS and land use plan amendment would be needed.

2.2.3 Leasable Geothermal

Geothermal resources are typically underground reservoirs of hot water or steam created by heat from the earth. Geothermal steam and hot water discharge at the earth's surface in the form of hot springs, geysers, mud pots, or steam vents. Geothermal resources also include subsurface areas of hot, dry rock (BLM and USFS 2008). The BLM is responsible for supervising and managing all exploration, development, and production operations on any federal geothermal leases in the planning area. High temperature geothermal resources are generally used for electric power generation. Low-temperature resources are used directly and for ground-source heat pumps (Geothermal Resources Council, 2003).

2.2.3.1 Resource Characterization

Current Condition

Geothermal resources occur in numerous places in the planning area as evidenced by flowing springs with elevated groundwater temperatures. The Record of Decision for the Geothermal Resources Programmatic (2008) amended the 1987 RMP to authorize geothermal leases.

There are several areas where measured temperature gradients in groundwater wells may indicate potential for low or medium grade geothermal energy including north of the Gas Hills, the Diamond Springs, Big Sand Draw, and Copper Mountain areas. Table 2-21 presents known thermal springs. None of these thermal springs were significant enough or did not meet the criteria to be included in the inventory of hot and warm spring inventory included in the Programmatic ROD for Geothermal Leasing in the Western U.S. (BLM and USFS, 2008).

Table 2-21. Thermal Springs in the Lander Planning Area

Thermal Spring	Location	Temperature (°C)	Flow (liters/minute)
Warm Springs Creek Springs	T. 42 N., R. 107 W.	29	503
Little Warm Springs	T. 41 N., R. 107 W.	25	2120
Jakey's Fork Spring	T. 41 N., R. 106 W.	20	15
Conant Creek Springs	T. 33 N., R. 94 W.	16	1136
Sweetwater Station Spring	T. 29 N., R. 95 W.	32	1890
Horse Creek Springs	T. 32 N., R. 86 W.	24	8327
Fort Washakie Hot Springs	T. 1S, R.1 W	44	568

Source: Heasler 1983

Trends

There are no active federal geothermal leases issued by the BLM. The Geothermal ROD provides a mechanism for the BLM to expedite processing of geothermal lease applications.

Forecasts

No utility level geothermal resources development is anticipated in this planning cycle. Although the ROD describes the planning area as having "potential" for geothermal development, the geothermal RFD prepared for the RMP revision determines that the resource is not likely to lead to commercial power development. A backlog of geothermal resources development applications in other western states is evidence of interest in geothermal development; the virtual absence of local interest in geothermal is reasonable, considering the area's low potential.

Energy generation through utilization of the heat differential of subterraneous materials has potential for the future on a project level basis. Technological improvements are utilizing far lower temperatures to generate electricity than was historically been re

quired using less costly equipment to capture the thermal energy. The most likely potential for utilization of heat differential geothermal resources is in co-generation, probably as a component of oil and gas development. Low potential geothermal resources are more viable if the developer is already drilling down to reach differentially heated material. Couple with new low temperature equipment, electrical power to operate facilities could be generated without CO2 or other emissions. Direct heat application could be used to warm gas lines and even facilities. As clean energy initiatives increase and oil and gas operators look at ways to reduce the emission of their projects , utilization of geothermal activities may increase. Geothermal projects are increasingly available as “off-the-shelf” systems which significantly reduces the cost to implement.

Key Features

Key features for geothermal resources are areas where measured temperature gradients in groundwater wells indicates potential for low or medium grade geothermal energy; these are areas north of the Gas Hills, the Diamond Springs area, Big Sand Draw, and the Copper Mountain area. Additional information regarding geothermal resources can be found in the RFD for geothermal resources available online.

2.2.4 Leasable Oil and Gas

Oil and gas production comes mostly from conventional oil and gas reservoirs; coal-bed natural gas (CBNG) will likely play a far greater role in the future. Two EISs being prepared concurrently with the RMP revision are considering CBNG wells. Conventional reservoirs include the structural or stratigraphic trapping of hydrocarbons in reservoir rocks within the Wind River Basin (WRB) (Fremont and Natrona County), and a small portion of the Great Divide Basin (Sweetwater County). Information from the RFD has been incorporated and summarized below. The Draft RFD is available at the online.

2.2.4.1 Resource Characterization

Current Condition

The planning area contains about 6,486,835 surface acres of all oil and gas mineral ownership types. The current subsurface mineral lease ownership includes 3,670,521 acres (57%) owned by the federal government, 1,762,005 acres (27%) owned by the Shoshone and Arapaho Tribes of the WRIR, and the remaining 1,060,508 acres (16%) is owned by state and private interests. The BLM manages most of the federal oil and gas mineral lands, about 2,785,627 acres. About 401,663 acres of state and private surface lands overlie BLM managed oil and gas mineral leads.

Excluding Wilderness Areas, wilderness study areas, and there WRIR there were about 1,049,222 acres of leased Federal oil and gas minerals as of December 1, 2007 and about 2,110,489 acres of unleased Federal oil and gas minerals. About 33 percent of Federal oil and gas minerals available for lease were leased at that time.

Leasing

Leasing procedures for oil, gas, and CBNG are the same. Based on the *Federal Onshore Oil and Gas Leasing Reform Act of 1987*, all leases must be offered for sale by competitive bid. Lands that do not receive competitive interest are available for noncompetitive leasing for a period not to exceed two years. The act requires that competitive sales are held at least quarterly and by oral auction. In Wyoming, the quarterly requirement is met in practice by holding such auctions every two months.

Competitive and noncompetitive leases are both issued for a term of ten years. If the lessee establishes hydrocarbon production, the competitive and noncompetitive leases can be held as long as oil or gas is capable of production in paying quantities. The federal government receives annual rental fees on all leases. Royalty on production received in producing leases, one half of which is returned to the State of Wyoming.

Map 9 presents the locations of leased and un-leased federal oil and gas minerals. Excluding lands under Forest Service Wilderness Areas, Bureau Wilderness Study Areas, and within the Wind River Indian Reservation (WRIR) there were about 1,049,222 acres of leased federal oil and gas minerals as of December 1, 2007 and about 2,110,489 acres of un-leased federal oil and gas minerals. About 33 percent of federal oil and gas minerals available for lease were leased at that time. These numbers will be updated for the Affected Environment Chapter to reflect leases subsequent to December 1, 2007.)

Federal oil and gas leases are incorporated into 35 active unit agreements that lie within or partly within the planning area. Active units encompass lands totaling approximately 421,960 acres, with approximately 344,725 acres lying entirely within the planning area. These units comprise a little more than 5.3 percent of the total planning area. Twenty-one companies operate the 35 units. Unique rules apply to unitized leases which are exempted from state spacing rules. The oldest still active unit is the Big Sand Draw Gas unit established in 1934.

Fifteen exploratory units (including the 3 CBNG units) have been approved in the last 10 years. These units were initially approved as exploration tools to investigate non-producing areas. They are still in their exploration and development drilling phase and cover about 73 percent of the total unit area. Seven of the 15 (including the 3 CBNG

units) are considered to be non productive. These units will likely contract to smaller developed unit areas once their productive limits are established.

Fourteen units have contracted to their developed areas and are still producing oil and gas. They cover 23 percent of the total unit area. Development drilling is continuing in some, while others are concentrating on maximizing recovery with existing wells.

The six remaining unit agreements (Beaver Creek, Bison Basin, Crooks Gap, Happy Springs, Lander Phosphoria, and Rolff Lake units) contain secondary oil recovery projects. Operators of these six units are working to obtain maximum oil recovery. They account for the remaining five percent of the total unit area.

Drilling and Well Counts

Historical Oil and gas drilling activity has been spread out across the planning area. The largest gas drilling concentrations have been in the northeast and in the southeast portion of the WRIR. Oil drilling has been mostly concentrated along a northwest - southeast trend on the western edge of the Wind River Basin (WRB). Even with the large number of wells, many townships have received little or no drilling activity.

There have been 4,481 surface-well locations spud or completed through October 23, 2008 (WOGCC, 2008). Of the 4,481 wells spud or drilled, 1,900 wells, or 42.4 percent are on BLM managed lands. There are 1,867 wells (41.7 percent) that lie within the boundary of the WRIR; 1,415 of those wells (31.5 percent of total wells) are managed by the Bureau of Indian Affairs, while the remaining wells (452 wells) have private oil and gas mineral ownership. There are an additional 1,114 wells (24.9 percent) that have been drilled on private and state owned oil and gas mineral ownership (RMG 2009).

<u>Conventional Oil and Gas</u>

Compared to other Wyoming BLM field offices, the planning area contains comparatively little oil production. The WRB produces mainly oil around the basin margins and mainly gas from the deeper areas of the basin. There is a significant amount of conventional gas production. Most of this deeper gas is from reservoirs of Upper Cretaceous and Tertiary age with permeabilities that vary from conventional to tight (Johnson, 1996). The basin-centered gas accumulations in the WRB appear to extend through an enormously thick stratigraphic interval near the basin trough. These gas accumulations occur down-dip from more permeable water-wet rocks, and the idea is that the presence of water above the gas accumulations renders the rocks lying at higher elevation impervious to gas, thus resulting in a trap facilitated by a capillary seal (Masters 1979).

Production

Table 2-22A lists the oil and gas fields and itemizes the number of producing zones, hydrocarbon production through 2007, and well activity. The major producing gas fields in descending order have been Madden, Beaver Creek, and Pavillion. The major oil fields have been Winkleman, Steamboat Butte, Beaver Creek,and Big Sand Draw. The top producing gas fields based on 2008 annual production are Madden, Frenchie Draw, Beaver Creek, Pavillion and Muddy Ridge. The 2008 top producing oil fields are Circle Ridge, Steamboat Butte, Winkleman Dome, Frenchie Draw, and Maverick Springs. At the end of 2007, there were 1,566 actively producing oil and gas wells and a cumulative production of 506,101,136 barrels (BBLS) of oil and 3,876,634,353,000 cubic feet of gas.

Table 2-22A. Producing Oil and Gas Fields (through December 2007)

Fields	Producing Zones	Cumulative Gas (Thousand Cubic Feet)	Cumulative Oil (BBLS)	Wells	Active	Inactive
Alkali Butte	9	9,379,319	56,919	15	3	12
Alkali Butte North	2	1,654,720	51	2	0	2
Antelope Springs	2	1,628,096	8,421	3	0	3
Arahoe Creek	2	76,942	23,674	2	0	2
Austin Creek	1	1,549,402	353,233	1	1	0
Beaver Creek	17	827,049,315	59,407,755	211	110	101
Big Sand Draw	8	196,902,304	55,515,483	87	35	52
Bison Basin	2	483,160	3,40,2540	38	31	7
Bonneville	3	1,794,895	22,751	9	5	4
Boulder Dome	3	0	11,074	4	0	4
Boysen	3	50,736	630	3	0	3
Campbell Ridge	1	477,663	31,934	2	1	1
Carvner	1	5,600	5,575	1	0	1
Castle Garden	2	5,639,462	12,321	6	5	1
Cedar Gap	1	320,610	1,282	1	0	1
Circle Ridge	14	679	40,336,477	391	111	280
Crooks Creek	1	4,434	0	2	0	2
Crooks Gap	6	1,105,944	7,990,708	30	4	26
Dallas	5	1,021	7,199,703	109	68	41
Day Butte	2	137,468	1,589	3	1	2
Deer Creek II	2	186,243	691	2	0	2
Derby	4	0	1,559,253	48	28	20
Dubois	1	1,555	244,570	9	3	6
Frenchie Draw	3	127,064,636	3,239,555	134	126	8
Fuller Reservoir	2	25,933,280	2,315,223	73	38	35
Gates Butte	1	372,901	2,791	1	1	0
Girrard	3	311,411	0	3	0	3
Golden Goose	3	153,954	944,922	5	1	4
Grieve	2	95,649,598	26,580,521	36	3	33

Table 2-22A. Producing Oil and Gas Fields (through December 2007)

Fields	Producing Zones	Cumulative Gas (Thousand Cubic Feet)	Cumulative Oil (BBLS)	Wells	Active	Inactive
Happy Springs	6	10,921,079	10,365,047	53	9	44
Haybarn	2	1,459,945	350,577	10	6	4
Hoodoo Hills	1	18,373	0	1	0	1
Howard Ranch	1	2,821,385	28,896	1	1	0
Indian Butte	1	21,203	0	1	0	1
Jade Ridge	2	1,015,632	33,090	2	0	2
Kanson Draw	2	1,209,038	4,760	5	1	4
Kirby Draw South	1	74,428	73,428	1	1	0
Kirk	1	0	3,388	1	0	1
Kohler	1	0	83,514	1	1	0
Lander	3	677	20,787,305	273	104	169
Long Butte	4	111,614,511	20	15	7	8
Longs Creek	3	3,682,290	2,031	4	2	2
Lost Cabin	3	2,822,709	508,704	15	6	9
Lost Soldier	1	976,394	483,517	1	1	0
Lysite	5	35,891,852	35,516	7	4	3
Madden	10	1,638,302,619	1,461,492	327	264	63
Maverick Springs	5	37,089	17,376,648	149	32	117
Maverick Springs SE	1	9,247	233,479	7	0	7
Meigh Ranch	1	37,722	163	3	0	3
Moneta Hills	3	1,925,468	94,537	20	10	10
Mount Rogers	1	66,288	0	1	0	1
Muddy Ridge	10	125,231,228	509,456	95	62	33
Muskrat	5	20,374,946	105,563	11	1	10
Ocean Lake	1	59,418	3,484	1	0	1
Owl Creek Valley	1	1,035,960	8,463	1	1	0
Paradise Valley	1	282,365	6,469	1	0	1
Pavillion	7	275,617,842	7,617	160	129	31
Picket Lake	2	1,751,580	17,468	7	4	3
Pilot Butte	15	8,769,616	8,683,881	65	23	42
Poison Creek	1	3,634,647	8,428	8	3	5
Popo Agie	1	0	39,322	1	1	0
Riverton	5	3,631,520	1,449,045	6	0	6
Riverton Dome	9	191,340,688	3,796,698	77	44	33
Riverton Dome East	9	74,444,493	218,714	36	10	26
Riverton East	1	6,751,097	22,310	1	0	1
Rolff Lake	3	1,560	1,213,079	11	5	6
Sage Creek North	1	21,011	58,781	4	0	4
Sand Draw North	3	2,294,124	678,743	5	2	3
Sand Draw South	7	9,277,024	3,202,199	32	14	18
Sand Mesa	3	4,840,068	2,093	12	4	8
Sheep Creek	1	0	329,618	10	4	6

Table 2-22A. Producing Oil and Gas Fields (through December 2007)

Fields	Producing Zones	Cumulative Gas (Thousand Cubic Feet)	Cumulative Oil (BBLS)	Wells	Active	Inactive
Sheldon	11	10,067,592	5,424,313	37	16	21
Sheldon Northwest	8	349,175	2,682,841	30	7	23
Sheldon West	2	6,266	1,761	2	0	2
Shoshoni	2	235,573	342	3	0	3
Squaw Butte	3	801,570	48,333	9	5	4
Steamboat Butte	17	13,449,344	81,260,740	167	54	113
Steffen Hill	4	449,034	0	4	2	2
Unnamed	9	3,908,395	56,715	46	25	21
Wertz	2	12,840,976	16,277,939	8	3	5
Wickersham Draw	2	53,159	0	2	0	2
Winkleman	6	2,783,129	118,520,664	212	123	89

Source: (IHS 2008)

Water is often produced in conjunction with oil and gas from most reservoirs. Increases in water production in recent years are mainly tied to increased gas production during that time. Cumulative water produced through August, 2007 was 4,389,859,424 barrels.

Producing Zones

There are 88 named oil and gas fields and seven unnamed fields located within the planning area (DeBruin 2006) – (Map 10). Table 2-23 presents information on all producing zones. Some producing zones are reported under more than one name. Those equivalent zones are presented in parenthesis. In some wells, more than one zone actually produces. Those variations are also presented in Table 2-22B.

Total wells (3,172 wells) include those presently producing, shut-in wells, and those wells that produced at some time in the past but have since been plugged due lack of economic production.

1

Table 2-22B Oil and Gas Productive Zones and Associated Productive Fields (through December 2007)

Productive Zones[1]	Productive Fields	Cumulative Gas (mcf)	Cumulative Oil (BBLS)	Active Wells	Inactive Wells	Total Productive Wells
Wind River (Wasatch)	8	122,558,551	542,903	58	28	86
Fort Union (Shotgun, Waltman)	30	865,180,397	8,669,329	513	153	666
Fort Union (Scotty Lake Coal)	1	0	0	2	1	3
Lance	18	80,571,201	164,392	26	49	75
Meeteetse	4	5,229,088	20,367	6	3	9
Lewis	2	1,751,580	17,468	2	3	5
Mesaverde (Almond)	9	95,267,508	103,566	22	21	43
Cody (Sussex, Shannon)	26	399,980,446	4,146,264	29	88	117
Frontier	31	270,978,117	6,942,037	92	83	175
Mowry	1	126,487	88	0	1	1
Muddy	18	131,587,753	28,280,031	20	72	92
Cloverly (Dakota, Lakota)	20	15,513,117	14,832,441	10	47	57
Morrison	7	1,681,197	3,371	2	6	8
Sundance (Nugget)	11	16,449,623	17,403,166	36	46	82
Chugwater (Crow Mountain, Alcova, Curtis)	12	849,330	3,334,026	12	32	44
Dinwoody	4	5,328	3,282	1	3	4
Phosphoria (Embar)	35	198,671,340	95,879,891	223	491	714
Tensleep	20	58,802,186	252,881,658	155	342	497
Amsden (Darwin)	1	96	846,170	1	8	9
Madison	7	778,678,060	46,908,318	29	30	59
Flathead	1	976,394	483,517	1	0	1
Unknown	3	337,267	1,094,854	0	3	3

Table 2-22B Oil and Gas Productive Zones and Associated Productive Fields (through December 2007)

Productive Zones[1]	Productive Fields	Cumulative Gas (mcf)	Cumulative Oil (BBLS)	Active Wells	Inactive Wells	Total Productive Wells
Wind River/Fort Union	1	21,379,163	24	42	3	45
Fort Union/Lance	7	28,780,937	286,711	20	3	23
Lance/Meeteetse/Mesaverde	2	14,312,237	72,028	8	1	9
Lance/Mesaverde	1	1,137,697	3,303	1	0	1
Meeteetse/Mesaverde	3	598,994	38,017	6	1	7
Lewis/Mesaverde	1	11,233	68	1	0	1
Cody/Frontier	1	18,373	0	0	1	1
Frontier/Mowry	1	1,890,999	0	0	1	1
Frontier/ Muddy	2	5,560,108	6,324	4	2	6
Frontier/Muddy/Cloverly/Morrison	1	20,545,559	24,948	11	0	11
Frontier/Muddy/Morrison	1	5,726,593	6,780	7	0	7
Frontier/Muddy/Sundance	1	101,184	13	0	1	1
Frontier/Cloverly	2	696,639,302	3,150,549	39	4	43
Frontier/Cloverly/Morrison	2	4,100,746	4,979	3	0	3
Frontier/Morrison	1	1,347,888	1,790	1	0	1
Muddy/Cloverly	4	7,017,358	61,369	0	4	4
Cloverly/Morrison	1	23,246,469	36,035	0	3	3
Sundance/Dinwoody/Phosphoria/ Tensleep	1	1,013	39,613	0	1	1
Sundance/Phosphoria	2	235,521	584,913	5	2	7
Sundance/Phosphoria/Tensleep	2	274,934	1,450,257	12	4	16
Sundance/Tensleep	2	164,364	705,453	1	3	4
Chugwater/Phosphoria	2	86,666	715,224	4	4	8
Chugwater/Phosphoria/Tensleep	2	63,950	539,572	0	5	5
Dinwoody/Phosphoria	2	5,328	1,630	1	1	2

Table 2-22B Oil and Gas Productive Zones and Associated Productive Fields (through December 2007)

Productive Zones[1]	Productive Fields	Cumulative Gas (mcf)	Cumulative Oil (BBLS)	Active Wells	Inactive Wells	Total Productive Wells
Phosphoria/Tensleep	8	32,368	6,095,601	75	13	88
Phosphoria/Tensleep/Amsden	3	0	6,476,697	84	35	119
Tensleep/Amsden	2	0	139,556	3	1	4
Tensleep/Amsden/Madison	1	0	97,849	1	0	1
Tensleep/Madison	1	138,618	0	0	1	1
Totals		**3,877,636,27**	**502,612,92**	**1,568**	**1,604**	**3,172**

Source: (IHS 2008)

[1]Names in parentheses indicate additional equivalent formation or member name terminology reported by operators for the indicated producing zone.

Cumulative production of oil and gas has been almost four trillion cubic feet of gas (TCF) and more than 500 million BBLS of oil (MMBO) through December 2007. The most prolific oil productive formations have been the Phosphoria Formation and Tensleep Sandstone; a significant amount of gas production has also been associated with these two formations. Almost all of the fields producing from these two formations are located within the WRIR, with some additional productive fields to the south and southeast of the Reservation. Both formations have been productive in 1,467 of the 3,172 total productive wells (46 percent).

Oil and Gas Plays

The potential for occurrence of hydrocarbon resources is based on the geology of the area, as well as the historic exploration and production activities. The industry standard for evaluating potential is the concept of a "play." An oil or gas play is an area, geologic formation, or geologic trend that has potential for oil or gas development, or is generating interest for leasing and exploration drilling. A play is defined by the geological properties (such as trapping style or type of reservoir) that are responsible for the accumulations or prospects. Various types of plays are identified and can be classified as either a conventional or unconventional play. Hydrocarbons in conventional plays can be recovered using traditional development and production practices and are largely related to a geologic structure. Unconventional, continuous-type plays are pervasive throughout a large area and are not a result of the buoyancy of hydrocarbons as conventional accumulations are.

The following are a listing of conventional plays within the WRB:

- Margin Sub-thrust Play
- Margin Anticline Plays
- Deep Basin Structure Play
- Muddy Sandstone Stratigraphic Play
- Phosphoria Stratigraphic Play
- Bighorn Wedge-Edge Pinch-out Play (Hypothetical)
- Flathead Lander and Equivalent Sandstone Stratigraphic Play (Hypothetical Play)
- Madison Limestone Stratigraphic Play (Hypothetical)
- Darwin & Amsden Sandstone Stratigraphic Play (Hypothetical)
- Triassic and Jurassic Stratigraphic Play (Hypothetical)
- Shallow Tertiary-Upper Cretaceous Stratigraphic Play
- Cody and Frontier Stratigraphic Play (Hypothetical).

Conventional plays within the Great Divide Basin (GDB) of Southwest Wyoming as identified in the Mineral Occurrence and Development Potential Report are the GDB Margin Anticline Play, GDB Sub-thrust Play (hypothetical), and the GDB Platform Play.

Unconventional plays in the WRB and GDB are the WRB Basin Center Gas Play, GDB Greater Green River Basin Cloverly-Frontier Play (Hypothetical), GDB Greater Green River Basin Mesaverde Play (Hypothetical), GDB Greater Green River Basin Lewis Shale Play (Hypothetical), and GDB Greater Green River Basin Fox Hills-Lance Play (Hypothetical). A detailed analysis of the plays is explained in the Mineral Report.

<u>Coalbed Natural Gas</u>

There is currently little CBNGproduction. Three areas have produced CBNG within the WRB in the Mesaverde Formation, all on or near the WRIR. Three CBNG pilot projects were proposed in the Fort Union Formation in the GDB in the Pappy Draw area; however, there were no producing CBNG wells the unit agreement was terminated and the leases expired.

Cumulative CBNG production has been more than 5.026 BCF and 13.7 million bbls water produced. Gas production has averaged 278,813 cft and 762 bbls of water per day. Table 2-23 presents production information for CBNG wells.

Table 2-23. Cumulative Production (through October, 2008) for Coalbed Natural Gas Wells

YEAR	CUMULATIVE OIL (barrels)	CUMULATIVE GAS (thousand cubic feet)	CUMULATIVE WATER (barrels)	DAYS ON PRODUCTION	ACTIVE WELLS
1990	0	4,397	5,590	28	1
1991	0	24,520	25,057	319	1
1992	0	15,590	20,982	246	1
…	…	…	…	…	
1999	0	39	994	8	1
2000	0	5,403	1,610,607	712	4
2001	0	8,238	1,674,494	727	4
…	…	…	…	…	
2005	0	364,463	428,149	2,004	9 to 16
2006	1,026	846,601	2,159,245	5,687	15 to 19
2007	417	1,826,016	2,843,328	3,911	11
2008	255	1,930,903	4,965,604	4,385	10 to 11
Total	**1,698**	**5,026,170**	**13,734,050**	**18,027**	

Source: (Wyoming Oil and Gas Conservation Commission 2008)

Coalbed Natural Gas Plays

Wind River Basin–Mesaverde Play:

The best potential for CBNG in the Wind River Basin is from Mesaverde coalbeds. The Meeteetse coals are generally too thin, but multiple-seam completions with Mesaverde coals may be possible in areas where coals in both formations are thick.

A gas well in the Riverton Dome field was recompleted in 1990 in Mesaverde coalbeds at depths of about 3,200 to 3,840 feet. The well produced as much as 233 MMCF/day and was shut in after producing about 45 MMCF and 52,000 BBLS of water. This was the only CBNG well in until a pilot project on the WRIR was begun in 2005.

In 2007, a 20-well pilot project in the Beaver Creek area was approved. Five of the 20 authorized wells have been completed as of 2008. The proponents then requested permission for an additional 220 CBNG wells involving 16,000 to 17,000 acres over a 10-year period which is being analyzed by an EIS begun in 2008.

In 2008, the Beaver Creek proponent also proposed up to 151 CBNG wells to be drilled over the next decade in the Riverton Dome. The Bureau of Indian Affairs signed the ROD for this project to begin in 2009. However, the project is currently under appeal with no known timetable of resolution.

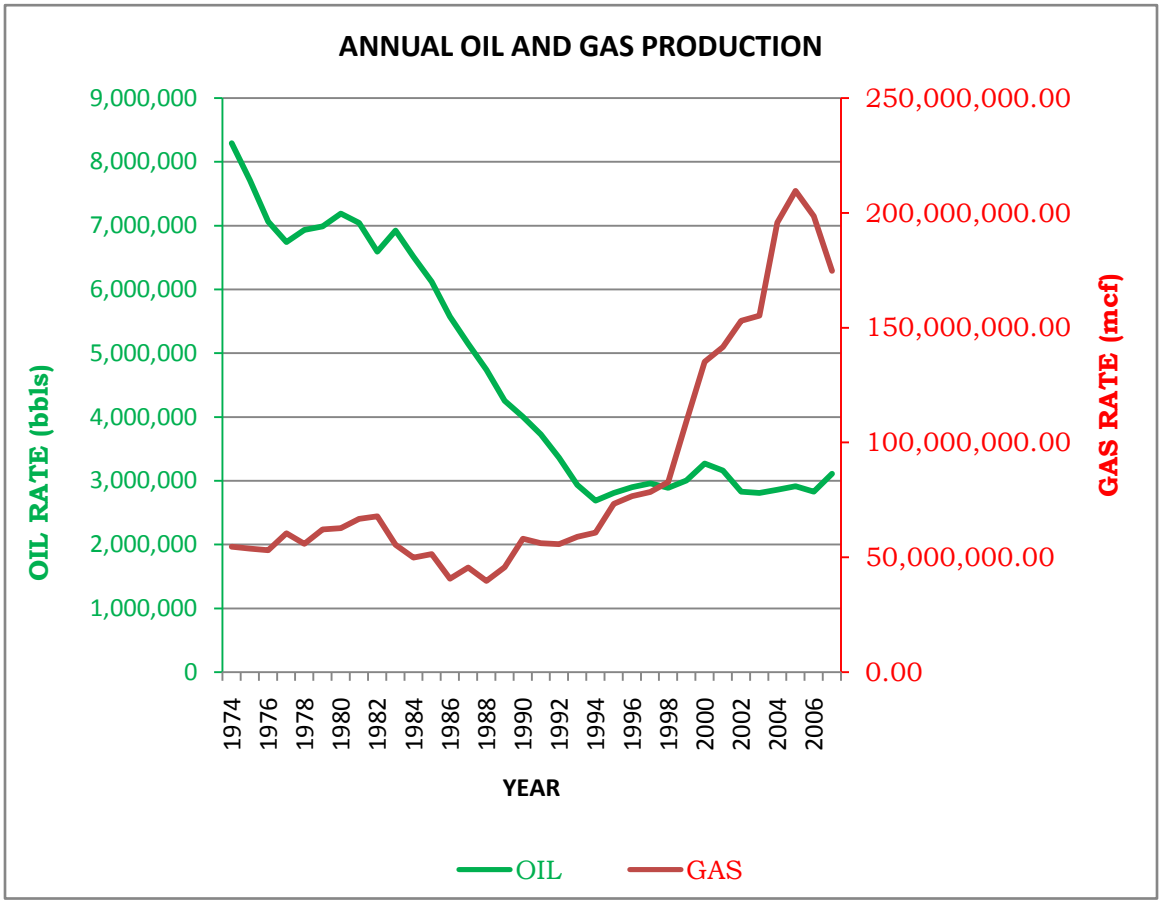
The WRB is a major gas-producing basin and the basic infrastructure is in place for the development of CBNG. Johnson et al. (1993) presented data from the USGS investigations on the WRIR. It is assumed these data can be extrapolated to off-reservation areas underlain by similar geology. This study estimated that for Mesaverde and Meeteetse coals in the main part of the WRB in the 300 to 3,000 depth range, in-place gas resources range from a low of 110 BCF to a high of 604 BCF. For the 3,000 to 6,000 feet depth range, in-place resources ranged from a low of 1.05 to 2.45 TCF. For the 6,000- to 9,000-feet-depth interval, in-place resources were estimated at a low of 1.46 TCF to a high of 3.14 TCF. Further information is available in Mineral Report.

Trends

Annual oil and gas production trends follow market forces and other global factors (Figure 2-9). The pace of APD submittal increased with the oil price spikes of 2008 and has fallen off as oil prices fell in 2009. Demand also depends on general economic condition and not only slowed during the current recession but for the first time since 1970s, gasoline consumption in the US fell by 5% between November, 2008, and January, 2009, despite significantly lower prices (US Deparment of Energy, May 2009). Predictions for the future depending upon market conditions and development of new recovery techniques.

The increase in annual gas production since 1994 is attributed to infield drilling activity tied to developments on existing fields. Development activities that were uneconomic for oil production in the 1990s when oil prices fell below $10 per barrel became more commercially viable as prices increased.

Figure 2-9. Oil and Gas Yearly Production Rates from Federal, Tribal, Private, and State Wells

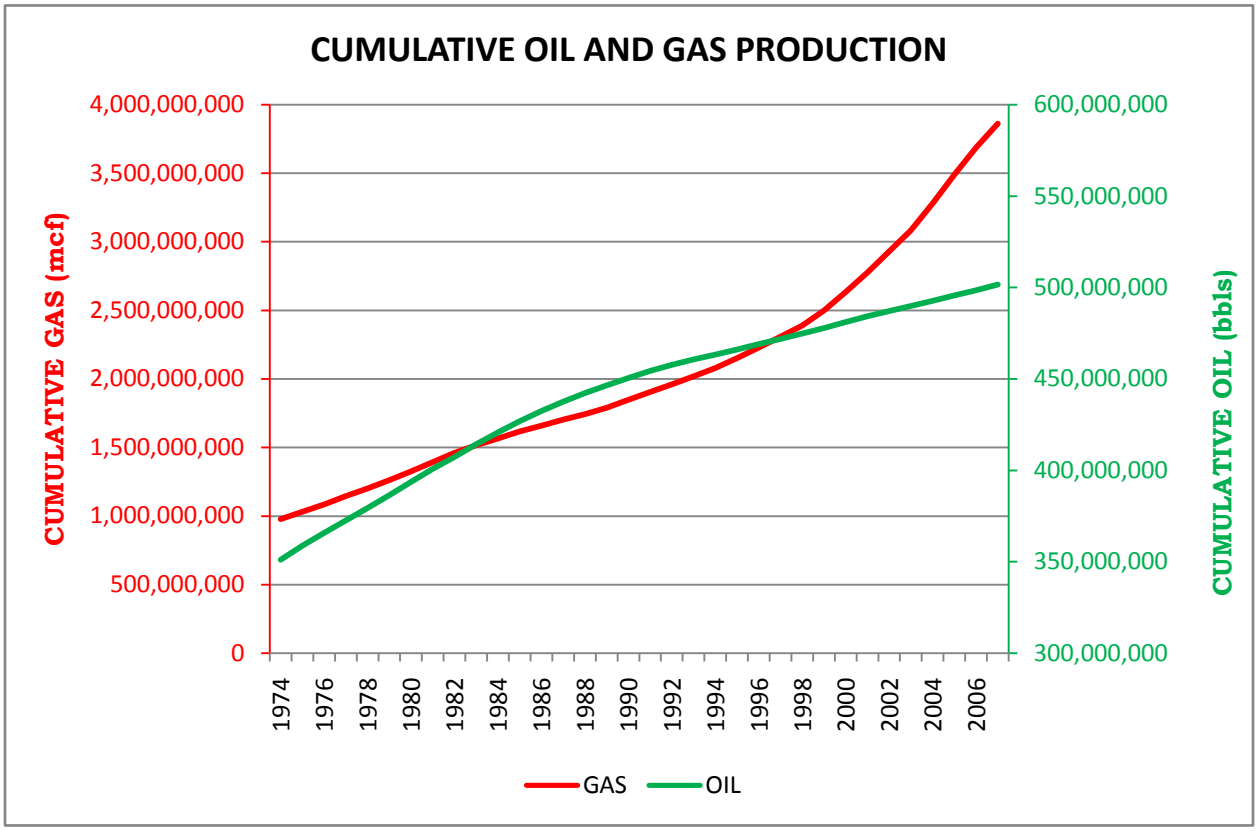


Source: (IHS 2008)

Cumulative production of oil and gas is depicted in Figure 2-10. Analysis shows that older wells were sited in the most productive areas of fields and are still making significant contributions to cumulative production. Wells completed before 1975 have contributed the most to cumulative oil production and are still producing about 18 percent of present production (RMG 2009). Wells completed from 1975 through 1984 are producing about nine percent of present production. Wells completed from 1985 through 1999 have not contributed significantly to cumulative production and are now only producing about 26 percent of total production. Oil wells completed in 2000 - 2007 account for about 47 percent of present production probably as a result of in-field development.

Gas wells completed from 1990 through 2004 account for about 81 percent of present production and the largest portion of cumulative production. During the periods prior to 1985 and the last 3-year epoch (2005 through 2007) larger percentages of production contributed to annual production rates, but wells completed during these epochs have significantly declined in their share of production and they now account for the remaining 19 percent of production (RMG 2009).

Figure 2-10. Oil and Gas Cumulative Production Rates from Federal, Tribal, Private, and State Wells



Source: IHS 2008

Coalbed Natural Gas

CBNG recovery was not understood and drilling techniques were still in development at the time of the 1987 RMP. As a consequence, CBNG was not analyzed in the EIS. Only one CBNG well periodically produced from 1990 through 1999. Subsequently, more wells came on line but did not exceed a maximum of 19 in 2006. During the first 10 months of 2008, 10 to 11 CGNG wells produced (RMG 2009).

Advanced technology has helped in the exploitation of CBNG (Garbutt, 2004) so that CBNG now produces the most gas in Wyoming. Improvements have been made in new logging measurements and sampling devices that enhance evaluation of coal deposits;

light cements and additives to minimize damage to sensitive reservoirs, nondamaging fracture-stimulations fluids and innovative hydraulic fracture designs are being used to improve gas and water flow to the wellbore, and artificial lift techniques and software are promoting rapid and efficient dewatering.

Forecasts

The RFD for oil and gas has estimated that during the 20-year planning cycle of 2008 to 2027 as many as 3,427 oil and gas wells could be drilled. These wells were assumed to be drilled at an average rate of 171 wells per year during the period with 178 wells drilled in the last year. Gas production is projected to increase and oil production is projected to be somewhat flat (RMG 2009).

Conventional Oil and Gas

Of the total projected 3,427 wells, 2,566 of these wells would be conventional oil and gas wells (RMG 2009). Seventy-five of these wells could be deep wells (greater than 15,000 feet in depth). Of the 2,566 oil and gas wells projected, almost all (2,542) are projected concentrated in the following areas (Map 11):

- High levels of activity are projected for in and around Madden and Frenchie Draw fields and in and around Muddy Ridge Field.
- Moderate levels of activity are projected In the northeastern corner, in and around Sand Mesa Field, in the Beaver Creek Field area, and in the southern end
- Low potential activity future drilling will be to improve enhanced oil production projects, add wells in and around existing fields that are maturely developed, or to explore for new oil and gas reservoirs away from existing developed areas.

Approximately 149,149 acres have been classified as having high potential for further development, 489,672 acres have been classified as having moderate potential, 1,279,711 acres as low potential, 2,115,652 acres as very low potential, 1,943,891 as having no potential, and 508,759 acres were not assessed.

Coalbed Natural Gas

It is anticipated that CBNG production will increase between 2008 and 2027. Up to 861 of the 3,427 estimated wells could be CBNG wells. Approximately 844 of these wells will be drilled somewhere in the areas of moderate or low potential (Map 12). CBNG gas wells drilled during the first 10 years will most likely be in areas of moderate potential where activity is currently taking place or proposed. The remaining 17 wells, of the 861 total wells, could be drilled within areas of very low potential (RMG 2009) As water is a major component of natural gas produced from cleats in coal, the issue of water quality and the method required for disposal will impact the economics of future CBNG activity.

Zero acres have been classified as having high potential for CBNG development, 149,401 have been classified as moderate potential, 1,309,236 acres have been classified as low potential, 1,611,953 acres have been classified as very low potential, 2,907,578 acres have been classified as having no potential, and 508,759 acres not assessed (Map 12).

Other Unconventional Gas Resources

In addition to CBNG, other potential unconventional gas resources (see Glossary) are part of the hydrocarbon resource that will likely be explored for and developed in the future. Unconventional gas is a potentially large resource, although it is technically challenging to develop. These two other types of unconventional gas with potential for future development are tight Sands Gas – formed in sandstone or carbonate (called tight gas sands) with low permeability, which prevents the gas from naturally flowing to a wellbore and shale gas – formed in fine-grained shale rock (called gas shales) with low permeability in which gas has been adsorbed by clay particles or is held within minute pores and microfractures.

Seismic Exploration Activities

It is likely that some seismic projects will occur at a rate of one-to-three seismic project each year. The majority of these projects will probably be 3D projects and cover relatively large areas, with a smaller number of 2D seismic projects.

Key Features

The key features related to oil and gas resources are the two oil and gas basins located in the planning area with high or moderate potential: the Wind River Basin and a small portion of the Great Divide Basin.

2.2.5 Leasable Oil Shale

2.2.5.1 Resource Characterization

Very small quantities of oil shale in the southern most portion of the planning area have been identified. These occurrences are not of commercial quality and are remote from transportation facilities needed to deliver any oil produced to market. In addition, there is no ready availability of an energy source for mining the oil shale. If a proposal to develop oil shale is made, an EIS and land use plan amendment would be needed.

2.2.6 Other Solid Leasable Minerals

Other solid leasable minerals are those solid minerals which are leased under the Mineral Leasing Act of 1920 and not related to energy production. Examples of solid leasable minerals include phosphate, carbonate minerals, silicate minerals, and other "hard rock minerals." Hard rock minerals occurring on acquired public lands that are not closed to mineral leasing can be developed only under a leasing system. Access to the federal leasable mineral estate is at the BLM's discretion.

2.2.6.1 Resource Characterization

Current Condition

<u>Phosphate</u>

Resource Type and Occurrence

Phosphates represent about the only significant solid leasable mineral. Studies performed over the years attempted to quantify the distribution and grade of phosphate-bearing sedimentary rocks in the Permian Phosphoria Formation in three general locations. The largest and most well known occurrence is on the northwest flank of the Wind River Range, particularly in the area known as the Lander Front or Lander Slope. The rock along the Lander Front can be traced south from the Dubois area to the Sweetwater River.

The other occurrences of phosphate-bearing sedimentary rocks are Crooks Mountain, Lysite Mountain and the Conant Creek Anticline southeast of Riverton. Less information is available about these areas. According to the U.S. Bureau of Mines (USBM 1982), the classification of phosphate deposits are based on two aspects: how well understood the physical extent of the deposit is (degree of geologic assurance) and how feasibly the deposit can be mined and marketed with existing technology and under current market conditions (feasibility of economic recovery) (King 1947).

In the Lander Front phosphate field, King (1947) calculated the upper phosphate zone (above drainage level) to contain 100,000,000 short tons of phosphate rock 36 feet thick and averaging only 16 percent phosphorus pentoxide; which is indicative of a low grade rock. An additional 13,825,000 tons is estimated for each 100 feet vertically below drainage level. The lower phosphate zone was estimated to contain above drainage level 30,000,000 short tons of phosphate rock 3 to 4 feet thick, averaging about 23.9 percent phosphorus pentoxide. These data are indicative of a medium-grade rock. An additional 3,780,000 tons is estimated in place for each 100 feet below drainage level.

As a general rule, lower grades of phosphate rock require lower strip ratios (i.e., less overburden) in order for a deposit to be economically strip-mined. Underground mining is likely out of the question for thin, low-grade beds.

An analysis performed by the U.S. Bureau of Mines (USBM, 1990) identified and ranked known mineral deposit areas, which are areas having past or present mineral production and /or known mineral resources. This effort mapped areas with respect to their favorability for phosphate (Map 13). Table 2-24 presents general data from this study. Crooks Mountain was not classified has having a favorability above low in this data set.

Table 2-24. Percentage of Phosphate Lands in Moderate and High Favorability Classifications

Phosphate Field	Total Area (acres)	High Favorability (acres)	Moderate Favorability (acres)
Lander Front	400,556	3,702 (0.9%)	396,854 (99.1%)
Conant Creek	509	0	509 (100%)
Lysite Mountain	2100	0	2100 (100%)

Source: USBM (1990).

Trends

In the early part of the 20th century phosphate deposits were recognized as being a valuable resource. To protect and preserve the phosphate lands, withdrawals were made which precluded the location of mining claims, and the entry and sale of the lands under the public land laws. In 1908, about 2 million acres were ultimately withdrawn in preparation for proposed legislation providing for the leasing of phosphate deposits and restricting the exports of the product. In 1963, the geological survey began an evaluation of all federal phosphate deposits to determine which should be leased competitively.

Little interest had been historically shown in planning area phosphate deposits until the early 1960s. A report developed by the proponent that 15 million tons of strippable phosphate rock averaging 23.3 percent phosphorus pentoxide are available on the south end of the Lander Front in the Twin Creek and Stambaugh areas with some possibility of some higher grade (perhaps 26 to 27 percent phosphorus pentoxide) in the Tweed Creek and Little Popo Agie areas (Susquehanna Western, Inc., 1963). This activity resulted in acquisition of lands under U.S. Phosphate leases, U. S. Prospecting Permits, Wyoming State Leases, and private leases.

Extensive surveying, mapping, drilling, trenching, and sampling of phosphate deposits were made and eventually eight federal leases totaling 12,628 acres were issued and held until 1985. Though exploration activities were conducted under prospecting permits before the issuance of the leases, no mining operations were ever conducted on the leases during their existence.

No additional phosphate development activity was proposed until 2008, when two companies had proposals for prospecting and leasing respectively. Both proposals focused on lands formerly leased in the earlier effort in the 1960s – 1980s, as well as lands north and south of these areas. These proposal are currently under consideration by the BLM State Office for a determination of whether the issuance of prospecting permits are warranted versus requiring competitive leasing.

Forecasts

In 2007, U.S. phosphate rock production fell below 30 million tons for the first time in more than 40 years, owing to lower production in Florida, and increased competing foreign production. Additionally, phosphate companies in Florida used a substantial amount of phosphate rock from stocks. One mine in Florida reopened after being closed for 18 months, but its output was offset by mine closures that occurred in 2006. China has surpassed the United States as the leading producer of phosphate rock in the world.

The United States remains the world's leading consumer, producer, and supplier of phosphate fertilizers but its share of the world market has been shrinking. Phosphate fertilizer production increasingly is being located in the large consuming regions of Asia and South America, reducing the need for imported fertilizers to these regions. U.S. exports of phosphate fertilizer to China and India, the two largest consumers of phosphate fertilizers, have dropped significantly since 2000 (USGS, 2008,).

Costs associated with startup capitalization and increasing severance taxes, under--utilized phosphate capacity and a shift to foreign production is a poor economic climate (USGS, 2008). In addition, the area deposits are thin and a lower grade in comparison to other deposits. Although transportation of mined material to processing facilities located elsewhere (Vernal, Utah, Soda Springs, Idaho, Pocatello, Idaho, etc.) is feasible, coupled with these other factors are thought make the development uneconomical.

Key Features

The vast majority of the phosphate deposits in the planning area are found along the Lander Front, but are thin and of low to moderate grades. Phosphate is found in areas with high visual resource values, as well as habitat important for large game such as mule deer and elk. Red Canyon and the Lander Front are ACECs, in part to protect visual resources; phosphate mining in those areas is strictly limited. No phosphate leasing is currently allowed in the Red Canyon Natural Landmark to protect visual resources. Similar constraints in other areas of potential phosphate leasing may be considered because of other resource values including crucial winter range and cultural resources.

2.2.7 Salable Minerals

2.2.7.1 Resource Characterization

Salable minerals, also known as mineral materials, include common varieties of sand, stone (e.g., decorative stone), gravel, pumice, clay, rock and petrified wood. These materials are typically used in everyday construction, agriculture, and decorative applications. Under the BLM minerals materials program (43 CFR 3600), the BLM manages exploration, development, and disposal of salable minerals either by sale or free use. Recreational collecting of this material is allowed, but large volume removal requires a mineral sale. The BLM does not sell salable minerals at less than fair market value.

The sale of mineral materials is a discretionary activity; BLM can deny an application because of other resources or use. A denial likely would have limited impact on the applicant because of the widespread availability of other locations of salable materials.

Current Condition

Aggregate

Aggregate sand and gravel disposals are perhaps the most common type of mineral materials disposal. Sand and gravel are commonly used for road base, oil and gas drill pads, and various building construction projects. While most sand and gravel disposals are accomplished through free use permits issued to government agencies and non-profit organizations, sand and gravel are also made available to the public through negotiated sales or competitive sales. On a case-by-case basis, a requester may be granted an exploration permit for sampling and testing in order to determine grade or quantity available at a certain site. The sampling and testing permit is issued for a limited time period, and the proponent may then be issued a sale through the normal process upon determining sufficient material is available.

Most large quantities of sand and gravel are found on old terrace benches along former and current major drainages, and pediment surfaces adjacent to range fronts. Deposits of glacial outwash are also sometimes utilized for sand and gravel disposals especially in the northern portion of the planning area (Map 13A).

Limestone

The potential for chemical grade limestone is unknown. Historically, the majority of limestone is considered common variety, salable limestone. Crushed limestone can be used for rip rap or for road base in place of sand and gravel. Not only is crushed limestone a valuable resources, but the fines (small particles produced in the crushing process) have uses in construction as well. Potential formations for the exploitation of limestone resources include the Alcova Limestone member of the Chugwater Group, and the Madison Limestone. Wherever these formations are exposed at land surface and are readily accessible from maintained road are potential sites for development (13-B).

Granite

Large quantities of granitic material are available at various locations in the planning area, most abundantly near South Pass City and along Highway 28 where granite of the Louis Lake granite outcrops. In addition, large quantities of granite are present in the Sweetwater Rocks and Granite Mountains area.

Shale

Salable shale is commonly obtained from exposures of Cody Shale. Recently, large quantities of Cody Shale were sold for use on various AML reclamation projects, particularly for cap material as its low permeability retards the infiltration of meteoric water through reclaimed pits and tailings piles.

Moss Rock

Moss rock is a particularly popular salable rock type amongst the public at large. This rock is characterized by the growth lichens on their exposed surfaces, and is valued for its decorative properties. The most usable variety of moss rock is rock that contains with horizontal partings, which make for easy surface “picking” by hand methods. Several areas have been authorized by the planning area over the past several years including three common use areas and several low-volume individual sales.

Disposal Activity

Most of the material obtained from public lands has historically been by way of free use permits issued to the Fremont County Road Department for the purpose of constructing and repairing roads. FUP disposals greater than 50,000 CY must go through the NEPA process. Often FUP disposals remain in pending status as requesting entities plan ahead to make sure those resources are in place and useable at the moment the need arises. Sometimes, they are road-related and the project had not reached the area where the particular pit is within convenient distance to where the road base is needed. Table 2-25A identifies authorized mineral material free-use permits.

Table 2-25A. Authorized Mineral Material Free-use Permits

Entity	Name or location	Case No.	Commodity	Amount
Wyoming Game & Fish Dept.	Bear Creek Pit, East Fork Wind River	WYW152033	Sand and gravel	3,000 CY
Fremont County Road Dept.	Jeffery City Pit	WYW154885	Sand and gravel	130,000 CY
Town of Dubois	Overlook site	WYW159799	Sand and gravel	10,000 CY
Fremont County Road Dept.	Moneta-Lysite Hwy Project	WYW149779	Sand and gravel	40,000 CY
Fremont County Road Dept.	Lost Cabin Pit	WYW152039	Sand and gravel	200,000 CY
WYDEQ AML	Gas Hills haul road	WYW158055	Sand and gravel	20,000 CY

Source: LR2000 Database, February 2009.

Many FUP disposls greater than 50,000 CY sstill must go through the NEPA process. Often FUP disposals remain in pending status for an extended period of time. This is due to the requesting party planning ahead to make sure that the materials are in place at the time the need arises. Sometimes, they are road related and the project has not reached the area where the proposed pit is within convenient distance to where the road base is needed. Table 2-25B presents pending FUPs.

Table 2-25B. Pending Mineral Material Free-use Permits

Entity	Name or location	Case No.	Commodity	Quantity
Fremont County Road Dept.	Sec. 23, T. 37 N., R. 94 W. (Muskrat Crossing)	WYW135187	sand and gravel	10,000 CY
Fremont County Road Dept.	Sec. 6, T. 36 N., R. 93 W. (Muskrat Pit)	WYW135188	sand and gravel	15,000 CY
Fremont County Road Dept.	Sec. 27, T. 30 N., R. 95 W. (Sweetwater Station)	WYW147151	sand and gravel	8,072 CY
Fremont County Road Dept.	Sec. 1, 12, T. 38 N., R .91 W. (Lysite Gravel Pit)	WYW147157	sand and gravel	20,000 CY
Fremont County Road Dept.	Sec. 30, T. 39 N., R. 90 W. (Badwater Borrow)	WYW159824	sand and gravel	5000 CY
Wyoming DOT	Sec. 26, T. 35 N., R. 94 W.	WYW152035	soil/fill	10,000 CY
Wyoming DOT	Sec. 9, T. 34 N., R. 92 W.	WYW152036	soil/fill	10,000 CY
Wyoming DOT	Sec. 32, T. 35 N., R. 93 W.	WYW152037	soil/fill	10,000 CY
Wyoming DOT	Sec. 31-32, T. 35 N., R. 92W.	WYW152038	soil/fill	10,000 CY

Source: LR2000 Database, February 2009.

The BLM makes mineral materials available to private entities through negotiated and competitive sales based on a national or regional appraisal figure per cubic yard or ton. A cost recovery fee is charged and NEPA analysis is performed. Additional regulations apply. Current pending and authorized sales are presented in Table 2-26. These sales are presented by case number to protect the privacy of individuals as required by law.

From time to time, BLM will make sales of mineral material after inviting competitive bids through publication and posting. In general, all sales over 200,000 cubic yards (individually) must be advertised. There are exceptions. The BLM may on occasion raise this floor to 400,000 cubic yards for specific sales if the BLM determines the sale is in the public interest and the sale will be used in conjunction with an urgent public works program and time does not warrant advertising for a competitive sale. Competitive sales are required by law to charge a cost recovery fee to the successful bidder.

Table 2-26. Current Pending and Authorized Sales of Mineral Materials

Case Number	Name or location	Commodity	Quantity
WYW142551	Sec. 30 & 31, T. 30 N., R. 91 W.	pending sand and gravel	—
WYW142558	Sec. 1, T. 33 N., R. 90 W.	Pending shale	100,000 TN
WYW142575	Sec. 14, T. 33 N., R. 90 W.	Pending limestone	—
WYW142588	Sec. 14, T. 33 N., R. 90 W.	Pending limestone	—
WYW159791	Sec. 14, T. 26 N., R. 97 W.	Pending sand and gravel	—
WYW161699	Sec. 8, T. 31 N., R. 97 W.	authorized moss rock	10 TN
WYW167927	Sec. 5,6,8, T. 31 N., R. 97 W.	pending moss rock	150 TN
WYW167944	Sec. 21, T. 27 N., R. 93 W.	authorized sand and gravel	50,000 CY
WYW168019	Sec. 7,18, T. 39 N., R. 93 W.	authorized decorative stone	100 TN
WYW168047	Sec. 6, T. 31 N., R. 97 W.	pending moss rock	500 TN
WYW168077	Sec. 17, 18, T. 28 N., R. 97 W.	pending decorative stone	15 TN
WYW168080	Sec. 27, T. 40 N., R. 93 W.	pending sand and gravel	—
WYW168128	Sec. 20, T. 30 N., R. 99 W	Pending sand and gravel	18,000CY

Source: LR2000 Database, February 2009.

There are currently three public rock common use areas (CUAs) open to the public. These include the Little Popo Agie CUA, Agate Flats CUA, and the Diamond Springs CUA. Environmental Assessments are performed for the development and expected lifetime of CUAs. There are currently no operating community pits. The last community pit (WYW102219) was closed in 1987. It operated for five years and was located in the Birdseye Pass area.

Trends

Mineral material disposals more or less track the economy. Because the main uses involve construction work and oilfield development, these activities index mineral material use. One exception may be abandoned mining land (AML) work which is less dependent upon the economy and more dependent upon the willingness of the state to use funds set aside for this purpose at a particular time. In addition, while there is no cost associated with mineral materials disposals when obtained through a FUP, local economic factors and the availability of federal funding for projects affects the rate of disposal. The uptick in oil and gas activity from approximately late 2004 until the third quarter of 2008 resulted in a period of increased use of mineral materials.

Planning area infrastructure has remained static during the last planning cycle, and due to this, FUPs and material sales have decreased compared to earlier periods. In addition, the majority of the large AML projects in the Gas Hills and Crooks Gap districts have been completed as of the mid-2000s, which were a large contributor to disposal activity.

An upward trend in mineral material disposal activity is expected due to the federal economic stimulus package put in place in early 2009. The availability of federal funds for "shovel-ready" local and regional road projects, school construction, and various other public work projects will require significant quantities of mineral materials.

Aggregate

Aggregate disposals track the economy and AML work. Disposals experienced a higher rate during the late 1980s until mid-2000 due to the large amount of AML work. Also, demand increased due to increased oilfield development in the mid-to-late 2000s. Development dropped off significantly beginning in fall of 2008.

Limestone

In the late 1980s, over 500,000 cubic yards of limestone were sold in the Gas Hills, for the purpose of AML work at former uranium mining properties. This material was taken from the Dutton Anticline where the Alcova Limestone is exposed at land surface. The permit expired in 2000, and no significant use of these resources has occurred since.

Granite

Large quantities of granite up to 100,000 cubic yards were sold from the so-called Black Rock quarry about 9 miles north of Jeffery City over the last decade or so, for the purpose of completing various AML related projects. No significant use of these resources has occurred since that time.

Shale

About 1.5 million cubic yards of shale was removed from shale pits near the Gas Hills and more than 1 million cubic yards were removed from another pit south of Jeffery City, both utilizing this material for AML reclamation activities during approximately the last decade. No significant use of these resources has occurred since that time.

Moss Rock

Moss rock use has dropped off due to unknown factors. Two common use areas were significantly utilized and availability of significant quantities of high quality moss rock in these locations is limited. The public-at-large is less willing to obtain moss rock through individual negotiated sales due to higher costs associated with cost recovery policy, and delays associated with NEPA analysis. Moss rock is available most from Frontier Sandstone outcrops, or other sandstones such as the Tensleep sandstones.

Forecasts

Increased interest in completing many of the smaller AML projects due to the availability of economic stimulus funding may once again utilize large quantities of mineral materials. Similar demand may result from public works projects fund by economic stimulus funding. Predicting future use based on oilfield development is not reliable due to unstable market conditions. However, as alternative energy uses such as wind farms become more popular in the planning area, increased demand for mineral material may result.

Key Features

Key features for mineral materials include several key sedimentary units where outcropped at land surface, and areas where alluvial material has collected, such as stream terraces and benches, and areas of glacial deposition.

- Limestone obtained from Alcova and Madison limestone outcrops, and used as crushed aggregate. Source area includes flanks of geologic structures where such limestones are exposed at land surface.
- Granite used for crushed aggregate use or selected for decorative uses is available where Precambrian-age granites outcrop at land surface, notably in South Pass and the Sweetwater Rocks/Granite Mountains area.
- Cody shale is a common use for low permeability cover material in AML projects. Source areas include flanks of geologic structures where Cody shale is exposed at land surface.

2.3 Fire and Fuels Management

The fire management program focuses on two categories of fires: unplanned or wildland fires and planned or prescribed fires. Objectives include reduction of fuels, maintenance or improvement of wildlife habitat or range conditions, the control of invasive species, and the maintenance of the historic fire return interval. Firefighter and public safety are the highest priority in every fire management activity. Fire and fuels management challenges have been increased because of the low volume of forest product sales described below and by the limited budget for vegetation treatments such as thinning. The impact to fire and fuels management posed by the pine beetle infestation presents the greatest fire risk.

Both wildland and prescribed fires can be utilized as management tools to achieve predetermined objectivesvestablished by the land use plan and by the Northern Wyoming Fire Zone Fire Management Plan (FMP). The fire program objectives are to concentrate fire suppression efforts in areas containing high resource and/or human values and in areas with intermingled landownership patterns, and to use prescribed fire and other fuel treatments to help meet the objectives of other programs.

The Response to Wildland Fire (RWF) is based on values to be protected from and/or enhanced by wildland fire. RWF is based on ecological, social, and legal consequences of the fire. The circumstances under which a fire occurs, and the likely consequences on firefighter and public safety and welfare, natural and cultural resources, and values to be protected, dictate the appropriate response to the fire. The RWF takes into consideration all resource values and concerns and coordinated across jurisdictional boundaries. Although fire terminology changes over time, the philosophy of approaches to suppression actions remains relatively consistent.

2.3.1 Unplanned/Wildland Fire

Unplanned or wildland fires are those that occur because of an act of nature, such as lightning, or occur by human accident or by intent to cause damage. While wildland fires include burning in areas where fire is specifically excluded or fires that exhibit burning characteristics (intensity, frequency, and seasonality) that are outside prescribed ranges, wildland fires can also provide a management tool for improving conditions in the planning area.

2.3.1.1 Regional Context

For much of the last century throughout the U.S., fire management has been to extensively suppress wildland fires and to not or minimally use prescribed fires to achieve management objectives. As a result, there is a significant buildup of vegetative fuels and biomass, exacerbated by the impact of disease in forest stands and drought.

There have been numerous larger fires in the planning area over the past 20 years, at a scale and quantity that exceeds the area burned in the previous 20-year period.

Table 2-27. Selected Large Wildfire Occurrence in LFO Planning Area 1988-2008

NAME	YEAR	Jurisdiction	CAUSE	Acres	Precipitation Zone	Fuel Type
North Fork	1988	BIA	Lightning	25,000 (approx.)	10-14” and 15-19”	Wyoming Sage-brush,/grass (FM2/5)
Bighorn Flat Unit 3	2000	BIA	Escaped Rx	751	10-14”	Wyoming Sage-brush,/grass (FM2/5)
Bighorn Flat Unit 1	2001	BIA	Escaped Rx	655	10-14”	Wyoming Sage-brush,/grass (FM2/5)
South Fork 2	2002	BIA	Lightning	13,978	15-19” and 20”+	Mountain Shrub/Grass, Wyoming Sage-brush/Grass (FM2/10) Lodgepole pine,
Wise Flat	2006	BIA	Lightning	1,044	15-19”	Grass, Juniper/Limber pine (FM2/6)
Bull Ridge	2006	BIA	Lightning	837	15-19”	Grass, Juniper/Limber pine (FM2/6)
Washakie Park	2006	BIA	Lightning	1,240	15-19”	Wyoming Sage-brush/grass, Mountain Shrub/Grass (FM2)
Kates Basin	2000	BIA	Lightning	137,069	10-14”, 15-19” and 20”+	Wyoming Sage-brush/Grass, Mountain Shrub/Grass, Juni-per/Limber pine, Lodge-pole pine
Murphy Draw	2000	BLM	Human Caused	1365	15-19”	Wyoming Sage-brush/Grass, Mountain Shrub/Grass, Juni-per/Limber Pine
Red Canyon	2000	BLM	Lightning	1312	15-19”	Wyoming Sage-brush/Grass, Mountain Shrub/Grass, Juni-per/Limber Pine
Beaver Rim	2001	BLM	Lightning	1927	15-19”	Wyoming Sage-brush/Grass, Mountain

						Shrub/Grass, Juniper/Limber Pine
Pass Creek	2002	BLM and USFS	Lightning	13433	15-19" and 20"+	Wyoming Sagebrush/Grass, Mountain Shrub/Grass, Juniper/Limber Pine, Lodgepole Pine
Sagehen	2005	BLM	Lightning	1271	15-19"	Wyoming Sagebrush/Grass, Mountain Shrub/Grass, Juniper/Limber Pine
Poison Spider	2006	BLM	Lightning	3166	15-19"	Wyoming Sagebrush/Grass, Mountain Shrub/Grass, Juniper/Limber Pine
Total Acres				203,048		

Source: BLM fire records

Whether this is a part of the natural fire cycles or representative of flammable conditions because of past fire and vegetation management is not precisely understood. Regardless, it appears that the planning area is within an undetermined period of increased larger fire occurrence. Much of the forest, shrublands, and grasslands are vulnerable to wildland fires, but under current conditions the areas that have the greatest potential for large wildland fires are within the 15- 19" and 20" plus precipitation zones where the natural fuel loading is greater. Nearly all of the fires larger than 100 acres have been within these precipitation zones (Map 7).

2.3.1.2 Resource Characterization

Indicators

National fire policy requires current and desired resource conditions related to fire management to be described in terms of three condition classes and five fire regimes. The Fire Regime Condition Classification (FRCC) System (www.frcc.gov) classifies existing ecosystem conditions to determine priority areas for treatment as mandated by national direction.

Fire regime is an indicator of the role wildfire plays in an ecosystem. A natural fire regime is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention but including the possible influence of aboriginal fire use (Agee 1993; Brown 1995). The BLM utilizes five historic fire regimes based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation. The historic fire regimes are shown in Table 2-28.

Table 2-28. Fire Regime Groups and Descriptions

Group	Frequency	Severity	Severity description
I	0–35 years	Low / mixed	Generally low-severity fires replacing less than 75% of the dominant over story vegetation; can include mixed-severity fires that replace up to 75% of the over story
II	0–35 years	Replacement	High-severity fires replacing greater than 75% of the dominant over story vegetation
III	35–200 years	Mixed/low	Generally Mixed-severity; can also include low-severity fires
IV	35–200 years	Replacement	High severity fires
V	200+ years	Replacement/any severity	Generally replacement-severity; can include any severity type in this frequency range.

Source: www.frcc.gov

Wildfires were generally either historic fire regimes III or IV, meaning that wildfires occurred every 35 to 200 years. In some areas, very little of the dominant overstory vegetation was replaced. In other areas, most of the dominant overstory was replaced.

Current FRCC indicates the degree of departure from the historic regime (Hann and Bunnell 2001). The classification describes the degree of departure from the historic natural fire regime in terms of either fire frequency or stand replacement. Extreme departure from the historic fire regimes results in changes to one or more of the following ecological components: vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated disturbances such as livestock grazing, and drought. Condition Class describes ecosystem health:

- **Condition Class 1**. For the most part, fire regimes in this fire condition class are within historical ranges. Vegetation composition and structure are intact. Therefore, the risk of losing key ecosystem components from the occurrence of fire remains relatively low.
- **Condition Class 2**. Fire regimes on these lands have been moderately altered from their historical range by either increased or decreased fire frequency. A moderate risk of losing key ecosystem components has been identified on these lands.
- **Condition Class 3**. Fire regimes on these lands have been substantially altered from their historical return interval. The risk of losing key ecosystem components from fire is high. Fire frequencies have departed from historical ranges by multiple return intervals. Vegetation composition, structure, and diversity have been substantially altered. Consequently, these lands verge on the greatest risk of ecological collapse.

Generally, insufficient on-the-ground data supports the allocation of the Fire Management Unit (FMU) into these condition classes; they are a best-effort classification based on outdated inventory information from the 1970s (2005 Update to the Wyoming BLM Forest and Woodland

Management Action Plan, (May 2005). The Fire Regime and Fire Regime Condition Class are shown in Maps 16 and 17 with the caveat that this data are extrapolated from nation-wide LANDFIRE mapping efforts and is a general representation for the area (www.landfire.gov).

Current Condition

The FMP provides RWF on all wildland fires. Responses range from monitor to full suppression. RWF also includes Wildland Fire use for resource benefit. BLM will use RWF to tailor response to meet management objectives. In establishing RWF, the BLM considers the impacts of both fire suppression and unsuppressed fire on wildlife, viewshed, invasive species and loss of forest product, particularly when cumulative impacts are considered.

The Wyoming BLM Forest and Woodland Management Action Plan concluded that the information regarding condition class within forest and woodland communities was based upon the foresters' professional opinions in the absence of any current inventory data. Moreover, these criteria were not the same as the FRCC definitions. In the future, the goal is to complete a vegetation fuels inventory that identifies fire regime and condition class across the landscape using current definitions and determination methods as identified in the Interagency FRCC Guidebook (www.frcc.gov).

Resources have not been available to properly inventory vegetation ecological condition and fuels build up. For example, the mountain pine beetle epidemic is clearly present in the Dubois FMU, but the extent of the beetle epidemic is only loosely identified in the Lander Slope, South Pass and Green Mountain FMUs. There has been insufficient funding and effort to address the natural fuels build up as well as overall health of forests and woodlands. Moreover, appropriate management treatment is not clear, particularly given funding constraints.

The locations of human-caused fires have been widespread with heavier concentrations of ignitions within the Green Mountain, Lander Slope, and Sweetwater Valley FMUs. Historically, wildfires have occurred in camping and woodcutting areas from accidental ignition caused by fireworks, campfires, and machinery. Non-human-caused wildland fires have been widespread, with natural fires occurring in areas of intense lightning activity within the Lander Slope and the Rattlesnake FMUs (Map 16).

Table 2-29 displays the best information available regarding condition and class:

Table 2-29. Fire Management Units and FRCC Ratings (BLM acres in parentheses)

Fire Management Unit	Acres	FRCC Rating	Condition Class	Wildland Fire	Treatments
Green/Crooks Mountain	284,435 (240,336) WUI present	IV for lodgepole limber pine/juniper, mountain shrub, big shrub	2-3 for timbered communities and 2 for shrubland communities	Allowed	Prescribed fire and treatments ongoing
Sweetwater Valley	2,108,950, (1,596,391) WUI present	IV for big sagebrush and V for juniper, limber pine, aspen	2	Allowed	Prescribed fire and treatments ongoing
Rattlesnake Hills	168,493 (117,495) WUI present	IV for big sagebrush and V for juniper, limber pine, aspen	2	Allowed	Treatment allowed but not ongoing
Lander Slope	270,819 (129,350) Significant WUI issues	IV for mountain shrub and limber-pine and lodgepole pine and Douglas fir	2	Not al-lowed	Vegetative treatments planned
Copper Mountain	191,067 (125,338) WUI present	IV for big sagebrush and V for juniper and limberpine	2	Allowed	Prescribed fire and treatments ongoing
Dubois (USFS has initial suppression management)	162,644 (42,469) WUI present	IV for mountain shrub and limber-pine and V for lod-gepole pine and Douglas fire	2 and class 1 for the badlands	Use al-lowed but unlikely because of WUI	Prescribed fire and treatments ongoing

Source: BLM Fire data and 2005 Amendment to 2003 Forest and Woodland Management Plan

All fire suppression actions will have limited use of heavy equipment in controlling wildfires. The use of minimum impact suppression tactics is standard protocol when possible, especially in areas with resource values potentially negatively affected by fire suppression activities.

In suppression actions requiring aerial or ground application of fire suppression chemicals or use of water from open water sources, fire suppression personnel will follow interagency fire suppression guidelines. Established guidelines require that fire suppression personnel will

avoid aerial or ground application of fire chemicals within 300 feet of waterways and will avoid dipping from rivers or lakes with a helicopter bucket containing residual fire chemicals. An adjacent reload site will be established, and fire chemicals will be managed with portable tanks. Deviation from these limits is allowed when life or property is threatened and the use of fire chemicals can be reasonably expected to alleviate the threat. In addition, where aquatic T&E species or their habitats are potentially affected by aerial application of retardant or foam, the following additional procedures apply:

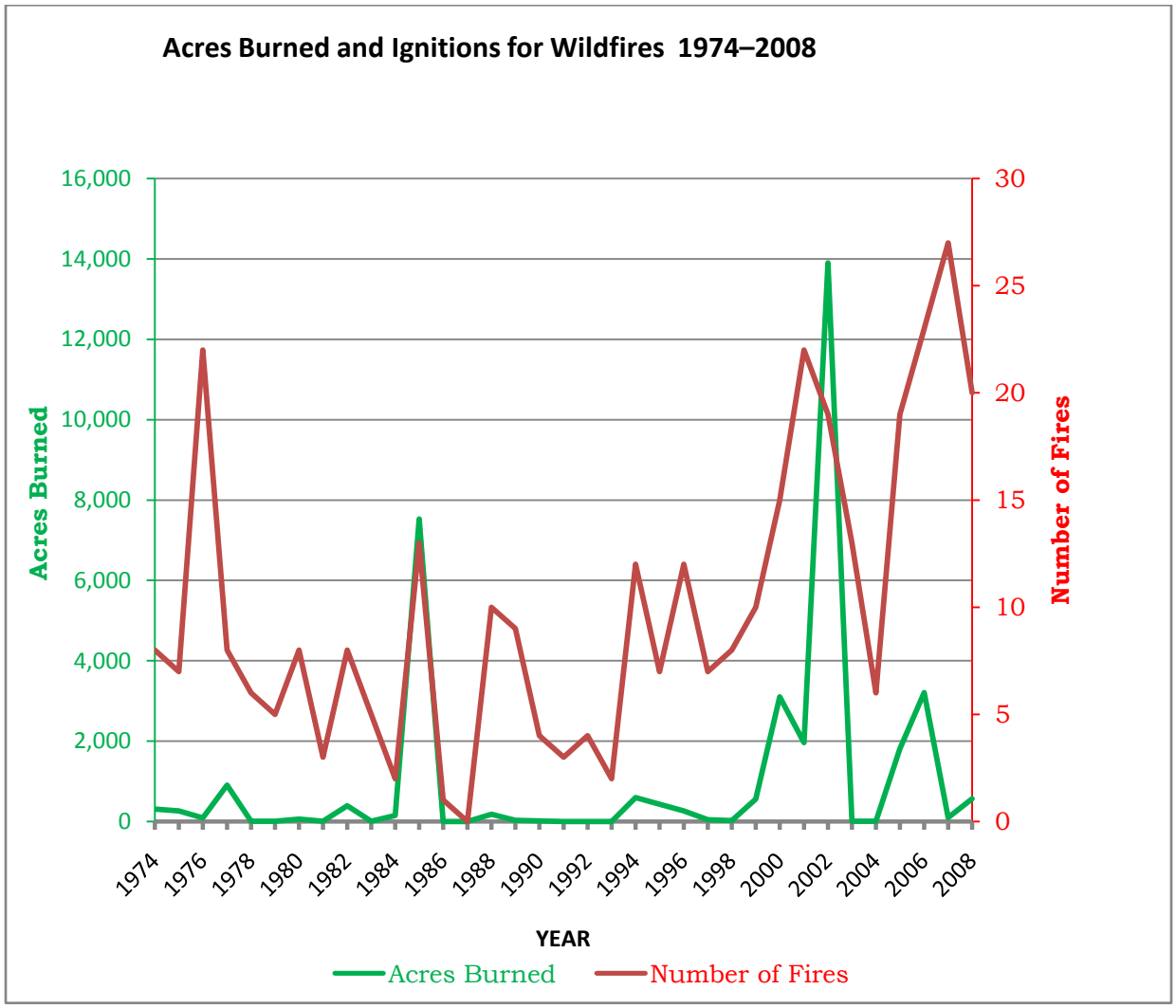
- As soon as practical, determine whether the aerial application has caused any adverse effect on the T&E species or their habitat.
- Aerial application of fire chemicals within 300 feet of a waterway, the unit administrator determines whether there have been any adverse effects to the T&E species. If an adverse effect is determined, BLM must consult with the U.S. Fish and Wildlife Service.

Trends

Wildland fire use has not been implemented to date. Coordination and planning steps need to be taken to allow wildland fire use in areas where fire will benefit vegetation and habitat resources. The decision to allow natural fire requires a complete analysis of the potential negative environmental impacts as well as any potential benefit. Various ecological communities have different responses to fire. Some sagebrush, notably Wyoming big sagebrush, take decades to return to sagebrush dominance post-burning. This loss of sagebrush overstory is a natural process, but can be detrimental to wildlife habitat requirements in a modern altered and somewhat reduced natural landscape. Also, cheatgrass and other invasives may out perform natives following fire events (Davies et al., 2008).

Between 1974 and 2008, approximately 36,522 acres were burned by wildfire. Accurate data for 1991 and 1992 are not available. These figures reflect all burned acres regardless of ownership (see Figure 2-11). These data not inclusive of wildfires occurring on the Wind River Indian Reservation, which accounts for more than 180,000 acres burned over the past 20 years.

Figure 2-11. Acres Burned and Ignitions for Wildfire 1974-2008



Source: Fire Reports for the Lander Field Office and the Wildland Fire Management Information database www.nifc.blm.gov

Wildland Urban Interface

New demands are being placed on public lands due to accelerated growth in and around cities and towns in the planning area. Growth has changed the way communities relate to surrounding public lands and has changed the expectations of communities. Effective management of public lands must address issues of public health and safety through the use of effective hazardous fuels treatments and strategic fire suppression actions in WUI areas. (WUI areas are discussed under Key Features, below, and are shown on Map 19).

The Fremont County Firewise program is pivitol in working with the private landowners to reduce the amount of fuels in and around structures within the WUI. A collaborative effort

among landowners, the BLM, and Firewise is necessary to ensure that private property will be less susceptible to damage because of unplanned wildfires. This need is currently being addressed through the Wind River Fire Prevention Council made up of representatives from the Fremont County Firewise, BLM, USFS, BIA, Wyoming State Forestry, Fremont County Rural Fire, and private citizens living within Fremont County established in 2005. The Council has successfully addressed the goal of reducing hazardous fuels loading within the WUI through collaborative projects and developing an active fire education program that has been successful over the past 3 years. The completion of the Fremont County Community Wildfire Protection Plan in 2005 was another important step in addressing fuels management actions regardless of land ownership or jurisdiction. The County Plan will be updated in 2009.

The LFO fuels program was initiated in 2002. Total acres treated has varied by year but vegetation treatments with fuels management objectives have increased from 450 acres treated in 2003 to 3,600 acres treated in 2008. Overall, the trend in fuels management related to wildfire and vegetation management is for a more extensive and aggressive program over the next 10 to 20 years. Fire and fuels management to reduce the dangers and negative effects of wildfire and to improve the condition of vegetation communities will continue to be a high priority.

Forecasts

National fire policy changes with changes in objectives, on-the-ground conditions, funding, and science. Therefore, policy is likely to change, particularly given the landscape level changes in vegetation such as with the recent pine beetle outbreak in lodgepole pine forests across much of its range. General goals, standards, and objectives will most likely remain the same:

- Use fuels management to meet land health standards, maintain and promote greater diversity within plant communities and improve habitat for key wildlife species.
- Maintain and protect air quality to meet or exceed applicable federal and state standards and regulations.
- Use RWF in fire suppression actions to protect public health and safety, public infrastructure and resource values, public and private property as well as to enhance landscapes through the use of wildland fire.
- Mitigate and reduce hazardous fuels within the WUI areas.

RWF will be made for each acre giving the flexibility to place wildland fire fighting resources where they are most needed and would benefit other resources, allowing fire in fire dependent ecosystems while reducing large fire suppression efforts and costs. The potential of fire causing negative environmental impacts such as increased erosion, loss of wildlife habitat, and increasing potential for invasive species will be considered.

It is desired that Condition Class be improved (moved) from CC2 or CC3 to CC1 or CC2. Accomplishing this is dependent on funding and the ability to implement projects while working work cooperatively with affected publics that may have conflicting interests and goals. It is assumed that base-level funding for maintaining a fuels management program will remain constant within this period. Extra funding for projects may become scarcer as budgets are reduced and there is greater competition for funding nationally.

BLM has combined forest management with fuels management with an emphasis on forest health. A certain amount of commercial and over-the-counter forest product sales will continue on forested BLM lands, but the programs will continue to be blended to achieve joint objectives over the next 10 to 20 years. As condition class improves, management will change.

Annual treatment acreages should be in the range of 1,000 - 5,000 acres for the next 10 - 20 years. This amount could increase if BLM partners with others to restore lost habitat, perhaps in mitigation for proposed new loss of habitat. Where possible, landscape level fuels treatments will be a priority, with continued strategic and smaller acreage treatments within the WUI. The program is driven by quality acres treated as opposed to treating acres to simply show large numbers (acres) of accomplishment.

Within the forested areas, the beetle kill could create a fuels-buildup problem that traditional forest management practices are not adequate to address. In the absence of a local market for timber and the increase in available timber due to the wide impact of the beetle kill, a BLM funding program will be necessary to deal with the fuels problem.

WUI brings more people in closer contact with forests and woodlands, making the public more invested as stakeholders and more concerned about the health and appearance of the forests. Many treatments are designed to reduce the risk of catastrophic fire while maintaining the aesthetic qualities of the landscape. For example, juniper woodlands adjacent to the Red Canyon Subdivision were thinned to approximately 30-foot spacing with a residual woodland stand representing a diversity of age classes. The finished treatment has maintained the qualities of juniper woodlands that landowners value while significantly reducing fuel loading.

The WUI will become more of an influence on fire suppression and fuel management activities in the future. Urban development and use of public land will increase as population grows and the desire to live in close proximity to wildlands remains desirable. The fire and fuels treatment program is impacted by the cost of suppressing wildland fires which has increased, particularly in the WUI. In 2000-2005, fire suppression costs in the WUI increased an average of 16% per year with an average of $185,601,628 being spent each year. Fire suppression costs are more than 12% of BLM's annual budget ($1.5 billion dollars in 2005.) As the WUI increases, this cost will increase and funds for fuels treatment decreases. (Headwaters Economics, 2006)

Key Features

Wildland fires key feature is the WUI. Significant WUI fuels reduction areas are shown in Table 2-30. In addition, the areas of historic fire regimes in the higher precipitation zones are most likely for future locations of wildland fires.

Table 2-30. Significant WUI Treatment Areas

Name	Adjacent Lands Jurisdiction	Fuels Reduction Treatment Type	Fuels Reduction Project Time	Natural Fuels Type
Union Pass	BLM and USFS	Forest fuels mechanical treat-ment	10 years	Lodgepole pine
Red Canyon Subdivision	BLM	Woodland and sagebrushme-chanical treatment	5 years	Juniper/limber pine and sagebrush
Dubois Area	BLM, USFS and State Lands	Forest fuels mechanical treat-ment	15 years	Lodgepole pine and mountain shrub
South Pass Atlantic City	BLM and USFS	Forest fuels, woodlandand sagebrush mechanical	15 years	Lodgepole pine, mountain shrub, WY sagebrush
Homestead Park	BLM and USFS	Forest fuels, woodland and sagebrush mechanical and RX	10 years	Lodgepole pine and and mountain shrub

2.3.2 Prescribed Fire

2.3.2.1 Regional Context

See the Unplanned/Wildland Fire section for regional context.

2.3.2.2 Resource Characterization

Indicators

See the Unplanned/Wildland Fire section for a discussion of the FRCC system.

Current Condition

Prescribed fire and other types of fuel reduction projects have become increasingly important as a tool to manage natural fuels buildup and to achieve habitat and rangeland health management objectives. The success of fire treatments is completely dependent upon the "buy in" of the impacted parties, including adjoining landowners or livestock permittees, surrounding municipalities, and regulatory agencies that monitor air quality. Any fire regimen is only successful if the BLM's partners and cooperators agree with the approach. There are many factors that impact the success of managed fire including fire size, heat, and weather conditions outside of BLM control. Although prescribed fires are most often implemented successfully, fires can become uncontrolled due to a number of factors including unanticipated weather changes.

The goal of planned fire is to reduce hazardous fuel accumulation, diversify age class structures, and rejuvenate areas where woody vegetation has become decadent. For example, various areas of sagebrush and mountain shrub habitat in the Mexican Creek drainage were successfully burned during 2002-2005, rejuvenating key wildlife habitat and reducing conifer encroachment. A similar project is currently being implemented near Lysite Mountain.

Prescribed fire can be used to open the timber canopy so that more grasses and forbs are available and areas are sufficiently open to be used by wildlife. Fire can also provide a mechanism for controlling plant diseases and insect infestations. Successional processes such as aspen gradually succeeding to lodgepole pine and other conifer in the absence of fire can be influenced by fire management. The success of fire as a management tool is very much a function of the precipitation timing and amounts following the fire. Post fire grazing management needs to be flexible and a function of on-the-ground conditions on a site specific basis.

The locations of planned fires are primarily selected so that fire will improve rangeland health and wildlife habitat while secondarily targeting areas of hazardous fuel loadings. Project area boundaries are established to enable appropriate containment and control of the planned fire.

There are locations and fuels situations which are not appropriate for fire treatment such as areas with high potential for erosion or weed infestation or which would negatively impact visual resources. In locations with Wyoming big sagebrush, the use of fire must be considered carefully. Wyoming sagebrush ecological sites within the planning area are within Fire Regime III, with the return to mature sagebrush dominated sites not occurring for at least 35 years, but more probably not occurring for closer to 100 years post-burning. The FMU analysis needs to consider both positive and potentially negative impacts from prescribed fire and wildlife habitat requirements (Davies et al., 2008 and Davies et al., 2009).

Trends

From 1985 to 2008 prescribed fires were used to treat 6,162 acres. For the most part, these treatments were successful. Results included improved herbaceous production, rejuvenated crown sprouting, and robust seed production among shrub species such as true mountain mahogany, antelope bitterbrush, snowberry, and mountain sagebrush. In a few cases, portions of the treated areas were revegetated by undesirable non-native species such as cheatgrass, with a corresponding negative impact to wildlife habitat and overall ecological health.

Vegetation treatment is addressed on a case-by-case basis as fire and chemical treatments may not be appropriate for conditions on the ground. Studies indicate that burning of certain sagebrush steppe communities should be undertaken with caution because of the threat of noxious weeds and the importance of intact sagebrush steppe to many wildlife species.

Forecasts

The fuels program will continue to plan and implement prescribed burns to meet vegetation treatment goals; however these goals will be more efficiently achieved with a larger scale, landscape-level fuels inventory which is currently being undertaken.

The majority of the fuels treatment acres will be non-fire treatments (mechanical and chemical) over the next ten-twenty year time period. There is the potential for significantly increased use of prescribed burning if large scale planning efforts are completed, cooperative agreements with livestock grazing permittees are put into place to allow proper recovery directly after burn treatments, and long-term grazing management allows maintenance of healthy ecological communities. In some cases rest *prior* to prescribed-burn treatment may be necessary to allow a buildup of fine fuels necessary to carry fire.

Large-scale prescribed burn project areas are currently being identified, but in order to achieve successful prescribed burning, planning at the allotment level (AMP) needs to include prescribed burning treatments where vegetation types are appropriate for the use of fire and include the required post-fire change in livestock grazing management.

Cheatgrass is a significant component in many areas within the Sweetwater Valley, Lander Slope, and Copper Mountain FMUs and it responds favorably to burning, negating the positive effects of prescribed burning on the vegetative community (Zouhar et al, 2008). There are several areas within these FMUs that would benefit from prescribed burning, but this treatment method will not be utilized due to the expected release of cheatgrass. Future use of herbicides to control cheatgrass post-burning may allow resource manager to use fire to enhance vegetative communities and reduce natural fuels loading.

Climate Change

Prescribed fire can be a powerful tool to counter the damage to impacts from climate change (described in more detail in the vegetation and climate sections.) Removal of decadent vegetation rejuvenates the carbon sequestration potential of the vegetation, for example. Fuels reduction is even more important as the climate warms and has different precipitation patterns. So long as prescribed fire does not benefit non-native species, prescribed fire could help counter the potential impacts of climate change.

Key Features

Areas that are of primary interest for the use of prescribed fire are:

- Vegetation communities within the 15-19” precipitation zones, especially large-scale prescribed fire treatments in the Rattlesnake and Green Mountain FMUs and smaller prescribed burn treatments within the Dubois, Lander Slope, Sweetwater Valley and Copper Mountain FMUs (Maps 7 and 14).
- Areas that have shown a positive response from such treatments are those dominated by mountain shrub/grass and juniper/limber pine woodlands.
- Areas that are identified within Condition Class 2 or 3 and Fire Regime Group IV.

Because of the potential for weed infestation, each site considered for fire treatment needs to be analyzed to determine if fire will encourage additional weed infestation.

2.3.3 Stabilization and Rehabilitation

The Burned Area Emergency Stabilization and Rehabilitation Plan (ES&R Plan) is an interdisciplinary response to protecting natural resources and threats to human health and safety. The guidelines for development of this plan are outlined in BLM Handbook H-1742-1 *Burned Area Emergency Stabilization and Rehabilitation*.

2.3.3.1 Regional Context

Fires throughout the West have become much larger and have threatened the natural integrity of the burnt ecosystem as well as becoming a threat to human health and safety. The recovery of burnt landscapes, especially large, landscape-level fires, sometimes requires actions to maintain the integrity of the natural resources and the safety of adjacent communities. The need for stabilizing and rehabilitating burnt areas has become increasingly important. Some areas do not successfully recover with native vegetation and become dominated by noxious weeds and non-native species. Many communities adjacent to wildfires are threatened by significant erosion of bare soil, loss of public infrastructure and contamination of water resources.

2.3.3.2 Resource **Characterization**

Indicators

All wildfires are analyzed for the need to implement an ES&R plan after the fire is contained. Key indicators of the need for an ES&R plan for a burn are significant areas of high-severity burns, steep terrain, high probability of proliferation of noxious weeds after the burn, and threats to human health and safety or loss of infrastructure. Very few fires require a plan.

Current Condition

ES&R plans were developed for wildland fires such as the Pass Creek Fire (2002), and the Arapaho Fire (2002), plus five other wildfires over the past 10 years. The plans for the Pass Creek and Purdy fires (USFS) were significant in their complexity and effort to address multiple threatened resources and values. Most of the plans are of relatively low complexity and not required significant funding to implement. Increased need for ES&R plans has corresponded with the increase in larger fires. Table 2-31 shows for ES&R plans 2003-2008.

1 **Table 2-31. Lander Field Office ES&R Plans and Treatments 2003-2008**

Fire name	Treatment Name	Treatment Category	Funding Source	Treatment	Fiscal Year
Arapahoe	Jeep Trail Closure	Erosion/Sedimentation	Suppression Activity Damage	20 acres	2003
Arapahoe	Rehabilitation-Road signing	Roads	Rehabilitation	1 sign	2003
Arapahoe	Erosion Control Structures	Erosion/Sedimentation	Emergency Stabilization	75 acres	2003
Arapahoe	Temp. Fence	Erosion/Sedimentation	Rehabilitation	320 acres	2003
Arapahoe	Monitoring	Invasive Weeds	Rehabilitation	356 acres	2003
Arapahoe	Seeding	Erosion/Sedimentation	Emergency Stabilization	30acres	2003
Poison Spider	Fence Repair	Fence Repair	Emergency Stabilization	2 miles	2007
Poison Spider	Rehabilitation-Road signing	Protection	Emergency Stabilization	25 signs	2007
Pass Creek	Monitoring weeds	Invasive Weeds	Rehabilitation	4,725 acres	2003
Pass Creek	Monitoring vegetation	Erosion/Sedimentation	Rehabilitation	4,725 acres	2003
Pass Creek	Rehabilitation-Road signing	Roads	Rehabilitation	44 signs	2003
Pass Creek	Seeding	Erosion/Sedimentation	Emergency Stabilization	250	2003
Pass Creek	Temporary Fence	Erosion/Sedimentation	Rehabilitation	600	2003
Murphy Draw	Temporary Fence	Erosion/Sedimentation	Rehabilitation	5.75 miles	2001
Murphy Draw	-Monitoring weeds	Invasive Weeds	Rehabilitation	30	2001
Murphy Draw	Monitoring vegetation	Erosion/Sedimentation	Rehabilitation	1,365	2001
Murphy Draw	Rehabilitation-weeds	Invasive Weeds	Rehabilitation	30	2001

Murphy Draw	Seeding	Erosion/Sedimentation	Emergency Stabilization	200	2001
Murphy Draw	Rehabilitation-Road signing	Protection	Emergency Stabilization	28 signs	2001
Cottonwood	Temporary Fence	Erosion/Sedimentation	Rehabilitation	1.6 miles	2000
Cottonwood	Rehabilitation-Monitoring weeds	Invasive Weeds	Rehabilitation	155	2000
Cottonwood	Monitoring vegetation	Erosion/Sedimentation	Rehabilitation	155	2000
Cottonwood	Rehabilitation-weeds			30	2000
Cottonwood	Seeding			155	2000
Cottonwood	Rehabilitation-Road signing	Protection	Emergency Stabilization	28 signs	2000
Cottonwood	Erosion Control Structures	Erosion/Sedimentation	Emergency Stabilization	10 waterbars	2000

Trends and Forecasts

The trends and forecast of the stabilization and rehabilitation program correspond with those of Wildfire, increasing with increasing larger and hotter fires and longer fire seasons.

Climate Change

The expected impacts to water, soil, vegetation, and forests will likely increase the need for and importance of stabilization and rehabilitation. Areas with burned vegetation are very vulnerable to erosion especially the increased storm events that are expected with climate change.

Key Features

Wildfire size and severity and lengths of fire seasons are the key features for emergency stabilization along with funding for rehabilitation activities.

2.4 Biological Resources

The planning area contains a vast diversity of biological resources. Please note that a Biological Assessment will be completed as part of the EIS to provide a context for the alternatives.

2.4.1 Vegetation-Introduction

There are three types of vegetative communities in the planning area: forest and woodland communities, grassland and shrubland communities, and riparian and wetland communities. These communities are identified on the LANDFIRE Vegetation Map (Map 20). Invasive, non-native plant species are present throughout the planning area and have invaded many areas.

Precipitation patterns and zones play an important role in the function and type of vegetative communities (Map 20).

- The Wind River Basin is in the 5-9” precipitation zone with some inclusions in and around the town of Shoshoni where precipitation may be under 5” annually.
- In the zone of increasing elevation up Beaver Rim into the Sweetwater Valley, most of this area is 10-14” High Plains East precipitation.
- Areas in and around Green Mountain and the Rattlesnake Mountain Range have areas over 15” annually. These areas are unique oases of the intermountain cold desert shrublands that dominate the area.
- The Lander Slope and Twin Creek areas of characterized by both the 10-14” and the 15”+ precipitation areas with ecological sites that portray those areas.
- The Dubois area is mostly in a rain shadow effect but all precipitation zones found in the planning area within a very short distance. As elevation increases, precipitation changes dramatically from a desert environment in and around Dubois to a Spruce/Fir/Aspen community in the Ramshorn Peak area near the headwaters of Tappan Creek.

The LANDFIRE description of current condition was selected because LFO is updating its forest and woodlands inventory but it is not sufficiently completed to support analysis. An Ecological Site Inventory of grass and shrubland condition has not been done for more than 35 years. While the LANDFIRE this data base can be used for broad scale planning efforts such as an RMP, it needs to be supplemented by on-the-ground site analysis until modern inventories are completed. FRCC does not provide useful information for riparian – wetlands because the scale is too broad. The riparian-wetlands section analyzes condition based on ground-level assessments of Proper Functioning Condition and Rangeland Health Assessments. The Fire Regime Groups and Descriptions and Fire Regime Condition Classifications are identified in Appendix D.

2.4.2 Vegetation – Forests, Woodlands, and Forest Products

BLM estimates that approximately 73,000 acres or 3 percent of BLM land consists of forest and woodland communities. These numbers are approximate and need to be updated with additional inventory information.

2.4.2.1 Regional Context

Climatic impacts from heat, drought, and fewer winter deep freezes have impacted all western forest and woodland communities. One hundred years of fire suppression have altered the ecology of the existing landscape. Aspen stands have been reported throughout the Rocky Mountain West to be declining, with extraordinarily fast loss of aspen in certain locations (Bartos, D.L. 1998). Juniper encroachment is widespread. Conifer stands have been decimated by pest infestation, particularly from the pine beetle.

2.4.2.2 Resource Characterization

Indicators

Age-class distribution, diversity and fire return intervals are the key indicators of forest and woodlands. Aspen, because of its importance as a vegetative resource for wildlife habitat, serves as overall indicators for forest and woodlands health. Pine beetle and other infestations have become increasingly important indicators.

Current Condition

Forest comprises approximately 25,000 acres or less than 1 percent of the planning area. Forests are dominated by lodgepole pine and Douglas fir and found primarily above Dubois and Lander, in the South Pass area, and Green Mountain (see Map 20). The importance of these forest stands is a function of their distribution, relatively long rotation age (number of years to maturity), and the diversity of plants and animals they support. Age-class distribution of forested lands is currently tending toward mature, heavily stocked stands with younger age class stands within smaller areas that have burned over the past 30 years and areas that have had some logging activity over the past 40 years. Portions of these older and more mature stands remain healthy but many are declining in tree vigor and productivity.

Woodlands, which include limberpine, Rocky Mountain and Utah juniper stands, aspen stands, and cottonwood galleries along waterways, constitute approximately 48,000 acres (approximately 2 percent) found throughout the planning area. In general, distribution of aspen has decreased while limberpine and juniper stands have increased. On-the-ground data collection and analysis of aerial photography will contribute an understanding of the distribution of all

woodland species. It is likely that inventory will determine that there are more woodland areas than indicated here, but not so much more as to undermine the validity of the analysis. Table 2-32 shows the existing vegetation type and Fire Regime Condition Class (FRCC) for forest and woodland communities**.**

Table 2-32. Vegetation Communities Associated Fire Regimes and Estimated FRCC

Vegetation type	Fire Regime Group	Landscape Level FRCC	FRCC Description
Forest (inclusive of major forest types; Lodgepole Pine and Douglas Fir)	IV	2	Stand replacement fires dominate Fire Regime Group IV. The FRCC for the forested communities is displaying indicators of moderate departure from reference conditions and is within the timeline where stand replacement fire would return the communities to early seral condition. Some of these indicators include insect and disease outbreaks and fuel loading associated with a mature forest stand. In some areas with LFO that point within the timeline may have been altered by changes in the fuel loading by logging and fuels reduction activities as well as historic fire suppression.
Woodlands (Inclusive of major woodland types; Juniper, aspen and limber-pine)	IV and V	2	The majority of the woodlands fall within FR group IV with isolated woodland stands in rock outcrops falling within FR group V. FRCC 2 is indicative of the woodland communities having moderate departure from reference conditions. Indicators for this FRCC include encroachment of conifers into mature to decadent aspen stands and encroachment of juniper and limber pine out from historic rocky and shallow-soiled sites into shrub habitat.

Source: LANDFIRE data

The advanced age and density of these stands, combined with the lack of vegetative treatments and altered natural fire regime, have contributed to the decline in overall forest stand health. There has been less vegetative treatment including methods to manage natural processes, insects and diseases, structure, density, species composition, age-class distribution as well as site quality of forest stands, than would be optimal.

The age class distribution of lodgepole pine stands is largely human-caused as a result of past logging activities with some small influence from wildfires and wind throw. Except where recent disturbance has occurred (approximately 50 years and less) lodgepole is largely even-aged stands between 100 and 200 years old and size classes are pole (5-9”DBH) and medium saw timber (9-21”DBH). (Old growth characteristics are not applied to lodgepole pine.)

Lodgepole pine is stressed by mountain pine beetle and dwarf mistletoe infestations in scattered patches throughout the planning area. Forested lands adjoining the planning area exhibit far more pest damage than in the planning area itself. However, time seems to favor the beetle's expanded area of impact. The Dubois area is the most heavily impacted by mountain pine beetle. Signs of disease on Green Mountain and the Lander Slope have been identified. Funding levels provide little scope for management response to the spread of mountain pine beetle. BLM works with the Shoshone National Forest and the community of Dubois.

Aspen are scattered throughout the planning area, although most stands are maturing and distributions are declining. Most of the aspen occur mixed within the forest and woodland sites and are mid-seral communities that naturally transition into conifer stands before a disturbance such as fire returns the stands to early and mid aspen dominated woodland communities. Aspen stands typically exhibit a diversity of understory vegetation, are used by wildlife and livestock, can serve as a natural fire break, and often occur as part of important riparian and wetland components in the forest system. Older aspen stands are showing signs of increased cankers, conks, and decay in the boles and generally have very little clone regeneration due to competition from conifers and herbivory from wildlife and livestock. The healthiest aspen stands are found on the Lander Slope and the Dubois area, probably due to the extensiveness of the forested landscape and the lack of concentrated browsing pressure.

Identified woodland areas are found on the Lander Slope, Green Mountain, the juniper/limber pine woodland in the Beaver Creek and Twin Creek areas, and portions of the Copper Mountain and Rattlesnake Mountains. Extensive herbivory has negatively impacted aspen stands in numerous areas, including on Green Mountain and Beaver Rim where degradation of aspen sites has resulted in severe hummocking in numerous areas. The long-term lack of fire necessary to regenerate aspen stands has also been detrimental.

Douglas fir and Englemann spruce are a minor component within the forested areas. Douglas fir stands are found in the South Pass, Lander Slope and Dubois areas and are restricted to limestone derived calcareous soils of the Wind River slope. Some of the Douglas fir stands in the Mexican Creek area of the Lander Slope display Old Growth Characteristics with basal bark scarring from past fires and age classes in excess of 300 years old. Englemann spruce are limited to forested drainage bottoms. Small stands of Englemann spruce are found on Green Mountain, the Lander Slope and the Dubois area. Neither of these species displays the degree of infestation and mortality that is currently affecting lodgepole pine and limber pine.

Management challenges for forests and woodlands include the lack of a natural fire regime, limited fuels management, fragmented and isolated stands, encroachment of woodland species, lack of a current forest inventory, declining or over mature stands, and, of greatest significance, management of disease, insects, pathogens, and invasive species.

Trends

The trend on forest health is downward because of pine beetle infestation, minimal forest management and commercial timbering, and threat from fire. Conifer spread due to the predominantly late seral stature forest and woodland communities and the long-term absence of fire is negatively impacting deciduous trees, particularly aspen.

Previous management of forested areas focused on removal of overstory trees to release residual smaller trees underneath primarily in the Green Mountain and South Pass areas, with some limited management in the Dubois area. In the past 10 to 15 years there has been a limited amount of commercial cutting in forested portions areas. Most of the timber management activity has been commercial and non-commercial removal of post and pole sized trees and firewood permits, hazardous fuels timber treatments, and some small-scale contracts for house log sized material. The Green Mountain and Dubois areas have had the most commercial cutting over the past 10 years but the quantity is relatively trivial.

Management of woodlands over the past 20 years has been largely non-existent. There has been limited treatment of aspen stands to encourage their growth and to reverse the continued loss of this important habitat component. Limberpine and juniper woodlands have increased in acreage extent as a result of a combination of factors, notably the lack of fire. The increase in juniper and limberpine woodlands is evident through repeat photography over the past 100 years and relating surveyor vegetation notes from the 1870s through early 20th century to current vegetative coverage. Small-scale mechanical and fire vegetative treatments have addressed juniper encroachment but not on the scale needed to reverse this trend.

Current management is much different than in 1987 and is more for forest treatments that obtain specific resource objectives while also providing timber to the public. In many of the forest and woodland areas there are resource objectives such as wildlife habitat and forest health improvement that require cutting or thinning of trees that are of marginal timber value such as juniper woodland treatments. There has been some harvest of both limber pine and juniper for character wood, fence posts and firewood, but this type of use is almost inconsequential.

The development of stewardship contracts for forest treatments by the USFS is in the early stages of implementation. There is a theoretical benefit of these contracts, but the lack of local infrastructure, challenging terrain and ost of transportation with reduced demand for saw timber, have undermined the appeal of even subsidized logging. A 2004 stewardship contract on Green Mountain was not successful due to low timber prices and the cost of transport to mills.

There has been a significant change in the local timber market, with a marked shift from demand for saw timber to limited local demandd for various wood products, including house logs, character wood, and fencing material. The closure of local commercial mills both contributed to and is a sign of diminished market for saw timber. The BLM State Office is compiling data regarding the sale of forest products. This information was expected to be received by spring, 2009 but was not completed. The actual data will be used in the Affected Environment.

Unique forest and woodlands include pre-settlement juniper and limber pine communities southeast of Lander to Beaver Rim, the Sweetwater Rocks area and Copper Mountain area, the Douglas fir stand on Beaver Rim, pre-settlement aged stands of Douglas fir in the Lander Slope area and the Engleman spruce on the Middlefork of Cottonwood creek on Green Mountain.

Forecast:

Increased impact from diseases, insects, and pathogens are likely. Bark beetle activity has increased across land ownerships. Steep, rocky terrain also makes many pest treatments unfeasible. Prolonged drought has weakened conifers and made them more susceptible to bark beetles, blister rust, and other stresses. Winters have also been mild, exacerbating many of these biological stressors. Even if these climatic trends reversed, which is unlikely, the damage is already done: many of the mature conifer trees on public land have died and/or are dying.

It is unlikely that any management approach will be able to reverse this downward trend across the forested landscape, particularly in so far as beetle kill is concerned. BLM lacks the funding and infrastructure to take a proactive role. Removal of hazard trees in and around campgrounds, more agressive WUI treatments and strategic forest and woodland health projects are the extent to which BLM is funded for addressing the downward trend.

Many of the aspen found at middle to high elevations are declining as succession from deciduous to conifer dominance proceeds. Absent treatment, this trend will continue. The loss of deciduous forestland affects watershed and riparian/wetland function and the diversity of habitat. Slowing down the landscape level loss of aspen is a high management priority and is being addressed by aspen regeneration projects based on recent aspen inventory data.

The Green Mountain area has the largest acreage of aspen, with over 6,000 acres of aspen habitat identified. Current treatment efforts of approximately 50 acres annually since 2006 is not enough, but with with proper funding and staffing to issue larger aspen health contracts and utilize tools such as the Stewardship Contracting authority, real impact to aspen could be achieved. Barring any major surface disturbance (e.g., fire, mechanical treatment), the majority of the aspen stands will eventually be replaced by conifers (Wyoming State Forestry Division, 2001) with impacts to overall forest health, wildlife habitat requirements and visual resources.

Management objectives will continue to focus more on controlling fuels accumulation, improving the contribution of forested areas to wildlife habitat and recreation usage, and supporting the use of the wooded community as part of carbon sequestration. The management challenges today include unprecedented pest infestation, the risk from fuels loading, the encroachment of juniper, and the need to consider climate change.

Comprehensive forest and woodland inventory is essential to management of these resources. An inventory has been completed for Green Mountain but needs to be completed for the entire field office with current forest health emphasis as opposed to former inventories that emphasized timber management.

Forest management actions such as timber harvesting, regeneration of disturbed sites, stand replacement, and commercial/pre-commercial thinning are needed to improve the health of diseased, ecologically unstable or degraded timber communities but limited financial resources are available. Potential exists to partner with interested parties to be pursued to minimize the impact on wildlife of the pest infestation, such as the partnership with the Rocky Mountain Elk Foundation established by the Shoshone National Forest. There may be a need to acquire legal access to certain areas of public land to support intensive management of disease-infested problem areas although discovery of infestation in these areas is often difficult.

Certain stands of un-merchantable, nonproductive lodgepole pine need to be replaced with young, vigorous trees utilizing vegetative treatments. This is a cost-intensive effort that requires partnering with private and state landowners to achieve significant benefits. The demand for minor wood products such as firewood, post/poles, Christmas trees, and wildlings is likely to continue and could be a tool to manage areas such as Green Mountain that would benefit from thinning, although the cost in time and fuel to drive to Green Mountain makes this area much less desirable than more accessible areas such as South Pass.

The 48,000 acres of woodlands will be managed only to enhance other resources including the declining health of aspen stands removing encroaching limberpine and juniper from mountain shrubland habitat. It is likely that the ongoing inventory will identify significantly higher acreage because of encroaching shrublands.

Forestlands located in the Lander Slope-Red Canyon, South Pass, Whiskey Mountain, and East Fork areas will be under restricted management for forest products due to access and topographical problems (very steep slopes) associated with timber harvesting. Stands that are within the WUI will be managed to reduce hazardous fuels loading.

The BLM has attempted to increase forest sales in the recent years to address fuel loading and beetle kill. Opportunity exists to combine the BLM harvest with other state, private, and other federal agencies where jurisdictional boundaries cut through larger sale areas. The Healthy Forest Initiative (August 22, 2002) promotes expediting fuels reduction and forest restoration and entering into stewardship contracts in which contractors would keep wood products in exchange for thinning trees and removing dead wood. This approach overlooks the lack of local demand for the wood products that could be garnered through stewardship contracts (with the exception of the Dubois area where demand was for logs for homes.

The wood product industry has diversified, and forest products have been used in other areas to fill niches such as chips, shavings for animal bedding, biomass for landscaping, and alternate fuels such as pellets. A more diversified forest product industry may enter the area in the future, particularly in response to the need to manage for beetle kill. However, the cost required for road construction, traditionally appraised in the stumpage value of the sale, would likely result in administrative costs higher than forest proceeds.

Climate Change

Climate change likely plays a role in changes in forest health. Forest communities are resilient in responding to normal variations in weather to which they are adapted. However, increases in insect infestations and tree mortality may be partially due to climatic factors, such as warmer and drier summer conditions and warmer winters which compound other variables such as long-term fire suppression, particularly in areas where stands are overstocked.

Forest and woodlands and the risk of loss from beetle kill or catastrophic fire must be considered in assessing the impact of public lands management on and from climate change. All vegetation and soil provide carbon sequestration. Dead trees do not act as carbon sinks; on the contrary, they are net carbon emitters, either very slowly, as when they decompose on the forest floor or quickly when burned, either as biomass or during a wildfire.

Landscape-scale fires release the carbon sequestered in the trees with no productive use of the heat energy released. However, fire is a trigger mechanism for seral stage regeneration and the post-burn rapid re-vegetation restarts the carbon sequestration cycle far more quickly than would have resulted from a more managed reduction of fuels. However, the carbon given up by the burned trees was emitted directly to the atmosphere along with a large quantity of air pollutants. Globally, forest fires (whether wildland or to make way for agricultural use) are significant contributors to GHG emissions and particulate pollution (ICPP, 2001).

Table 2-33 identifies primary forest and woodland areas and potential treatment methods to protect and enhance those resources while providing timber products to the public.

Table 2-33. Potential Treatments

Forest and Woodland Area	Resource Type	Primary Resource Value and Management Objectives/Concerns
Green Mountain	Forest and Woodland	-Maintenance of foresth health -WUI fuels reduction treatments -Aspen health -Woodland encroachment -Timber products available to the public
South Pass	Forest and Woodland	-Maintenance of forest health -WUI fuels reduction treatments -Aspen health -Timber Products to the public
Dubois	Forest and Woodland	-Maintenance of forest ealth -WUI fuels reduction treatments -Aspen Health -Timber Products to the public
Lander Slope	Forest and Woodland	-Maintenance of forest health -WUI fuels reduction treatments -Woodland encroachment -Maintenance and protection of forests and woodlands with unique or Old Growth Characteristics -Timber products to the public
Beaver Creek and Twin Creek Areas	Woodland	-Woodland encroachment -Enhancement of aspen stands -Maintenance and protection of forests and woodlands with unique or Old Growth Characteristics
Rattlesnake Mountains	Woodland	-Woodland encroachment
Copper Mountain	Woodland	-Woodland encroachment -Maintenance and protection of forests and woodlands with unique or Old Growth Characteristics

Key Features

- Pest infestation including dwarf mistletoe, can be found in all forestlands. Mistletoe causes reduced growth and vigor, leaving trees more susceptible to attack by insects.
- The Wildland Urban Interface and priority areas for fuels treatments.
- Aspen stands.
- Smaller woodland areas are scattered throughout the area such as those juniper and pine woodlands found in the Sweetwater Rocks. These areas include a mixture of juniper/limberpine woodlands with Old Growth Characteristics on the sparse, rocky ridges as well as woodland encroachment into shrub habitat that has occurred in the modern absence of fire disturbance. Aspen woodlands are found in the greatest extent within the Green Mountain area with isolated pockets found throughout the area.

2.4.3 Vegetation – Grasslands and Shrublands

2.4.3.1 Regional Context

The sagebrush biome is emerging as increasingly important as it is lost throughout the west to development, urbanization, and fragmentation. For decades, the objective in sagebrush steppe was to convert it to crops or grassland whenever it could be done in a cost effective manner. In the Great Basin altered fire regimes from cheatgrass have removed approximately half of the sagebrush within the last few decades. The importance of sagebrush is emerging; the centerpiece of that new perspective is the sage-grouse, which west wide is exhibiting declining populations and distributions. Sagebrush in the planning area remains largely intact and the LFO is positioned to become a final source of proper function for the biome.

Indicators:

The most common indicators of vegetation health include cover, diversity, and presence and density of noxious weed species. Standard of Healthy Rangeland Standard #3 identifies the following as indicators:

- Vegetative cover
- Plant composition and diversity (species, age class, structure, successional stages, desired plant community, etc.)
- Bare ground and litter
- Erosion (rills, gullies, pedestals, capping)
- Water infiltration rates
- Invasive species

Current Condition

USDA National Resource Conservation Service developed Major Land Resource Areas (MLRAs) as geographic areas with similar elevation, topography, geology, climate, water, soils, biological resources and land use. Map 22 shows the MLRAs in the planning area:

- MLRA 32 - Northern Intermountain Desertic Basins - MLRA 32 occupies the lowest elevations and has characteristics similar to the Bighorn Basin. This area includes salt desert environments and soils that support sagebrush but not large contiguous stands. This MLRA has the longest growing season in the planning area, but is also the driest.
- MLRA 34A - Cool Central Desertic Basins and Plateaus – While many MLRAs in Wyoming support sagebrush, MLRA 34A forms the core of sagebrush habitat in Wyoming. This is the most intact tract of sagebrush remaining in the world. Virtually everywhere else the sagebrush biome is fragmented and threatened. Green Mountain and to a lessor extent Crooks Mountain have the alpine characteristics associated with MLRA 43B, but the region is too small to map separately on the scale appropriate for MLRAs.
- MLRA 43B – Central Rocky Mountains - MLRA 43B is an alpine environment. It has the shortest growing season and the highest precipitation in the planning area. It includes the Wind River Front and the south slopes of the Owl creek and Copper Mountains. Much of this MLRA is forest or mountain shrub vegetation types.

More detailed information may be found at: http://soils.usda.gov/survey/geography/mlra/

Each MLRA contains a set of "Ecological Sites" which describe the land capability and function based precipitation zones, soil factor differences that determine plant production and composition, the hydrology of the site, and the functioning of the ecological processes of the water cycle, nutrient cycles, and energy flow. Different ecological sites will exhibit significant differences in the number and relative proportion of species, and total annual vegetation production.

Ecological site descriptions are used as the initial basis for determining the current and potential range conditions for each site. State and transition models are used to develop objectives, and guide management actions necessary to meet the SRH. These models describe the anticipated vegetation changes on a given site over time in response to various types of disturbances and environmental factors (NRCS Pasture and Rangeland Handbook, 2003).

Grasslands

Approximately 800,000 acres (including lands of all ownership) are grasslands, which include lowland, foothill, mountain, and alpine types (Map 20). Most of the grassland areas are located in valley bottoms, uppermost south–facing slopes, and scattered patches in windswept ridges such as the bighorn sheep habitat on Whiskey Mountain in Dubois (see ACEC map below).

The average composition of the grass vegetation type is 48 to 80% grass species, 10% forbs, and 10 to 42% shrubs. Grasses comprises less than 2 percent of the planning area but are important to wildlife, livestock, and wild horses and contribute to the diversity of the area. The standard habitat types included within this vegetative type are highland short grass, sagebrush mixed grass, lowland short grass, and sagebrush mixed shrub. Open grasslands are important components in bighorn sheep habitat. The FRCC for grasslands is shown in Table 2-30 below.

Shrublands: Shrubland take many forms based primarily on soils and precipitation zones.

Sagebrush is the most common vegetation type. 92 percent of the public lands are sagebrush vegetation types. The average species composition varies widely across the sagebrush landscape dependent upon soil classification and average annual precipitation. An estimate for most mid-seral sagebrush communities within the 10-14" annual precipitation zone is for 50-65 percent grass, 5-10 percent forbs, and 15-35 percent shrubs.

Multiple sagebrush species exist in tje area. Great Basin Sagebrush and Silver sage are discussed in the riparian section. Bud Sage is identified in the discussion of saline upland sites. Three tip sage is uncommon, but present on clay soils and is common along the Lander Slope. Low and black sage are found on shallow soils. However, when people talk about sagebrush they refer to big sagebrush.

Big sagebrush includes two subspecies of similar appearance, including mountain big sagebrush and Wyoming big sagebrush. Only Wyoming big sagebrush occurs in the 5-9" precipitation zone. Both subspecies occur in the 10-14" precipitation zone, and mountain big sagebrush is exclusive to the 15-19" precipitation zone. Big Sagebrush has a taproot that can draw moisture from deep in the soil profile. Because of this characteristic, big sagebrush is the predominant species in most places where snowfall accumulates.

A major change in the function of sagebrush habitat occurs at approximately 15" of precipitation. In sagebrush habitats in the 5-9" and 10-14" zones, the herbaceous component of the plant community is almost entirely dependent on spring precipitation, primarily in late April and early May. Moisture associated with the winter snowpack is generally no longer in the surface layers of the soil profile by the time growing season temperatures prevail. In the 15-19" precipitation zone, the snow pack tends to persist long enough that it is available in conjunction with growing season temperatures. This causes entirely different plant communities and site progression - even though mountain sagebrush is still a major component of the plant community in both situations. In this high elevation circumstance mountain sagebrush is considered a mountain shrub species and will be discussed in the next section. The remainder of this section refers to big sagebrush communities in the lower precipitation zones.

Big sagebrush is a biome level plant that supports a variety of obligate species such as sage-grouse, pigmy rabbits, and vesper sparrows. Many species such as mule deer, pronghorn ante-

lope, and ferruginous hawk are not sagebrush obligates, but occupy ranges closely correlated with sagebrush. Domestic sheep utilize sagebrush, especially on winter ranges.

Big sagebrush occurs in conjunction with an herbaceous understory on a variety of soils ranging from sandy to loamy. When the soil is exceptionally sandy, spiney hopsage may co-exist with big sagebrush. Rabbitbrush invariably co-exists with sagebrush, but at a lower volume based on relative weight or canopy cover. Most mid-seral sagebrush communities within the 10-14" annual precipitation zone are 50-65 percent grass, 5-10 percent forbs, and 15-35 percent shrubs.

Almost all big sagebrush communities can support an understory of cool season bunchgrasses. Needle and thread is the key grass species on sandy soils; bluebunch wheatgrass is more prevalent on loamy sites. These large cool season bunchgrasses occur in conjunction with a mix of smaller grasses such as thickspike wheatgrass, Sandberg bluegrass and Prairie junegrass. Cool season bunchgrasses complete over 90% of their growth in a relatively short period, primarily in May. When subjected to repeated heavy grazing use during that short growth period, the cool season bunchgrasses tend to drop out of the plant community, after which only the mix of smaller grasses remain.

Depending on location and soil type, blue grama or upland (needle leaf or threadleaf) sedges will prevail instead of the mix of smaller grasses previously identified. Blue grama is a warm season grass that produces a minimum of forage and ground cover. Blue Grama is a problem in MLRA 32, but does not occur to a significant degree in MLRA 34A. Sagebrush communities are increasingly vulnerable to cheatgrass infestations. The cheatgrass issue is a greater concerning MLRA 32. However, perhaps in response to climate change issues, cheatgrass appears to be rapidly increasing its area occupied. While cheatgrass is relatively uncommon in MLRA 43A, no area occupied by sagebrush is immune from the threat.

Plant succession in big sagebrush communities is complex, and if lost from a given site, cool season bunchgrasses do not readily reemerge on these sites unless niches are opened through sagebrush treatments. This is true even if grazing management is excellent. In the modern era where sage-grouse habitat is a keynote consideration, treatments may or may not be appropriate and prescribed fire should be used only with great care.

<u>Mountain Shrub Communities</u> occur primarily in the 15-19" zone. Mountain big sagebrush, bitterbrush, and snow berry are the key species. Mountain mahogany sometimes occurs as a mountain shrub species but it occurs mostly in conjunction with Utah juniper on rocky outcrops in lower precipitation zones. The grass component includes needle grasses, mountain brome and Idaho fescue. Arrowleaf balsamroot is a key forb. Mountain shrub areas provide excellent forage for livestock and wildlife, particularly for mule deer.

<u>Salt desert</u> habitats are found in two basic forms, saline upland and saline lowland.

- Saline upland sites are found along the base of Beaver Rim, and in the northeast portion of the planning area. These sites are dominated by Gardner's saltbush, often with bud sage. If the salt content is not too severe, these sites have an herbaceous component that includes thickspike wheatgrass and Indian ricegrass. On the edge between a saline upland site and a loamy site, Wyoming sagebrush and bottlebrush squirreltail may intermingle with the salt tolerant species. They offer more values than their low production appearance would indicate as high levels of protein in the fall and winter make these sites prime winter range for livestock and wildlife, particularly domestic sheep and antelope. However saline soils make reclamation efforts difficult when disturbed.

  When saline upland sites are subject to unmanaged grazing, the herbaceous component declines and pure stands of gardener's saltbush develop. The more salt content in the soil, the more vulnerable these sites are to this transition. Saline Upland sites are also vulnerable to invasion by the noxious weed halogeton. In most circumstances, halogeton is primarily an opportunistic species that occupies disturbed sites. However halogeton does have the ability to advance onto undisturbed saline upland sites.

- Saline lowland sites are dominated by greasewood, with variable amounts of basin big sagebrush depending on the degree of salinity. The proportion of greasewood increases with the salinity. Greasewood is poisonous when it is comprises the entire diet of cattle, but provides excellent feed when animals have free access to other habitat types.

Rocklands

This "vegetative" type covers approximately 1.7 percent of the planning area. Sites include areas of un-merchantable trees or brush, and rocky or barren areas and with little or no potential for agricultural based actives because they are inaccessible or produce no forage. Typical sites are Sweetwater Rocks, Copper Mountains and Green Mountain. These areas are highly sought-after by wildlife for escape and thermal cover and are attractive to recreationalist.

Fire Regime Condition Classifications

A general discussion of the Fire Regime groups and FRCC for these vegetative types is provided in Table 2-34. This is an estimate based on data from Biophysical Settings (BPS), Existing Vegetation, Fire Regimes, and Fire Regime Condition Classifications (FRCC) from regional LANDFIRE data (www.landfire.gov) as well as estimates from on the ground conditions.

Table 2-34. Upland Vegetation Communities and Associated Fire Regimes and Estimated FRCC

Vegetation Groups	Dominant Fire Regime Group	Estimated Landscape Level FRCC	FRCC Description
Sagebrush Shrublands	IV	FRCC 1: 16% FRCC 2: 48% FRCC 3: 35%	Sagebrush shrublands within the LFO planning area are generally dominated by mature to decadent sagebrush with a secondary component of grass. Depending upon their location within the Field Office, these sites would have historically carried fire with variable burnt patch size. A combination of factors including historic and current livestock grazing, human infrastructure and fire suppression have altered the natural disturbance regime within the sagebrush shrublands found in the Lander Field Office. Key ecosystem components are still present, though vegetation composition and structure has been significantly altered in FRCC 3 areas.
Grasslands	I	FRCC 1: 34% FRCC 2: 26% FRCC 3: 41%	Grasslands within the Lander Field Office would historically have experienced fire return interval of 25 years across the landscape. These areas have an altered fuel loading due to a combination of factors including historic and current livestock grazing, human infrastructure and fire suppression. Fire frequency within this vegetative type is far less than would have occurred historically, though the potential loss of key ecosystem components is minimal. Vegetation composition and structure has been significantly altered in FRCC 3 areas.
Greasewood and Salt desert shrub	IV	Unspecified, needs to be split from Sagebrush Shrublands, Estimated to be dominated by FRCC 1 across landscape.	Fire was very infrequent in this vegetative type. Fire Return Intervals are estimated to be 200 years.
Mountain Shrub	IV	Unspecified, needs to be split from Sagebrush Shrublands, Estimated to be dominated by FRCC 2 across landscape.	These vegetative communities are dominated by mature to decadent shrub. Though these communities are generally in condition class 2, all of the ecological components are present.

Inventory Data

The latest inventory of vegetative condition and health in the planning area was collected as part of the Gas Hills and Green Mountain Grazing EIS (BLM, 1986) and analyzed condition based upon seral stage. Table 2-35 identifies the number of acres in each seral state. The data were derived from a condition scoring system where an existing plant community is compared to a reference plant community. The higher the similarity, the higher the exisiting plant community score. These data provide little analytic assistance and assigns pejorative terminology with little utility for management. It is offered as the latest ESI prepared for the planning area.

Table 2- 35. Ecological Status of Vegetation Communities

Condition	Total Acres	Percent of Total
Excellent	61,727	2
Good	588,161	22
Fair	627,473	24
Poor	103,094	4
Unclassified	1,236,259	48
Total:	2,616,714	100

Most vegetative communities have been influenced by surface-disturbing activities, livestock grazing, and fire or fire suppression. As mineral developments and pipeline projects increase, sagebrush grassland conditions are increasingly impacted.

Current management practices for upland grass and shrub communities are addressed primarily through monitoring of livestock grazing, evaluating terms and conditions of individual grazing permits, and development of AMPs, which are implemented to the extent staff time and resources allow. As discussed in the Grazing Section, workload and budget constraints place limits on the amount of monitoring and follow-up that is possible. Historically overlooked are factors such as drought and climate change or mineral development. Moreover, short-term indicators such as stubble height of vegetation in riparian areas or utilization on uplands are only useful for determining whether livestock grazing may continue in a given season; unless they are correlated to long term trend data establishing a cause and effect relationship. Long-term indicators such as upland condition and trend studies that would provide long-term information are in place for some high priority Improve category allotments, but are lacking in and other allotments. Standards assessments need to be completed and vegetative condition assessed for health and trend.

The ecological health of vegetation communities (both rangeland and riparian) is one of the most important issues to be addressed in the revised RMP. This perspective is in accordance with the BLM mandate to manage public lands to promote healthy rangelands. Multiple-use can successfully take place only if the health of the rangeland is protected.

Trends

The mostly arid climates afford little reserve moisture during times of prolonged drought. While the native plant community developed in the drought/wet pendulum swings, human intervention and climate change are altering that relationship. Increased surface disturbance (mostly caused by humans, but in some cases due to drought and erosion) have opened the door to invasive species. The loss of soil through wind and water erosion can remove valuable nutrients and organic matter from the ecosystem. When the rate of loss exceeds the rate of soil formation there is a net loss of soil. There is a threshold when the amount of soil loss starts to affect plant communities. This threshold varies with soil type. Once a threshold has been crossed the potential plant community that could be supported on a site would change.

Historic overuse of the rangeland by season-long livestock grazing and continued season-long grazing concentration on many riparian areas have led to plant communities in many locations that are incommensurate with the potential of the site. In some areas, range site vegetation has actually crossed the "threshold" of what the site could have produced at its potential. In other words, the vegetation on the site has moved to a different transitional state, and may not be able to be changed through rest and/or management without mechanical intervention.

With active management and intervention, some rangelands have shown improvements in cover and litter. These improvements can be found in grazing allotments with allotment management plans (AMPs) and management agreements. Improved vegetative cover, density, and frequency of native plants have been documented in some of these allotments. However, in some allotments, even with AMPs, there has been little or no progress towards meeting the SRH. This failure to make progress is being addressed on an allotment-by-allotment basis but is an important theme for the new RMP to address through the resources and uses.

Increased oil and gas and other mineral development are impacting range conditions. The slow introduction of noxious weeds such halogeton, has slowly made its way into these areas. Once established, halogeton tends to spread displacing desirable species. In the past, little monitoring and enforcement of reclamation activities was undertaken and some mines were simply abandoned without regard to reclamation. These are slowly being reclaimed under a variety of programs with mixed success.

Forecasts

Invasive species are having dramatic impacts on native plant communities and disrupt functions of native ecosystems; this impact is likely to continue.

There is no reason to believe that sites that have crossed thresholds will advance to more preferred plant communities in the lifetime of this planning effort. The awareness that this situation of crossed thresholds is associated with grazing issues is rising. Cause and effect relationships are clearer. This increased awareness should translate to improved objective development, and more targeted management changes. At a minimum, plant communities currently in satisfactory status should be maintained.

Reclamation knowledge and skills are rising. Enhanced reclamation success in comparison with previous efforts is a reasonable expectation if for no other reason than LFO now has a surface compliance officer with primary responsibilities for assessing both interim and final reclamation. However, reclamation is a serious challenge because of the low reclamation potential in many area and challenges imposed by increased development and changing climate. Overly optimistic assessments of reclamation potential must be avoided.

Climate Change

The long-term impacts of changing climate are predicted in only the most general way, with little guidance for site-specific management. Longer periods of drought and extreme weather events are said to be “more likely” while spring snow melt is “likely” to be earlier, with high temperatures being experienced in the spring growing months. Cool season bunchgrasses do not resume growth if their spring growing season is aborted by drought, even if satisfactory climate conditions return. They cannot stop and start. Even in the absence of any climate changes, Wyoming’s historic pendulum swings in precipitation require monitoring, observation, and timely inventories of rangelands so that proper response to changes can be implemented quickly. In the rapidly evolving field of climate change, long-term prediction is not possible.

Changing climate presents new challenges to the goal of managing for healthy rangelands yet healthy lands contribute to the carbon sequestration that is needed to combat further change. Drought conditions may become more common, making long-established practices unsustainable. In six out of the last eight years, drought impact on vegetative communities has been significant; the relatively “wet” 2008 only serves to contrast with prior dry year impacts.

Above all, the uncertain of climate change requires extremely adaptive management. Earlier land use management assumed a static climate - although that seems particularly off track in light of Wyoming’s historic wild climatic swings - but that wishful approach will no longer be a scientifically justifiable. Climate change increases the importance of healthy rangelands. Grasslands and shrublands are efficient sequestesr of carbon. The need to maintain and improve vegetative condition required by SHR will result in improved carbon sequestration.

Key Features

- Maintaining diversity of native plant communities assures that landscapes are more resilient to changes and disturbances and insures that habitat is maintained for wildlife. Given the predicted impacts described under the resource use sections of this document, it will be difficult to maintain or improve diversity in many sagebrush grassland areas and nearly impossible in areas having intensive disturbance and development.

- Desirable species composition is another important feature of healthy landscapes. Certain species will increase or decrease based on the disturbance regime and the character of entire landscapes can be affected by these shifts. Cool season bunch grasses tend to decrease under improper management and their reduction decreases the land's capabilities for drought tolerance, watershed protection, and productivity. Conversely, native warm season grasses and mat-forming sedges are an important part of a diverse upland plant community; when they increase at the expense of cool season bunch grasses, however, productivity and drought tolerance are lost.

- The existence and spread of invasive, nonnative species decreases the ability of the land to provide ecosystem services such as watershed health, wildlife habitat, livestock forage, and visual appeal.

- Sage-grouse habitat has been lost throughout the west and extensive livestock grazing and mineral development in the planning area has impacted sage-grouse. The RMP must analyze identify specific management activities to meet these priority features.

- Sagebrush grasslands are characterized by native species that are adapted to the native landscape and are valuable as forage, habitat, and watershed protection. Healthy plant communities can exhibit a range of species diversity and composition; however, trends indicate a decline in ecological condition and thresholds that, once crossed, result in degraded conditions. In such circumstances, the land can no longer provide the quality and degree of goods and services of which it was once capable.

- Sustainability of uses and communities lost or degraded in the past. By using the land in a sustainable manner the likelihood of high diversity, desirable species composition, and control of nonnative invasive species are increased. These outcomes, in turn, create conditions where greater degrees of use are sustainable.

- The challenge for vegetation health is the areas of low-reclamation potential. While some reclamation success has been achieved, there are areas of historic disturbance that have not been adequately reclaimed and in many areas where reclamation has been achieved it is limited to soil stabilization and not habitat restoration.

2.4.4 Riparian-Wetland Resources

Riparian areas are the transition zones between terrestrial and aquatic ecosystems and are often the key sites in arid and semi-arid environments. These communities are found in areas along perennial or intermittent drainages, seeps, and springs and make up a relatively small but productive portion of the landscape. Wetlands are comprised of aquatic vegetation with unique soil characteristics that have developed under the influence of perennial water.

Healthy riparian/wetland areas enhance water quality, control erosion, diminish the impact of floods, and act as a stabilizing force during drought. These areas provide biological diversity, stable banks and shorelines, floodplain maintenance, clean and stable water supplies, aquifer recharge, flood energy dissipation and moderation, fish and wildlife habitat, livestock forage, opportunities for recreation, carbon sequestration, and scenery.

Riparian-wetland communities make up less than 5 percent of the BLM administered public lands but their value is inversely proportional to their physical extent. Some rangeland studies have found that even though riparian meadows and stream corridors cover only one to two percent of a given pasture they often supply 20 percent of the forage consumed; in steeply sloping pastures they may account for more than 80 percent of the herbaceous forage removed by cattle. These areas are also of great benefit to wildlife, some have called riparian stream corridors the single most productive type of habitat on the land (Kauffman and Krueger, 1984). The influence of riparian ecosystems to wildlife is not limited to those animal species that are restricted in distribution to streamside habitat, but also is important to elk, mule deer, pronghorn antelope, sage grouse, blue and ruffed grouse, non-game species, and insects.

Riparian/wetland areas support the greatest diversity of plant and animal life of all habitat types. These areas are important to a large number of wildlife migrants as well as to a diverse population of seasonal residents. Most terrestrial animal and insect life depends on riparian or wetland areas as sources of water, forage, and cover. It is estimated that 70 to 85 percent of Wyoming's wildlife use riparian areas for a least a portion of their life cycles.

For management purposes, the BLM separates riparian/wetland areas into those associated with flowing water (lotic) or those associated with non-flowing water (lentic).

2.4.4.1 Regional Context

The region has an arid, cold desert continental climate with limited riparian wetland areas. Drought is a common occurrence.

2.4.4.2 Resource Characterization

Riparian areas are a form of wetland transition between permanently saturated wetlands and upland areas. These areas exhibit vegetation or physical characteristics of permanent surface or subsurface water influence. Types of plants that occur in this vegetative community are a complex mix of hydrophytic plants. The plants are made up mostly of herbaceous understory with a mix of forbs throughout and typically an overstory of woody type species. However, not all riparian-wetland systems exhibit a woody overstory, climate and exposure to the weather elements has an effect of what grows in a given area.

BLM defines wetlands as areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support and which normally supports, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Riparian-wetland areas include marshes, shallow swamps, lakeshores, bogs, wet meadows, and estuaries along with lands adjacent to or contiguous with perennial and intermittent flowing rivers and streams, lakes, and reservoirs with stable water levels. Ephemeral streams that do not exhibit the presence of vegetation dependent upon free water in the soil are usually not considered riparian/wetland areas.

Indicators

There are a number of indicators used to evaluate the condition of wetland-riparian areas. Indicators include plant composition and diversity, bank stability, channel morphology and floodplain function, erosion and water infiltration rates, ground cover and the chemical, physical and biological characteristics of the water. Standard 2 of the SHR identifies as indicators:

- Erosion and deposition rate
- Channel morphology and floodplain function
- Channel succession and erosion cycle
- Vegetative cover
- Plant composition and diversity (species, age class, structure, successional stages, desired plant community, etc.)
- Bank stability
- Woody debris and instream cover
- Bare ground and litter

Current Condition

Riparian/wetland vegetation communities in the planning area typically comprised of herbaceous plants or a combination of herbaceous and woody plants. Three basic kinds of riparian/wetland habitats are common in the planning area.

Forest Dominated Riparian

Cottonwood is the most important riparian tree species but aspen, boxelder, or a variety of conifer species are also present. Cottonwood regeneration is dependent on the presence of bare moist soil for seedling germination, so stands tend to occur on ephemeral systems or perennial systems where the channel is braided. Cottonwood stands are invariably the product of systems that feature highly variable stream flows that periodically scour potential germination sites, and move the stream channel laterally across the floodplain. The introduced species of salt cedar (tamarisk) and Russian olive currently dominate many riparian zones that formerly featured cottonwood.

Shrub Dominated Riparian

Systems with persistent water availability and at least moderate gradients, generally form shrub dominated riparian areas. Several species of willow are the main shrub component of riparian zones, but other species such as water birch and alder are common.

Herbaceous Dominated Riparian

Wetlands and riparian areas with low gradients are typically dominated by grasses, sedges, rushes, bulrushes, and forbs.

Moisture Gradients

Riparian areas can be described as occupying wetland, subirrigated or lowland ecological sites, with wetland sites having the most soil moisture and lowland sites having the least.

- The wetland site features continuously available moisture in soil layers – except during periods of severe drought. Broad leafed riparian sedges are the predominant feature of the desired plant community.
- The sub-irrigated site (floodplain) is frequently wet at the surface and features a high water table. Willows, riparian sedges and tufted hairgrass are the predominate species of the desired plant community.
- The sub-irrigated lowland site (terrace) features soil surface layers with dependent on precipitation for moisture, but some species of vegetation can access moisture deep in the soil profile. The desired plant community is highly variable on these sites, but basin sagebrush and great basin wildrye is often a key component. Silver sage occurs also occurs on this site. These terrace sites offer important habitats, particularly for deer and sage-grouse because the height of these communities makes them available even in severe winters with high amounts of snow. Mature cottonwoods may be present on the lowland site, but they do not regenerate on these sites.

Many riparian areas in the LFO exhibit all three ecological sites along the moisture gradient.

Proper Functioning Condition Assessment (PFC) – PFC is the assessment tool used to determine the relative health of stream hydrology, riparian/wetland vegetation, and the aquatic fauna and flora of creeks. A wetland system that exhibits high integrity and proper function has a mosaic of well-connected, high-quality water and habitats that support a wide assemblage of native species and the genetic diversity necessary for long-term persistence and adaptation in a variable environment. BLM utilizes PFC as a tool to measure riparian-wetland as required by Standard 2 of the SHR.

Most but not all lotic (moving water) and lentic (standing water) riparian-wetland habitats (Map 23) were assessed for PFC between 1994 and 2002 (BLM, 1993). PFC assessments still need to be completed on approximately 91 acres and 51 miles of riparian-wetland habitats. The PFC assessment ratings for lotic and lentic areas are shown in Table 2-36.

Table 2-36. Results of Proper Functioning Condition Assessment Ratings

	Lotic Miles	Lentic Acres
Proper Functioning Condition	104	1,259
Functional-at-Risk Upward Trend	37	109
Functional-at-Risk Not Apparent Trend	96	202
Functional-at-Risk Downward Trend	96	1,298
Non-Functional	33	195
Unknown	51	91
Total	417	3,154

Source: BLM data

The minimum acceptable condition for public land riparian/wetland areas is PFC and approximately 28 percent of assessed lotic miles and 41 percent of lentic acres were meeting this standard at the time of the evaluations. The majority of these areas have not been formally reassessed to determine what effects the multi-year drought has had, although site visits and monitoring have shown a continued declining trend on some riparian-wetland areas.

The presence or absence of wetland, sub-irrigated and lowland sites in their proper place in the landscape is often a key indicator and product of riparian health. When a riparian area is in a downward trend, the water table drops and the site dries out. Vegetation common to a lowland site will encroach upon the adjacent sub-irrigated site. Poor road design, water diversions, and herbivory have been identified as factors affecting the condition of riparian-wetland areas.

Unmanaged livestock grazing adversely affects riparian zones as preference for these areas during the hot summer season is pronounced, and repeated heavy use causes plant communities to shift to more grazing resistant species. A shift from deep rooted sedges that armor streambanks to shallow rooted bluegrasses that do not armor streambanks is of keynote importance. This shift pre-stages a change in stream channel morphology where wider or deeper watercourses, that more effectively drain the watershed, are created

When riparian areas that feature cottonwood stands are not functional, adult trees persist but reproduction tends to fail. Cottonwood seedlings are not exceptionally palatable, but tend to be heavily browsed because of their position in the landscape. Cottonwood galleries become remnant galleries and eventually the stand is lost as the existing trees slowly die out.

On shrub dominated systems, upland species such as big sagebrush encroach on the lowland site. Herbaceous species on the sub-irrigated site shift from preferred species such as sedges and tufted hairgrass to less valuable but grazing resistant mix dominated by bluegrasses, dandelion, cinquefoil, and pussytoes. Older willows take on a mushroomed appearance, and reproduction is unsuccessful. The wetland site narrows, and is eventually the sedges are replaced by the grazing resistant mix that formed on the sub-irrigated site.

On herbaceous dominated sites, the progression is much the same as described for the shrub dominated sites, except no shrubs are involved in the transition, and the wetland site tends to undergo hummocking as it transitions to the lowland site.

Hummocked areas feature an uneven soil surface where steep sided mounds approximately a square foot in size dominate the site. Hummocked areas tend to be located in low gradient "lentic" sites not armored by bedrock, though it is not uncommon to also find them in streamside riparian zones. The origin of hummocks is in dispute by some commentors, but their presence is strongly correlated with repeated concentration of cattle in the summer. The creation of hummocks leads to a shift in plant composition; the top of the hummocks is a drier site than the interspaces. Wetland plants are replaced with upland species on the tops of the hummocks. Capillary action from seasonal wetting brings salts to the surface which has lead to the formation of alkali deposits, or soil salinization, in some areas. Soil compaction and root shearing, caused by hoof action in the interspaces between hummocks, accelerates erosion. As wetlands dry, they are more vulnerable to erosion by wind and water. Wetlands with severe hummock formation do not produce riparian values commensurate with their potential.

Lowland sites dominated by basin big sagebrush and great basin wildrye are generally not evaluated in a PFC format, because they make limited contributions to riparian features. However when these sites are not functional the herbaceous component is primarily annual mustards. In recent years, cheatgrass has become an increasing concern in these locations.

The primary reasons documented as to why riparian-wetland areas were not assessed in proper functioning condition include: vegetation shifts from riparian/wetland plants to upland species; poor vegetative composition and diversity; wide and shallow channels; headcuts and excessive erosion; unstable banks; narrowing of floodplains; and excessive hummocking.

A variety of actions have been undertaken to improve conditions including the implementation of grazing systems, installation of additional range improvement projects, stubble height monitoring, the repair of roads and stream crossings, and vegetative treatments.

Some streams that historically supported beaver populations are documented as having no current beaver activity currently due to a loss of adequate amounts of woody plants and appropriate dam building material as well as erosion caused by soil disturbing activities. Beaver were crucial to maintaining the dam and pond complexes on small streams throughout the planning area, however, they are largely absent from these former habitats. Without beaver to maintain them, the old dams have washed-out, water tables have dropped, and streams have become entrenched. These degraded ecosystems function as drainage ditches rather than wetlands and associated riparian zones that formerly stored water and served to spread out and dissipate the energy of floods.

Trends

The results of the PFC assessments completed indicate that many riparian/wetland areas (26 percent of lotic miles and 42 percent of lentic acres) are in a downward trend. This downward trend has been exacerbated by the multi-year drought the area has experienced since 2000. Drought has affected vegetation production and water availability on riparian/wetland areas. Springs dependent on rainfall to re-charge their aquifers have experienced decreased flows in recent years. Stream reaches in some areas have become dry or nearly dry during late summer and fall due to lack of snow runoff and below average precipitation.

Riparian-wetland areas where intensive livestock grazing management has been implemented have generally seen upward trends. Where management emphasis has been placed on riparian-wetland areas these areas are improving. Intensive management typically includes changing the time of year for livestock use, reducing the amount of time used, creating fenced riparian pastures and exclosures and developing offsite water and forage through vegetative treatments.

Fencing riparian-wetland areas into exclosures and eliminating grazing or having very limited grazing use has proven to be the quickest way to improve riparian-wetland conditions, although fencing can have negative consequences to wildlife, recreation, and visual resources (open space). Riparian pastures have been successful in improving conditions but the speed of improvement appears to depend on the length of time grazing is allowed within the pasture.

Management of is complicated by the fact that the BLM often controls only small segments along stream courses, with the majority of the stream under mixed ownership.

Mineral extraction has increased significantly, requiring new roads and other soil disturbances, all of which have the potential to impact riparian-wetlands. Although soil disturbance must be kept 500 feet away from riparian-wetland areas, erosion from the disturbed soil still can degrade the riparian areas. The increase in soil disturbance from these permitted activities, as well as the potential for additional mineral development and major ROW activities, has had and will continue to have a negative impact on riparian/wetland areas throughout the planning area. The observed degradation, notwithstanding the standard stipulations, suggest either different stipulations, better enforcement, or some other approach.

Motorized recreational use of the planning area has also had an impact on riparian-wetland areas. When use occurs off of existing trails, it creates new soil disturbances and the resulting erosion causes silt infiltration of riparian-wetlands. Users break down banks or create larger disturbance areas by avoiding a muddy area. This outcome has been observed in a number of places during the wet spring period or where motorized hunting occurs after snowfall.

Forecasts

Surface disturbing activities are not authorized within 500 feet of riparian-wetland areas. This standard surface stipulation helps prevent but does not preclude impacts to these important areas caused by energy development and ROWs which are likely to continue into the future and may have limited impact on mining. Even when riparian-wetland areas are avoided, reclamation is still key. Successful reclamation of soil-disturbing activities should be an ongoing focus, as should the control of invasive weeds.

As management moves more aggressively towards meeting the SHR and improving reclamation success of surface-disturbing activities, the upward trend established in some intensely managed grazing allotments could be extended. Rangeland Health assessments completed thus far indicate that allotments not meeting health standards often fail due to the condition of riparian/wetland habitats (Standard 2). Addressing impacts from grazing animals will continue. Data regarding conditions in areas that have received rangeland improvements since the 1987 RMP need to be analyzed to understand what has occurred on the ground in these locations.

The success of exclosure fencing on riparian-wetland health suggests that the number of riparian/wetland exclosures and pastures will increase. However, fencing has negative implications as well, and cannot be assumed to be either a panacea or appropriate in all applications.

It is predicted that in areas not receiving grazing management emphasis, riparian/wetland conditions will continue to decline. If areas degrade significantly, they may never recover to their historic potential.

The reduction in timber harvesting from historic levels has significantly reduced the impact to riparian-wetlands from such activities. While there is no immediate likelihood that commercial timber harvesting will resume, the need to deal with pine beetle and other invasive pests may require activities that could impact riparian wetlands.

BLM's Riparian-Wetland Initiative for the 1990s set goals for public land riparian/wetland areas. These included restoring and maintaining riparian-wetland areas so that at least 75 percent are in PFC by 1997 and protecting riparian-wetland areas and associated uplands through proper land management and by avoiding or mitigating negative impacts. Based on completed PFC assessments, the BLM has not achieved these goals.

Key Features

Riparian-wetland areas are allkey features, as they are the most economically and environmentally important attributes of all landscapes in the planning area. All riparian-wetland should be considered high priority in land use decisions. These areas are vital to agricultural interests in that these lands produce the largest amount of forage for livestock. Species diversity is also importnat in these areas. However, the majority of the riparian areas in the watershed have been documented as not being in PFC.

These areas contain significant cultural resources. Prehistoric and historic peoples relied on riparian-wetlands areas for campsites, food, water, and hunting opportunities.

Riparian-wetland communities also support a large number of BLM's Sensitive Species and WGFD's Species of Greatest Conservation Need. In addition, Ute ladies'-tresses, a USFWS endangered plant, is only found in riparian areas.

The importance of greater sage-grouse both as a BLM sensitive species and as identified by the Governor's Task Force is receiving national attention. Healthy riparian-wetland areas are very important brood-rearing habitat for greater sage-grouse as they provide needed forbs and insects necessary for chick survival.

The most numerous riparian-wetland areas occur in the parts of the planning area that have higher precipitation levels. Stream flows in the foothills and mountainous areas tend to be perennial and intermittent in nature. In the lower precipitation areas, stream flows can be perennial, but there is a larger amount of intermittent and ephemeral drainages. In areas where the availability of water is limited, the riparian-wetland areas are all the more valuable.

The importance and value of riparian-wetland areas to the public is illustrated by the number of areas nominated for consideration as ACECs. A recommendation was made through scoping that all public land riparian-wetland areas should be designated as ACECs due to their values for biodiversity and recreation. The Sweetwater River Watershed was also identified for ACEC consideration. Riparian-wetland areas in this watershed constitute a majority of the public land riparian-wetland areas in the planning area.

2.4.5 Vegetation- Invasive Species and Pest Management

An invasive species is defined as "a species that is nonnative to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental health or harm to human health" (National Invasive Species Management Plan, 2008). These species make efficient use of local natural resources difficult and may interfere with management objectives for the site.

Noxious weeds are native or nonnative plants that are unwanted in a particular area at a particular time as designated by the State of Wyoming or declared by Weed Control Districts. Although noxious weeds are almost always nonnative, a distinction is made in this document because they can and do include undesirable native plants.

The primary insect pests of concern in the area are grasshoppers and Mormon crickets. These insects have not reached a level needing control for more than a decade. The local weed and pest districts and USDA Animal and Plant Health Inspection Service (APHIS) survey and determine the need for insect control. Because these other agencies make decisions as to how insects will be controlled on BLM lands, insects are not further discussed in this document.

2.4.5.1 Regional Context

In 2007, invasive vegetation and noxious weeds were determined to be the dominant vegetation on an estimated 35 million acres of public lands in the western United States (BLM Vegetation Treatments Using Herbicides Final Programmatic EIS, 2007. In 1996 the spread of weeds on all western public lands was estimated to be 2,300 acres per day (Partners Against Weeds Action Plan, 1996.) It is likely that the daily rate of spread has increased. It is difficult to estimate the total harm caused by invasive species; however, as early as 1992, invasive species were determined to result in 2 to 3 billion dollars in crop loss alone (NISMP 2008).

Executive Order 13112 established athe Invasive Species Advisory Committee representing diverse constituencies around the nation to develop an invasive species plan. Completed in 2001, the plan has been recently updated with a five-step approach to dealing with invasive species: Prevention, Early Detection and Rapid Response, Control and Management, Restoration, and Collaboration.

2.4.5.2 Resource Characterization

Indicators

SHR Standard #4 has identified noxious weeds as an indicator of healthy rangeland. The indicator for the presence of noxious weeds and other invasive species is most usually surface-disturbing activities, changes in water regime, or other major events.

Current Condition

The State of Wyoming designated noxious weeds are those plants that are considered detrimental or poisonous. Typically, these weeds are perennial or biennial, difficult to control, and usually interfere with agriculture. Wyoming designates six animal species and 25 plant species as pests and noxious weeds. This list (Appendix F) is dynamic and additions to it are made as necessary by the Wyoming Board of Agriculture and the Wyoming Weed and Pest Council. Most of the weeds found on this list are capable of producing monotypic stands as they may process a competitive advantage in establishing on disturbed soils; also, some are allelopathic, producing or accumulating toxins to keep the seeds of other species from germinating.

There are 30 additional plant species listed by adjoining states as noxious weeds, bringing the total list to 55 plants that are weedy in Wyoming or bordering states. A number of other species are of concern for the community. here is also a secondary, more general group of weeds that are usually annuals, such as cheatgrass, halogeton (*Halogeton glomeratus*, Russian thistle, and annual mustards, that quickly occupy disturbed soils and can make rehabilitation difficult through moisture competition. All of the State of Wyoming Designated Noxious Weeds are either perennials or biennials and are typically problems for agriculture. Though they can be very vexing and significance, annuals such as cheatgrass, Russian thistle, and halogeton are not on the State's noxious weed list.

Other weeds such as black henbane (*Hyoscyamus niger*), larkspur (*Delphinium* sp.), and locoweeds (*Astragulus* and *Oxytropis* sp.'s) are of special concern because they are poisonous plants. Under state law, local weed and pest districts can declare additional species to be a weed or pest within their district. Appendix F identifies the secondary declared weeds by Weed and Pest Districts as of 2008.

Development of a weed-management strategy is set at the local level and aligned with land use planning objectives. Close cooperation with local community groups is a critical component of any effective strategy. Part of the analysis of proposed weed treatments includes determining what post-treatment management prescriptions need to be applied.

Weed Management Areas (WMAs), based on similar geography, weed problems, climate, and human-use patterns, are tools to facilitate cooperation among all land managers and owners to manage a common problem with weeds. The formation of a WMA replaces jurisdictional boundaries that are barriers to weed management programs in favor of natural or more logical boundaries that facilitate cooperation, coordination, and implementation of an Integrated Weed Management program. One agency or landowner's weed management success will be largely determined by the cooperative efforts of other landowners in the area. Currently, the Lander Field Office participates in the Popo Agie WMA, the Dubois-Crowheart WMA, and will soon be a cooperator in the newly formed Lower Wind River WMA.

BLM's invasive species program has treated from 136 to 800 acres annually over the past decade, depending on program funding. Approximately 70 acres are treated annually by energy companies for noxious weeds as well as limited general vegetation control for fire hazards.

The foundation for any control program is the development and maintenance of a current detailed inventory of target species distribution. Inventory is critical to an effective program. Fremont County Weed and Pest District FCWPD has a full-time staff position dedicated for this purpose. The FCWPD plans, funds, and staffs a systematic weed and pest survey with the goal of examining all weed susceptible lands at least every five years. Thus, about 20 percent of the land surface each year is searched for new infestations of plants and animals that are currently recognized as being injurious or damaging. Map 24 shows identified infestations.

Treatment and inventory figures supplied by the FCWPD show that as of 2007, there were 11,546.75 acres of BLM-administered public lands identified as having noxious weed infestations, including some minor acres for black henbane and Swaisonpea. Natrona County has approximately 500 acres of infestations, primarily leafy spurge. Other weeds such as common burdock, perennial pepperweed, bull thistle, and sulfur cinquefoil are found in the planning area, but rarely, if ever, on BLM-administered public lands. See http://www.fcwp.org/.

There is no comparable weed inventory occurring in Sweetwater County so treatment records document weed occurrences. It is likely that Sweetwater County has some invasive species, but due to the low rainfall black henbane on roads and pipeline ROWs has been the major concern. Black henbane appears to be spreading with the increasing oil- and gas-related surface-disturbing activities in Sweetwater County. This disturbed area also contains primarily annual weeds on disturbed ground such as cheatgrass, halogeton, and Russian thistle.

There are no inventory records kept for the annual weeds (not designated as noxious) such as tumble mustard, cocklebur, and wild licorice. Other annual weeds appear to be confined to areas where the soil surface has been disturbed. There are old sheep bed grounds that stand out on the rangeland as small polygons, usually one to several acres in size, that persist as cheatgrass monocultures. These typically are found on south-facing aspects where the cheatgrass can enjoy two growing seasons and produce two crops of seed most years; in such situations it enjoys a competitive advantage that has enabled it to persist even though sheep have not been grazed in these locations for decades.

Trends

There has been an increase in weed occurrences through expansion oil and gas fields, along roads and pipelines, and increased recreational use. As this disturbance continues or increases, there will be an increase in weeds, even with an increased focus on weed protection. The value of the disturbed lands has been adversely impacted for livestock grazing and wildlife habitat compared to what existed prior to disturbances. Also, unrestricted or poorly timed livestock grazing commonly kills new seedlings before they can establish root systems on rehabilitation projects. Since an invasive species may out-compete and displace native species, this failure to return to pre-disturbance condition is invitation to invasive species.

Prior to the 1990s, leafy spruge was largely a problem confined to the Lander Slope. It has since spread to ephemeral drainages in the Government Draw area and out to Beaver Creek. It can also be found sporadically along the Sweetwater River and even in nooks and crannies in the Sweetwater Rocks in the Split Rock area. Horse Creek and Keester Basin in Natrona County also have some isolated patches of leafy spurge, but they do not seem to be expanding at the present time. The introduction of *Aphthona* flea beattles has also shown dramatic results in some areas heavily infested by leafy spurge. It has taken time for these insects to adapt to local climate and soils, but over time they have done well on the sites that are favorable to them.

Russian knapweed probably has had the greatest expansion of all of the local noxious weed species. It occurs along Twin and Beaver Creeks, along all the major, and the wide floodplain of Badwater Creek and its tributaries in the northeastern part of Fremont County. It is also commonly found in the ephemeral drainages between Poison Creek, by Moneta, to Lysite.

Spotted and diffuse knapweed are present more and more along highways and in campground areas. There is an infestation on the eastern part of Green Mountain, in the Cooper Creek drainage that appears to be related to former surface disturbing activities.

Tamarisk, or salt cedar, has expanded its range in the past two decades to now infest several small drainages to the north of Beaver Rim, including Big Sand Draw, and a dozen or more small reservoirs. There is also a small infestaton at Carmody Lake, atop Beaver Rim.

One formerly prevalent weed of the Lander Slope was musk thistle. But with the successful introduction of *Rhinocyllus conicus* and *Trichosirocalus horridus* insects this weed is no longer found in the dense thickets that used to exist here roughly 25 years ago.

Generally, the trend is for new weeds to slowly become introduced into the planning area, usually from the west coast and usually along highways. Perennial pepperweed, though still infrequently found, is becoming more prevalent. Hoary cress is more commonly found and has expanded to roads just below the Rams Horn Peak, north of the town of Dubois. Dyer's woad has been found at two locations near Lander, one being in a Lander city park.

Where land management changes can be effected, weeds can be better controlled. Without a change in the management that led to the original infestation, simply killing one weed may only open the area to another weed and has little long term benefit.

BLM Weed Program Budget Trends

In 1997 through 2007 BLM spent about $37,000 annually in the weed program. The year of greatest expenditure was 2007 at $78,000 and the year of lowest expenditure was 1997 at $10,000. Almost $5,000 is spent annually on inventory. The remainder is spent on chemical control, herbicides, and obtaining, catching, and moving APHIS approved insect vectors that attack specific noxious weed species. Project funding ensures that all treatment locations are also incorporated into the FCWPD GIS. A small portion of funds is used to opportunistically cost-share the printing of small weed booklets that are distributed free to the public and special publications to keep county residents informed about local noxious weeds and assistance available through the local weed and pest districts. The amounts that have been allocated in no way reflect the economic impacts presented by weeds.

Program consistency and the application of strategy have greatly improved in the past decade with more consistent funding. However, program funding is still handled on a year-to-year basis due to BLM's annual budget allocations from Congress and there is no guarantee of consistent or sufficient program funding.

Forecasts

In 2007 the BLM established national priorities for use in conjunction local priorities for meeting restoration goals-which are expected to improve efforts to prevent the spread of invasive species. The following treatment priorities have been established to promote integrated efforts across BLM resource programs that manage vegetation:

- WUI protection treatments that are designed to reduce risk of wildfire to the community and/or its infrastructure, developed collaboratively
- Treatments to restore or maintain healthy, diverse, resilient, and productive native plant communities
- Special status species habitat improvement projects designed to improve or protect special status fish, wildlife, and plant habitat
- Treatments that are planned, implemented, and/or monitored using funding from multiple sources, both internal and external
- Landscape treatments (> 1,000 acres for mechanical and >4,500 acres for prescribed fires), coordinated across boundaries, to improve treatment effectiveness
- The Federal Noxious Weed Act requires that BLM enter into cooperative agreements with state agencies or local agencies to coordinate the management of noxious weeds or undesirable plants on BLM lands. The BLM has agreements with Fremont County and the WMAs in furtherance of this aim.

For noxious weeds and invasive plants, vegetation treatment priorities identified in the *Vegetation Treatment on BLM Lands in Thirteen Western States EIS* (BLM 1991a) are still applicable. More specific control priorities for current management include:

- Prevent infestation by use of certified weed-free hay, straw, seed, and reclamation material along with vehicle washing and weed survey of areas proposed for surface disturbing activities. Prevention is the first line of defense and by far the most cost-effective approach.
- Collaboration with other stakeholders is of crucial importance. The BLM has been a cost-sharing sponsor of Fremont County Weed and Pest District coordinated efforts such as periodic newspaper supplements about local weed control efforts and the printing of weed identification booklets that are distributed to the public. Fremont County Weed and Pest District has also given presentations to the Lander Field Office staff to increase weed awareness and issues.

Much of the BLM policy for dealing with invasive species has been reactive, waiting for invasive species to be identified. A management opportunity exists to emphasize the prevention aspect of weed policy. This approach takes the position that limited resources to fight invasive species need to be spent with an eye to cost-effectiveness. This means identifying the factors leading to infestation and changing management prescriptions, as well as adopting BMPs to stop as much new infestation as possible. Management techniques should also be varied, depending on other stress factors such as drought that may negatively impact native vegetation.

Great potential in reversing the trend of weed infestation spreading comes from innovations such as inventory and treatment records kept in a well maintained GIS system so that management can focus on limiting their spread and packing loads of treatment chemicals to remote canyons on foot and by horse to treat small infestations of new noxious weeds that are not yet, but could be a major problem if ignored.

Rigorous compliance with guidance regarding post treatment rest is necessary. This is also true where soils are being reclaimed after disturbance. Newly sprouted vegetation does not have a well developed root system to allow it to withstand grazing stress and it is easily killed at this stage. Temporary exclosure fencing, sequential scheduling of surface disturbing activities, and timing pasture rotations/grazing strategies to coincide with seedling establishment are methods that have been used successfully. Even with greater management focus on weeds, weed infestation is likely to increase as drought persists and development increases.

Climate Change

One of the biggest unknowns is how changing climate will impact invasive species. Native species became established under a static climate pattern. Increasing levels of CO2 and changing temperature and precipitation patterns may or may not be beneficial to non-native species. versus native species. The scientific data are not yet available to make any predictions. Extensive research is being conducted that will help BLM in its adaptive management. Increased development and soil disturbing activities coupled with changing weather patterns which may disproportionately favor non-native species are the key features for invasive species

Key Features

The Lander Slope contains the bulk of the acreage infested with leafy spurge. On average, the BLM annually treats with 700 acres annually in Fremont County and 70 acres in Natrona County with herbicides. Insect vectors are also used to combat noxious weeds; however it is difficult to monitor their natural dispersal and effectiveness, especially when chemical, mechanical, or cultural (grazing) methods may also be occurring on the same site.

The Dubois area experiences extensive recreation use and is a valued scenic area on a major thoroughfare for Grand Teton/Yellowstone National Park. The Dubois-Crowheart WMA was created to prevent new weed infestations, educate the public as to weeds and associated problems they cause, and to combat weeds in this area.

Areas of disturbed soils and those subject to accelerated erosion are at increased risk from invasive species including present and increased oil and gas activity including pipeline construction in the Badwater Creek drainage; and AML projects and large mine rehab in the Gas Hills and Green Mountain areas. The newly created Lower Wind River WMA was formed to combat the spread of weeds due to the mineral development activity occurring in the Badwater Creek and Gas Hills areas.

At present, the WSAs, study exclosures, and most of the ACECs are weed-free or nearly so. Roads and watercourses are the typical routes of weed invasion and by far the most noxious weed infested area is the Lander Slope ACEC and secondarily the riparian zone of Beaver Creek. With such well-established stands of leafy spurge, Russian knapweed, and hoary cress, the strategy is to contain these weeds at the perimeter of the infestation, typically through herbicides, and to introduce insect vectors within the infested areas. This strategy has proven very effective on sites preferred by the insects, and it has not worked on other areas. These weed-attacking insects did not come with instructions so these releases have been, and continue to be, a learning experience.

2.4.6 Fish, Wildlife and Special Status Species

2.4.7 Fish

Fish habitats are managed according to laws, regulations, BLM policies, and principles of fish management within the BLM's multiple-use mandate. The BLM's responsibility is to manage aquatic habitat; authority for the fish and aquatic life is the responsibility of the WGFD. BLM's management of the habitat directly also indirectly affects all aquatic species both upstream and downstream of BLM-administered lands.

2.4.7.1 Regional Context

Fish habitat includes perennial and intermittent streams, lakes, and reservoirs that support fish through at least a portion of the year. The Wind River and North Platte watersheds are the two major drainages that occur within the planning area (Map 7-A). The condition of fish habitat is related to hydrologic conditions of the upland and riparian areas associated with, or contributing to, a specific stream or waterbody. Aquatic habitat quality varies by location and orientation to geographic landforms and vegetation.

2.4.7.2 Resource Characterization

Indicators

Stream habitat conditions are closely tied to riparian conditions and water quality. Riparian vegetation moderates water temperatures, increases bank stability, supports insects used as important food source, filters sediment, provides in stream habitat for fish, and provides organic material for aquatic insects. Indicators of the health of fish populations and their habitat are population numbers, water quality and quantity, bank cover, insect populations, habitat quality, habitat gains or losses, listing as Threatened or Endangered or BLM sensitive species or WGFD's "Species of Greatest Conservation Need", SHR, PFC ratings, and disease.

Other indicators include habitats outside of the planning area as potential vectors impacting local fish and aquatic life. Point source discharge, which is managed by the State of Wyoming, also has implications to fish and aquatic life. The listing of a waterbody as impaired under the Clean Water Act would raise concerns for potential impacts to fish and aquatic life. Discussions of the implications of water quality are discussed in the Surface Water Section.

Current Condition

Fish are typically classified as game or non-game as well as native and nonnative species. Table 2-37 depicts fish species known to occur. Fisheries are in the Sweetwater and Wind River watersheds and, on a limited basis, in the Great Divide Basin (Map 25). Most fish populations occur in the larger rivers and their tributaries, although there are several waterbodies that are stocked by the WGFD.

The range of fish species are adapted to a variety of stream habitats, from cold, rapid waters at higher elevation areas to slow, turbid waters of the high desert.

The WGFD identifies approximately 367 miles of the 775 miles of stream that occur on BLM public lands support fish. The remaining stream miles either are unsuitable for fish or have no resident fish communities, that is, only support fish seasonally when conditions are suitable. The majority of these streams are managed by the WGFD for brook, brown, cutthroat, and rainbow trout species. However, management is focused on managing some streams for native species.

Table 2-37 identifies the fish species known to occur in the planning area.

Table 2-37. Fish Species Known to Occur in the Lander Planning Area

Common Name	
Burbot	Longnose Dace
Brook Trout	Longnose Sucker
Black Bullhead	Mottled Sculpin
Black Crappie	Mountain Sucker
Bluegill	Mountain Whitefish
Brown Trout	Shorthead Redhorse
Bear River Cutthroat Trout	Plains Killifish
Channel Catfish	Rainbow Trout
Creek Chub	River Carpsucker
Carp	Sauger
Cutthroat Trout	Sand Shiner
Emerald Shiner	Splake
Flathead Chub	Snake River Cutthroat Trout
Fathead Minnow	Stonecat
Green Sunfish - Bluegill Hybrid	Spottail Shiner
Grass Carp	Tiger Muskie
Golden Shiner	Walleye
Iowa Darter	White Crappie
Johnny Darter	White Sucker
Lake Trout	Yellow Perch
Lake Chub	Yellowstone Cutthroat Trout
Largemouth Bass	--

Source: WGFD

The WGFD classifies cold-water sport fisheries into ribbon categories based on estimated pounds of sport fish per mile. These categories, ranging from high to low, are blue, red, yellow, or green for streams containing cold-water sport fisheries and orange for streams containing populations of cool/warm sport fish species. Of the BLM stream miles that support cold-water populations, less than 1 mile in the planning area is categorized as blue ribbon; 6 miles are red ribbon; 54 miles are yellow ribbon; and 138 miles are green ribbon.

The Sweetwater River and associated tributaries provide spawning habitat for both native and nonnative fish. The majority of the spawning areas are identified for trout species as they are the easiest to detect. Spawning areas for the native non-game fish communities are largely undetermined. There are very few streams with contiguous miles of fisheries on public lands. The majority of stream miles occur on private lands with segments on BLM lands. The premier stream sections on public land are in the Sweetwater Canyon stretch of the Sweetwater River.

The planning area is not known to support any federally listed T&E fish species; however, the Sweetwater River drains into the North Platte system, which has imposed water depletion limits to protect listed species downstream. The only BLM sensitive fish species known to occur in the planning area is the Yellowstone cutthroat trout, which is found near Dubois. Species of special concern for WGFD that are found on BLM lands include burbot, sauger, Yellowstone cutthroat, flathead chub, lake chub, and mountain sucker.

There are three segments of rivers that have in-stream flow protections for fish. These include 10.2 miles on the Sweetwater River below Wilson Bar, 5.2 miles on the Wind River below the confluence with Jakey's Fork, and 1.4 miles below the canyon on the Little Popo Agie River. The Wind River and Little Popo Agie River segments do not cross BLM public lands; however, approximately 9.8 miles of the Sweetwater River segment is on BLM-administered public lands.

There are several reservoirs on BLM-administered lands capable of supporting a fishery; many of these reservoirs are stocked with game fish by the WGFD, but have been impacted by lack of adequate water in recent years. Some reservoirs have been dry for a number of years and many have low and fluctuating water levels. Lack of adequate water has resulted from reduced snowpack and spring/summer drought.

Silver Creek and Western Nuclear Reservoirs are currently stocked and managed for rainbow and brook trout and Antelope Springs and Jensen Reservoirs are stocked and managed for rainbow trout. Picket Lake has had several species of fish stocked in an attempt to find one that would thrive. It currently is managed for yellow perch and the WGFD has ceased stocking it. Carmody Lake is a playa that relies on snowmelt and has been dry for several years. WGFD stocks it with rainbow trout when there is enough water to sustain a population for the year. Snyder Creek Reservoir has historically been stocked and managed for rainbow trout, however, due to drought and the abandonment of the irrigation ditch which fed the reservoir it has ceased to function as a fishery. Spring Creek Reservoir is managed for rainbow and brook trout, but has not been stocked in recent years due to low water. Rocky Draw Reservoir also used to be managed for brook trout but has not had water in it for the past 15 years. These reservoir fisheries do not have specific management prescriptions other than the 500 foot setback from riparian-wetland areas for permitted surface-disturbing activities.

Fish habitat quality is closely tied to riparian conditions and water quality. Riparian vegetation moderates water temperatures, increases bank stability, supports insects used as an important food source, filters sediment, provides in-stream habitat for fish, and provides organic material for aquatic insects. Proper Functioning Condition discussed in the Riparian section, is one of the primary indicators used to assess the quality of fishery habitat.

Trends

Management of aquatic resources is somewhat limited as the Lander Field Office does not have a fish biologist. Stream segments have not been sampled in many years and long-term monitoring data is lacking. The BLM relies on WGFD fisheries biologists to provide information on fish populations and to assist in identifying habitat improvement and restoration projects.

All fish habitat is influenced by sediment loading from surface-disturbing activities upstream of spawning areas and activities that alter stream hydrology can adversely affect fish habitat and influence reproduction and survival of fish. Thus, while BLM manages relatively little fish habitat, it is upstream of fish habitat on state and private lands.

In general, cold- and cool-water sport fisheries are in decline and populations of non-game fish range from stable to declining. Cold-water sport fisheries are dominated by trout; cool-water sport fisheries contain burbot, sauger, and walleye. Overall, there has been a reduction in total miles of suitable stream fishery due to on-going drought conditions and areas of degraded stream or water conditions since completion of the 1987 RMP. Water rights for most perennial streams are privately owned and controlled. Due to drought conditions and increased demands for water, sections of secondary streams and tributaries of primary rivers can become nearly dry during late summer and early fall. This directly affects river fisheries habitat.

Low water flows affect the timing and success of spawning efforts for lotic fish species. Dry conditions in the autumn affect fall spawners, such as brown and brook trout, which attempt to spawn when water levels are low, but can be hindered by lack of available habitat in periods of drought. Spring spawners, such as cutthroat trout and sauger, miss peak flows, which can occur prior to the spawning season.

Low water flow and warming climate adversely affects spawning success of lotic fish species by resulting in earlier and shorter duration runoff. Water temperatures begin warming earlier in the spring and can result in poorer conditions for egg incubation. High spring runoff is necessary for cleaning spawning substrates and scouring pools. Larval and juvenile fish require side channels and clean gravel/cobble for nursery habitat and protection from predators. Pool habitat is necessary for the survival of juvenile and adult fish during winter. During drought periods, there has been a loss of deep pools on some streams needed to over-winter fish.

Forecasts

Current management provides protection from permitted surface-disturbing activities within 500 feet of riparian-wetland areas. However, management does not provide protection from impacts caused by livestock, wild horse, and wildlife grazing or OHV use except where emergency closures can be implemented to stop activities causing stream bank damage. Continuation of activities that degrade riparian-wetlands will likely result in further declines in fish communities and shift streams from cold-water to cool- and warm-water fish communities dominated by non-game fish species. Current management practices encourage the development of additional stock water reservoirs that could reduce the amount of water runoff feeding streams. Stock water reservoirs increase evaporation loss.

Water depletions through consumptive uses and evaporative loss are expected to continue to increase and could affect water quality and availability for fish, resulting in decreased population densities. This outcome could result in a reduction in the number of recreational fishing opportunities available in the planning area. Habitat improvements and enhancements could offset some of the decline in fisheries habitat, but such opportunities on BLM-administered lands are somewhat limited by irregular land ownership patterns and the inability to influence water diversions and in-stream flows.

Climate Change

Both climate change and short-term variation in weather patterns may contribute to changes in stream systems such as flow, temperature, and turbidity. Aquatic systems are highly dynamic and are constantly changing in response to environmental variations such as summer heat versus winter ice, droughts versus floods, and longer term changes. Lotic systems depend on high-water events to create and maintain fish habitat by scouring pools that offer winter or low-water habitat, supplementing large woody debris and undercutting banks to create overhead cover, and the cleaning of sediment from spawning gravels. Accustomed to a dynamic environment, fish tolerate and even need periodic disruptions to their stream habitats. However, if the disruptions are too extreme, fish habitat can be adversely impacted and permanently reduce or eliminate fish populations from some stream reaches or even entire stream systems.

Many of the lotic fish populations survive in isolated systems. Such systems have limited or no ability to be repopulated from other systems, if the present population is lost. These populations have survived many periodic droughts, but if climate change results in droughts that are more severe than historic patterns, fish populations and species numbers may experience irreversible adverse impacts. If glacial retreat or early snow pack melt continues, perennial waterbodies may become intermittent and unable to support fish populations.

Key Features

Existing fisheries and aquatic habitats need more intensive management so that no additional degradation is experienced. Riparian area need to be managed for PFC to provide for the vegetative, hydrologic, and soil-stability attributes needed to create and maintain quality aquatic habitats. Aquatic and riparian habitats need to be managed so fish habitat is protected and meet SHR. Road crossings of streams should be designed or modified to avoid being barriers to the passage of fish and other aquatic species and to avoid degrading the riparian areas. Management strategies are needed to prevent infestation of aquatic habitat by invasive species. The availability of year-round water is essential to maintain viable fish populations. Management decisions need to ensure that adequate water is available to support fisheries and aquatic habitats during periods of drought and when authorizing projects and activities that result in a water depletion. In addition, management decisions should ensure that water quality is maintained or improved.

The Sweetwater River within the Sweetwater Canyon is the highest-quality fisheries in the planning area. This stretch of river supports a cold-water fishery including brown, rainbow, brook, and cutthroat trout species and has approximately 10 miles of contiguous public land habitat; such a stretch is rare within the planning area. This area provides excellent fishing opportunities and is a popular destination for recreationists. This stream section also has an instream flow protection for fish and a Class 1 water designation by the Wyoming DEQ; such a designation is uncommon outside wilderness areas. Maintaining the overall quality of this important fishery should be a priority when making land use allocations for the area.

Streams that support Yellowstone cutthroat trout, which is the only native trout found in the planning area, should be another priority area when making land use allocations. This species is found in the headwaters of the Wind River and its tributaries in the Dubois area. It is on the Wyoming BLM Sensitive Species list and has been petitioned for federal listing in the past. Population decline in this area could contribute to the need to list the species in the future.

Sauger and burbot are also species of concern for the WGFD and are found in the planning area. Burbot are in Torrey Creek, Wind River, Popo Agie River, and Boysen Reservoir; sauger are in the Wind River, Little Wind River, Popo Agie, Little Popo Agie and Boysen Reservoir. Actions affecting water quality and quantity for these waters and upstream tributaries could adversely affect spawning success and survival of early life stages for these species. Early life stages are sensitive to environmental conditions and decreasing turbidity during spring could lead to increased predation of larval sauger.

Core spawning areas for sauger are in the Little Wind River downstream of the confluence with Beaver Creek and in the Popo Agie River upstream of the confluence with the Little Wind River. The lower Beaver Creek is ephemeral which results in turbid spring flushes. Actions that could cause a shift toward perennial flow in Beaver Creak may result in clearer discharge and would be undesirable. Actions affecting water quantity and quality in the lower reaches of Beaver Creek could affect spawning success for sauger.

Burbot spawn from January and February and prefer clear water. Threats that could affect spawning success for burbot would be activities that warm water or increase turbidity and sedimentation during the late fall and winter.

2.4.8 Wildlife

Wildlife resources include game species (big game, trophy game, furbearers, small game, waterfowl, and upland game birds) and non-game species (raptors, reptiles and amphibians, non-game mammals, and neotropical migrant birds), as well as their habitat. The BLM is responsible for managing wildlife habitats, whereas management of wildlife species is overseen by state and federal wildlife management agencies. The WGFD manages resident wildlife populations and migratory game birds in the planning area. The USFWS provides regulatory oversights for all species that are listed, proposed for listing, or are candidates for listing under the ESA; see the Special Status Species section. The USFWS also administers the Bald and Golden Eagle Act and the Migratory Bird Treaty Act, which protects eagles as well as migratory bird species whether they are hunted (e.g., waterfowl) or not (e.g., songbirds).

2.4.8.1 Regional Context

BLM-administered lands contain a variety of habitats that possess the biological and physical attributes important in the life cycles of many wildlife species. The diversity of habitat provides important areas for breeding, birthing, foraging, wintering, and migration. As with all ecological systems, the Great Basin fauna is strongly interconnected with the flora present in the planning area, and characterized by wildlife habitats that vary in vegetation types, water resources, geology, topography, and climate. Elevations in the planning area range from 4,750 feet to 10,400 feet, which support habitats including coniferous forests, juniper woodlands, aspen stands, mountain shrub, canyons and rim rock, badlands, sagebrush-steppe shrublands, grasslands, and wetland/riparian areas. Wildlife species have unique inter-relationships, which link assemblages to one another on a landscape and to specific habitats within the landscape.

Wildlife species are typically described by their vertebrate class: mammals, birds, reptiles, and amphibians. Mammals and birds are further described as either game or non-game species. Emphasis is placed on species that are of particular interest for hunting and photography/viewing, as well as on species or groups of species that serve as indicators of ecosystem health or management activities. Data is available from WGFD annual reports on population objectives and estimates, population indices, and harvest statistics.

2.4.8.2 Resource Characterization

Indicators

Important indicators of wildlife habitat come from population age and structure (males, females, young), species recruitment and harvest rates, wildlife observations, presence or absence of disease, habitat quality (such as compliance with the SHR and the PFC ratings), and gain or loss of significant habitats. The listing of species as threatened or endangered, as Wyoming BLM sensitive species, or as species listed on WGFD's "Species of Greatest Conservation Need" raises issues about the role BLM habitat management had in the listing. Impacts to wildlife and their habitats come from a variety of resource uses including recreation, livestock grazing, mineral development, and ROWs activities.

Current Condition

In general, wildlife habitat is a function of factors that impact vegetation, such as soil disturbing activities, invasive weeds, and grazing/browsing. The portions of the planning area that do not meet PFC or SHR are less supportive of wildlife. Soil-disturbing activities and even human presence have degraded and fragmented habitat. These human caused effects are discussed in other sections but human caused changes impact all wildlife to varying degrees.

Game Species

Big Game: Big game species include pronghorn, mule deer, white-tailed deer, elk, moose, and bighorn sheep. The vast majority of the planning area is big game habitat, and includes some seasonal ranges that are of extreme importance to the survival of herds (Maps 26 and 27). BLM's management of the multiple uses occurring on the public lands including wildlife habitat management has significant influence upon the well-being of big game and other wildlife. The BLM routinely consults and coordinates with the WGFD in issues concerning habitat quality and carrying capacity for big game. In addition, the BLM continues to consider requests by the WGFD, USFWS, and other stakeholders interested in the reintroduction or augmentation of native big game or other species into suitable habitat.

WGFD's big game herd management objectives are based on herd units. Boundaries of the herd unit areas are set up to encompass all of the seasonal ranges and habitats or special life

function areas (calving and lambing areas, etc.) utilized by a more or less discreet population or herd. The intention is to incorporate the herd unit within its biological boundaries. Since there will always be some interchange of animals between adjacent populations and use patterns by portions of populations change over time, these boundaries are not necessarily perfect or permanent, but represent the best data presently available.

Game populations are managed based on habitat condition and the quality of animals being produced. Population levels are linked to a variety of factors including vegetation quality and quantity, habitat fragmentation, migration corridor quality, type and degree of disturbance and weather patterns and trends such as prolonged drought. Big game populations are managed largely by hunting. Each herd unit may incorporate one to several hunt areas depending upon the need for different harvest management strategies on different portions of the population.

Additional information on herd populations, including trend data, is available from the WGFD online.

Management challenges for big game species include poor habitat conditions, fire management, drought, increased development and urbanization, habitat fragmentation, OHV use, disease, and the impacts of grazing on the frequency, quality, and composition of key forage species. The BLM and the WGFD continually coordinate and evaluate actions affecting herd units and habitat conditions to determine appropriate management direction.

Pronghorn, mule deer, and elk are common year-round throughout the planning area, whereas moose and bighorn sheep are found in limited areas. Moose are found primarily in the riparian habitats along the Sweetwater River, Wind River, and Popo Agie River corridors. Bighorn sheep are predominantly located in the Whiskey Mountain and East Fork areas near Dubois, although small populations occur in the Sinks and North Fork Canyons near Lander and on Green Mountain. White-tailed deer populations are expanding, but are still fairly limited to habitats along water courses near agricultural fields.

Table 2-38 provides herd population information. More information including trend data is available at the WGF sebsite, gf.state.**wy**.us.

Table 2-38. Herd Units, Acreages, and Population Estimates in the Planning Area

Big Game Species	Herd Unit Name	Total Herd Unit Acres	Herd Unit Acres in Planning Area	Percent of Herd Unit in Plan-ning Area	Herd Unit acres on BLM in Planning Area	Percent of Herd Unit on BLM in Planning Area	Herd Unit Population Objective	Herd Unit Population 2005	Herd Unit Population 2007
Pronghorn									
	Badwater	648,299	407,181	63	269,915	42	3,000	3,900	3,645
	Beaver Rim	2,618,700	2,422,184	92	1,590,126	61	25,000	25,900	24,504
	Copper Mountain	1,458,546	14,155	1	5,419	1	4,800	5,000	5,152
	North Ferris	328,978	21,968	7	10,478	3	5,000	4,800	5,200
	Project	1,949,591	1,949,292	100	258	< 1	400	308	288
	Rattlesnake	630,441	37,149	6	21,504	3	12,000	Unknown	Unknown
	Red Desert	2,181,405	469,685	22	411,393	19	15,000	12,400	13,200
	Sublette	6,850,689	87,467	1	29,080	1	48,000	49,100	62,200
	Wind River	796,952	790,994	99	36,781	5	400	Unknown	627
	Total		6,200,075		2,374,954				
Mule Deer									
	Beaver Rim	831,894	712,714	86	547,696	66	2,600	900	1,150
	Chain Lakes	699,791	22,731	3	22,089	3	500	500	480
	Dubois	1,232,962	791,750	64	36,833	3	10,000	7,900	7,085
	Ferris	783,489	21,965	3	10,479	1	5,000	2,700	3,288
	Project	1,953,011	1,952,714	100	81	< 1	500	402	480
	Rattlesnake	825,740	152,671	18	107,716	13	5,500	4,700	4,540
	Southwest Big-horns	1,953,173	420,324	22	275,320	14	28,000	25,900	26,455
	South Wind River	1,238,837	1,085,162	88	575,338	46	13,000	10,200	10,267
	Steamboat	2,562,699	29,234	1	27,714	1	4,000	4,000	4,520*
	Sublette	3,901,897	27,281	1	0	0	32,000	28,900	31,241
	Sweetwater	1,015,088	987,151	97	771,693	76	6,000	5,800	5,643
	Total		6,203,697		2,374,959				
White-tailed Deer									
	Bighorn Basin	8,177,677	277,852	3	5,516	0	No Objec-tive	Unknown	Unknown
	Central	9,230,982	152,671	2	107,716	1	No Objec-tive	Unknown	Unknown
	Total		430,523		113,232				
Elk									
	Ferris	797,724	21,991	3	10,489	1	350	500	510
	Green Mountain	1,774,154	1,627,184	92	1,252,837	71	500	1,300*	Unknown
	Jackson	1,119,001	24,148	2	0	0	11,000	12,500	12,881
	Rattlesnake	810,866	152,564	19	107,660	13	200	Unknown	Unknown
	Shamrock	699,943	22,762	3	22,119	3	75	130	120
	South Bighorn	3,251,163	406,015	12	273,021	8	2,900	3,300	5,450
	South Wind River	1,519,564	985,502	65	484,405	32	3,300	4,000	3,696
	Steamboat	2,529,713	201,885	8	185,251	7	1,200	1,250	1,300
	Green River	530,153	3,055	1	0	0	2,500	2,300	2,452
	Wiggins Fork	2,771,646	2,765,470	100	36,924	1	6,000	6,000*	5,974
	Total		6,210,576		2,372,706				
Moose									

Table 2-38. Herd Units, Acreages, and Population Estimates in the Planning Area

Big Game Species	Herd Unit Name	Total Herd Unit Acres	Herd Unit Acres in Planning Area	Percent of Herd Unit in Plan-ning Area	Herd Unit acres on BLM in Planning Area	Percent of Herd Unit on BLM in Planning Area	Herd Unit Population Objective	Herd Unit Population 2005	Herd Unit Population 2007
	Dubois	798,105	792,204	99	36,832	5	400	Unknown	Unknown
	Jackson	962,708	23,975	2	0	0	3,600	1,500	1,691
	Lander	2,712,810	2,095,132	77	1,367,605	50	450	327	315
	Sublette	3,717,236	3,239	0	0	0	5,500	4,000	4,629
	Total		2,914,550		1,404,437				
Bighorn Sheep									
	Franc's Peak	1,797,318	494,160	27	17,003	1	1,360	1,400	1,386
	Jackson	1,065,568	23,940	2	0	0	500	400	406
	Temple Peak	770,471	511,807	66	40,040	5	250		40
	Whiskey Moun-tain	898,151	347,238	39	8,290	1	1,350	650	681
	Yount's Peak	849,174	172,297	20	53	0	900	900	923
	Total		1,549,442		65,386				

Source: WGFD 2005 and 2007 Job Completion Reports, WGFD 2007 *Estimated using modeling

Table 2-39 identifies the acres of various seasonal habitats by big game species on BLM lands.

Table 2-39. Big Game Seasonal Habitats

Seasonal Range	Pronghorn	Mule Deer	White-tailed Deer	Elk	Moose	Bighorn Sheep
Spring/Summer/Fall	560,593	236,489		62,663	101,739	22,176
Yearlong	496,348	545,944		92,384	11,270	
Winter/Yearlong	906,318	427,070		102,541	13,200	5,704
Winter		843		48,196	17,759	
Crucial Winter/Yearlong	351,178	200,407		38,355	38,100	9,151
Crucial Winter				28,570	5,429	
OUT*	59,699	963,372	114,413	1,986,068	1,214,563	38,235
Severe Winter Relief				13,092		
No Herd Unit			2,259,725	2,262	972,072	2,298,866
Parturition Areas**				22,708		4,803
TOTAL BLM ACRES	2,374,136	2,374,125	2,374,138	2,374,131	2,374,132	2,374,132

Source: WGFD 2005

* OUT These areas do not contain enough animals to be important habitat, or the habitats are of limited importance to the species.

** Parturition areas overlap other seasonal ranges

***Trophy Game*:** Mountain lion, black bear, grizzly bear, and gray wolf are classified as trophy animals by the WGFD. Grizzly bears and wolves are discussed in the Special Status Species sections. Mountain lions are typically found in remote areas having dense cover and rocky, rugged terrain habitats where deer, their primary prey base, are present. In the planning area, mountain lions are predominantly found along the Wind River front, in the Dubois area, and the Bridger, Rattlesnake and Green Mountains; however, mountain lions have been observed throughout the planning area, as most of it supports suitable deer habitat. The WGFD determined season for mountain lions typically runs from September through March. Black bears are found primarily in coniferous forests, aspen and riparian shrub habitats, and in mountain grasslands. The species has limited habitat here and is predominantly found along the Wind River front and the Dubois area. Wyoming has both a spring and fall black bear hunting season.

***Furbearers*:** Badger, beaver, bobcat, mink, muskrat, marten, and weasel are found throughout the planning area. Population estimates are available only on a statewide basis. Trapping seasons have been established for most furbearers with badgers being taken year-round; others are typically trapped in winter (bobcat, muskrat, mink, and weasel). Trapping dates vary for beaver and marten. The challenge of managing habitats for furbearing species has been exacerbated by the number of trapped furbearers permitted. Beaver, for example, were once far more and the reduction in their numbers has had an impact on the health of the riparian/wetlands communities they formerly occupied.

Muskrats and mink are usually associated with streams, lakes, and riparian habitats. Martens inhabit coniferous forests and badgers are common throughout sagebrush/grasslands.

Beaver are common in perennial waters where willows and aspen are plentiful. Major beaver habitat areas are found associated with streams of the Upper Sweetwater, Beaver Creek, and Twin Creek drainages, streams on the Lander Slope including the Popo Agie drainages, and streams on Green Mountain. Although there is some evidence that excessive trapping in the 1970s and 1980s contributed to a decline in the beaver population, habitat loss and poor quality riparian communities have also led to lower beaver numbers in many areas.

Canada lynx is classified as a protected species in Wyoming and is listed as threatened species under the ESA. Canada lynx is further discussed in the Special Status Species section.

***Small Game*:** Common species include cottontail rabbit, snowshoe hare, fox and red squirrels. These species are found throughout the planning area and are hunted during the fall and winter. There are no estimates of population size, mortality, or natality rates for these species. Cottontail rabbits, fox and red squirrels are found throughout the planning area and snowshoe hare are found in the transition area between mountain shrub habitats and coniferous forests.

Game Birds: Game birds are typically described as either upland or waterfowl. Upland game birds include greater sage-grouse, blue grouse, ruffed grouse, chukar partridge, gray partridge, pheasant, sand hill crane, and mourning dove. Greater sage-grouse are discussed in more detail under the Special Status Species section.

Blue grouse and, occasionally, ruffed grouse, are found in preferred habitats on Green Mountain and on the east end of Crooks Mountain. The forest-woodland edges near South Pass, the Lander Slope, and the upper Wind River Valley (Dubois) also support appreciable stands of preferred habitat and limited populations of blue and ruffed grouse.

Chukar and gray partridges are most abundantly found among the rolling breaks and sparse grasslands near Lander. The highest quality habitat is found in the Sheep Mountain area along Twin Creek, in and adjacent to the canyons in the Lander Slope and Red Canyon areas, and along the south slopes and drainages of the Lysite and Copper Mountains. Pheasants are limited primarily to areas near agricultural fields in the Riverton, Lander, and Shoshoni areas.

Many species of waterfowl occur in the planning area. Their abundance varies from year to year depending on the availability of water. The entire planning area is part of the Central Flyway (one of four major north-south routes for migratory birds, generally avoiding mountain ranges or areas with limited food availability). Water sources- natural lakes, streams, and human-made reservoirs-are important resting areas for a variety of ducks, geese, and shorebirds. Waterfowl species include ducks, geese, coots, snipe, and rails. Hunting seasons for waterfowl are set by the WG&F within season frameworks established by the USFWS.

Predatory Animals: Coyote, red fox, raccoon, porcupine, skunk, and jackrabbit are classified by the State as predatory animals. Predators are not protected by seasons or bag limits; consequently any number of animals can be hunted or trapped at any time. Predator control is conducted on public lands by USDA APHIS-Wildlife Services with little input from the BLM. These predator species are found throughout the planning area. Populations tend to fluctuate with the availability or prey species and no population estimates exist.

Non-game Species

***Raptors*:** Raptor species include osprey, red-tailed hawk, Swainson's hawk, ferruginous hawk, northern harrier, goshawk, Cooper's hawk, sharp-shinned hawk, rough-legged hawk, golden eagle, bald eagle, merlin, American kestrel, peregrine falcon, prairie falcon, and numerous owls including great-horned , long-eared, short-eared, great gray, burrowing, barn, western screech, northern pygmy, boreal, and northern saw-whet. Raptors are found in a variety of habitats. They are sensitive to environmental disturbance and occupy an ecological position at the top of the food chain; thus, they act as biological indicators of environmental quality.

The nesting season is considered the most critical period in the raptor life cycle since it determines population productivity, short-term diversity, and long-term trends. Most species have specific nest site requirements which are key factors in nest site selection and in reproductive success. These include nesting strata, available prey base and nest site disturbance. Nests can occur in a myriad of habitats, including steep cliffs and rock ledges, trees, and on the ground. Human-made structures such as barns, utility poles, tanks, etc. are also used as nesting habitat. Golden eagles, peregrine falcons, and prairie falcons usually build their nests on steep cliffs and rock ledges, but other species such as red-tailed hawks and great-horned owls often build on these sites, as well. Ferruginous hawks usually nest on rock outcrops or promontories, tall sagebrush, or in trees where numerous small mammals provide abundant prey base.

Several species of raptors typically nest in trees and most known raptor nests within the planning area are constructed in cottonwood trees. Swainson's hawks, red-tailed hawks, American kestrels, great horned owls, and screech owls prefer the more open plains area and usually nest in trees along drainages. Cooper's hawks, sharp-shinned hawks, and goshawks (a BLM-listed Sensitive Species), long-eared owls, and northern saw-whet owls usually nest in lodgepole pine stands, mixed conifer forests, or aspen woodlands. Because of the dense canopy cover, these nests are difficult to find. Consequently, intensive inventories of these species have been limited to areas targeted for habitat alteration.

Several species of raptors are ground nesters. Short-eared owls typically nest in tall grasslands with sparse sagebrush or shrubland cover. Burrowing owls, another BLM Sensitive Species, nest in abandoned prairie dog burrows and feed on prairie dogs and other rodents. Northern harriers also are ground nesters but are generally nest in riparian or marsh habitats.

Raptor habitat protection has been directed towards long-term nest site protection and minimizing habitat disturbance around nesting sites during the critical nesting period. Raptor nesting stipulations have been applied to surface-disturbing activities. Current stipulations consist of buffer zones around nests, season restrictions on human activities and "raptor proofing" of electrical transmission facilities to prevent electrocution. Habitat management has been limited to maintaining upland range sites in satisfactory ecological condition. Range management practices that maintain ranges in good condition will provide an adequate prey base for raptor species.

***Mammals*:** Non-game mammals include species such as mice, rats, voles, ground squirrels, shrews, bats, and prairie dogs; these species are found throughout the planning area. Bat surveys have been conducted in suitable caves and mines. There are several known maternity roosts and hibernacula identified in the planning area, primarily the historic mines in South Pass and the Copper Mountains. No estimates of population size are available for any of these species. Several of these species are further discussed in the Special Status Species section.

***Neotropical Migrants*:** This category includes shorebirds, water birds, and songbirds; a myriad of these species are found throughout the planning area. Every vegetation community type supports various bird species. The community typically having the most diverse array of species is the riparian-wetlands. Population estimates have not been established for many of these species; however, the WGFD has been conducting breeding bird surveys that provide limited information. Several species are further discussed under the Special Status Species Section.

There are four designated Important Bird Areas (IBA) found in the planning area. These areas were established by Audubon Wyoming to recognize areas that provide essential habitat for one or more species of bird. The areas include Ninemile Draw, Red Canyon Ranch, Red Desert, and Sweetwater River Project. The Ninemile Draw and Red Desert IBAs identify habitats for sagebrush-obligate species and the Red Canyon Ranch and Sweetwater River Project IBAs focus on habitats for riparian migrants.

***Reptiles*:** Species include greater short-horned lizard, northern sagebrush lizard, eastern yellow-bellied racer, bullsnake, intermountain wandering garter snake, and prairie rattlesnake. These species are found throughout the planning area, but typically occur in the more arid shrub-steppe and grassland habitats. No estimates of population size are available for any of these species. Several reptile species are BLM-listed Sensitive Species and discussed below.

***Amphibians*:** Species include tiger salamander, plains spadefoot toad, great basin spadefoot toad, boreal toad, northern leopard frog, spotted frog, and boreal chorus frog. Several species occur on the Wyoming BLM Sensitive Species list due to reduction in suitable riparian/wetland habitat. No estimates of population size are available for any of these species. Amphibians that are listed on the Wyoming BLM Sensitive Species list are further discussed below.

Trends

Many wildlife species dependent on healthy riparian and sagebrush communities are on a downward trend due to loss of habitat and declining habitat conditions. Many of these habitats are currently in degraded condition or have been affected by human activities that have fragmented or altered these habitats. With the substantial increase in permitted surface disturbing activities (wells, roads, pipelines, mines, livestock facilities) combined with increases in non-permitted activities such as motorized recreation, there has been an increase in habitat loss, fragmentation, and the encroachment of invasive plants. Many disturbances involve permanent structures or alterations to habitat that result in long-term degradation or permanent habitat loss. Reclamation success of disturbed areas has been limited so habitat has not been restored on these sites and adequate habitat restoration has occurred at relatively few sites.

There has been a substantial increase in weeds adjacent to private agricultural fields, in developed oil and gas fields and along waterways, roads, and pipelines. Invasive, non-native species

have limited to no habitat value for wildlife but frequently colonize distubed areas and negatively impact adjacent native vegetation communities. The shrub component of the plant community takes a decade or more to establish, and many reclamation efforts that were conducted 20+ years ago have yet to yield established shrubs communities.

Lands adjoining BLM lands are increasingly developed. Many of these subdivisions are in the foothills of Lander and Dubois and lie in crucial winter range, particularly for mule deer. These developments with the associated houses, fences, roads, vehicles, pets and human activity is forcing mule deer into less suitable areas with poor forage and cover attributes. An overall reduction in the numbers of mule deer has occurred throughout Wyoming.

The increase in human activities has also affected winter ranges for elk, bighorn sheep, and pronghorn to some degree. Public lands that had limited use in past decades are now experiencing human use and activities throughout the year. In recent years, the popularity of non-consumptive uses like wildlife viewing and photography has increased dramatically.

Changes in livestock management to improve rangeland and riparian conditions has improved habitat conditions for some wildlife species, but has adversely affected others. There has been an increase in the number of water developments and fences used to improve livestock distribution, which has also increased livestock use in areas that wildlife have depended on to meet their forage and cover needs. Constructing fences has altered the way wildlife utilize an area by disrupting natural movement patterns between seasonal ranges.

There has been a loss of wildlife habitat due to weed infestations, particularly along waterways and roads, in the oil and gas fields, and adjacent to private agricultural fields. Invasive, nonnative species typically have negatively impacted many vegetation communities and have limited to no habitat value for wildlife.

OHV use has increased on public lands and many trails are illegally developed as riders pioneer routes into new areas. These trails have fragmented and damaged habitat, allowed motorized vehicles into wildlife areas, and has resulted in the spread of invasive species.

Game Species

***Big Game*:** Species that are dependent on woody plant communities (pronghorn, mule deer, and moose) are below historic population levels due to declines in habitat quality and quantity (although WGF attributes other factors as contributing to declining moose populations.) Pronghorn numbers are currently stable to increasing although well below herd objectives, primarily due to more conservative hunting seasons established by WGFD.

The BLM does not have data as to the amount of habitat lost since the 1987 RMP and has very little data about the success of reclamation. The BLM monitors reclamation for purposes of

bond releases not as a measure of habitat restoration. Once the bond is released, generally after 70% vegetation has been established, there is no continuing monitoring. Many of the older disturbances have not been reclaimed and some mine pits, while reclaimed, no longer support vegetation or habitat.

BLM now requires large scale oil and gas projects to determine existing vegetative conditions prior to authorizing full field development. In the absence of identified non-human caused impacts to big game, authorized activities must be considered the most likely contributor to reduced numbers.

Elk and bighorn sheep, which require herbaceous plants for forage and cover, generally have stable to increasing populations. Elk numbers have increased significantly in recent years and are above historic levels. Bighorn sheep numbers in the Lander area have declined to almost a nonexistent population. The number of bighorn sheep in the Dubois area south of the highway has remained stable in recent years but are well below historic levels. The population north of the highway has remained stable and is at historic levels.

Pronghorn and mule deer populations have generally been below objective numbers for several years. This is attributed to habitat quality of the shrub component on many ranges. Habitat condition of many of the Wyoming big sagebrush communities associated with pronghorn and mule deer winter ranges is declining due to poor plant recruitment and old age. Known reasons for this decline include overgrazing and drought; woody plants require deeper penetrating moisture than herbaceous plants. The role of fire is less clear, since Wyoming big sagebrush may not become re-established after fire. There has been an increase in juniper establishment in many key mule deer habitats, making them less desirable for use. Declines in overall habitat quality have affected the reproduction and survival rates resulting in less recruitment of young.

Moose populations are stable to declining and well below historic levels and herd objective numbers. The main reason for lower numbers is primarily due to the poor condition of many riparian-wetland areas because of drought and livestock overgrazing. Reduced aspen, cottonwood, and willow health in riparian and uplands also have negative impacts to moose. Lower numbers of beaver also contribute to poor riparian health. Other contributors to lower moose populations include diseases and parasites and increased mortality from vehicles, fences, and predators. The declines mirror the loss of sagebrush habitat discussed in the vegetation section.

White-tailed deer are expanding into new areas, but it is unclear if the population is actually increasing or if the population is spreading into other habitats.

Elk numbers have been generally at or over objective numbers for all herd units in the planning area. Elk largely utilize grass forage, which has not been quite as impacted from the drought as

woody plants. Herds that migrate from high elevation summer habitats to lower elevations winter habitats have been the least affected by drought conditions.

***Trophy Game*:** Black bear populations are fairly stable and mountain lions appear to be expanding into a few new areas. Due to the secretive nature of black bears and mountain lions, population estimates are difficult to obtain. Grizzly bear and gray wolf populations are increasing as evidenced by delisting efforts.

Furbearers: It is expected that beaver, mink, and muskrat populations are declining the area due to degraded riparian conditions and drought. Water volumes have decreased in many riparian systems from a loss of water storage capability and from a lack of precipitation. Beavers are no longer present in some streams that historically supported colonies and many beaver dams are not being maintained. Distribution of mink and muskrat populations is not available but it is expected to have decreased due to a loss of water in some riparian systems. Beaver are dependent on aspen, willow and cottonwood trees to build and maintain their dams and lodges. Conifer trees have invaded many riparian areas adjacent to streams due to a drop in the water table and drier conditions at these sites. Conifers take up available water and space, both surface and subsurface, choking out aspen, willow, and cottonwood communities.

***Small Game*:** Rabbit and squirrel populations are cyclic, so trend data is difficult to determine. Populations generally appear to be stable.

***Game Birds*:** Blue and ruffed grouse habitat condition is not adequately documented but conditions are known to vary from poor to excellent in different sites. In areas with established populations, chukar populations appear to fluctuate primarily with the severity of winter conditions and weather conditions during spring nesting. Greater sage-grouse populations, which are discussed further in the Special Status Species section, declined significantly during the 1990s, but rebounded to near historic levels in the early to mid 2000's. WGF has determined that over the past several years this trend has reversed again and numbers are declining (WGF comments, May, 2008).

Generally, waterfowl populations are stable on large waterbodies that have consistent water. Duck populations remain 11% above long-term averages. Additionally, all species of geese have had increasing population trends over the last ten years (USFS, 2008). Drought has affected the availability of water in ponds, small reservoirs and streams historically used to support broods reducing avialbility of habitat. The trampling of riparian/wetland vegetation and the removal of nesting cover for waterfowl and shorebird species has likely led to reproductive rates that below potential for some species.

Predatory Animals: Coyote populations are typically consistent with prey cycles. When rabbit and ground squirrel populations are high, coyote populations are also high. Red fox popula-

tions appear to be expanding into new areas. It is expected that populations for skunk, raccoon, and porcupine are static to increasing.

Non-Game Species

***Raptors*:** Golden eagle populations have increased and peregrine falcons are now well established in the North Fork Canyon area due to successful reintroduction efforts. Ferruginous hawks appear to be on a decline as indicated by the large number of previously active nests that are now inactive. Bald eagles are being observed more frequently and with the delisting of the species, it is assumed their population numbers are continuing upward.

***Mammals*:** Non-game mammal species that are dependent on woody plant communities are generally declining in numbers due to declines in habitat quality and quantity. Species that require herbaceous plants for forage and cover have stable to increasing populations. No or very little population data exists on many of these species, so the trend is undetermined.

***Neotropical Migrants*:** Species that are dependent on woody plant communities are generally declining in numbers due to declines in habitat quality and quantity. Species that require herbaceous plants for forage and cover have stable to increasing populations. Due to the declining condition of many riparian areas, species dependent on these areas for all or part of their life cycle have been likely impacted. Populations of sagebrush obligate species have been declining as indicated by the number of species appearing on BLM's Sensitive Species list and WGFD's Species of Greatest Conservation Need list. Juniper obligate species have generally seen stable to upward trends based on the increase in amount of juniper present throughout the planning area. Breeding Bird surveys are used to identify trends by species.

***Reptiles*:** It is estimated that the trend for reptiles is downward due to the overall increase in habitat alteration and loss, but there is little to no population information for these species.

***Amphibians*:** The declining condition of many riparian areas, combined with drought, has adversely affected amphibian populations. Populations are on a downward trend as evidenced by the number of amphibian species that are on the Wyoming BLM Sensitive Species List and the WGFD's Species of Greatest Conservation Need list.

Forecasts

Under current management, the forecast for wildlife resources is predicted to decline. Surface disturbing activities such as energy development and utility corridor installation will result in increased habitat loss and fragmentation. Disturbance areas are not being reclaimed adequately and quickly enough to prevent long-term habitat loss. Most reclamation activities are focused around site stabilization and not returning sites to usable habitats. This is particularly true for wildlife species dependent on woody species to meet all or part of their forage and cover requirements. Seed mixes used for reclamation activities typically focus on planting grass species. In recent years, BLM has added forbs to seed mixes, but has been reluctant to include a variety of shrubs due to poor establishment rates. Cost has been a factor, as shrub seeds are not as readily available as grass seed and adding shrubs may necessitate multiple plantings. Reclamation requirements need to be strengthened in order to reduce the loss of habitat.

Road densities and development "footprints" should be held to a minimum and unneeded roads reclaimed to prevent or mitigate loss of habitat. Wildlife species with small home ranges will be impacted by reclamation success more than species with larger home ranges. Population declines may be proportionally higher for those species that are less adaptable or more sensitive to habitat changes. Habitat improvements and enhancements can help offset these trends to some degree, but cannot serve as a substitute for important habitat protection.

If habitat losses increase, there may be increased damage to private property due to the reduction in quality public land habitat. Wildlife, particularly big game, trophy game, and small game species will utilize all habitats regardless of ownership, but changes in private land uses may decrease habitat values and put more pressure on public lands to provide wildlife habitat especially for big game species. Combined, these changes would reduce the amount of habitat available for wildlife and would result in reduced numbers for many species. There could also be declining revenues for wildlife management from a reduction in number of hunting opportunities offered by the WGFD. The number of hunter days and individual hunting experiences will likely continue the gradual declines of the past decade for many game species.

Current wildlife protection measures protect species primarily during the birthing and winter periods which is when wildlife are typically the most sensitive to disturbance. These protection measures are seasonal protections during specific times of the year, but do not prevent habitat loss outside these periods. For example, surface disturbing activities are restricted during the nesting period in identified greater sage-grouse nesting habitat, but after this period is over, surface disturbing activities can proceed. This can result in habitat being altered or removed during the non-critical periods and not being available when birds return to nest the next year.

Surface-disturbing or disruptive activities may also be prohibited on crucial winter range during the winter months, but once the period is past, disturbance activities may degrade or remove

the habitat needed for winter survival. Many species' breeding, birthing, and winter habitats are historic and determined by specific habitat characteristics, so many of these species cannot go elsewhere. Unless there is management direction to limit the amount of habitat altered on important habitats regardless of time, wildlife may return to these seasonally important areas to find them unsuitable for their needs. Continued and cumulative loss/degradation of critical habitats would result in decreased natality rates and increased mortality rates.

By far the greatest impact on raptor production and population trends is human disturbance at the nest site during critical periods. Incubation is the most critical period. When disturbed, raptors are much more likely to desert their nest during incubation than after hatching. Once eggs hatch, raptors exhibit a strong parental instinct and will usually not desert their young. A second critical period is fledging. If the nest is disturbed during fledging, it could cause the young to leave the nest before they are able to fly. Consequently, the fledglings fall to the ground where they are easy prey for predators. Management strategies that reduce the level of human activity near an occupied nest will reduce the risk of these negative impacts.

Current management directs increased management to improve rangeland vegetative conditions where necessary. One consequence of this management direction has been an increase in the number of livestock control fences recently permitted on public lands. Although current policy requires the use of "wildlife friendly" fencing, it is expected that requests for additional fencing will continue with loss and fragmentation of wildlife habitat. Increasing fencing across historic movement/migration routes would affect wildlife's ability to access their seasonal habitats. There are no currently identified historic migration routes but all wildlife movement is impacted by human activities including road and fence building.

With increases in wildlife habitat alteration, fragmentation, or loss exists the potential that additional wildlife species may be listed under the ESA or added to BLM's Sensitive Species list and/or the WGFD's list of Species of Greatest Conservation Concern.

A substantial, but not quantified, impact to wildlife is the likely loss of forest habitat due to pine bark beetle infestation, potentially accompanied by catastrophic wildfire. There will be impacts from the loss or change in forest communities to wildlife dependant on these habitats. Some species, such as certain birds, will benefit from beetle kill. Some species of wildlife may also benefit from fire, but most others will see negative impacts.

Climate Change

Changing climate has the potential to dramatically alter habitat. Wetter conditions could result in sagebrush communities turning into grasslands or becoming more forested. Drier and warmer conditions could lead to a more desert vegetative community composed of xeric and saline adapted vegetation. Coniferous forests may retreat to higher elevations, which would allow for

more sagebrush below the forest and a decrease in alpine areas above. The likely effects would be less available habitat for alpine species and more available habitat for xeric species.

Species diversity and abundance are lower for xeric habitats when compared to the sagebrush and forested ecosystems; thus species diversity and abundance may become lower if the climate is drier and warmer. Species may be lost from this region once habitat quality and quantity becomes limiting. Smaller fauna such as migratory birds, reptiles, amphibians, pollinating insects, bats, and rodents may be affected first. The resulting effects on these species would then affect larger animals, which prey upon these smaller animals or graze in ecosystems maintained by an interrelation of ecological structure and process that include these animals. Potential changes in vegetation may alter the availability of plants and composition within these habitats. Adjustments in forage allocation for livestock and wild horses may become necessary in the future to maintain viable wildlife populations.

Under drought conditions, grasslands and rangeland could expand into previously forested areas. Additionally, sagebrush habitats may decline sharply throughout the region and be replaced with grasslands as herbaceous vegetation requires less precipitation than shrubs. Increasing CO_2 concentrations can also lead to preferential fertilization and growth of specific plant species, such as invasive species like cheatgrass. New competitive advantages for some species could lead to changes in the composition of rangeland vegetation.

Climate has changed throughout history; however, there is concern that because climate *patterns* are changing, the results may be less predictable than in the past. Climate change is unlikely to mean that as average temperatures increase, habitat for a particular species moves north. A more likely scenario in the Rocky Mountain north is that warmer temperatures will be accompanied by different precipitation patterns leading to gradual changes of ecosystems which favor non-native species. These changes will have profound impacts to wildlife habitat, particularly those species such as Shiras moose that are at the edge of their habitat range.

Impacts to habitat caused by changing climate are cumulative to the impacts associated with on the ground human activities, increasing the impacts to wildlife. It is expected that habitat loss and existing downward trend would continue with forecasted climate changes.

Key Features

There are several key areas that should guide land use allocation or management decisions. These areas include:

Designated birthing and winter range habitats – These areas are typically used each year and are usually the most limited in terms of size and availability. Protection of these habitats from disturbance throughout all phases of project development is essential to maintaining viable and robust wildlife populations. In most parts of the planning area, current management focuses

primarily on protecting animals using these habitats during the birthing or winter period and not protecting the habitat itself. Management decisions need to consider protection of these historical habitats to ensure they are available and are in good condition when animals return each year. Identification and prioritization of key habitat improvements should be encouraged and within these areas, treatments, prevention of habitat fragmentation, and limitation of impacts from resource uses such as recreation and livestock grazing should be considered.

Whiskey Mountain bighorn sheep area – This area near Dubois supports one of the largest and most visible bighorn sheep herds in North America. BLM lands are crucial winter range for bighorn sheep and are cooperatively managed by an Interagency Technical Committee composed of BLM, WGFD, and USFS biologists. The BLM has completed two land exchanges in this area to acquire and protect crucial bighorn sheep habitat. Due to the area's local and national importance and to protect the significant monetary investments made by BLM, WGFD, USFS, the town of Dubois and the State of Wyoming, the area should be a priority when making land use decisions. The area is currently an ACEC and is closed to oil and gas leasing and has been withdrawn from surface entry and mining; however, the withdrawals are not permanent and are currently scheduled to expire in 2010 and 2018. There is an existing winter closure and the majority of the area has been retired from livestock grazing, but grazing is still permitted within the core winter habitat for bighorn sheep on BLM Ridge. The transmission of disease from domestic goats used as pack animals and domestic sheep is a concern in any area managed for bighorn sheep. This concern was recently addressed on the adjacent Shoshone National Forest when the Foundation for North American Wild Sheep negotiated the buyout of an existing pack goat permit to ensure protection for the Whiskey Mountain bighorn sheep herd.

East Fork elk winter range – This area north of Dubois is recognized as one of the most outstanding "managed" elk winter ranges in the west. As many as 6,000 to 7,000 elk summer on forest lands and migrate south to winter in this area. This area provides crucial winter range for elk without the need for supplemental feeding which is unlike many elk herds of this size in the state. This winter range supports a free-ranging elk herd which reduces the potential for disease and resource damage and also provides crucial winter range for elk as well as year-round habitat for a smaller group of bighorn sheep.

This area is composed of two Wildlife Management Areas administered by the WGFD. The BLM-administered lands within the Inberg/Roy Wildlife Habitat Management Area have been designated an ACEC; however the lands under BLM administration within the Spence/Moriarity Wildlife Management Area are not. In addition, the Dubois Badlands (including the WSA) contains important wildlife habitat as well as scenic values. All of these lands should be a priority when making land use allocations. Current management for the ACEC lands includes no-leasing for oil and gas, withdrawals for mineral exploration and closed to livestock grazing. The WGFD

maintains a winter closure that affects BLM lands within the ACEC. The same type of management decisions need to be made for the BLM lands that are not currently within the ACEC.

Lander Slope and Red Canyon areas – The eastern slopes of the Wind River mountains near Lander are crucial winter range for elk and mule deer. These wind-swept slopes are essential for the survival of these herds as they provide the necessary winter forage that is not available on adjacent areas due to deep snows. Without this habitat, elk and mule deer would be forced onto private lands to meet their forage demands, creating conflicts with landowners and domestic livestock. The WGFD's Wildlife Habitat Management Area in Red Canyon is for wintering elk. The Lander Slope area has seen a substantial increase in subdivisions of private lands. BLM must consider the value of public lands as habitats to wildlife and the impacts from increased urbanization of the area when making land use allocations for the area. Because of the areas' extreme importance to wintering wildlife, two current ACECs are designated with prescriptions include a NSO stipulation for oil and gas leasing, a requirement for a Plan of Operation for mining activity, restrictions on phosphate leasing, and a winter closure of the area. Management decisions regarding these types of activities need to be considered in the RMP revision.

Green Mountain area – Both Green and Crooks Mountains south of Jeffrey City provide year-round habitat for a predominantly non-migratory elk herd. Elk primarily summer on top and on the south slopes during the summer and are fairly restricted to the north slopes during the winter months because of snow depths. Designated calving areas are identified on top of the mountain. This area experiences high recreation use and is the site of uranium exploration and development. Protection of important winter and calving habitat should be a considered when developing land use allocations. Due to the important winter habitat in this area, the crucial elk winter range is currently designated as an ACEC. Existing management prescriptions include a NSO stipulation for oil and gas leasing and a winter closure.

Riparian habitats – Actions that improve and/or maintain riparian habitats should be considered when making management decisions. Riparian areas in the South Pass, Upper Beaver Creek, and Sweetwater River Valley are important moose habitat and moose populations are currently below desired levels.

Many species of wildlife are dependent on healthy riparian habitats to provide for their necessary forage and cover requirements. The availability of clean water on a year-round basis is essential for maintaining wildlife and fish populations. Compared to all other habitats, these areas by far support the greatest diversity of wildlife and plant species. Many species of birds, amphibians, reptiles, and mammal are only found in riparian habitats.

Greater sage-grouse core areas – Areas that fall within the Wyoming Governor's identified core areas for greater sage-grouse (Map 29) should be thoroughly evaluated when making land use allocations in these areas. The planning area has been identified as supporting some of the

best greater sage-grouse habitat in Wyoming and throughout the species range (Connelly, 2004). High densities of greater sage-grouse are noted in specific areas (Map 30). Of particular importance is the area between Hudson and the Sweetwater River which contains important breeding, nesting, brood-rearing, and winter habitats, recognized as an Important Bird Area by Audubon Wyoming for greater sage-grouse. The area is mostly undeveloped bu oil and gas and mineral exploration, thus habitats are mainly intact and un-fragmented. The area has been identified as a greater sage-grouse stronghold for breeding populations in western North America and contributes significantly to the conservation of the species. Greater sage-grouse is a BLM-listed Sensitive Species and has been petitioned for listing under the ESA. Management of greater sage-grouse populations and habitats to preclude listing of the species should be a priority when making management decisions regarding land use allocations.

2.4.9 Special Status Species

The BLM is responsible for managing habitat for special status species. Special status species include those plant and animal species that are currently listed as T&E under provisions of the ESA, those proposed for listing or are candidates for listing, or those designated by the Wyoming BLM State Director as sensitive. The planning area includes potential habitat for five T&E species, 41 sensitive species, and one experimental population.

On public lands nationwide, the number of plants and animals afforded protection under the ESA has grown 300 percent within the last 15 years. Many other species are considered sensitive because they have declined in abundance and distribution to a point that warrants concern. The recognition of special status species has occurred since the 1987 Plan was completed so the current plan does not address the conservation needs of special status species. Principal considerations include management of habitat to ensure continued use by the sensitive species. Areas where other resource activities may conflict with special status species and their habitat requirements need to be identified and appropriate mitigation measures applied. Conservation measures for many special status species have been developed as a result of programmatic consultations with the USFWS.

2.4.10 Special Status Species – Plants

2.4.10.1 Regional Context

The planning area includes habitats for a variety of special status plant species. The landscape exhibits diverse climates, topography, soils, and rock cliffs and outcrops. Due in large part to their rarity and lack of comprehensive inventories, precise information regarding the location, population size, and condition of each population in the planning area is relatively unknown.

2.4.10.2 Resource Characterization

Indicators

Special status plant habitats are considered healthy if plant populations are able to maintain or increase the number of plants within a single population and the number of populations sustain or increase. Declines in numbers or populations could lead to the need to list the species.

Current Condition

Fifteen special status plant species are known or expected to occur in the planning area. Three species are listed as either threatened or endangered and 12 species are listed on Wyoming BLM's Sensitive Species list. Table 2-40A lists the planning area's special status plant species.

Table 2-40A. Special Status Plants in the Planning Area

Common Name	Status
Blowout penstemon	Endangered
Ute ladies'-tresses	Threatened
Desert yellowhead[1]	Threatened
Meadow pussytoes	BLM Sensitive
Porter's sagebrush	BLM Sensitive
Dubois milkvetch	BLM Sensitive
Nelson's milkvetch	BLM Sensitive
Cedar rim thistle	BLM Sensitive
Owl creek miner's candle	BLM Sensitive
Fremont bladderpod	BLM Sensitive
Beaver rim phlox	BLM Sensitive
Rocky Mountain twinpod	BLM Sensitive
Persistent sepal yellowcress	BLM Sensitive
Shoshonea	BLM Sensitive
Barneby's clover	BLM Sensitive

Source: Wyoming BLM Sensitive Species List

[1]Designated critical habitat for this species occurs in the planning area.

BLM manages for both known populations of sensitive species plants and suitable habitat even where populations could occur but have not been inventoried. No blowout penstemon and Ute ladies'-tresse have been identified, although both occur in the neighboring Rawlins Field Office. A small amount of potential habitat for blowout penstemon does exist south of Green Mountain. This member of the figwort family takes its name from its typical type of habitat - a "blowout" depression is a sparsely vegetated area in sand dunes caused by wind erosion. All proposed actions in or near potential habitat are evaluated for the possibility of occurrence. Ute ladies'-tresses has only been documented in the Rawlins Field Office, however potential habitat occurs within the planning area. Ute ladies'-tresses is found on moist peat, sand, silt, or gravel soils near wet meadows, springs, lakes, ponds, or perennial streams.

The planning area contains the only known population and designated critical habitat for desert yellowhead in the world. This population only occurs in an area of approximately eight acres and appears to be associated with a specific geologic formation. Although recent population inventories are lacking, this species may be trending downward due to long-term. Critical habitat for this species has been designated by the USFWS and is currently closed to vehicle traffic and is withdrawn from locatable mineral exploration and development. Grazing by domestic livestock and wildlife has not been found to be detrimental to this species.

BLM-listed Sensitive Species are described under the following habitat areas where they are known to be found.

Basin-prairie shrub, mountain-foothill shrub, or grasslands habitat

Porter's sagebrush: This sensitive plant inhabits sparsely vegetated badlands of ashy or tufaceous mudstone and clay slopes at 5,300 to 6,500 feet in elevation. Although computer modeling suggests that suitable habitat may exist across much of the planning area, this species has primarily been found in the Sand Draw and Lysite areas of the planning area.

Riparian or wetland habitats

- Meadow pussytoes: This plant species occurs in moist, hummocky meadows, near seeps or springs surrounded by sage/grasslands at 4,950 to 7,900 feet in elevation.
- Persistent sepal yellowcress: This riparian species occurs along riverbanks and shorelines, usually on sandy soils near the high water line. These species are generally protected by a prohibition on disturbance or development within 500 feet of riparian areas.

Special habitats (rocky outcrops, badlands, etc.)

- Dubois milkvetch: Known only in the area around Dubois, this species occurs near barren shale, limestone, or redbed badlands, slopes and ridges from 6,900 to 8,800 feet in elevation.
- Nelson's milkvetch: More widespread than the Dubois species, this milkvetch is found in alkaline clay flats, shale bluffs and gullies, pebbly slopes, and volcanic cinders in sparsely vegetated sagebrush, juniper, and cushion plant communities at 5,200 to 7,600 feet elevation.
- Cedar Rim thistle: Known from several sites in a number of Wyoming counties, this species prefers barren, chalky hills, gravelly slopes, and fine textured, sandy-shaley draws at 6,700 to 7,200 feet elevation.
- Owl Creek miner's candle: Considered endemic to the Owl Creek and Bridger Mountains and northern Wind River Basin, this species occurs on sandy-gravelly slopes and desert ridges on Wind River formation sandstones at 4,700 to 6,000 feet elevation.
- Fremont bladderpod: Endemic to the east slope of the Wind River Range this species may be found on rocky limestone slopes and ridges at 7,000 to 9,000 feet elevation.
- Beaver Rim phlox: Endemic to the WRB, this plant occurs on sparsely vegetated slopes on sandstone, siltstone, or limestone substrates at 6,000 to 7,400 feet elevation.
- Rocky Mountain twinpod: Known from a number of locations in Wyoming, mostly in Fremont and Hot Springs counties, this species occurs on sparsely vegetated rocky slopes of limestone, sandstone, or clay at 5,600 to 8,300 feet elevation.
- Shoshonea: A narrow endemic known primarily from Fremont, Hot Springs, and Park counties, this species occurs in shallow, stony calcareous soils of exposed limestone outcrops, ridgetops, and talus slopes at 5,900 to 9,200 feet elevation.
- Barneby's clover: A local endemic known only from the southeastern foothills of the Wind River Range and southern Beaver Rim, this plant occurs on ledges, crevices, and seams on reddish-cream Nugget Sandstone outcrops at 5,600 to 6,700 feet elevation.

The BLM Sensitive plant species described above often occur on multiple use areas and, unless they are located within an ACEC, are not afforded any specific protection other than by avoidance where they have been found to occur. Many are difficult to survey for except during their flowering period and are likely often disturbed by activities (i.e., road building, energy development, etc.) that are proposed and permitted during other seasons of the year.

Trends

The trend for special status plant species is similar to that of other plant species. Activities that may affect individual plants or populations include habitat degradation and fragmentation, livestock grazing, larger populations of wild horses and wildlife, invasive species, OHV use, energy development and climate change. As demands for commodities production have increased in recent years, so has public concern for special status species and their habitats. It is therefore reasonable to expect that, as time goes on, it will become increasingly more difficult to find a balance between resource development and habitat conservation.

Management of special status plant species presents a number of challenges including declining population trends for select species, drought and other natural events, spread of invasive species, maintaining PFC for riparian-wetland habitats, vegetation treatment with prescribed fire or herbicides, lack of periodic disturbance events (e.g., fire and flood), physical trampling (e.g., OHV use), loss of habitat resulting from altered hydrology, and challenges presented by special status plant populations occurring over multiple land ownerships. While threats to some species may remain low due to the remoteness of habitat, threats to other species may increase despite distance or restricted access. For example, special status plant species dependent on groundwater levels may be affected by upstream depletions of groundwater far removed from impact populations. Moreover, early successional special status plant species protected from habitat alteration, may still be adversely affected by natural succession and the lack of fire, flooding, or other disturbance factors necessary to retain early successional habitat.

Forecasts

Under current management, the forecast for special status plant species is predicted to decline overall. Many of the forecasts presented for other species of plants also apply to special status species. This is because the forecast changes would also alter the habitat quality and availability for special status species.

Key Features

There are several key issues that should guide land use allocation or management decisions regarding special status plants. Maintaining designated critical habitat for desert yellowhead needs to be a priority when making land use decisions in this area. The planning area contains the only known population of this plant making it extremely rare and thus is the most important of the special status plant species. Conservation measures have been developed as part of the Biological Assessment and the USFWS is currently working on a recovery plan for the species. Designated critical habitat is currently protected by a mineral withdrawal, a protection afforded few other resources.

Another issue that should be addressed when making land use allocations is maintaining and/or increasing habitats for all plant species currently on BLM's Sensitive Species list. These species have been identified as having small populations, limited available habitat, or specific threats to their existence. They are to be managed to avoid population declines to the point that they are listed as endangered&E. Ensuring these populations can remain intact or grow should be considered when making management decisions in these habitats.

2.4.11 Special Status Species – Fish

Special status fish species are either listed as endangered or threatened, or are proposed or candidate species for listing under the ESA. Special status fish species also include those designated by the BLM as sensitive.

2.4.11.1 Regional Context

The only special status fish species known to occur in the planning area is Yellowstone cutthroat trout found in the Wind River drainage near Dubois. This drainage lies within the southern extent of the Yellowstone ecosystem. In addition, the Sweetwater River drainage is part of the North Platte system which is subject to water depletion limitations to protect T&E species, including special status fish species, downstream and outside of the planning area. For activities in which depletion may occur, the BLM consults with the USFWS.

2.4.11.2 Resource Characterization

Indicators: For a discussion of indicators related to fish species, see the Fish section.

Current Condition

Only one special status fish species is known to occur in the planning area. Endemic only to tributaries of the Yellowstone River system, the Yellowstone cutthroat trout is found only in the far northwestern part of the planning area. The species is found in relatively clear, cold streams such as the East Fork of the Wind River and its tributaries. Although no specific protection exists for this species, Yellowstone cutthroat trout are protected somewhat from sediment loading by restriction of surface disturbing activities within 500 feet of riparian areas.

Trends

The trend for Yellowstone cutthroat trout is the same as for other fish species. Drought conditions affected the volume of water available in streams that support Yellowstone cutthroat trout and have generally led to declines in the population. Low water flows can affect the timing and success of spawning efforts leading to reduced reproduction rates.

Some streams have seen a loss in the number of deep pools needed to over-winter fish. In recent years, high water runoff that flushes sediment out of the deep pools and cleans spawning beds have been lacking. With increased danger of wildland fire increases, the likelihood of habitat degradation from the use of fire retardant also increases.

Forecasts

Many of the forecasts described in the Fish section for other species of fish also apply to special status species because the forecast changes would also alter the habitat quality and availability for special status species. There is an increasing risk due to the loss of suitable habitat that Yellowstone cutthroat trout may be added to the T&E list. The WGFD has concerns of future declines in Yellowstone cutthroat populations.

Key Features

The primary that should guide land use allocation or management decisions regarding special status fish is the management of Yellowstone cutthroat trout habitat in the Dubois area. Land use decisions should protect these areas such that habitat and population declines do not occur, resulting in the need to federally list the species.

2.4.12 Special Status Species – Wildlife

Special status species include those animal species that are currently listed as T&E under provisions of the ESA, those proposed for listing or are candidates for listing, or those designated by the Wyoming BLM State Director as sensitive. The BLM is responsible for managing public land to support the habitat required by special status species.

2.4.12.1 Regional Context

The planning area includes habitats for a variety of special status wildlife species. Lands contain a variety of habitats that possess the biological and physical attributes important in the life cycles of many special status species. As with all ecological systems, the Great Basin fauna is strongly interconnected with the flora present, and characterized by wildlife habitats that vary in vegetation types, water resources, geology, topography, and climate. Elevations range from 4,750 feet to 10,400 feet, which support habitats including coniferous forests, juniper woodlands, aspen stands, mountain shrub, canyons and rim rock, badlands, sagebrush-steppe shrublands, grasslands, and wetland/riparian areas. Wildlife species have unique inter-relationships, which link assemblages to one another on a landscape and to specific habitats within the landscape.

2.4.12.2 Resource Characterization

Table 2-40B identifies the special status wildlife species that are either known to occur within the planning area or those with suitable habitat existing in the planning area.

Table 2-40B. Special Status Wildlife Known to Occur in Suitable Habitat

Common Name	Status
Canada lynx	Threatened
Black-footed ferret	Endangered
Gray wolf	Experimental
Bald eagle	BLM Sensitive
Grizzly bear	BLM Sensitive
Dwarf shrew	BLM Sensitive
Long-eared Myotis	BLM Sensitive
Spotted bat	BLM Sensitive
Townsend's big-eared bat	BLM Sensitive
White-tailed prairie dog	BLM Sensitive
Swift fox	BLM Sensitive
Pygmy rabbit	BLM Sensitive
White-faced ibis	BLM Sensitive
Mountain plover	BLM Sensitive
Trumpeter swan	BLM Sensitive
Northern goshawk	BLM Sensitive
Ferruginous hawk	BLM Sensitive
Peregrine falcon	BLM Sensitive
Greater sage-grouse	BLM Sensitive
Long-billed curlew	BLM Sensitive
Yellow-billed cuckoo	BLM Sensitive
Burrowing owl	BLM Sensitive
Sage thrasher	BLM Sensitive
Loggerhead shrike	BLM Sensitive
Brewer's sparrow	BLM Sensitive
Sage sparrow	BLM Sensitive
Baird's sparrow	BLM Sensitive
Yellowstone cutthroat trout	BLM Sensitive
Northern leopard frog	BLM Sensitive
Great basin spadefoot	BLM Sensitive
Boreal toad (Rocky Mtn. population)	BLM Sensitive
Spotted frog	BLM Sensitive

Source: USFWS Species List for Lander Field Office 2008 and the Wyoming BLM State Directors Sensitive Species List Amended April, 2008.

Indicators

For a discussion of indicators related to wildlife special status species, see the Wildlife section.

Current Condition

Special status wildlife species inhabit a variety of habitat types, including coniferous forest, aspen stands, mountain shrub, sagebrush-steppe shrublands, grasslands, and riparian/wetland habitats. For most special status species, comprehensive data on population numbers and distribution are not available.

Canada lynx: Although there is currently no documented lynx occurrence on BLM-administered lands, five lynx analysis units (LAUs) are located adjacent to larger tracts of USFS land in the northwest portion of the planning area (Map 31). BLM consults with the USFWS on all proposed activities that might modify potential lynx habitat within these LAUs.

Because suitable lynx habitat is already somewhat impacted by development, primarily subdivisions, it is questionable whether the lynx will ever become established here. With the increasingly fragmented habitat by development and associated road building, it is doubtful whether Canada lynx will utilize these habitats.

Black-footed ferret: Although historically distributed throughout much of Wyoming, the only black-footed ferrets now found in the state are at the Shirley Basin/Medicine Bow Management Area in Laramie. These animals constitute a reintroduced, experimental population of descendents of the last wild ferrets trapped near Meeteetse in 1981 outside the planning area.

This species is almost entirely dependent on large colonies of prairie dogs which constitute the main prey source for the ferret. The decline of the prairie dog from sylvatic plague, conversion of grasslands to agricultural uses, and widespread prairie dog eradication programs is closely tied to the decline of the ferret. Consequently, the ferret's future is dependent upon that of the prairie dog (see also white-tailed prairie dog in this section). Currently, the only remaining area in the planning area thought to have ferret reintroduction potential is the Pathfinder White-tailed Prairie Dog Complex which lies at the juncture of Fremont, Natrona, and Carbon counties. This has been proposed as an ACEC for protection of the ferret.

Gray wolf: Known to occur in the northwest corner of the planning area (and believed to be elsewhere), the gray wolf was reintroduced to central Idaho and the Yellowstone National Park as a nonessential, experimental population in 1995–1996. As with grizzly bear habitat management, the role of the BLM has been to seek to limit human/wolf conflicts and conserve habitat. Similar to other listed species, BLM consults with the USFWS before implementing any project that may affect the gray wolf or its habitat.

The management status of gray wolves has not been firmly established. Recovery numbers indicate a rebound in the population that will be managed by the WGFD if/when Wyoming's Wolf Management Plan is accepted by USFWS and the courts. WGFD proposes to manage wolves as a trophy game animal in the northwestern part of the planning area near Dubois. Outside of the trophy area, which is the majority of the planning area, gray wolves would be classified as a predator and managed as furbearers. It is not possible to determine at this time if the gray wolf will be relisted or otherwise specially managed.

BLM-listed Sensitive Species are described under the following habitat areas where they are known to be found.

Basin-prairie shrub, mountain-foothill shrub, or grasslands habitat

Greater sage-grouse: Greater sage-grouse are the most common and widespread game bird in the planning area. There have been 221 strutting grounds documented within the planning area with 213 being occupied and 8 being unoccupied. Of the occupied leks, 119 are located on BLM-administered lands, 15 on private lands, 11 on state lands, 5 on Bureau of Reclamation-administered lands, and 63 on the Wind River Indian Reservation. Currently, human-caused disturbance is seasonally restricted within 2 miles of greater sage-grouse strutting grounds to mitigate impacts to breeding and nesting. Additionally, No Surface Occupancy (NSO) is permitted within ¼ mile of an active strutting ground. Based on recent research suggesting the current protective buffers do not provide adequate protection for nesting greater sage-grouse, and that greater sage-grouse tend to avoid nesting near vertical structures (i.e., overhead utility lines, etc.), the BLM nationwide is considering significant modifications to greater sage-grouse protections. A State of Wyoming Executive Order for the protection of greater sage-grouse has served to increase the high profile of this iconic game bird.

Sage grouse have been declining across the west, which has prompted several petitions to list them as threatened under the ESA. They are currently a Wyoming BLM Sensitive Species and the Wyoming Governor has issued an executive order (State of Wyoming Executive Order 2008-2) for increased protection of greater sage-grouse by delineating core areas throughout the state that further restrict human activities in critical areas. Population levels throughout the planning area plummeted during the 199's and then experienced a population resurgence starting around 2000. It is thought this resurgence was a result of well-timed precipitation events. These precipitation events promoted grass growth which aided young survival.

Populations in the high energy development fields near Lysite and Moneta and in the lower precipitation areas of the Wind River Basin (below Beaver Rim) have not seen the same degrees of growth as other areas of the planning area. There have been more sage grouse leks identified in recent years than historically identified, but this is most likely attributed to more intensive searches being conducted because of listing threats and other surveys conducted for research purposes, rather than a resurgence of populations.

Greater sage-grouse are considered to be representative of the many sagebrush-obligate species found in the planning area. The degradation, fragmentation, and/or loss of habitat across the west have all been cited as reasons for listing. Greater sage-grouse habitat in the planning area is thought to be some of the best intact habitat in the species' range and is a large part of the core habitat areas delineated in the recent Wyoming Governor's executive order. In addition, Audubon Wyoming has designated the Ninemile Draw area south of Hudson as an Important Bird Area (IBA) for greater sage-grouse.

Ferruginous hawk: This species is protected from harm or take (as are all raptors and most avian species) through the Migratory Bird Treaty Act (MBTA). Raptor habitat protection has been directed towards long-term nest site protection and minimizing habitat disturbance around nesting sites during the critical nesting period. Seasonal BLM stipulations that limit human-related activities near raptor nests have been applied to surface disturbing activities such as ROWs and oil and gas development. Additional stipulations consist of "raptor-proofing" electrical transmission facilities to prevent electrocution of raptors.

Ferruginous hawks usually nest on rock outcrops or promontories, tall sagebrush, or in trees where numerous small mammals provide abundant prey base. Ferruginous hawk nests have been documented throughout the planning area. Protection of raptor concentration areas from disturbances and human activity is important not only to maintain a stable raptor population but also to balance the predator-prey relationships that influence rodent populations. It hass been surmised that ferruginous hawk populations may be, as many previously active ferruginous hawk nests have been unoccupied in recent years.

Dwarf shrew: Very little is known about this species and its population status. In other areas, it has been found to occupy a wide range of habitats from alpine tundra to semi-arid grasslands. No standards have been adopted to inventory or establish protection measures for the species.

White-tailed prairie dog: This medium-sized rodent species inhabits rolling and level sagebrush-steppe and grassland habitats. Declines throughout its range have been documented, primarily because of recreational shooting and management as an agricultural pest. Conservation of this species is now primarily directed toward avoiding occupied burrows with ground-disturbing activities (i.e., road building, energy development, etc.).

Pygmy rabbit: This species is the smallest of all North American rabbits and is associated with habitats having dense sagebrush in deep soil. Most observations of this species have occurred in the southern part of the planning area. Pygmy rabbits have very small home ranges and do not venture far from these habitats. Such habitat is threatened by projects that would remove this sagebrush, such as pipelines, roads, and vegetative treatments. To date, no standards have been adopted for the protection of this species. However, avoidance of habitat by only a modest distance may be sufficient to sustain the population.

Burrowing owl: This species uses burrows built by other animals such as prairie dogs for seasonal nesting and roosting. As with all raptor species, seasonal BLM stipulations that limit human-related activities near nests have been applied to surface disturbing activities such as ROW and oil and gas development. Burrowing owls generally feed on insects, small rodents, reptiles, and small birds and can be found in suitable habitats throughout the planning area.

Sage thrasher, loggerhead shrike, sage sparrow, and Brewer's sparrow: These sensitive bird species are all associated with sagebrush-steppe or shrubland habitats in which they nest. These species can be found throughout the planning area. No specific protection exists for these species or their habitats other than protection afforded by the Migratory Bird Treaty Act.

Swift fox: This species has historically occupied short or mixed grass prairies on level to moderately rolling terrain in the Great Plains. There have been no recent observations of this species in the planning area; however, the best suitable habitat exists in the northeastern most part of the planning area. WGFD reports that recent studies and anecdotal information suggests that the swift fox is capable of inhabiting, surviving, and reproducing in sagebrush/grassland habitats. No specific protection exists for these species or its habitat.

Baird's sparrow: This species generally prefers open grasslands and overgrown fields with taller, denser grasses, habitat is typically associated with agricultural areas. No specific protection exists for these species or its habitat. Baird's sparrow has not been documented within the planning area, although it is listed as a BLM Sensitive Species for the LFO.

Forested Habitats

Northern goshawk: This species is protected from disturbance during its nesting season as are all raptors. Suitable habitat exists for this species primarily in the Green Mountain area and on the Lander Slope. Nests have been documented on Green Mountain.

Long-eared myotis: This species seasonally inhabits coniferous forests and woodlands and forages over water in these environments. No specific protection exists for this species.

Grizzly bear: Until recently, the grizzly bear was listed as a federally threatened species. However, it has recently been down-listed to a sensitive status. The BLM's role has been to limit human/bear conflicts and to conserve grizzly bear habitat to the extent possible. Grizzly bears have expanded their range in part due to increasing population numbers that were the result of T&E protections. Forage shortages (pine nuts, moths, and berries) during drought years has caused individuals to range farther in search of adequate food supplies. Grizzly bears encounters with domestic livestock were recorded in Dubois.

Riparian or wetland habitats

Bald eagle: Sightings from as early as 1974 indicate that this species winters along the Middle and Little Popo Agie Rivers as well as the Wind River. Currently, no known nesting occurs on BLM-administered lands, but one nest sighting has been identified on USFS. Identified active nests and winter roost sites would be protected from disturbance within 0.5 miles of the site. In addition, a seasonal protection from disturbing activities would be applied between February 1 – August 15 for active nests and between November 1 and April 1 for identified winter roosting areas. Additional restrictions on disturbance within suitable habitat may also apply.

Yellow-billed cuckoo: This species is associated with wooded riparian areas. Occupied habitats have not been identified for this species. No specific protection exists for this species or its habitat other than protections afforded by the Migratory Bird Treaty Act (MBTA).

White-face ibis: A wading bird, this species is generally associated with marshlands. This species has been observed in suitable habitats in the planning area. No specific protection exists for this species other than protections afforded by MBTA.

Trumpeter swan: This species is generally associated with larger water bodies such as lakes, rivers; most observations have been along the Sweetwater and Wind Rivers. Scoping comments identified viewing trumpeter swans while recreating in the Sweetwater Rocks as an important part of wildlife experience. No protection exists for this species other than the MBTA.

Long-billed curlew: This species is also associated with wetlands but may also nest in dry meadows. It breeds in the western U.S. in the spring and summer and winters along the Gulf coast and in Mexico. This species has been observed in suitable habitats in the planning area. No specific protection exists for this species other than protections afforded by the MBTA.

Northern leopard frog, Great Basin spadefoot, boreal toad, and spotted frog: These species occur on the sensitive species list due to degradation or loss of suitable habitat. No estimates of population size are available for any of these species. These species are protected by a prohibition against disturbance or development within 500 feet of riparian/wetland areas. These species have been observed in suitable habitats in the planning area.

Special habitats

Peregrine falcon: This raptor species nests in tall cliffs and preys upon other bird species. Suitable habitat limited primarily to the steep canyons along the Lander slope. As with all raptors, this species is protected from disturbance during its nesting period.

Spotted bat: This species is known to seasonally roost in cliff crevices near perennial water. No specific protection exists for this species although measures to prevent disturbance of maternity roosts and hibernacula for this and other bat species has been considered.

Townsend's big-eared bat: Unlike other bat species that may be found in the planning area (i.e., long-eared myotis and spotted bat), this species is a "cave obligate" requiring caves or mineshafts throughout its life cycle. Suitable habitat is mostly limited to abandoned mine shafts. Many shafts and adits that support bats have been fitted with "bat grates" to allow bat use but prevent human entry.

Mountain plover: This species is known to breed and raise young in the planning area during the spring, summer, and early fall. Plovers are generally found in habitats that have little or no vegetation structure such as grasslands, alkali flats, or low shrubs (i.e., saltbush). Plovers may nest on sites where vegetation is sparse to bare or closely-cropped. This species is protected from disturbance during its nesting period (April 10 – July 10).

Trends

Population trends for individual species are dependent upon the quality and condition of the habitats they rely on. Like all wildlife, those species associated with the declining conditions of sagebrush and riparian communities are experiencing downward trends. Additional factors such as invasive plants, human disturbance, and resource uses have exacerbated these conditions and led to increased habitat degradation and fragmentation. By the very nature of the species being special status, its populations are limited or rare and have been determined to be at risk of being listed as T&E or needing other special management. This status likely makes the species more vulnerable than wildlife as a whole. In some instances, several special status species are limited to a relatively small area (i.e., BLM-administered lands near Dubois).

Forecasts

Under current management, the forecast for special status species is predicted to decline. Many of the forecasts for other species of wildlife presented in the Wildlife section also apply to special status species. This is because the forecasted changes (e.g., increased habitat disturbance/loss and climate change-related habitat alteration) would also alter the habitat quality and availability for special status species.

Key Features

The primary issues that should guide land use allocation or management decisions regarding special status wildlife is the maintenance or enhancement of habitats. Land use decisions should protect these areas such that habitat and population declines do not occur, resulting in the need to list any of these species. The focus on some special status species habitat is often used as an indicator of habitat quality for several other special status species. For example, focusing on greater sage-grouse habitat will also benefit many of the other sagebrush obligate species using these same habitats. Key species that should be focused on when making land use allocation decisions and used as indicators for other species include:

Greater sage-grouse: The Governor of Wyoming has established greater sage-grouse core areas where protection of habitat and populations should be considered a priority. Much emphasis has been placed on protecting habitats as listing of the species would result in significant economic impacts to the State of Wyoming and throughout the West. Management decisions that protect and maintain important greater sage-grouse habitats will also protect and maintain habitats for other special status species that are sagebrush obligates, such as ferruginous hawk, sage thrasher, loggerhead shrike, Brewer's sparrow, sage sparrow, and swift fox.

Canada lynx: This species has been a focus of much attention due to petitions for listing of the species. Management decisions that protect and maintain Canada lynx habitat, which is the transition zone between forest and mountain shrub communities, will also benefit other special status species linked to these habitats such as grizzly bear and gray wolf.

Leopard frog and boreal toad: Many species of wildlife are dependent on healthy riparian and aquatic habitats to provide the necessary forage and cover needs. These species could be used as indicators of many riparian obligate species. Improvement of riparian/wetland and aquatic systems will provide habitat for a wide variety of special status species including white-faced ibis, bald eagle, trumpeter swan, great basin spadefoot, and Yellowstone cutthroat trout.

Pygmy rabbit: Information regarding this species has been the result of increased research due to requests to federally list the species. Pygmy rabbit ranges have been greatly expanded due to more intensive surveys for the species. The unique habitat required to support this species is also habitat used extensively by the loggerhead shrike and greater sage-grouse.

Peregrine falcon: The recovery of this species has been considered a success and efforts to ensure that populations continue to grow is a priority. Limited habitat for this species occurs in the planning area, therefore it should be considered when making land use allocations in these habitats. Maintenance of suitable habitat for this species also provides for other cliff nesting raptors as well as the spotted bat.

Grizzly Bear: Due to the recent delisting of this species, emphasis has been place on monitoring efforts to ensure populations do not decline. A serious threat to the grizzly population is loss and fragmentation of habitat. Potential conflicts can occur between recreationists and livestock grazing which typically result in the removal or death of the bear. If conflicts rise to the point that a number of bears are removed from the population, then relisting of the species could occur. Resolution of conflicts may help ensure population recovery critieria are met, such as adjusting livestock grazing season of use in areas with identified conflicts. The WGF does not necessarily favor increased grizzly bear numbers outside the designated occupancy zone.

2.4.13 Wild Horses

The BLM protects, manages, and controls wild horses and burros under the authority of the Wild Free-Roaming Horses and Burros Act of 1971 to ensure that healthy herds thrive on healthy rangelands. Horses originally evolved on this continent and disappeared some 10,000 – 12,000 years ago. Modern horses were re-introduced to the west by the Spanish under Cortez. The BLM manages these living symbols of the western spirit as part of its multiple-use mission.

Most of the wild horses are found on BLM-administered lands. The BLM is responsible for managing the size and distribution of the herds. Wild horses provide a historic resource that is of particular interest to the public. However, this species also competes with other grazing species for forage within its range.

2.4.13.1 Regional Context

As required by the Wild Free-Roaming Horses and Burros Act of 1971, BLM designated 30 Herd Management Areas (HMAs) with populations totaling approximately 4,400 horses. Those 30 areas comprised roughly 6.6 million acres of public land, 400,000 acres of land owned by the State of Wyoming, and 2.5 million acres of privately owned lands. In recognition of the need to consolidate herds to ensure long-term genetic diversity, these management areas were combined and consolidated. There are currently 16 HMAs in the state; the statewide target is for a population of 2,700. The planning area has approximately 1,000 horses in seven HMAs; there are no burros (Map 32). Wild horses are featured in State of Wyoming tourism advertisements.

2.4.13.2 Resource Characterization

Indicators

Indicators of health for wild horses can be broken down into two main areas: the health of the horses and the vegetative health of the habitat in which they live. Each is a reflection of the other.

Physical health can be determined quite easily during inventory by observation of body conditions at various times of the year. Genetic health can be assessed by the same observations. The presence of physical abnormalities can help to determine this. With the elimination of virtually all natural predators, wild horse herd size, unless artificially controlled, will exceed the appropriate management levels established by the Consent Decree and will eventually overutilize forage. The health of the vegetative communities within the HMAs is assessed using the Wyoming Standards for Healthy Rangelands.

Current Condition

The Appropriate Management Levels (AML) were established in 1993 and 1994 from a process that included five years of intensive monitoring, evaluation of data, public input, and environmental analysis. Since that time some boundary adjustments and realignments to the HMAs have been made via the RMP maintenance process. The AML for each HMA was confirmed on a statewide basis through a 2003 Consent Decree between the BLM and the State of Wyoming. The AML is the herd population objective for the HMA that will ensure a thriving ecological balance among all the users and resources of the HMA (e.g., wildlife, livestock, wild horses, vegetation, water, and soil). Table 2-42 identifies the HMAs and appropriate management levels.

Table 2-42. Appropriate Management Level of Each Herd Management Areas

HMA NAME	Appropriate Management Level
Green Mountain	170 - 300
Conant Creek	60 - 100
Rock Creek Mountain	50 - 86
Dishpan Butte	50 -100
Muskrat Basin	160 - 250
Crooks Mountain	65 - 85
Antelope Hills/Cyclone Rim	60 - 82

Lander Field Office

Population control is maintained by periodic gathers in which health of the population is assessed and horses removed to keep the population within the limits of the Consent Decree. Fertility control is administered to mares by the anti-ferility vacine PZP which has declining effectiveness over time. By the fourth year following injection, the drug has only limited effectiveness. Study has determined that the administering of the drug does not cause early foaling. Table 2-43 depicts wild horse removals in the planning area from 1980-2006 by HMA.

Table 2-43. Wild Horse Removals from 1980-2006 by HMA

Antelope Hills/Cyclone Rim HMA	
Year	**Number Removed**
1986	88
1987	184
1988	63
1989	154
2000	59
2001	50
2004	208
Crooks Mountain HMA	
1985	708
1996	319
1998	220
2002	103
2006	74
Green Mountain HMA	
1980	255
1984	199
1993	318
1995	88
1996	105
1997	145
2002	155
2003	75
2005	4990
2006	89
Muskrat Basin HMA	

1983	157
1985	285
1986	314
1988	159
1993	195
1995	206
1997	128
2001	152
2004	127
Dishpan Butte HMA	
1985	145
1995	214
2001	57
2004	123
Rock Creek Mountain HMA	
1985	131
1986	58
1995	10
2001	47
2004	0
Conant Creek HMA	
1985	115
1986	21
1993	89
1995	10
2001	66
2004	95

Source: BLM files

Wild horses graze on the range throughout the year. BLM uses an AUM rate of 1.15 AUM for horses. Using this rule, the 1,000 wild horses in the planning area consume 13,800 AUMs on an annual basis. By comparison, for the 20 year period of 1989-2008, BLM billed an average of 204,507 domestic livestock AUMs per year.

Antelope Hills/Cyclone Rim HMA

The Antelope Hills HMA encompasses 159,000 acres. The AML for this HMA is 60–82 adult horses. The area is located approximately 15 miles south/southeast of Atlantic City at approximately 7,200 feet. The HMA is bisected by the Continental Divide National Scenic Trail. The area receives 5–7" of precipitation annually. The predominant vegetation type is sagebrush/grass. Riparian zones are infrequent but very important to wild horses. The topography ranges from rolling flatlands south of Cyclone Rim, uplifted ridges along Cyclone Rim, and abrupt rocky zones interspersed with rolling lands north of the rim to the Sweetwater River.

Many of the horses in this HMA exhibit traits of the Spanish mustang, the horses brought to the New World by Cortez. There are a variety of colors. As genetic research continues on the wild horse populations tin the Red Desert meta-population (Green Mountain, Crooks Mountain, Stewart Creek, Antelope Hill/Cyclone Rim, and Lost Creek HMAs), the necessity of maintaining the population of wild horses in the Antelope Hills/Cyclone Rim HMA in genetic isolation may change if it is determined that populations adjacent to the HMA share the same or genetic base so that the uniqueness of the herd may be preserved. If surrounding HMAs do not share the uniqueness, further intermingling could cause this genetic resource to disappear. Continued monitoring and research may result in adjustment to management decisions for the Antelope Hills/Cyclone rim and Lost Creek HMAs.

This HMA is an appropriate location for a wild horse viewing scenic loop.

Crooks Mountain HMA

The Crooks Mountain HMA is located directly southeast of Sweetwater Station and encompasses about 58,000 acres. The AML for this HMA is 65–100 adult horses. Elevations range from 6,900 to 8,100 feet. The lower elevations receive approximately 10–14" of precipitation annually; the upper elevations receive 15–20". The major vegetation types are sagebrush-grass, woodland, and riparian. Topography is generally rolling hills and slopes to the north and south of Crooks Mountain. The Crooks Mountain portion of the herd area is quite steep and broken with mountainous terrain. The area supports significant wildlife populations of elk, deer, and antelope. Most of the horses are bays or blacks with an occasional paint and/or grey.

Muskrat Basin, Conant Creek, Rock Creek, and Dishpan Butte HMAs

These four HMAs are located in the central part of Fremont County. They encompass about 375,000 acres of land, of which about 90 percent are BLM-administered public lands. The AML for these HMAs is 320 horses. While the four HMAs are managed with recognized individual populations, there is no geographic separation of the HMAs and the gates between them remain open a significant part of the year. As a result, the horses move regularly among the HMAs, helping to ensure the overall genetic health of the horses. A full range of colors is present; are solid in color. Health is good with few apparent problems.

Topography of the area includes high ridges and steep terrain with grand vistas. Beaver Rim, located on the western edge of the HMAs, is a beautiful, high escarpment with sweeping views of the Wind River Mountains, Copper Mountains, and Owl Creek Mountains. Elevations in the HMAs range from 5,300 to 7,200 feet. The area receives 5–12" of precipitation a year, depending on the elevation, most of it in the form of snow. Domestic cattle and sheep utilize the area during spring, summer, and fall. Vegetation is dominated by various sage and grass species. Elk, deer, and antelope also inhabit this area.

Muskrat Basin/Dishpan Butte is an appropriate location for a wild horse viewing scenic loop.

Green Mountain HMA

The Green Mountain HMA encompasses 117,000 acres, of which 74,000 acres are BLM-administered public lands. The AML for this HMA is 300 horses. A full range of colors is present. Most horses are solid in color, but a noticeable number of tobiano paints are present. The horses range from 11–15 hands and 750–1,000 pounds mature weight. Health is good with few apparent problems.

Topography within the herd area is generally gently rolling hills and slopes north and south of Green Mountain. Green Mountain itself is quite steep with mountainous terrain and conifer/aspen forests. Elevations range from 6,200 to 9,200 feet with grand vistas of the Red Desert, Sweetwater Rocks, and the National Oregon/California Pioneer Trails from the higher elevations. Precipitation ranges from 10–14" at the lower elevations to 15–20" at the upper elevations. Most of the precipitation is in the form of snow. Domestic cattle and sheep utilize the area in all seasons with summer cattle use predominating. Vegetation around the mountain is dominated by various sage, grass, woodland, and riparian species. The area supports significant wildlife populations of elk, deer, antelope, and moose.

Trends

In general, with almost no natural predators, populations of wild horses grow at approximately 20 percent per year. In the absence of intervention and given normal vegetative conditions, populations would soon exceed the maximums established in the consent decree. Regular round up and monitoring and artificial population control (which is also used to control for desirable attributes such as genetic type) are needed to limit herd size. Funding has been limited so that the interval between gathers has increased beyond the optimal time to maintain AMLs.

Advances in genetic research indicate that wild horses have a variety of histories and originate from a variety of background. The genetic root of most of the wild horses is predominantly American and some with beginnings as recent as World War II. Occasionally, populations have genetic roots that can be traced to the Spanish exploration period through the identification of genotypes associated with the Spanish Colonial breed. These provide a genetic resource that the majority of wild horses on public lands do not provide. Further research in the genetic origins of the wild horses in the Antelope Hills/Cyclone Rim area, the Red Desert meta-population, and the Lost Creek HMA (in Rawlins) will determine the management requirements for the future to encourage desirable genetic types.

Drought could substantially reduce the food available for wild horses. The drought also increases the conflict between wild horses and livestock grazing, an already contentious situation in some parts of the planning area. While the trend for forage reduction started by the drought is expected to continue, drought alone would probably not cause a decrease in herd population below the levels needed to maintain genetic diversity. Successful wolf re-introduction could have an impact on herd size, particularly in harsh winter conditions which limit the horses' ability to evade predators. Wider dispersal of livestock grazing through range developments puts stress on upland range forage, providing competition to wild horses. Fences and cattle guards pose hazards to horses which limit their ability to survive winter conditions..

Increasing mineral development impacts wild horses as forage is reduced by surface disturbing activities and expansion of invasive weeds. Wild horses' habitat can be fragmented by development which limits the herd's genetic pool by cutting separating herds. Fragmentation can also cause concentration of herd distribution which could strain available forage.

Monitoring of the habitat and wild horses is being done including precipitation data, rangeland condition and trend, forage utilization data, permitted and actual use by livestock by grazing allotment, wildlife actual use and forage requirements, wild horse population data, including, population counts, reproductive rates, age/sex structure, fertility control work, identification of high use or concentration areas and other factors that will develop as the herds are studied.

Forecasts

Though monitoring data indicate horses have localized impacts on vegetation in areas near water, current management of the horse herd should not affect these vegetation communities. Range impacts could occur if the herd numbers are allowed to grow beyond appropriate management levels. Continuing to implement fertility control during gathers will help maintain and improve the rangeland resources. On-going studies will verify impacts to riparian areas.

The intrusion of modern development, particularly mineral development, has the potential to reduce the recreation aspect of viewing wild horses moving freely in open country. For many visitors, the viewing of wild horses can be a powerful and lasting image and is promoted as such by the State of Wyoming. Development of viewing of wild horses as a recreational experience could be explored in future management decisions, with the same approach as taken for the Pilot Butte Wild Horse Scenic loop in the Rock Springs Field Office which has made a significant contribution to the economy of Rock Springs and Green River, Wyoming.

Key Feature

The genetic type associated with the Spanish horses is the most significant feature for wild horses. The need to control herd population size before populations overwhelm habitat is critical. While public support for free roaming horses regardless of genetic origin is widespread, the descendents of the horses introduced by the Spanish four centuries or more ago are the most important and guide the selection process during gathers.

Wild horse viewing areas have been very popular in other field offices and there are several appropriate locations in the planning area. Development of driving loops could help to contribute to local economies and provide recreational opportunities to local communities.

2.5 Heritage and Visual Resources

2.5.1 Cultural Resources

2.5.1.1 Regional Context

Cultural resources in the Rocky Mountain west represent human occupation over many thousands of years. Cultural history in this area is generally believed to have begun at least 12,000 years ago, when the first human groups entered this region. Since that time, human occupation of the area appears to have continued basically uninterrupted up to the present time.

Generally, cultural resources can be broken up into three categories – prehistoric resources, historic resources, and spiritual/sacred/traditional cultural properties (TCPs).

- *Prehistoric* cultural resources are those sites, structures, objects, or materials deposited or left behind prior to the entry of non-American Indian (i.e., European) explorers and settlers into an area. In this part of Wyoming, the Prehistoric period spanned from approximately 12,000 years before the present (BP) to approximately 300 BP.
- *Historic* cultural resources are those sites, structures, objects, or materials deposited or left behind after the European presence was established.
- *Spiritual/Sacred/Traditional* cultural resources/properties can include prehistoric or historic resources, structures, topographic features, habitats, plants, wildlife, and/or minerals that Native Americans or other groups consider essential for the preservation of traditional culture.

2.5.1.2 Resource Characterization

Current Condition

<u>The Prehistoric Stage</u>

The Prehistoric Stage dates from at least 12,000 years BO to around 300 years BP. The Prehistoric Period is characterized by a stable cultural phase, where the way of life appears to have changed little throughout its time span. The peoples utilizing this region were Native American hunters and gathers who adapted their lifestyle to the high-plains environment and roamed the region in search of food and shelter. The movements of these nomadic peoples were generally determined by seasonal changes in resource availability. These people generally traveled in small bands, spending only a limited amount of time in any one location. For the most part, the material items of these groups were made from naturally available resources. These resources included items such as stone, wood, bone, pelts, sinew, and plant fibers.

Within the Prehistoric Stage, there are several defined periods:

- The Paleo-Indian Period, from about 8,500 to 11,500 years BP is the period when evidence of humans is first found in this region. The Paleo-Indian Period is characterized by big game hunting traditions utilizing typically well-made spear points. At the beginning of the period, the Paleo-Indians hunted animals now extinct such as mammoth and giant bison, and used Clovis, Folsom, and Agate Basin projectile points, among others. As conditions became drier and warmer and as many of these Pleistocene species died out, these groups had to adapt to hunting more modern species such as bison, deer, and mountain sheep. Paleo-Indian sites and artifacts are rarely found in the planning area.
- The Archaic Period, from about 1800 to 8500 BP, signals the finalization of a shift to a wider use of available resources and less specialization. The climate had changed from an earlier wetter and cooler regime to dryer and hotter conditions. Projectile points changed in response to this shift as well, and generally became smaller through time. This period is broken down into the following divisions: the Great Divide Phase (6000-8500 BP), the Opal Phase (3700-6200 BP), the Pine Springs Phase (2900-3700 BP), and the Deadman Wash Phase (1800-2900 BP). The Opal Phase, with its housepits and reuse of site areas, is especially well-represented in the planning area.
- The Late Prehistoric Period, from 250 to about 1800 BP, begins with an apparent increase in population, as well as a technological change signaled by the introduction of the bow and arrow. The Uinta Phase of this period (about 1000 BP to 1800 BP) is characterized by Rose Springs projectile points and numerous short term foraging and processing camps, sometimes with house-floor types of features. The Uinta is followed by the Firehole Phase (250-1000 BP). This phase is characterized by a sudden shift to small tri-notched and side-notched projectile points, and a change in site types. Population densities also appear to have decreased in the Firehole Phase, and it is postulated that old and new cultural groups were moving and/or being displaced. Uinta Phase sites, with their cylindrical roasting pits and shallow floor features, are well-represented in the planning area.

Common cultural resources of the prehistoric period include: lithic scatters, stone circle habitations, petroglyphs and/or pictographs, open campsites, fire hearths or firepits, lithic quarries, and housepit habitations.

For the RMP revision effort, the planning area was divided into nine archeological sub-regions depicted on Map 33. The sub-regions were identified based on our understanding of the human utilization of landscapes and resources within the region. These archeological units were developed to better understand and categorize the various prehistoric resources. Further details can be found in the Regional Overview.

The Historic Stage

This stage is generally considered to be the time during which written documents were maintained of the events that occurred in the area. The Historic Stage is generally considered to have begun in the early 19th century, with the arrival of the first Euro-American fur trappers and traders into the region. The fur traders were followed by explorers, missionaries, emigrants, miners, stockgrowers, and merchants. The history of the lands within the Lander Field Office Area shares in many of the major events in Western American history.

A brief account of the historic phases that occurred within the planning areas is as follows:

- Fur Trade (1811-1840)
- Exploration (1811-1870s)
- Historic Military (1830s-1890s)
- Emigration (1840-1869)
- Historic Mining (1867-1930s)
- Reservation (1868-present)
- Settlement (1870s-present)
- Ranching (1870s-present)
- Homesteading (1870s-1930s)
- Expansion Era - early commerce and industry (1880s-1928)
- Historic Oil and Gas Exploration (1884-1930s)
- Regional Railroad (1906-present)
- Irrigation Districts (1906-present)
- Auto Roads (1910s-present)
- Tie-hack industry (1880s-1980s)
- Depression (1929-1939)
- Modern Mining (1940s-present)

Highlights of the area's history include the discovery of South Pass and a feasible route over the continental divide in 1811 and again in 1824; the great overland migrations on the Oregon, Mormon, and California Trails from 1840-1869; the mapping of the Oregon Trail by John C. Fremont in 1842; the creation of the Pony Express and the transcontinental telegraph line along the California Trail in the early 1860s; the founding of South Pass City, Atlantic City, and Miner's Delight during the South Pass gold rush of 1867-1872; the creation of the Wind River Indian Reservation in 1868, and the later incorporation of Northern Arapahos into the reservation; the early settlement of the Lander Valley in the early 1870s; the founding of the Sun Ranch, the first ranch in the Sweetwater Valley, in 1872; the settlement of the Wind River Basin in the 1880s; the first oil well west of the Mississippi River, at Dallas Dome, in 1884; the founding of Riverton, Shoshoni, and Moneta and the railroad reaching those towns and Lander in 1906; the creation of the Riverton Irrigation Project in 1905-6; establishment of the early Yellowstone National Park auto tour routes in the 1910s and 1920s; the Hudson coal mining boom from 1907 to the

1920s; the tie hack industry around Dubois and Riverton from 1907 to the 1940s; and the uranium boom in the Gas Hills, Crooks Gap, and Jeffrey City in the 1950s.

The following historic cultural resources are commonly found: ranching developments; trash scatters and dumps; mining prospects, developments, and mines; emigrant and stage trails, sites and landmarks; livestock herder campsites; and abandoned homesteads.

Spiritual/Sacred/Traditional Cultural Resources and Properties

Spiritual, sacred, and traditional cultural resources and properties can be from both the prehistoric and historic phases. They include prehistoric or historic resources, structures, topographic features, habitats, plants, wildlife, and/or minerals that Native Americans or other groups consider essential for the preservation of traditional culture. These properties often are the locations where events important to a cultural group have taken place or where spiritual/sacred practices have occurred or may still occur. They may also be the locations where traditional practices (such as gathering plants for use in ceremonies) are conducted.

The following spiritual, sacred, and/or traditional resources or properties are found in the planning area: burials; battlefields; medicine wheels; sun dance locations; prayer circles and lodges; sweat lodges; and altars, cairns, and rock alignments. When these types of resources are found, traditional elders or authorities are consulted to determine if they are considered spiritual, sacred, or traditional properties (TCPs).

Indicators

Cultural resource indicators of condition are primarily based on the National Register of Historic Places criteria for evaluation as defined by the National Historic Preservation Act (NHPA) in the 36 CFR Part 60.4 regulations. The criteria are:

"The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and

(a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
(b) that are associated with the lives of persons significant in our past; or
(c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
(d) that have yielded, or may be likely to yield, information important in prehistory or history."

When dealing with spiritual, sacred, or traditional cultural properties, more ephemeral indicators of condition may come into play. These types of properties may be considered significant to specific cultural groups, even if the integrity of the properties has been compromised. Indicators in these cases are more dependent on the cultural importance of a property, as defined by traditional elders or authorities.

Prehistoric cultural resources: Because there are no written records for prehistoric recourses, most of these types of resources are evaluated under criterion (d). That is, they are evaluated on their potential for information on the lifeways and practices of prehistoric peoples. Prehistoric resources may also be evaluated as spiritual or traditional cultural properties if they are thought to be important to specific modern cultural groups. Occasionally, prehistoric resources are evaluated under criterion (c), if there are distinctive stylistic, artistic, or architectural components present. Loss of integrity for prehistoric resources can result from long-term deterioration or erosion, direct or indirect disruption by modern activities, or vandalism/looting.

Historic cultural resources: Historic resources are can be evaluated under any of the National Register criteria. Some historic resources may be associated with important historical events or persons (criteria (a) and (b)), while others can contain important archeological information (criterion (d)). Historic resources may also be evaluated under criterion (c), if there are distinctive architectural or artistic components present. And rarely historic resources are evaluated as spiritual or sacred cultural properties, if they are important to specific modern cultural groups. Loss of integrity for historic resources can result from deterioration or erosion, direct or indirect disruption by modern activities, or vandalism/looting.

Spiritual/Sacred/Traditional cultural properties: These properties derive their significance from their importance to specific modern cultural groups, such as Native American tribes or religious groups. BLM relies on traditional elders or authorities from these groups to help evaluate the importance and condition of these properties.

Current Condition

Files search (Class I) inventories and intensive field inventories (Class III) have been conducted for BLM-sponsored or sanctioned projects since about 1975. Inventories have primarily been related to oil and gas exploration/development, utility rights-of-way, and mining. Additional information on inventory will be supplied with the RMP EIS.

The Lander Field Office maintains a file of known cultural resources dating back to 1948. The data have been gathered from various sources, including universities, archeological and historical contractors, local informants and sources, BLM and state government agencies, and historical accounts. The files include information on prehistoric and historic cultural resources of many types. However, most cultural resources under 50 years of age (recent) are not formally

recorded unless they are of special significance; as a result, the files do not include most known cultural resource sites of recent origin.Table 2-44 briefly describes those resources, and Map 34 shows the locations of these sites.

Table 2-44. Selected Cultural Sites and National Register Status

Affected Resource	Type	Designation Status	Current Size	Location of Resource
Castle Gardens Petroglyph/Pictograph Site	Prehistoric Rock Art Site	Enrolled on the National Register	80 acres	Eastern Fremont County near the Gas Hills
Oregon/Mormon Pioneer/California/Pony Express National Historic Trails	Historic Emigrant Trails	Congressionally-designated National Historic Trails; also an existing ACEC	90 linear miles, with a ¼ mile on each side management corridor	Along the Sweetwater River, from near Independence Rock to Burnt Ranch, south of Atlantic City
South Pass Historic Mining Area	Historic Gold Mining District, with mines, settlements, and military outposts	Miner's Delight and South Pass City enrolled on the National Register; the entire historic mining area and several sites within it are National Register eligible	16,000 acres	Southwestern Fremont County, on the southern edge of the Wind River Mountains
Warm Spring Canyon Flume, Natural Bridge, and Geyser	Historic Tie Flume and natural features	Considered eligible to the National Register	190 acres	Northwestern Fremont County near Dubois
Regionally-Significant Historic Trails and Early Highways: A. Bridger Trail	Historic Wagon Trail	Considered eligible to the National Register	See ACEC proposal	Northeastern Fremont County near Lost Cabin
B. Rawlins to Fort Washakie Stage Trail	Historic Wagon Trail	Considered eligible to the National Register	See ACEC proposal	South of Green Mountain to Lander
C. Casper to Lander Road	Historic Wagon Trail	Considered eligible to the National Register	See ACEC proposal	Eastern Fremont County, near Deer Creek to near Alkali Butte
D. Point of Rocks to South Pass Stage Road	Historic Wagon Trail	Considered eligible to the National Register	See ACEC proposal	Southwestern Fremont County, from Burnt Ranch to South Pass City
E. Green River to South Pass to Fort Washakie Stage Trail	Historic Wagon Trail	Considered eligible to the National Register	See ACEC proposal	Southwestern Fremont County, from South Pass City to Lander
F. Birdseye Pass Stage Trail	Historic Wagon Trail	Considered eligible to the National Register	See ACEC proposal	Northeastern Fremont County, near Wind River Canyon
G. Yellostone/National Park to Park Highway	Historic Auto Highway	Considered eligible to the National Register	See ACEC proposal	Northeastern Fremont County, from east of Moneta to Shoshoni
Cedar Ridge Traditional Cultural Property	Prehistoric - Historic , sacred TCP	Considered eligible to the National Register	See ACEC proposal	Northeastern Fremont County near Lost Cabin

Table 2-44 depicts many of the more important cultural resources but is not meant to be inclusive of all important cultural resources. The National Historic Trails and related sites are discussed under Congressionally designated trails.

These specific resources are significant enough that standard NHPA regulations are not adequate for their management. These resources require proactive management to maintain the qualities that make them significant. The NHPA did not make a determination that its minimal protections would be adequate to protect individual resources.

Prehistoric Cultural Resources:

Castle Gardens Petroglyph/Pictograph Area

The Castle Gardens Petroglyph/Pictograph site is a well-known rock art area located in the eastern part of the planning area. The site contains a large number of prehistoric drawings etched in and/or painted on sandstone. The rock art is recognized as some of the best in the Wyoming region, and has become well known within the Northwestern Plains. Several styles of art are evident, and many excellent shield motif representations are present. The prehistoric rock art is estimated to date from the Late Prehistoric Period (250 to about 1800 BP), and the functions of the drawings are assumed to be mostly concerned with spiritual beliefs or a record of important events. The rock art can be found over a large portion of the Castle Gardens uplifted area, which covers an area 6 miles along by 1 mile wide. The majority of the rock art is, however, located at the far eastern end of the Castle Gardens area.

The site is considered to be a spiritual site to the Eastern Shoshone and Northern Arapaho Tribes as well, and modern traditional use of the site has been documented as well.

The Castle Gardens Petroglyph/Pictograph site was first recorded in the early 1940s (Sowers 1941). Since then, it has become well-known, and the rock art has suffered from vandalism and weathering. In the 1970s, BLM constructed a road into the site. At that time, it was thought that increased access and fencing would slow the damage, and a road, parking lot, toilets, picnic tables, fences around panels, and signs were installed. However, instead of decreasing the vandalism, the development only caused vandalism to increase. Today the site is seriously damaged, but still retains much of its character and TCP power.

The Castle Gardens Rock Art Site is listed on the NRHP and is managed for cultural and recreational values. The immediate site is protected from oil and gas development, locatable mineral exploration (segregated from mining), grazing (fenced exclosure) and closed to OHV use. Castle Gardens is not part of any current ACEC, but it has been nominated for ACEC designation.

Lower Beaver Creek

The lower Beaver Creek area appears to be a focal point for a special type of prehistoric site. Informally termed '*Beaver Creek sites*', these prehistoric campsites are the remains of a cultural group that frequented the Wind River Basin (WRB) around 1,000 BP. These sites appear to represent a special utilization of high desert Wyoming basins that lasted for several hundred years and then faded away. "Beaver Creek sites" usually contain roasting pit features, which are often surrounded by shallow structural depressions. They also usually date to the Uinta Phase of the Late Prehistoric Period (1,800–1,000 years BP). Beaver Creek sites were first recognized in the Beaver Creek Oil and Gas Unit, which is located about 12 miles south of Riverton. Sites of this type are often buried and often are missed during archeological surface inventories. As a consequence, discoveries of these sites during construction of oil and gas well pads and roads are frequent. These discoveries became a problem because of the number of Beaver Creek sites that were requiring special mitigation during construction. Eventually, special management procedures were instituted within the unit to ensure proper mitigation of impacts to the sites, while allowing oil and gas exploration activities to continue.

Recently, Beaver Creek sites have been discovered in other parts of the WRB, and in the Sweetwater Valley. If we discover other areas with high concentrations of these sites, we may have to institute special management procedures to protect them where development is elevated. For this reason, present and future "Beaver Creek site areas" are be identified as a key feature for possible management decisions in this RMP revision.

Prehistoric Rock Art: The area contains a great deal of *prehistoric rock art*, and much of it is of outstanding quality. This resource is highly significant for several reasons: rock art is considered highly important to Native American tribes; rock art is important for its scientific value in understanding the prehistoric occupants of this region; and rock art is important to the public for its artistic and historical values. Rock art is also very fragile and is easily destroyed.

Warm Spring Canyon Flume, Natural Bridge, and Geyser

The Warm Spring Canyon flume, Natural Bridge, and geyser are in a unique historical and natural area located on the lower slopes of the northern Wind River Mountains near Dubois, Wyoming. The natural and historical elements of this area are very closely related and will be dealt with together in this section.

The historical element is a flume that runs down Warm Spring Canyon. In the 1920s no adequate haul roads existed so instead the Warm Spring Canyon Flume was built to transport the hand-hewn ties down to the Wind River. Once on the Wind River, the ties were floated down to a processing plant in Riverton, where railroad companies picked them up for use on the many railroad lines of the region. The flume, completed in 1928, was part of an early system of railroad tie procurement that relied on few machines. Instead, mountain camps of woodcut-

ters were set up where the ties were roughhewn from trees, mostly by hand. The woodcutters, called tie hacks, were so skilled they could produce an almost finished tie by hand in a short time. The flume spanned 9 steep, twisting miles and was often suspended on the walls of the canyon because of the stream's narrow course. The flume utilized water to run the ties down to the river and during its active life carried hundreds of thousands of ties out of the mountains. It was finally abandoned in 1942, when a haul road was completed and more economical trucks were used to transport the ties (Pinkerton 1981).

The portion of the flume that lies on BLM-administered land is near the lower end of the canyon. It is here where the flume encounters a natural curiosity called the "Natural Bridge." This natural bridge is a limestone cavity through which Warm Spring Creek flows. The flume was built through the natural bridge and is suspended on its walls. Another nearby natural phenomenon unique to the area is an inactive geyser, which lies just above the canyon. This geyser now more closely resembles a warm spring situated deep inside the old geyser pipe.

Portions of the flume on BLM-administered land have deteriorated because of the elements and landslides. Despite these ongoing processes, some of the flume is still in good shape, and the segment within the natural bridge has been shielded and remains in good condition. The inactive geyser has some modern trash around it, but otherwise it is in good condition. Limited access to the area has probably deterred much damage to the area's features, and this will probably continue to be the situation in the future.

Most of the original flume was located on national forest lands. A small part, near the lower end of the flume's course, lies on BLM-administered and private land. The natural bridge and geyser are found on BLM lands. The Warm Spring Flume, natural bridge, and geyser area is considered eligible to the National Register, but no formal nomination procedures have been completed for this site.

The Warm Spring Canyon Flume site is managed for historical and natural values. The site is protected from oil and gas development (NSO), and from other uses incompatible with its historic qualities. The Warm Springs Canyon Flume was recommended in the 1987 Lander RMP to be withdrawn from mineral entry, but that has not yet been accomplished. The site was the subject of an engineering and stabilization study, and current management states that a management plan will be done and the flume stabilized; but the management plan and stabilization has not yet been done. Warm Springs Canyon Flume is not part of an ACEC, but has been nominated for ACEC designation.

South Pass Historic Mining District

South Pass Historic Mining District (SPHMA): This area consists of approximately 12,000 acres consisting of a historic gold mining region southwest of Lander on the southern end of the Wind River Mountains and currently protected as an ACEC. It is discussed here because of its relevance to the history of the area. It has both sagebrush steppe and forested areas, with steep to rolling hills. The area contains important historic resources and geological hazards resulting from mining activities. South Pass was and still is the largest gold mining area in Wyoming. The influences of this marginal gold mining area on the early development of the Wyoming Territory and the state of Wyoming were considerable.

Gold was first discovered in the South Pass area in 1842 by a trapper with the American Fur Company. This was followed by limited prospecting in the 1850s and early 1860s, but no organized operations were established because of Indian hostilities and/or unprofitable diggings. It was not until 1867 that large numbers of prospectors entered this area, which was known at that time as the "Sweetwater Mines" area. The year 1867 was a very active period, which included the discovery of most of the major gold deposits, including the Carrissa, Miner's Delight, and King Solomon Iodes. By 1868, up to 1,000 people may have lived in the area, and the towns of South Pass City, Atlantic City, and Miner's Delight were established. However, the mining boom died quickly, and by 1872, the original gold prospects were played out and the area (including the towns) became almost deserted. Recurrent periods of gold mining activity occurred in the South Pass area in the l880s, 1907 to 1911, and the 1930s, but the efforts were never very profitable.

Although the mining activities proved short-lived and mostly unprofitable, development in the South Pass region had major social and cultural impacts on Wyoming. The South Pass towns were some of the first permanent European settlements and generated a new economic base. The economic stimuli from mining operations also encouraged growth of the budding regional economy.

Freighting companies, merchants and speculators benefited from the importation of equipment and the sales of basic supplies, land and claims. Stagecoach lines also sprang up to carry people, goods and mail to and from the mining area market. The increased economic activity even had impacts on markets as far away as Salt Lake City and Denver. Settlement of the Wind River Basin and the development of the Lander Valley's economy were also highly influenced by the South Pass mining activity. The first settlers in the Lander area came mainly from the South Pass settlements, and the early farming communities in the valleys were able to rely on the mining area markets for much of their livelihoods. The mining settlements also provided added impetus to the coming cattle industry, by contributing capital and markets for some of the first cattle ranching outfits in the state.

Along with the mining industry came early military and transportation endeavors. Camp Stambaugh, built in 1870, was an army post constructed near Atlantic City to offer protection to the miners and other settlers from hostile Indians. Occupied until 1877, the fort was not much involved in hostilities and instead, became an important supply station for the local area.

Stagecoach lines sprang up to serve the needs of the miners and bring new people into the area. Stage roads from the Green River, Point of Rocks and Lander all went through the South Pass area. They continued to provide an important service until the early 1900s.

The South Pass settlements have survived up the present by supporting limited gold mining operations, cattle and sheep grazing, small commercial concerns, and recent iron-ore extraction operations. In the 1960s and 1970s, historical interest in the area sparked a movement to preserve the old towns and mines. Some of the more important sites in the SPHMA were stabilized or reconstructed. Currently, the area has several historical sites that are frequented by visitors, but several others are suffering from weathering and lack of care.

The SPHMA is eligible for listing on the NRHP and is managed as an ACEC for cultural and recreational values. The area is protected from oil and gas development (NSO), locatable mineral exploration (segregated from mining and Plan of Operations requirements), utility system (avoided) and OHV use (limited).

Miner's Delight Townsite is a historic site associated with the SPHMA established in 1868 and was one of the three original towns that sprang up in the initial gold rush that occurred at the south end of the Wind River Mountain Range. Despite several small booms and busts, the town never grew much and lingered on only with a few residents up into the 1930s. By the 1960s, the townsite was abandoned and falling into disrepair. In the 1980s, limited stabilization was conducted, and today the site is in fair condition and is managed by BLM as a "ghost town."

Miner's Delight is listed on the NRHP. Approximately 100 acres of this site is located on BLM-administered lands and is managed for historical and recreational values. The site is protected from oil and gas development (NSO), locatable mineral exploration (segregated from mining), major utility systems, and from other uses incompatible with its historic qualities. A cultural resources management plan was developed and approved for Miner's Delight; some fencing, historic surveys, structural stabilization, protection, and archeological excavations have been done at the site, but further work is needed at the site to maintain and protect it.

A major success story for cultural resources is South Pass City, another historic site associated with the SPHMA and in the ACEC. Located about eight miles southwest of Miner's Delight, South Pass City was the original settlement when the gold rush occurred and was the largest town in the original mining district. South Pass City also experienced booms and busts and was mostly abandoned by the middle of the 20th century.

Local interest in the town's preservation eventually resulted in the State of Wyoming purchasing some of the town. With substantial funding, reconstruction of historic buildings was performed and the site was developed as a heritage tourism destination. Additional historic structures from the old town site were located on BLM-administered land, which were then leased to the State of Wyoming to enhance its historic preservation efforts. Currently, the Wyoming Department of State Parks and Cultural Resources manages the site to portray life in an early mining town. (Any RMP decisions would apply only to those portions not managed by the State of Wyoming.) Recently, BLM lands have been transferred to the State for consolidation with its state park for improved management. Additional transfers to the State may be considered with the RMP revision.

The condition trend for the SPHMA is down at a slow rate. Weathering, collection, and vandalism are occurring on an occasional basis. Some of the more important sites in the SPHMA were stabilized or reconstructed. Currently, the area has several historical sites that are frequented by visitors, but others are suffering from weathering and lack of care. The condition trend for Miner's Delight is down at a slow rate. It has been stabilized to a certain extent, but needs major work to stop its slow deterioration from weathering and vandalism. The condition trend for South Pass City is level or up. The coordination with the State of Wyoming has resulted in significantly improved management and stewardship of the historic site.

Unless more stabilization is done at certain sites within the SPHMA, standing structures will be eventually lost as they deteriorate beyond repair. As physical degradation becomes more apparent and requiring more effort (money) to restore, the necessary efforts to stabilize and restore these resources will continue to increase. And looting and vandalism will also continue to affect sites in the historic mining area unless it is controlled.

2.5.2 Regionally-Significant Historic Trails and Early Highways

2.5.2.1 Regional Context

There are a number of regionally-significant historic trails and early auto highways in the planning area. These historic trails and early highways were important in the early development of Wyoming and Montana, and they have all been determined eligible for National Register nomination. They include the Bridger Trail, the Rawlins–Fort Washakie Stage Trail, the Casper to Lander Stage Road, the Point of Rock to South Pass to Lander Stage Trail, the Birdseye Pass Stage Trail, the Green River to South Pass to Fort Washakie Stage Trail, and the Yellowstone/National Park to Park Highway. All have been nominated for ACEC designation.

2.5.2.2 Resource Characterization

The **Bridger Trail** is a historic wagon trail that connected the Oregon Trail near Casper to the Montana gold fields. This trail passes through the northeastern part of the planning area, and runs from the southeast past Lost Cabin and up over the Bridger Mountains near Bridger Pass. This regionally significant historic trail was blazed by Jim Bridger in 1864 as an alternative to the Bozeman Trail. It later became an important route for settlers headed for the Bighorn Basin. After the railroad arrived in the early 1900s, this trail became a local access route, and its historic setting remained very good for the next 50 years.

Because its location was not known by the BLM, oil and gas activities were allowed to impact the trail in the 1970s, 80s, and 90s. Once the trail's location was clarified, protection measures began to be applied. Recently, oil and gas activity has dramatically increased around the trail; at the same time, protection measures have been instituted that are designed to help protect its historical character. Most of the trail through the planning area is still visible as a single set of ruts or as a swale. The Bridger Trail has been nominated for ACEC designation. Because of increased oil and gas activity in the last 15 years, the Bridger Trail's trend is down. More recent mitigation measures have slowed the rate of intrusions.

The **Rawlins-Fort Washakie Stage Trail** connected the transcontinental railroad at Rawlins with the new settlements of Fort Washakie and Lander. This trail was established in the 1870s and was a major transportation link until 1906, when the railroad reached Lander. Used by freighters, stagecoaches, and the military, this route was an important early link with the outside world for the Sweetwater Valley, the South Pass Mines, and the Lander Valley. At present, the trail ranges from slightly-to-moderately-to-severely damaged by modern intrusions, and some parts of the trail through have been completely obliterated. About two-thirds of the original trail is still visible as one or more ruts or as one or more swales. The condition trend is slowly down. Occasional oil and gas development and ROWs have threatened the trail over the last 25 years, and this trend is expected to continue.

The **Casper to Lander Road** became an important transportation artery between Casper and the Lander Valley after the railroad arrived in Casper in the 1880s. It, too, lasted until the railroad reached Shoshoni, Riverton, and Lander in 1906. It was a freight and stagecoach route as well as an important part of the development of the Wind River Basin. At present, the trail ranges from slightly-to-moderately-to-severely damaged by modern intrusions, and some parts of the trail have been completely obliterated. Most of the trail through the LFO is still visible as a single set of ruts or as a swale. The condition trend is slowly down. Occasional development and ROWs have threatened the trail over the last 25 years, and this trend is expected to continue but mitigation measures have slowed the rate of intrusions.

The **Point of Rocks to South Pass Stage Trail** was a supply route for the South Pass area mines in the 1870s. This transportation corridor was an important link for the entrepreneurs developing the South Pass mining area, but was supplanted when a main rail depot was established at Green River. At present, the trail ranges from slightly-to-moderately damaged by modern intrusions, and some parts of the trail have been completely obliterated. The condition trend is very slowly down. Developments and ROWs have threatened the trail over the last 25 years, and this trend is expected to continue. Part of the Point of Rocks to South Pass to Lander Trail is contained in the South Pass Historic Mining Area ACEC.

The **Green River to South Pass to Fort Washakie Stage Trail** was an important trail from the railroad at Green River to the mines at South Pass and the Lander Valley. It began in the 1870s and was used until 1906, when the railroad reached Lander. Together with the Rawlins-Fort Washakie Stage Trail, this was the major supply route into the South Pass and Lander areas for several decades. At present, the trail ranges from slightly-to-moderately-to-severely damaged by modern intrusions, and some parts of the trail through have been obliterated. The condition trend is slowly down. Occasional development and ROWs have threatened the trail over the last 25 years, and this trend is expected to continue but mitigation measures have slowed the rate of intrusions.Parts of the Green River to South Pass to Fort Washakie Stage Trail happen to run through the South Pass Historic Mining Area and Red Canyon ACECs, but the trail itself has been nominated for ACEC designation so that special management can be applied.

The **Birdseye Pass Stage Trail** connected the Wind River Basin to the Bighorn Basin in the late 1800s. It was the main route from the Lander and Riverton areas to Thermopolis and points further north until the early 1900s, when the railroad reached Worland. At present, the trail ranges from slightly to-moderately-to-severely damaged by modern intrusions, and major parts of the trail through the field office have been obliterated. The condition trend is slowly down. Occasional development and ROWs have threatened the trail over the last 25 years, and this trend is expected to continue bit mitigation measures have slowed the rate of intrusions.

The **Yellowstone/National Park to Park Highway** is another early auto road located in central Wyoming. It was publicized as a road system that connected national parks all over the western U.S. Local towns attempted to generate tourist income from automobile tourists through improved roads and advertisements, claiming that this route was the best way to Yellowstone and Rocky Mountain National Parks. The highway was used in the 1910s and 1920s until better roads supplanted it a tourist route. Oil and gas development and ROWs have dramatically increased impacts to this early auto road over the last 25 years, and this trend is expected to continue. At present, the highway ranges --from slightly-to-moderately-to-severely damaged by modern intrusions, and major parts of the trail through the field office have been completely obliterated.

The condition trend is down. Recent oil and gas development and ROWs have dramatically increased impacts to this early auto road over the last 25 years, and this trend is expected to continue but mitigation measures have slowed the rate of intrusions. The Yellowstone/National Park to Park Highway has been nominated for ACEC designation.

2.5.3 Spiritual, Sacred, and Traditional Resources and Properties

2.5.3.1 Regional Context

General Spiritual/Sacred/Traditional Cultural Properties

These are properties that are religious, sacred, or significant to a particular cultural group. Sacred sites can be Prehistoric or Historic, and may or may not be still used by that group, while ceremonial properties and Traditional Cultural Properties (TCPs) are still used by at least some members of the particular group. Sacred and ceremonial sites and TCPs are not common, but do occur in the planning area. They have generally not been publically identified but some are known to the BLM and are protected in a quiet way (many of these sites are kept undisclosed because of their vulnerability to looting or vandalism, and because the groups have requested they remain unidentified). Rock figures and unusual shapes, burials, medicine wheels, and vision quest sites are examples of these kinds of sites. Martin's Cove, a site sacred to the LDS Church, could also be considered a TCP. The conditions of the types of properties can range from good to poor, depending on the amount of unwanted impacts they have received.

2.5.3.2 Resource Characterization

A few spiritual, sacred, or traditional cultural properties are known in the planning area and are being managed for these values. These sites are protected, on a case-by-case basis, from oil and gas development (NSO), and from other uses incompatible with their special qualities.

Cedar Ridge Complex is a specific spiritual/sacred/traditional cultural property located in the northeastern portion of the planning area. Most of Cedar Ridge is within the Casper Field Office, but some of it extends into LFO. Cedar Ridge is not part of any current ACEC, but it has been has been nominated for ACEC designation. Cedar Ridge is protected by special management in the CFO RMP. The Cedar Ridge complex is culturally important to the Eastern Shoshone Tribe, the Crow Tribe, and possibly other tribes. It was established as a TCP in 1997 after extensive consultation with the Eastern Shoshone Tribe and the Wyoming State Historic Preservation Office.

This locality was used for more than 5,500 years as a ceremonial site for prayers and rituals and continues to be a sacred place for the Eastern Shoshone Tribe to conduct religious observances.

The site is considered integral to the proper functioning of contemporary Shoshone ways of life (Executive Order 13007, AIRFA), and elements of the NHPA enjoin federal agencies to prevent disturbance and provide access to such sites. The portion of the ridge in the planning area has not had much modern development to date.

Trends for Prehistoric Cultural Resources

Overall, the condition trend for prehistoric cultural resources in the planning area is down. While the protection of prehistoric cultural resources has some of the strongest regulatory basis of any of the multiple uses, increasing development, particularly oil and gas and mineral extraction and ROWs, presents a long term threat to the resources. Over the last 20 years, impacts from development to prehistoric resources have increased, and undiscovered buried sites are especially vulnerable to destruction during construction. On the other hand, increased awareness of where buried resources are present and improved data recovery measures have substantially increased our knowledge of the prehistoric resources present in the LFO. Consultation prior to development and avoidance are the best management approaches.

Due to the additional effects of natural impacts on prehistoric cultural resources from weather and exposure, the trend under any amount of development would tend to be down. Within the last two decades, knowledge of the existence and location of cultural resources has increased, as have the management techniques needed to protect the resources for the future.

Collecting, looting, and vandalism of prehistoric sites have been and continue to be serious problems and have contributed to the deterioration of many sites, along with the resulting loss of scientific information and the loss of site integrity and context. Certain types of sites, such as rock art and historic structures have been seriously damaged from these kinds of activities.

Specific Affected Prehistoric Cultural Resources

Overall, the condition trend for Castle Gardens is down. Vandalism is an ongoing problem that seriously threatens the site as does erosion. Vandalism has not abated, partially because the site has not been very actively managed. Development and implementation of a well-thought-out management plan is essential to reverse this trend. Recent analysis of the Castle Gardens site by a conservation expert will provide insight to managing this property in the future.

Historic Cultural Resources

As with prehistoric resources, increasing development presents a long term threat to the resources. However, historic resources have not suffered as much as prehistoric resources, mainly due to the fact that historic resources are generally not located near current development areas. Over the last 20 years, impacts from development to historic resources have remained about level but could change in the future if development begins near historic areas and sites.

Vandalism of historic sites is currently a greater concern than development, and continues to be a problem. Vandalism has contributed to the deterioration of several sites, especially those sites that are easy to access. Certain types of historic sites, such as abandoned towns, mines, and ranches have been damaged.

Specific Affected Historic Cultural Resources

The condition trend for Warm Springs Canyon Flume, Natural Bridge, and Geyser is down and potentially irreversibly so. Landslides and natural deterioration continue to destroy and degrade the remaining intact portions of the flume. Unless stabilization and preservation measures are implemented, the entire flume will be someday be gone.

Spiritual, Sacred, and Traditional Resources and Properties

The condition trend for general Spiritual/Sacred/Traditional cultural properties is slowly down. As development activities continue, impacts to spiritual, sacred, and traditional cultural properties have increased.

Specific Affected Spiritual, Sacred, and Traditional Resources and Properties

The condition trend for Cedar Ridge is level. The portion of the Cedar Ridge in the planning area has not had much modern development to date, and is being managed to protect its spiritual and sacred values.

Forecasts

Under current management, national and Wyoming cultural resource goals will continue to be minimally met; however, these goals could be met more successfully and efficiently with better tools and additional resources. Pressures on cultural resources will likely increase from continued oil and gas and other development, and direct and cumulative impacts will continue to degrade a percentage of the cultural landscape. Case-by-case inventory will prevent harm to most individual sites, but the lack of comprehensive inventory coverage will continue to hamper broad scale interpretation and assessment of cumulative effects. Inventories would probably continue at roughly 250 or more projects per year, with inventories covering approximately 7500 acres per year.

Impacts to prehistoric resources that *cannot* be mitigated could be expected to occur once every five to 10 years; however, as oil and gas exploration and development increases, the potential for difficult cultural resources issues to arise also increases. For historic trail resources, the forecast is not as positive. Impacts to trail resources that *cannot* be fully mitigated are expected to occur once each year, and the historic integrity of these resources is expected to continue to degrade as time goes on.

The demand for consumptive use of cultural resources through tourism and archeological research projects is low, but anticipated to increase through time. This reflects an increasing interest in history and the fragile nature of the resource. Historic trails, particularly those falling under the NHT system, could see increased visitation. Maintaining the historic setting is critical to providing a quality experience for visitors. The setting is an essential component in determining whether a trail segment contributes to the trail's overall significance.

Natural weathering impacts will also continue and these impacts do not proceed in a linear fashion. As conditions deteriorate, there is a loss of plant cover and a loss of weather resistance, and the rate of deterioration increases. As physical degradation becomes more apparent and requiring more effort (money) to restore, the necessary efforts to stabilize and restore these resources will continue to increase.

Collecting, looting, and vandalism of prehistoric and historic sites, which are difficult to quantify, is nevertheless forecast to continue to be a serious problem in the planning area. These activities will also contribute to the deterioration of many sites. Certain types of sites, such as rock art sites, rock shelters, certain open sites, and historic structures will continue to suffer damage from these kinds of activities.

New types of motorized and non-motorized vehicles have increased the utilization of remote parts of the planning area. This factor has accordingly increased the vulnerability of remote cultural resource sites through human-caused activities and degradation.

American Indian concerns are also becoming increasingly important as development pressures and awareness of three main issues increase. The first issue concerns American Indian human remains. The Native American Graves Protection and Repatriation Act (1990) charges the BLM with establishing the cultural identity of human remains and either leaving them in place (if possible) or returning them to the appropriate tribal group for reburial according to their wishes. In addition, any associated funerary objects, sacred objects, or other objects of cultural patrimony need to be restored to their rightful owners. While the main intent of the act was to return human remains and associated artifacts from museum collections, new discoveries of human remains are also incorporated.

The Act requires the BLM to consult with a broad spectrum of tribal authorities to determine the tribe to which the remains and materials should be repatriated as well as to learn about areas to avoid. New discoveries of human remains and associated artifacts are uncommon, but do occur on public lands in the planning area, and may increase as development continues.

The second critical issue involves American Indian religious concerns. As the landscape is continually modified by development, there is an increasing risk of encroaching on areas of religious significance to tribal people. At the same time, tribal awareness of these areas is growing, resulting in the identification of more areas and sites of religious significance. These localities may be specific features or places, or may be broader areas identified by elders or through oral tradition or may be the origin or home of a spirit entity, the scene of an event in tribal history or the locus of some intangible spiritual value. They may also bbe the physical places where tribal people have customarily carried out religious, spiritual, or ceremonial activities or other traditional practices that form an integral part of their culture (including petroglyph and pictograph sites). The American Indian Religious Freedom Act and Executive Order 13007 charges agencies with protecting these areas, consistent with other rights, and ensuring access to them.

The third critical issue is the identification of areas where plants or minerals are collected by traditional Native American practitioners. While some of these may not be considered TCPs, in many cases it is important to know where they are located and to whom they are important. For these types of properties, proper notifications can be made under the American Indian Religious Freedom Act prior to authorization of land uses that could adversely affect them or preclude tribal members' access. In some cases, they may also be eligible TCPs requiring full compliance with section 106 of the (NHPA).

Climate Change

Climate change predictions include increased duration and frequency of droughts and an increase in extreme precipitation events. Climate changes that result in increased erosion, fire, or mass wasting of rock outcrops could have direct and adverse impacts on cultural resources.

Key Features

The specific affected cultural resources described above are some of the resource features are significant enough to guide land use allocations and/or management decisions. They include:

- the Castle Gardens Petroglyph/Pictograph Area (prehistoric cultural resource)
- the Warm Spring Canyon Flume, Natural Bridge, and Geyser (historic cultural resource)
- the Regionally-Significant Historic Trails and Early Highways
- general Spiritual/Sacred/Traditional cultural properties, not currently disclosed to the public (spiritual/sacred/traditional properties) including rock art
- Cedar Ridge (spiritual/sacred/traditional cultural property)

Other cultural resources within the field office could also guide land use allocations and/or management decisions. They are:

- Areas where significant prehistoric sites are frequently found, and where intensive development or use is occurring
- Areas where significant and fragile rock art and historical inscription sites are found

2.5.4 Paleontological Resources

Fossils are the remnants, impressions, and traces of once-living organisms preserved in the Earth's crust. Fossils can be the altered remnants of plants or animals (body fossils), or reflect their presence or actions (impressions and trace fossils). Fossils are typically preserved in sedimentary rocks, or, in unique situations, igneous rocks. They can be microscopic, as in single-celled animals (bacteria) or pollen; or macroscopic, such as fossils of leaves, petrified wood, shells of invertebrate animals, bones, teeth, tracks, feeding traces, and burrows and not limited to fossils of animals, especially dinosaur bones or teeth, or petrified wood.

Management of paleontological resources is aimed at protecting vertebrate and other scientifically significant fossils for the benefit of the public. Significant fossils are defined by BLM policy as including all vertebrate fossil remains, and those plant and invertebrate fossils determined to be scientifically unique on a case-by-case basis. Abundance of these resources varies, with some geologic formations containing few or no significant fossils, to other formations known to commonly produce significant fossils throughout the formation.

Collecting fossils on BLM-administered lands is allowed with some restrictions, depending on the significance of the fossils. Hobby collecting of common invertebrate or plant fossils is allowed in reasonable quantities, using only hand tools. Commercial collecting of fossils is not permitted. Collection of all vertebrate and any administratively designated plant or invertebrate fossils may be done only under permits issued to qualified researchers for reconnaissance work and collection of surface finds, with a 1-square-meter surface disturbance limit. If the disturbance will exceed 1 square meter or require mechanized equipment, the researcher must apply for an excavation permi which requires NEPA analysis. All fossils collected under a permit remain public property and must be curated in an approved repository.

2.5.4.1 Regional Context

The most prolific vertebrate-bearing formations are the Wind River, Wagon Bed, White River, and Morrison formations. The Wind River Formation has produced early mammal fossils and is the focus of several national paleontological institutions. The Wagon Bed and White River Formations contain marine vertebrate fossils such as turtles. The Morrison Formation has been shown in this area to contain dinosaur remains.

Recently, paleontological resource management policies have been updated for the entire BLM. Additional information about formations that are known to contain significant fossil resources is being gathered and applied to better manage these resources.

2.5.4.2 Resource Characterization

Indicators

Indicators of location are based on the presence of the geologic formations. Indicators of condition measure the loss of those characteristics that make the fossil locality or feature important for scientific use. Natural weathering, decay, erosion, improper collection, and vandalism can remove or damage those characteristics that make the resource scientifically important.

Current Condition

The BLM utilizes the Potential Fossil Yield Classification system to classify the potential to discover or impact significant paleontological resources to assist in determining proper mitigation approaches for surface-disturbing activities, disposal or acquisition actions, recreation possibilities or limitations, and other BLM-approved activities. The system also highlights areas likely to be a focus of paleontological research efforts or illegal collecting. The formations listed in Table 2-45 have been identified as being “high” or “very high” for containing fossil remains.

Table 2-45. Formations Containing High or Very High Fossil Yield Classifications

Formation	Age	Fossil Yield Classification
White River Group	Oligocene and Eocene	5 – Very High
Wiggins Formation	Upper Eocene	5 – Very High
Washakie Formation	Upper Eocene	5 – Very High
Tepee Trail Formation	Upper Eocene	5 – Very High
Aycross Formation	Middle Eocene	5 – Very High
Wagon Bed Formation	Middle Eocene	5 – Very High
Bridger Formation	Middle Eocene	5 – Very High
Wind River Formation	Lower Eocene	5 – Very High
Indian Meadows Formation	Lower Eocene	5 – Very High
Fort Union Formation	Paleocene	4 – High
Lance Formation	Upper Cretaceous	5 – Very High
Niobrara Formation	Upper Cretaceous	5 – Very High
Cloverly Formation	Lower Cretaceous	5 – Very High
Morrison Formation	Upper Jurassic	5 – Very High
Sundance Formation	Upper Jurassic	5 – Very High

Source: BLM records

As shown in Map 35 more than 50 percent of the total acreage is classified as Class 4 or 5 geologic formations.

Known fossil deposits represent about a relatively young period of geologic history, starting with the Upper Jurassic Era, approximately 145 million years BP. These formations are being scrutinized more closely for their paleontological resources during management analyses. Projects located within areas with the above formations exposed at or near the surface may require further paleontological assessment before or during surface-disturbing activities.

Not as much is known about the paleontological resources as would be helpful. Site-specific areas are receiving intense investigation from academic institutions and consulting paleontologists. Areas of interest include Cenozoic formations exposed between Boysen Reservoir and Madden, between the Antelope Hills and Crooks Mountain, near Bison Basin, and Beaver Rim, and Mesozoic formations along the Lander Front and in the Gas Hills. Currently, there are 31 active paleontological permits for various types of work; 13 are for consultants working for land users; 17 are for research institutions doing survey; and 1 is for a researcher doing excavation.

BLM is now actively managing paleontological resources on public land, and land uses in high or very high potential formations may be subject to survey, monitoring, avoidance, or recovery of significant fossil resources. Active hobby collecting of invertebrate fossils occurs in the area, although information documenting this type of use is limited. There are occasional instances of illegal fossil collecting occurring; law enforcement is needed to deter this type of activity.

Trends

The general trend for paleontological resources is stable to upward. Increased levels of identification, avoidance, and recovery of significant fossils through increasing application of mitigation measures will help to protect the paleontological resource and add to the base of scientific knowledge. Some significant fossils will be destroyed during surface-disturbing activities, but pre-disturbance surveys and on-site monitoring efforts will also protect many that would have been lost without these efforts. Natural weathering will continue to destroy fossils and no management actions exist that will substantially alter that situation. Illegal collecting and looting of fossil resources will continue to be a problem. These activities will continue to contribute to the deterioration of paleontological localities, due to the loss of scientific information, and due to the loss of locality integrity and context.

Forecasts

As application of mitigation measures increases, the general forecast is predicted to be an improvement in the protection of paleontological resources. Although energy-related development is expected to continue at a relatively high rate for the next 5–10 years which will result in increased impacts on paleontological resources, the additional mitigation efforts will offset much of the adverse impacts caused by this development.

Implementation of management actions that would deter accelerated erosion would also serve to indirectly protect paleontological resources from some natural or human-caused erosion. However, most natural erosion processes will continue to destroy fossils.

It is predicted that the number of researchers studying and collecting fossils will remain about the same; however, mitigation actions performed by qualified paleontological consultants will lead to an increase in known fossil localities and recovery of significant fossils that would have been otherwise undiscovered. This will result in an improvement of scientific knowledge and better management of the resource in the long term. Collecting and looting of paleontological resources, which are difficult to quantify, is nevertheless forecast to continue to be a problem.

Climate Change

Climate changes that result in increased erosion or mass wasting of rock outcrops would have direct impacts on paleontological resources. Interestingly, one of the reasons to study paleontological resources is to learn about earlier periods of climate change.

Key Features

The formations that have high or very high potential for paleontological resources may be key features potentially guide land use allocations or management decisions in the planning area. These formations are identified on Table 2-52. Of known specific interest is the Wind River Formation (especially in the Lysite area), Mesozoic deposits in the Gas Hills and along the Lander Slope, and Tertiary deposits near Bison Basin and Beaver Rim.

2.5.5 Visual Resources

The BLM uses a Visual Resource Management (VRM) system to classify the aesthetic value of its lands and set management objectives during the planning process. The VRM system involves assessing visual resources and assigning them to one of four inventory classes (Class 1 to 4) based on three factors: scenic quality, visual sensitivity, and distance from travel or observation points. These inventory classes are one of many considerations during the land use allocation and impact analysis process. Final Visual Resource management classes are assigned during the planning process; these classes establish a measurable standard for the amount of change allowed to a specific areas visual resource.

The following are the objectives or standards for each Visual Resource Management Class:

Class 1: The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

Class 2: The objective to this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

Class 3: The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

Class 4: The objective of this class is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

2.5.5.1 Regional Context

The planning area contains a moderate amount of areas that possess a high degree of scenic quality and visual sensitivity, drawing an increasing number of visitors each year who come to the area to recreate and sightsee. These visual attributes have made the planning area a nationally recognized scenic destination. In general, high scenic quality is a product of the area's extraordinary topography, geology, and cultural history. Scenically diverse vistas and canyon riverways, rare and unusual geological formations, colorful and highly contrasting sandstones, and numerous historic remnants contribute to the area's high visual quality. Areas with high visual sensitivity are the result of the high degree of visitor interest in and public concern for a particular area's visual resources, an area's high degree of public visibility, the level of use of an area by the public, and the type of visitor use that an area receives.

2.5.5.2 Resource Characterization

Indicators

The indicators that are of particular importance are the resources with high public visibility, such as those in the scenic corridors along the highways such as Split Rock which have guided travelers since before written history. Red Canyon is an internationally recognized visual resource. The Dubois Badlands, located along a major route to Yellowstone and Grand Teton National Parks, are well recognized by local travels and visitors to the area. The scenic corridor along the NHT is considered by many) to be an important contributor to the visitor experience.

Current Condition

The visual resources inventory now being completed will provide the basis of VRM for new management decisions. The inventory that was utilized in the 1987 RMP was neither complete nor conducted under current guidance. VRM classes were discussed in the EIS prepared for the RMP but did not update earlier management actions and VRM management classes were not transferred to the ROD. These classes and associated acreages are listed in Table 2-45A.

Table 2-46A. Visual Resource Management Class Acreages and Representative Areas

VRM Management Class	Representative Areas	Percent of Classified Acreage
1	Red Canyon National Natural Landmark and Oregon–Mormon Pioneer National Historic Trail[1]	0.05
2	South Pass Historic Mining Area, Lysite Mountain, and the Lander Slope	11.66
3	Blue Ridge/Cedar Ridge, Rattlesnake Hills, and the lower slopes of Green Mountain	12.04
4	Bison Basin Road, Crooks Gap, and Antelope Hills	73.98
5	Green Mountain Uranium Mines, Beaver Creek Oil Fields, and Gas Hills[2]	2.27

[1] The 1987 Lander RMP did not designate WSAs as Class 1; Instruction Memorandum number 2000-096 dated 03/21/2000, states, "All WSAs should be classified as Class 1, and managed according to VRM Class 1 management objectives until such time as the Congress decides to designate the area as wilderness or release it for other uses."

[2] The current BLM VRM management system was established after the ROD was published for the Lander RMP. Therefore the existing RMP utilized a now-outdated classification system; under this system a Class 5 management class was established to manage these areas for the main objective of rehabilitation or enhancement of the landscape character.

Map 36 shows the VRM classes established in the 1987 RMP. Map 37 shows the new inventory levels, Maps 38-40 show the three inventory considerations used to develop the new inventory classes. Under current management, Classes 3 and 4 comprise the majority of the public lands (Table 2-45). In general, areas located on or near transportation routes in the lower portions of the basin, areas undergoing oil and gas or other development, and areas with less visual variety and scenic quality are in these categories. The major areas that possess both outstanding scenic quality and high visual sensitivity include, but are not limited to, the Sweetwater Rocks, Beaver Rim, Sweetwater Canyon, Red Canyon, South Pass Historic Landscape, Green Mountain, the Lander Slope, and the Dubois Badlands.

Areas of high scenic quality and visual sensitivity that are associated with travel corridors include: Sweetwater Basin to Beaver Rim (from Highway 220 south to State Highway 287 from Muddy Gap northwest to Beaver Creek), Highway 28 starting at or near Commissary Hill through the South Pass historic landscape to the planning area boundary, State Highway 287 from the Reservation boundary north to the planning area boundary including small portions of the Wyoming Centennial Scenic Byway, Highway 20/789 from Shoshoni to the reservation line recently designated as the Wind River Canyon Scenic Byway, and the National Historic and Continental Divide National Scenic Trail Corridors.

Management actions in the 1987 RMP related to visual resources are integrated with other programs such as recreation and include:

- Designate OHV (formally Off-Road Vehicle) use for 100,500 acres as limited to existing roads and trails to protect watershed and scenic values (Lander Slope/Red Canyon, Green Mountain, and Whiskey Mountain). Also, designate 4,580 acres as closed to OHV used to protect visual resources, primitive recreation, and fragile soils.
- Established "a ¼-mile or visible horizon corridor (whichever is closer) on each side of selected trail segments, where modern intrusions and disturbances will be minimized or prohibited" for the NHTs.
- Withdraw from locatable mineral entry 2 percent of the planning area to protect wildlife, native plant resources, and scenic value.
- Close 1 percent of the planning area to oil and gas leasing to protect wildlife, native plant resources, and scenic value.
- Designate approximately 5,000 acres of federal surface within the Dubois Badlands Management Unit as an ACEC. "This action will protect the bighorn sheep habitat, the scenic quality, and the erosive nature of the badlands."
- Designate approximately 15,000 acres of federal surface within the Red Canyon Management Unit as an ACEC to protect highly visible steep slopes and areas with important wildlife habitat.

- Designate approximately 25,000 acres of federal surface as an ACEC to protect important wildlife habitat and scenic quality of the Lander Slope Management Unit.

Trends

The BLM authorizes a wide variety of activities ranging from vegetation and habitat improvement projects to large scale energy, mineral and mining operations which have the potential to impact scenic quality. Recreational opportunities, experiences, and benefits depend on the scenic quality of the landscapes. By far, the greatest threat to visual resources are proposed developments such as wind turbine farms and linear transmission lines that do not lend themselves to the type of siting that mitigates the impact to visual resources. Wind potential is more likely to be better on locations of high visual prominence such as Cyclone Rim or Beaver Rim.

Modern management techniques for visual resources incorporate methods for minimizing the impact of activities on visual resources. Contrast, location, finishing, and staging are all utilized to limit the impact of development. To a great extent, the trend in this regard has been upward, reflecting a change in earlier management that allowed developments such as citing towers on mountain tops or fencing and water development projects near to the NHTs.

Currently, site-specific mitigation of impacts to visual resources is being implemented through project level analysis, with reference to the 1987 RMP EIS. The inventory that produced these classes did not map distance zones and visual sensitivity levels. This factor contributes to an overall challenge of managing neighboring visual planning units with contrasting objectives (such as actions in a Class 4 area viewed from a Class 2). The route for the Continental Divide National Scenic trail was delineated after the VRM classes were established resulting in visual impacts to the trail's viewshed impacting the user's recreational experiences and benefits.

Cumulative impacts are resulting from the increase in recreation and tourism, vehicular travel, the increasing number of roads and trails, and the increasing numbers of sightseers attracted to the area. Additional impacts are resulting from the development of utility corridors, oil and gas development, seismic exploration, activities in support of livestock grazing, and other land use disturbances. Conflicts between visual resources and other uses have occurred in the Beaver Rim, South Pass, Oregon Trail, and more recently Continental Divide National Scenic landscapes. Conflicts associated with visual resources typically are a product of maintaining existing visual prescriptions and/or the observed trend of increasing visual sensitivity (better public access, and changes in land use patterns such as the designation of the Continental Divide Trail). Table 2-46B discusses the trends in the LFOs visual resources.

Table 2-46B. Visual Resource Indicators and Conditions and Trends

Indicator	Determining Factors	Condition/Trend
Visual Quality- a measure of the visual appeal of a tract of land	Landscapes are rated based on seven key factors: landform, vegetation, presence of water, color, adjacent scenery, scarcity, and cultural modifications.	Increased development in and adjacent to public lands has caused some viewshed degradation.
Visual Sensitivity, a measure of public concern for scenic quality	Type of users, amount of use, public interest, adjacent land uses, and special areas	Planning area-wide Visual sensitivity has increased. Housing developments adjacent to public lands, increasing populations, better public access, and an increasing outdoor recreation public are all factors that have contributed to an overall heightened visual sensitivity.
Distance Zones- Landscapes are subdivided into three different zones based on relative visibility from travel routes or observation points	The three zones: foreground middleground (3–5 miles from key observation points), background (6–14 miles), and seldom seen (not seen or hidden from view)	Expanding developments and new/improved travel routes in and adjacent to BLM lands have placed more viewsheds in the critical foreground middleground zones.

Source: BLM Visual Resource Management Guidance

Forecasts

If current trends continue, conflicts associated with visual resources and other land uses will continue. Viewshed quality will decrease while visual sensitivity and the frequency of contrasts in the critical foreground/middle ground viewshed zone increases. The phenomenon of diverging visual resources indicators limits the BLM's ability to apply effective visual mitigation as well as lowers public tolerance for viewshed alteration. In most places VRM objectives are being met; however, if current management continues, the challenge of meeting these objectives will increase especially in the case of areas managed to maintain the existing visual environment (such as VRM Classes 1 and 2) that are within view of areas managed for a more intensive development scenario (such as VRM Class 3 and 4). Historic land uses will continue to degrade viewsheds because they were permitted without ever having been subjected to current visual contrast rating which results in a lack of visual mitigation measures being applied to the activity.

Existing visual management techniques will not protect the Continental Divide National Scenic Trail from continued land use development. This development will degrade the visual environment in turn eventually modifying the existing recreational experiences and benefits.

Key Features

The planning area encompasses two major physiographic provinces, the middle Rocky Mountains and Wyoming basin which form the base of the visual resources key features. Table 2-47 displays the unique scenic features by physiographic province, the VRM class, and a short discussion of resource indicators that should guide the land use allocation.

Table 2-47. Unique Scenic Features in the Planning Area

Unique Scenic Features (Current VRM Class)	Factors Influencing Allocation or Management
Wyoming Basin Physiographic Province	
Beaver Rim (Class 2, 3)	Large landscape feature with lots of contrast. Creates a strong lateral horizon line across U.S. Highway 287 and State Highway 135 corridors. The top of the rim provides stunning views of adjacent mountain ranges and the Wind River Basin.
Blue Ridge (Class 3)	Large feature running parallel to the Wind River Mountains; the viewshed is dominated by the adjacent scenery.
Burnt Ranch (Class 2)	Mixed private and public lands coupled with the historic landscape create a viewshed with high visual sensitivity.
Castle Gardens Petroglyph Site (Class 2, 3)	Important cultural resource area with high recreation visitation. Visual sensitivity in this area is high.
Cedar Ridge (Class 3)	The area is a high-use recreation area, with color contrast and large sandstone abutments.
Continental Divide National Scenic Trail Corridor (1, 2, 3, 4, 5)	The trail corridor through the planning area is an important recreation setting. Visual sensitivity along the route is high; in addition this is part of a small section of the entire trail that displays the physiographic province.
Green Mountain (2, 3, 5)	Mountainous landscape unique to the Wyoming Basin provides a desirable setting for recreationist. The landscape contains high amounts of contrast and scenic overlooks spanning the Sweetwater Valley and Continental Divide Basin.
Historic Trail Corridor (1, 2)	High visitation and public interests coupled with a historic landscape create high visual sensitivity. Adjacent views of the Sweetwater Rocks and Wind River Mountains create a setting that makes history feel alive.
Rattlesnake Hills (2, 3, 4)	High-contrast mountainous terrain with mixed conifer and aspen pockets unique to the physiographic province.
Red Butte (2, 3)	Highly visible feature in view from Lander and surrounding areas.
Red Canyon (1)	A very unique landscape with high visual sensitivity; it is designated National Natural Landmark and is an identity landscape for the Lander area.
South Pass Historic Landscape (1, 2, 3, 4)	Historic and pre-historic resources, developed recreation sites, and a moderate visual quality combine to form an important visual resource and recreational setting within the planning area.
Copper Mountains Lysite Mountain (2, 3, 4)	Landscape here is unique and mountainous, including rugged cliffs and slopes. Views of Boysen Reservoir and Wind River Canyon compliment this viewshed. A WSA within this area contributes to an overall heightened visual sensitivity level.
Sweetwater Canyon (2)	The canyon offers a unique landscape running through a prairie canyon ecosystem, diverse topography with high-contrast riparian vegetation types including aspen and cottonwood. A WSA within this area contributes to the areas heightened visual sensitivity.
Sweetwater Rocks/Granite Mountains/Sentinel Rocks (2, 3)	A high degree of contrast exists between the high granite mountains and the adjacent plains, creating a unique landscape that provides the backdrop for the historical trail. Sweetwater River is visible in many areas within the rocks. Four WSAs within this viewshed contribute to the areas high degree of visual sensitivity.

Table Mountain-Lander (2, 3)	This highly visible feature is in view from the town of Lander and surrounding areas.
Twin Creek (2, 3, 4)	Chugwater formations create high color and landform contrast. Adjacent scenery and features create a highly desirable visual setting.
Mixed Middle Rocky Mountains and Wyoming Basin Physiographic Province	
Duboise Area (2, 3, 4, 5)	This high-contrast viewshed spans floodplains, badlands, mountainous terrain, and peaks And provides an identity landscape for the town of Dubois as well as diverse recreation opportunities and experiences. The two WSAs in this area increase visual sensitivity levels.
Eastern Aspect of the Wind River Range (1, 2, 3)	This area is within view from most residential areas in and surrounding Riverton, Lander, and Hudson and produces a very high degree of visual sensitivity. Numerous canyon riverways and rugged terrain provide for diverse recreation opportunities. It adds positive adjacent scenery influence to several other viewsheds within the planning area.

(Source: BLM, 1987)

2.6 Land Resources

2.6.1 Lands and Realty

2.6.1.1 Resource Characterization

The planning area includes all of Fremont, and small portions of Natrona, Carbon, Sweetwater and Hot Springs Counties. Many isolated parcels of State Trust Land and private land are dispersed throughout the decision area and interspersed with public land. The Shoshone National Forest is located in the north and western-most edge of the planning area. The Wind River Indian Reservation (WRIR) is located in the north central portion. The existing surface management pattern is shown on Map 1 in Chapter 1 and is summarized in Table 2-48 Federal mineral estate is shown on Map 2 and consists of 3,817,485 acres.

Table 2-48. Planning Area Surface Management in the

Surface Manager	Acres Managed	Percent of Planning Area
BLM	2,393,578	37
USFS	875,604	13
State of Wyoming	278,131	4
Bureau of Reclamation	125,705	2
Private	1,223,420	19
WRIR	1,546,505	24
USFWS	111	0
DoD	1,339	0
Water	42,434	1
TOTAL	6,486,831	100.00%

Land Use Authorizations

Land use authorizations include: ROW grants and communication site leases issued under Title V of the FLPMA; ROW grants under Section 28 of the MLA; permits and leases under Section 302(b) of the FLPMA; and federal aid highways and mineral material sites. Past and current conditions associated with these components of land use authorizations are described below. BLM has seen increasing interest in land use authorizations, including higher demand for ROW for mineral development. This is likely to continue as development increase.

Rights-of-Way Grants

The majority of ROW applications are for the development of power lines, communication facilities (including fiber optic lines), access roads, water-related facilities (water wells and pipelines), and pipelines and ancillary facilities for the transportation and delivery of mineral-related commodities. Table 2-49 identifies the existing authorized ROWs by the authorization type. BLM issues ROWs that are nonexclusive, so the total acreage contains a large amount of overlapping authorizations and is not representative of the total acreage that is actually encumbered by ROWs. The actual encumbered acreage would be much smaller.

Table 2-49. Existing Rights-of-Way in the Planning Area

Authorization Type	Number of Existing ROW Authorizations Length (miles)	Total Acres
Roads	272	7,856
Pipelines and Associated Sites	271	14,091
Power lines and Associated Sites	262	121,594
Telephone and Fiber Optic Lines	92	1,392
Water Facilities, Ditches and Reservoirs	55	3,761
FHWA Roads and Material Sites	74	4,213
Established Communication Sites (Multiuser)	3	N/A
Communication Use Authorizations	31	323
Total	1,060	153,230

Source: BLM Realty data, retrieved on March 30, 2009

In the past 10 years, regional demand for ROWs on public land has increased. Much of this demand has focused on conveyance of energy products through and from the sparsely populated western states to population centers, most recently dominated by west coast power demands. The upsurge in exploration and development of fuels such as natural gas has resulted in the need for more pipelines and higher pipeline capacities. Technological advancements have also resulted in new demands on public land, largely related to wind energy and communication sites for telecommunications (e.g., cellular and fiber optic).

BLM's objective under the ROW program is to grant ROW to any qualified entity and to direct and control the use of ROW in a manner that protects the natural resources associated with the public lands and adjacent lands, prevents unnecessary or undue degradation, promotes the use of ROW in common considering technological compatibility, national security, and land use plans, to the fullest extent possible, all BLM ROW actions with state and local governments, interested individuals, and appropriate quasi-public entities.

Under the 1987 RMP, ROW authorizations are grouped together and collectively referred to as "major utility and transportation systems". The plan directed that these systems be, "… located to make use of existing corridors whenever possible, to provide for cost efficient routes and to provide for protection of other resource values such as scenery and wildlife. Most of the area will be open for the location of major utility systems." ROW avoidance areas were identified for areas with the most potential conflicts, with no distinction made for scale or type of ROW being considered. ROW avoidance areas identified are generally associated with existing ACECs..

The 1987 RMP identified six WSAs, including Copper Mountain WSA, Sweetwater Canyon WSA, and four WSAs in Sweetwater Rocks. In January of 1990 two additional WSAs, the Dubois Badlands WSA and Whiskey Mountain WSA were added. Within WSAs, existing ROWs may be renewed if they are being used for their authorized purpose. New ROWs may be approved for temporary uses if they satisfy the non-impairment criteria (Section III. C. 3 of BLM H-8550-1).

Communication Site Right-of-Way Grants and Leases

The 1987 RMP did not identify preferred locations or include any other specific discussion of communication site ROW. These have been approved on a case-by-case basis. Currently, there are three multiple owner approved communication sites, they are: Horse Heaven, Cedar Rim and Crooks Mountain. Additional information is included in Table 2-49.

Land Use Permits and Leases

The most common type of authorization issued under this authority were minimum impact land use permits for commercial filming on public lands. Additionally, permits were issued for water well testing and monitoring and short-term equipment storage. The LFO currently administers three land use leases, one for the Martin's Cove Site consisting of 994 acres, an agricultural lease consisting of 11 acres (authorized as resolution of unauthorized use), and for a coral and barn consisting of less than 1 acre (authorized as resolution of unauthorized use).

Unauthorized Use/Trespass

Unauthorized use or trespass is the use, occupancy, or development of public land without a required authorization, or in a way that is beyond the scope and terms and conditions of an authorization; this definition excludes uses defined as casual use in the regulations.

The 1987 RMP directs that unauthorized land uses would be resolved through termination, authorization by lease or permit, or sale. It also identified specific criteria for consideration for unauthorized use decisions and directed that new cases of unauthorized use would be terminated immediately.

Temporary permits might be issued to provide short-term authorization, unless the situation warranted immediate cessation of the use and restoration of the land. It directed that highest priority be given to the following unauthorized uses: new authorized activities or uses where prompt action could minimize damage to public resources; cases where delay might be detrimental to authorized users; cases involving special areas, sensitive ecosystems, and resources of national significance; and cases involving malicious or criminal activities. The most common occurrences of unauthorized use/trespass are illegal dumping, roadways, irrigation and agricultural development, pipelines and power lines.

Some trespass actions, such as illegal dumping, can cause unmitigated damage to public lands and natural resources. If BLM is unable to identify a responsible party, the cost to resolve trespass and to clean up and reclaim the area paid by the general public. These costs direct appropriated funds away from planned work, and impact BLM's ability to complete its mission. In addition, the fair market value for use of the public lands is not realized by the public.

There are currently 30 unresolved potential unauthorized use/trespass cases pending. On average, the BLM resolves 1 unauthorized use/trespass case per year. Resolution of trespass includes payment of administrative costs, rental value for period of use, and penalties (assessed based on the willful or non-willful nature of the use) and may include removal, rehabilitation and restoration of affected lands or authorization of the use. Authorization of an unauthorized use or trespass has been accomplished through issuance of a land use permit, land use lease or a ROW, whichever authorization is most appropriate based on the use.

Land Tenure Adjustments

Adjustments to land ownership (land tenure) are an important component of the BLM's land management strategy. The BLM completes ownership transactions when such transactions are in the public interest and consistent with publicly-approved land use plans. In the planning area, the land-ownership pattern mainly consists of large blocks of public land surrounding scattered parcels of private and state lands. In addition to these large blocks, there are areas of scattered public lands within state and private lands which can be difficult to manage. In many cases the small size of the scattered parcels, their isolation from other parcels of public land, and lack of legal access can make them of marginal utility for retaining in public ownership. These isolated parcels can serve other resource purposes such as providing wildlife habitat in an area that has been fragmented by suburban development or providing recreational facilities.

The 1987 RMP identified 108 tracts of approximately 12,500 acres as available for for future disposal through sale or exchange (Appendix C). Land tenure adjustments, such as condemnation and accepting donated land, are authorized by law but are not discussed here because they are not part of current management and not expected to be part of future management.

Exchanges

Conducted under the authority of Section 206 of the FLPMA, land exchanges are a tool that enables the BLM and other landowners to improve land management, consolidate ownership, and protect environmentally sensitive areas. By exchanging public land that is isolated and difficult to manage, the BLM is able to acquire other lands with importance for recreation, wildlife, fisheries, wetlands, habitat for threatened and endangered species, wilderness, open space, scenic, cultural and other resource conservation purposes. Land exchanges allow the BLM to reposition lands into more manageable units and to meet community expansion needs and continue to be the preferred method of land ownership adjustment with state governments.

Since the 1987 RMP was approved, three exchanges have been completed that affected lands within the LFO planning area. The Steers exchange allowed the BLM to acquire lands for wildlife and recreation. The Red Creek and Eastman exchanges facilitated the acquisition of lands in the Whiskey Mountain area for the protection of Bighorn Sheep range and sensitive cultural areas. Only modest exchange activity has taken place in recent years although interest in exchanges continues to increase. Exchanges take huge amounts of staff time.

Acquisitions

The BLM has the authority under Section 205 of the FLPMA to purchase lands or interests in lands. The most common motivation for acquiring lands is to enhance recreation opportunities and acquire critical wildlife habitat. Acquisition of land or interests in land by purchase is used sparingly given the limited funds available through appropriations and other sources.

Current planning identifies the need for continuing acquisition of access to public lands to enhance recreational opportunities as well as wildlife management. Acquiring access easements across non-federal lands for roads and trails provides for legal public access to “landlocked” public lands and for connectivity of trails. Easement acquisition has been a long-term goal in large part because of the scattered land pattern. Since the 1987 RMP there have been 12 easements for access obtained such as the Shoshone Lake Road easement, providing public access to BLM lands. Scoping has identified areas in which improved access would improve public use, particularly in the Sweetwater Rocks area.

Land Sales

Section 203 of the FLPMA gives BLM the authority to dispose of public lands by sale under certain criteria. FLPMA requires that public lands be retained in public ownership, unless disposal

of certain parcels is warranted. Since the approval of the 1987 RMP, approximately 5 parcels, totaling 1,468 acres have been disposed of under the authority of Section 203, including the Riverton Landfill and the Railroad Grade to South Pass City.

Recreation and Public Purpose Leases and Conveyances

The R&PP Act (43 U.S.C. 869 et seq.) authorizes BLM to lease or convey public lands to state and local governments and to qualified nonprofit organizations for recreation or public purpose uses. Lands are leased or conveyedat less than fair market value, or at no cost. Examples R&PP leases include: historic sites (lands transferred in South Pass as part of the Wyoming Parks program), landfill sites (Fremont County landfill), transfer stations, gun clubs, overlooks (Dubois Overlook) and other public uses. BLM has issued 2 leases for a total of 35 acres. These leases are still in operation. Additionally, the LFO has issued 7 patents under the R&PP Act authority.

Withdrawals

Lands are withdrawn under the authority of Section 204 of the FLPMA and by Congressional Act. A withdrawal is a formal action that withholds an area of public land from settlement, sale, location, or entry under general land laws to maintain other public values or reserving the area for a particular public purpose; or transferring jurisdiction from one agency to another. Withdrawals are established for public purposes, reclamation projects, and power site reserves. Approximately 29,040 acres are currently withdrawn from location and entry under the Mining Law. Table 2-50 identifies lands withdrawn from mineral location and entry.

Table 2-50. Lands Withdrawn from Location and Entry under the Mining Laws

Area	Resource Value Protected	Public Land Order #	Acres
Whiskey Mountain	Bighorn Sheep Range	6997	9,610
Whiskey Mountain	Bighorn Sheep Range	7434	1,431
East Fork	Elk Winter Range	6960	10,536
East Fork	Elk Winter Range	888	3,193
East Fork	Elk Winter Range	4644	240
Yermo Site	Desert Yellowhead (T&E Plant)	7688	360
Devil's Gate	Interpretative Site	6623	344
National Historic Trails	Congressional Trails	4915	3,326
TOTAL WITHDRAWALS/ACRES		8	29,040

Five parcels are segregated for withdrawal for transfer to the Department of Energy. These parcels contain tailings from uranium milling facilities considered to be hazardous and unsafe to human health. This is discussed further in the Minerals Section.

Forecasts

Land Use Authorizations

Right-of-Way Grants: Demands access roads and utility will remain moderate over the next 10 to 20 years, depending on the location of energy mineral development. A small increase in demand for major energy transportation ROWs is expected, potentially involving one or two major projects every 10 years. It is likely that minor ROW applications for access roadways and utilities to private residence will continue at the current rate with minimal increases.

Communication Sites: With the current market demand for communications infrastructure, the need for public land for communication sites is likely to continue in the depending upon technology improvements. Since fiber optic lines providing telephone service tend to run between population centers and are often installed with excess capacity, existing authorized ROW may be sufficient to meet future needs with minimal additional authorizations needed. Fiber optic lines are also often associated with major transmission lines, so there could be a need for additional fiber optic ROWs to provide ancillary support for future transmission lines.

Lease, Permits and Easements: Applications for permits for commercial filming and other minor actions are likely to continue at their current levels. The limited nature of these activities has little impact. It is not expected that there will be any new lease or easement actions issued under the authority of Section 302 of FLPMA in the foreseeable future.

Unauthorized Use/Trespass: Trespass will most likely continue at its present rate, since these types of activity are usually directly correlated to development and only minimal development is expected in the near future. BLM will continue to initiate trespass cases on these types of activities whenever they are reported to BLM either from internal or external sources.

<u>Land Tenure Adjustments</u>: With the growing interest in conservation for wildlife protection and private conservation easements being pursued by non-profit entities, it is possible that increased interest may prompt BLM to participate in more land tenure adjustment actions.

Exchange: The exchange program is the most important to protect sensitive resource values such as wildlife, cultural and visual resources that are under increasing threat from development. Due to the complicated and time consuming nature of exchange actions and the limited amount of personnel available to process the actions, only exchanges containing lands with high priority for disposal and/or acquisition are likely to be initiated. National attention on the sage-grouse may well prove to be a prime motivator for exchange in the coming years.

Acquisitions: Acquisitions would continue indefinitely to improve management opportunities, to enhance recreation opportunities, and to further resource preservation. The lack of available funds and dedicated personnel to process these actions has traditionally limited the ability to pursue the acquisition of lands.

Other than partnering with interested publics to acquire land and/or easements, the only potential source of funding for acquisitions of lands is the Land and Water Conservation Fund (LWCF). While the LFO has not participated in an LWCF funded project, those funds have been used in the planning area by other stakeholders for the acquisition of wildlife conservation easements on private lands adjoining BLM-administered lands. However, eligibility and limitations of LWCF funding may limit the acquisition opportunities. This can be especially true with acquisition of conservation easements.

Sales: While sales may be made to create contiguous ownership or to dispose of isolated and difficult to manage parcels, no appreciable sale activity is likely. The lands identified for disposal will remain mostly intact due to lack of demand for parcels. BLM emphasis on exchanges will continue to limit the activity within the sales program.

Recreation and Public Purposes Act Leases and Conveyances: A small number of R&PP applications are expected over the next two decades. Public land could be needed for expansion purposes of existing facilities. In addition, new facility needs for local communities may be identified. The growth of Lander, Riverton, and Dubois has been slow but steady for the last decade. However, what small amount of BLM managed land is near the growth areas is also significant to wildlife and recreational uses, and may not meet BLM's criteria for disposal.

Key Features

Given the range of ROW activities that could be authorized, it may be appropriate to distinguish on the basis of scale (minor, major) and/or type (linear, site-type, communication site) in order to ensure that the criteria of the ROW program objective are met. It is not uncommon for ROW application processing to become bogged down due to resource issues present near the proposed project location. Identification of ROW exclusion areas would ease the pressures being placed on areas containing sensitive resources where ROWs may not be compatible and would provide a useful tool for streamlining the processing of ROW applications.

It is appropriate to identify high priority resources values, areas, and/or goals for the acquisition program. BLM may want to consider the appropriateness of withdrawal of lands from location and entry under the Mining Law for accomplishing resource protection goals and identify areas where withdrawal may be an appropriate management objective.

2.6.2 Renewable Energy

Renewable energy generally is defined as energy derived from sources such as wind, solar, biomass, and geothermal. BLM's policy is to encourage the development of renewable energy in acceptable areas. Additionally, Executive Order 13212 instructs the BLM "to expedite projects that will increase the production, transmission, or conservation of energy." Wind, solar, and biomass proposals would be processed under the authority of Title V of the FLPMA as ROW actions. Geothermal actions are considered a fluid leasable mineral and are processed according to the provisions of the MLA and discussed above. Wind energy refers to electricity generated by wind powered turbines. Of the four classifications of renewable energy mentioned, the only interest in development has been related to wind energy.

Solar power refers to generation of energy that is dependent on the sun. The two primary technologies for solar power generation are photovoltaic (PV) panels and concentrating solar power (CSP). The website for the Solar Energy EIS, http://solareis.anl.gov/eis/index.cfm, contains information on solar technologies and issues involving solar projects, such as the amount of land required for each technology, storage requirements, and abilities. The omission of Wyoming inclusion in the PEIS would not preclude consideration of a site specific proposal but none have been made. The new RMP EIS is not specifically evaluating solar energy development potential but Wyoming has considerable solar potential which could be co-localed with already disturbed soils.

Biomass refers to energy from organic products, often but not exclusively waste products, that are either burned directly or converted to fuels that can be burned to produce energy.

2.6.2.1 Resource Characterization

Current Condition

Wind Power

BLM completed a Programmatic EIS for a Wind Energy Development Program in 2005 for the western United States. The ROD amended the Lander RMP by implementing programmatic policies and BMPs for wind energy development. Subsequent policy (Instruction Memorandum 2009-043) has provided additional guidance for wind energy development on BLM land. ROWs for wind energy projects are issued for specific sites for meteorological towers, sites for meteorological towers and a project area (for the purpose of excluding other wind energy ROWs while site testing and monitoring is being completed), and for full wind energy development. Wind energy potential is shown on Map 41.

The Wind Energy Programmatic EIS acknowledges that guidance exists for many specific issues relevant to wind development, such as soil reclamation and VRM. Areas with wind resource potential identified in the Wind Energy Programmatic EIS are available at: http://windeis.anl.gov/. Lander's low potential is, in part, based on the limited availability of transmission lines, which change in the future. The ROD is not intended to replace site specific analysis, but provides a mechanism for evaluating wind testing and development. The wind energy ROD provides:

- Wind energy projects may be excluded from additional areas if resource impacts that cannot be mitigated conflict with existing and planned multiple use activities.
- To the extent possible, wind energy projects shall be developed in a manner that will not prevent other land uses.

There is one ROW authorization for installation of meteorological towers for wind site testing and monitoring, which includes a project area (17,456 acres are located within the planning area and Casper FO) where no additional facilities are authorized. The authorization for the project area serves to exclude issuance of other wind ROWs.

The LFO has 9 ROW applications for wind site testing and monitoring, including project areas. but no applications for full wind energy development. Utility scale wind energy development generally requires large project areas to achieve efficiencies of scale. Technological advances in wind power generation have led to increases in turbine heights for purposes of efficiency. The increased dimensions of the turbine blades allow the blades to rotate at a slower pace, resulting in reduced impacts for birds and bats. An example of height dimensions for a wind turbine with a capacity of 2.5 MW recently installed on BLM lands - hub height 262 feet, height from base to blade tip 426 feet. Future developments are expected to be even taller

Power Transmission

A significant challenge with renewable electrical generation is the transmitting it to the grid and the the load centers that subsidize its use (Wyoming offers limity renwable subsidy.) There is no excess transmitting capacity out of the planning area and the introduction of new power transmission lines would increase the project footprint and potential for resource impacts. Like wind turbines, power transmission lines also include vertical structures, but introduce a linear feature that can be particularly noticeable on a visual horizon on certain landscapes.

Forecasts

Wind Resources

The planning area has no Class 5 wind locations; there are areas of moderate wind potential in the south and southeastern areas with high potential for resource conflicts. Because of the size of the wind farms, the most probable forecast is for limited wind energy development.

Solar Resources

Technology changes or the need for limiting carbon production or the desire to avoid bringing power from the grid for individual projects may change the future dynamics of solar power in the planning area. There are currently several private solar projects of various sizes in the area (the National Outdoor Leadership School Rocky Mountain installation in Lander is one of the largest in the state) and potential exists for future generation. The demand for electricity produced by both methods of solar production may become far greater depending upon whether carbon emissions are subject to limits or are taxed, although utility level generation is unlikely.

Although Wyoming was not included in the Programmatic EIS for Solar Energy, Wyoming's clear skies and many sunny days have solar potential. Oil and gas developments in areas of low reclamation potential could co-locate with solar projects to synergistic effect. Many oil and gas production facilities utilize solar polar to limit environmental impact.

Biomass

A potential for biomass energy production could arise from pine beetle kill. Such a proposal would be site specific and would need to be evaluated in a NEPA analysis because of the potential for degradation of resources such as water and soil.

Key Features

The planning area does not have the same utility wind potential of other locations in Wyoming, Localized non-utility projects are the most likely application of wind power going forward and, indeed, "distributed" power is the most efficient generation of renewable energy. The key feature for *limiting* wind energy development area the Congressionally designated National Historic and Scenic Trails and Wilderness Study Areas which are excluded from development by the Wind ROD. The ROD was not clear on what was excluded, do developing management objectives to address this issue would greatly aide in construing this point. Previously disturbed soil is a key feature for solar resources. Pine beetle kill forests are a key feature for biomass.

2.6.3 Rights-of-Way and Corridors

An important component of the realty program is the transportation of commodities that are ultimately delivered as utility services, such as natural gas, CO_2 for oil recovery enhancement, and electricity. ROW corridors are an integral part of the commodity transmission process. A ROW corridor is defined as a parcel of land with specific boundaries as being a preferred location for ROWs and facilities. The 1987 RMP did not formally designate ROW corridors; however areas were identified for avoidance by major utility ROW. ROW avoidance areas identified in the plan are associated.

The 1987 RMP identified six areas as WSAs. In January of 1990 a Supplemental EIS process was completed that identified two additional WSAs. Within WSAs, existing ROWs may be renewed if they are being used for their authorized purpose. New ROWs may be approved for temporary uses if they satisfy the non-impairment criteria. New ROWs may be approved for temporary or permanent uses that do not satisfy the nonimpairment criteria.

2.6.3.1 Resource Characterization

Current Condition

Although the 1987 RMP did not designate any ROW corridors, a corridor was recently designated through a programmatic planning process, the Designation of Energy Corridors on Federal Land in Eleven Western States. The Programmatic ROD designated Energy Corridor 79-216, of which a very small segment is located in the northeast corner of the planning area (Map 42). Corridor 79-216 is the only designated corridor.

BLM encourages ROW to co-locate to reduce impacts to natural resources hrough limiting the proliferation of scattered ROWs. Examples of this would be location of a power distribution line linear facility along the alignment of an existing highway or pipeline ROW also linear.

As development (both community and mineral resource) has continued, the number of new ROW applications has remained steady with slight increases from year to year. The planning area currently contains portions of several major intrastate or interstate ROW, specifically for oil and gas pipelines and high voltage transmission lines. Resource conflicts that have arisen during processing of major ROW within the planning area include wildlife, VRM, and the NHTs.

Notably, recent planning efforts in adjacent Casper Field Office and Rawlins Field Office have designated ROW corridors that terminate at the LFO planning area boundary Map 43). This constitutes a major planning gap, limits the ability for proponents to gain connectivity for facilities, and does not provide clear guidance for routing and siting of major facilities.

Forecasts

Under the current rate of development, areas where there are major ROWs in common may become more heavily used, but crowding is not anticipated. Formal designation of ROW corridors during the current planning process should streamline development of major projects, help to meet the BLM's objectives and will serve to protect natural resources by identifying areas where installation of new major ROW would be the least impactive.

Wind site testing and monitoring are determining the potential for utility-scale wind energy development which would most likely require additional transmission infrastructure. Designation of corridors could aide in streamlining these types of authorizations.

If the current rate of development continues and no additional electrical generation occurs, the existing transmission infrastructure is expected to adequately meet future needs over the next 10 to 20 years. Current electrical power transmission infrastructure is considered inadequate to support additional utility-scale power generation in the planning area, so in the event that the this type of development occurs there would probably be a need for the addition new transmission lines. Natural gas pipeline capacity is also limited in some areas and depending on the future development of mineral resources there could be need for new natural gas pipelines.

Key Features

The lack of designation of ROW corridors in the 1987 RMP has presented many management challenges, including protection of sensitive resource areas, lack of communication of preferred routes for major ROWs, bordering BLM planning documents designating corridors that terminate at the LFO planning area boundary, lack of streamlined major ROW processing.

2.6.4 Comprehensive Trails and Travel Management

2.6.4.1 Current Level and Locations of Use

Travel and transportation are an integral part of virtually every activity that occurs on BLM public lands: recreation, livestock management, wildlife management, management of commodity resources, ROW to private in-holdings, maintenance of electronic sites, and management and monitoring of public lands. This section addresses public travel and access. Maps 44-48 show the detailed road network within the Lander Field Office; including in this network are county maintained roads, BLM improved roads, and various two track ways.

Comprehensive trails and travel management is the proactive management of public access, natural resources, and regulatory needs to ensure that all aspects of road and trail system planning and management are considered. This includes resource management, road and trail design, maintenance, and recreation and non-recreational uses of the roads and trails. Travel activities in this context incorporates access needs and the effects of all forms of travel, both motorized and non-motorized. Comprehensive trails and travel planning means providing clear specific direction on the proper levels of land and water access for all modes of travel. Travel management objectives serve as the foundation for appropriate travel and access prescriptions.

43 CFR 8342.1 designation criteria state that “The authorized officer shall designate all public lands as either open, limited, or closed to off-road vehicles. All designations shall be based on the protection of the resources of the public lands, the promotion of the safety of all the users of the public lands, and the minimization of conflicts among various uses of the public lands.”

On a national level and in response to increasing demand for trails recreation on public lands, the BLM developed an OHV strategy and a mountain bike strategy. A Non-motorized/Non-mechanized strategy is planned. These strategies emphasize that the BLM should be proactive in seeking travel management solutions that conserve natural resources while providing for ample recreation opportunitie; thisguidance will be finalized during this planning process.

Visitors use roads and trails for a variety of recreational activities involving various modes of travel. Non-mechanize modes of travel include cross-country skiing, dog sledding, snowshoeing, horseback riding, hiking, boating, hang-gliding, para-gliding, and ballooning. Mechanized vehicles predominantly involve mountain bikes and specialized equipment such as mountain skateboards. Motorized travel includes standard passenger vehicles on maintained roads and OHVs on primitive roads and trails. OHVs include motorcycles, ATVs, jeeps, specialized 4x4 trucks, snowmobiles, and motor boats. ("OHV" mean all of the motorized devices.)

The type and amount of use and the location of roads and trails influence physical, social, and administrative recreation setting and the overall quality of the recreation experience. Many roads were constructed to create access to public land improvements and projects for timber/vegetation management, gas/mineral development, range management, and various ROWs. Some of these roads are maintained by the permittee to maintain the improvement, such as a livestock/wildlife pond or fence. Numerous roads were not necessarily intended to be left behind or open for recreational use but have become popular routes for visitors engaged in mechanized/motorized recreation activities.

The vast majority of mechanized/motorized routes were created or "pioneered" by public land users themselves. Loosely enforced travel designations that made cross-country mechanized and motorized use easier, high levels of use, and improvements in mechanized/motorized vehicle technology have allowed public land users to gain access to and through more terrain. The repeated passage of vehicles maintains these routes. These user created routes are not engineered and as a result are often rutted and eroded.

In the early 1980s, in response to Presidential Executive Orders 11644 and 11989, the BLM began designating all roads and trails on public lands into OHV designation categories, open, limited to existing roads and trails, limited to designated roads and trails, and closed to OHV use. Subsequent travel guidance has provided BLM with direction to apply these restrictions to all forms of travel if such restrictions are necessary to meet planning objectives.

• Open—Available for OHV travel without restriction, based on an analysis that determines there are no compelling resource protection needs, user conflicts, or public safety issues to warrant limiting cross-country travel.

• Limited—Managed as limited to designated or existing roads and trails for the purpose of restricting OHV travel in order to protect resources. Restrictions may include the number or types of vehicles, time or season of use, use of existing roads and trails only, use of designated roads or trails, or licensed use only. The BLM may also impose other restrictions to protect resources.

• Closed—OHV travel is not allowed in areas designated as closed. Areas are closed in order to protect resources, ensure visitor safety, or reduce user conflicts.

• Temporary—Areas may be closed to OHV use temporarily in order to allow resources to recover or for other purposes. The LFO has also implemented several emergency road closures to protect valuable/vulnerable resources. While some of these emergency closures were established with a time horizon to achieve resource objectives, two of these closures (the Desert Yellowhead closure to protect endemic sensitive plant species and the closure of Rocky Ridge for historic resources) were established until threats to resources were addressed or subsided.

The primary factors describing the condition of travel management are as follows:

• The lack of comprehensive travel management that considers the relationship between various resources, access for authorized permittees, and recreation uses;

• The lack of planning for recreational experiences that preceded the construction of historic routes;

• Unauthorized uses emanating from designated routes causing impacts on other resources;

• Subdivision of private property creating new access points to public lands;

• Routes that are open to motorized use being accessible only to adjacent landowners; and

• Conflicts between recreational users.

The 1987 RMP limited OHV use to designated roads and vehicle routes in the Whiskey Mountain, Lander Slope/Red Canyon, and Green Mountain areas. In all cases, implementation was never fully achieved because designated routes and trails were not fully identified. The LFO RMP did not restrict or limit mechanized or non-motorized travel. Table 2-51 summarizes the travel management designations for all areas in the planning area.

Table 2-51. Travel Management Designations in the Lander Planning Area

Area	Designation	Acreage	Notes
Lander Slope/Red Canyon	Limited to designated roads and vehicle routes. Seasonal closures to protect wintering wildlife Dec. 1 to June 15.	40,000	Implementation was not fully completed to identify the designated roads/routes. Seasonal closures have been implemented; however, adjacent land and route managers (WGFD, state and county governments) currently implement contrasting seasonal closures.
Green Mountain	Limited to designated roads and vehicle routes Seasonal Closures to protect wintering wildlife Dec. 1 to June 15	56,000	Implementation was not fully completed to identify the designated roads/routes.
Whiskey Mountain	Limited to designated roads and vehicle routes. Seasonal Closures to protect wintering wildlife Dec. 1 to June 15	8,392	Implementation was not fully completed to identify the designated roads/routes. Acreage also includes lands acquired in exchanges in the 90s (post-1987 RMP).
Castle Gardens	Closed	80	Archaeology/Recreation site
Dubois Badlands	Closed	4,520	Public lands within the WSA
All other public lands in the Lander Field Office	Limited to existing roads and vehicle routes	2,400,000	Several specific roads were closed through Federal Register Notice procedures (i.e., Rocky Ridge Historic Trail Corridor, Desert Yellowhead site)

LFO ROD 1987

At the present time, the BLM has complete route inventories for the Green Mountain, Lander Slope, Dubois Badlands WSA, Whiskey Basin, and Sweetwater Canyon WSA. Additional needs will be addressed utilizing remote sensing technology. With existing route inventories and remote sensing technology the BLM will have the opportunity to fully implement travel management in several travel management areas.

In many cases, routes usually do not have trails that were built with recreation experiences in mind. Most routes either follow historic non-recreational routes (such as, grazing or mining access) or were created by OHV users repeatedly driving cross-country. In many cases the trails do not provide desirable recreation experiences. These routes—especially the user-created ones—are often unsustainable and cause resource damage. There are approximately 2,400 miles of routes, for an average density of 2.7 miles of routes per square mile. Almost 90 percent of these routes are open to motorized travel.

As is the case throughout the West, OHV use has increased dramatically since the current RMP was written. Open lands that once did not experience impacts because of light use now commonly have impacts on cultural resources, as well as significant recreation impacts.

The most popular OHV areas are Coalmine Draw, Dubois Badlands, Shoshoni Lake Road, and to a lesser extent the Sand Draw area. This use occurs nearly year long, and for many users the act of driving/riding is the primary reason for their recreation visit. Most of these visitors live within an hour's drive of the area and enjoy practicing their technical skills, using their equipment, and spending time with family and friends. During the autumn, most parts of the Resource Area experience increased OHV use from hunters. Much of this use is focused in the Lander Slope, Red Canyon, South Pass, Green Mountain, and Dubois areas. These tend to be destination areas, with visitors coming from parts of Wyoming and the Rocky Mountain Region.

In addition to heavier OHV use, increased urbanization on adjacent private lands has created additional non-motorized use and new expectations for recreation experiences. Many of these users recreate on BLM lands because the lands are close to home and provide a convenient place to exercise, relieve stress, and allow users to spend an hour or two with family and friends. The new uses in these places include "backyard" hiking, mountain biking, dog walking, and rock climbing. At times these uses and expectations conflict with the experiences desired by motorized users. Until recently, there has been very little demand—and consequently very few resources allocated for—non-motorized recreation travel. This type of use has been increasing in all of the public lands bordering municipalities. The towns of Lander, Riverton, and Dubois have all experienced population growth. Subsequently, the public lands adjacent to them have the highest incidence of non-motorized use. Mountain biking has become very popular at Johnny Behind the Rocks, Baldwin Creek, Red Canyon, and the Dubois Badlands. Casual hiking (as opposed to destination hiking) has also become very popular in these areas.

Correlated with the growth of communities is the subdivision of private lands adjacent to BLM parcels. Often BLM lands are isolated and provide limited public access. In these instances, enforcement of travel restrictions is difficult, and motorized trespass can frequently occur from adjacent private grounds. High-density subdivisions have often changed this scenario. In most cases subdivision are not designed to give public access to the BLM lands. However, it has been observed that often the new community provides stewardship to the adjacent lands, and often this attitude makes monitoring and managing by the BLM more efficient. Examples of this are generally found around the Dubois and Lander area.

Finally, increased transportation demands by non-recreational uses (for example, oil and gas, grazing) has greatly affected recreation travel in some areas. Often recreation experiences can suffer when transportation systems for other uses are increased or created. As a result of all of these factors, there is a need for comprehensive travel management of all recreation uses, and for close coordination with transportation planning for non-recreational uses.

Forecasts

The unknown rate of growth of OHV use is due in part to the increased cost of the sport. As technology has increased, so too has the cost of equipment. An ATV or off-road motorcycle costs $5,000 to $8,000. A pickup truck, trailer, and hundreds of dollars of safety equipment are also needed. In short, a family may need to spend tens of thousands of dollars to enjoy this sport, which may limit the number of people who can participate. In addition, it is unknown how the future cost of gasoline will affect OHV use.

Non-motorized use close to urbanizing areas will grow as population grows. It is expected that demand for hiking and mountain biking trails will increase adjacent to all as well as in areas close to major subdivisions outside of incorporated towns. It is expected that subdivision of private property adjacent to BLM will continue. Continued collaboration between the BLM and municipalities/counties will help provide appropriate access during the subdivision design and valuable stewardship once the homes are occupied.

Construction of new areas of oil and gas development is expected to increase in the northern portion of the planning area. While motorized recreationists will likely use these routes, they likely will not be designed to optimize recreation experiences. The new routes may also conflict with existing OHV routes and current recreation experiences.

Key Features

Public lands close to communities and those areas discussed earlier are the key features. Use will also likely increase in the northern portion of the Field Office where new routes are developed for oil and gas production. Use may become more concentrated in these areas as other places urbanize and motorized users look for areas with fewer recreation conflicts.

2.6.5 Recreation

2.6.5.1 Resource Characterization

Public lands provide a broad spectrum of outdoor opportunities that afford visitors the freedom of recreational choice with minimal regulatory constraints. Recreational opportunities are offered to the public on all BLM-administered lands where legal access exists.

The planning process identifies areas where recreation is the management focus. These Special Recreation Management Areas were traditionally areas that had higher recreation use or required extra recreation investment or where more intensive recreation management was needed.

The 2005 revision of the BLM Handbook - H-1610-1 Land Use Planning Handbook amended the characteristics for identifying a SRMA. SRMAs are now areas identified in land use plans to direct recreation funding and personnel to fulfill commitments made to provide specific "structured" recreation opportunities (i.e., activity, experience, and benefit opportunities). SRMAs now must identify a distinct, primary recreation-tourism market or niche, as well as a corresponding and distinguishing recreation management strategy (destination, community, or undeveloped). SRMA management is focused on an outcome objective developed in response to customer demand. Recreation settings are then prescribed to achieve the outcome objectives and guide allowable use decisions and management actions. Allowable use decisions limit other resource uses in SRMAs. Management action typically lies within four broad categories including management, marketing, monitoring and administration.

Areas not identified as SRMAs are managed as Extensive Recreation Management Areas (ERMAs), where recreation is unstructured and does not require intensive management or significant investments in trails or facilities. Recognition of singularly dominant, activity-based demand alone, such as heavy OHV use or river rafting, however strong, generally constitutes insufficient rationale for the identification of new SRMAs which also require setting, benefits and recreational experiences. Management within ERMAs is focused on custodial actions that address visitor health and safety, user conflicts, resource protection issues, and maintaining appropriate activity participation. Allowable use decisions and management actions are therefore not directed at maintaining or creating particular physical, social, or operational settings; instead these planning decisions are aimed at those simple caretaking issues. The difference between SRMAs and ERMAs under current guidance is summarized in Table 2-52.

Table 2-52. Extensive Recreation Management Area and Special Recreation Management Area Management and Objectives

ERMA Management	SRMA Management
Unstructured—No identifiable market demand for structured recreation or no available/realistic supply for identified demand.	*Structured*—Tied to identified primary market demand for structured recreation (i.e., activities, experiences, and benefits and the maintenance of recreation setting character).
ERMA Objectives	**SRMA Objectives**
Custodial—Focused on minimal visitor services actions necessary to achieve resource protection, ensure human health and safety, and reduce resource use/user conflict.	*Guarantees specific recreational experiences and benefits*--Directed at producing and guaranteeing specific recreation outcomes and setting character.

Current Condition and level of use:

The 1987 RMP identified three SRMAs:

- South Pass: The South Pass Historic Mining Area is a SRMA, with emphasis on recreational opportunities in rustic, open-space settings.
- National Historic Trail (NHT): An SRMA for the MHTs. The management prescriptions for the NHTs are very general, with particular focus on preventing over utilization of the NHT and the contributing historic sites, whether by trekkers or hunters. Subsequent actions have refined the kind of BLM monitoring and prescriptions that are required to protect the historic resources. Detailed SRMA plans have not been adopted.
- Continental Divide National Scenic Trail: The existing plan recognizes the Continental Divide National Scenic Trail but does not provide detailed management prescriptions.

The 2005 revision of the BLM land use planning handbook clarified that any area not delineated as a SRMA is an ERMA. The LFO manages thirteen ERMAs: the LFO wide ERMA created as a result of the above update, and 12 distinct ERMAs to address local recreation issues including: Castle Gardens, Whiskey Mountain/East Fork, Green Mountain, Lander Slope/Red Canyon, Dubois Badlands, Sweetwater Canyon, Sweetwater Rocks, Lysite Badlands, Copper Mountain, Beaver Rim, Government Draw, and Warm Springs Canyon. BLM recognizes areas that require more active management in order to meet standard ERMA objectives focused on resource protection, human health and safety, and alleviating resource use/user conflicts. Identification of separate ERMAs will be used to recognize areas that require more active management then the rest of the planning area, to recognize an area where customer demand may warrant a SRMA allocation but the various alternatives to management preclude SRMA management, and/or in areas where the potential exists for future consideration of the area for SRMA allocation during a planning amendment process.

General recreation management in the 1987 RMP was not outcome based, causing planning decisions to focus on direct actions rather then minimum actions to produce outcomes. In doing so recreation sections of RMPs provided little/no guidance for the future and were mostly dictated by other program decisions (wildlife) and the existing management situation. The erroneous focus on direct actions also created a situation where SRMAs lacked sufficient allowable use decisions and detail to maintain the areas recreational value. Finally, recreation management actions were splayed across the field office usually to address concerns associated with overuse, while the SRMA and ERMA allocations had no bearing or influence on the action. The new land use planning guidance for recreation addresses these and other shortcomings.

The 1987 RMP directed that management and maintenance be provided at seven existing developed recreational sites in both ERMAs and SRMAs: Atlantic City, Big Atlantic Gulch, and Cottonwood campgrounds; Split Rock and Devil's Gate interpretive sites; and Wild Horse Point overlook and Castle Gardens picnic areas (Map 49) and also in each of the management units.

The BLM has added several developed sites including: Beaver Creek Nordic Ski area, Steamboat Lake Interpretive Site, and the Martins Cove interpretive trail. All of the units emphasize resolution of competing uses and provide resource management; camping is limited to 14 days to avoid "homestead" camping. All are managed for dispersed recreation. The following summarizes the management unit specific management actions (other than the SRMAs above):

Green Mountain: The unit is managed as an ERMA with the following specific prescriptions:

- 14-day camping limits
- Safety hazards eliminated
- Aesthetic values improved
- Quotas established for commercial hunting camps

Beaver Creek: The unit is managed as an ERMA with the following specific prescriptions:

- The Split Rock interpretive site is maintained as part of the management plan for the NHT with provisions for use by visitors, resource protection, and interpretative needs.

Lander Slope: The unit is managed as an ERMA with no major recreational developments.

- 14-day camping limits and in conformance with adjoining USFS lands
- Quotas on commercial hunting camps

Red Canyon: The unit is managed to protect wildlife values and geology, particularly as reflected by the National Natural Landmark. To protect elk winter range, the unit is closed to all winter sport activities.

- 14-day camping limit

Gas Hills: Generally, the unit is managed as an ERMA. However, two intensive managed areas are identified:

- Devil's Gate interpretive site is managed to meet interpretive and visitors' needs coupled with resource protection.
- Castle Gardens management focuses on interpretation and resource protection while allowing for dispersed recreation management.

East Fork: Minimal recreation management is provided. The emphasis is on reducing user conflicts and providing resource protection.

Whiskey Mountain: is managed in cooperation with the WGFD on non-consumptive wildlife visitor use management.

- 14-day camping limit
- Commercial hunting camps not permitted if they are not compatible with bighorn sheep management

Dubois Badlands: This unit is an ERMA that is managed in its "natural state" with a focus on emphasizing resolving competing uses and providing resource protection.

General Field Office Area: The unit is managed as an ERMA with dispersed recreation where visitors will have the freedom of recreational choice with minimal regulation.

The SRMAs and distinct ERMAs discussed above encompass most areas of known higher use levels and potential for increased recreation use. The planning process and the customer demand data sources will aid BLM in further projecting new areas where potential increases in use and demand may occur.

Use Figures

By 2000, 78% of Americans participated at least monthly in outdoor recreation activities, up 50% from 1994 (Cordell et al., 1999, p. 221). Most public land use estimates and activity participation estimates depend entirely on field observations and professional judgment of the recreation staff and hence are not scientifically based. Recreation use figures are tracked in the Recreation Management Information System and are available at the Field Office. In addition several other entities such as the Wyoming Game and Fish Department, County Governments, and the Wyoming State Trails program collect use figure information.

While visitor use figures are critical to an input/output (or IO model) economic analysis; these figures are not an indicator of recreational quality. One example of this phenomenon is in areas enjoyed for solitude or naturalness, in these areas increases in visitor use can degrade the quality of recreation environment. Another problem with visitor use figures as a recreation indicator lie in the simple fact that these figures do not provide any indication of customer demand; instead they simply reflect where people are going based on current management.

Finally, a limitation of input/output economic analysis and visitor use figures lies in the simple fact that the IO model is only concerned with use figures of **non-residents.** The BLM recreation program is often geared to supply local customer demand; an IO model and the visitor use data supporting it does not recognize economic benefits accrued as a result of recreation enhancements to support local community residents. A non-market analysis technique (such as Contingent Valuation Method) is far superior to capturing the true economic contribution of recreation management. Based on time and data constraints this plan will use an IO model to calculate the economic benefits of recreation, therefore visitor use data in support of this analysis will only be compiled for non-resident visitors.

Visitor use figures do provide: a data source to project where potential resource impacts or user conflicts might arise and where a high amount of the recreation programs labor and operations budget is focused.

Developed recreation sites and facilities have been constructed to enhance recreation opportunities, protect resources, manage activities, or reduce recreation use conflicts. These infrastructure developments range from: campgrounds to trailheads with simple bulletin boards. Developed recreation sites can exist within an SRMA or an ERMA; Table 2-53 below lists the developed recreation sites within the planning area. These sites are depicted on Map 49.

Table 2-53. Developed Recreation Sites within the Planning Area

Site/Location Name	Type of Use	2004 Visits	2004 Visitor Days	Visitor Use Trend:
Atlantic City Campground	Overnight camping	2,604	2,734	Trending up
Big Atlantic Gulch Campground	Overnight Camping	1,067	1,103	Trending up
Beaver Creek Nordic Ski Area	Day-use Nordic Skiing	Unk	Unk	Trending up
Castle Gardens Archaeology Site	Day-use petroglyph viewing	2,500	650	Trending up
Cottonwood Campground	Overnight camping	1,399	1,539	Trending up
Devils Gate Interpretive Site	Historic trail interpretation	50,000	10,104	Trending up
Martin's Cove Trail	Foot access	45,000	33,375	Trending up
Split Rock Interpretive Site	Historic trail interpretation	57,000	11,281	Trending up
Steamboat Lake Overlook	Wildlife interpretation	300	34	Trending up
Wild Horse Point Picnic Area	Day-use picnicking	400	90	Trending up

RMIS

Table 2-54 delineates the recreation features that the BLM currently recognizes as undeveloped recreation sites. Some of these sites are lightly marketed in order to match recreationist to desired outcomes or address resource concerns. These areas over-lay both SRMAs and ERMAs.

Table 2.54. Undeveloped Recreation Sites in the Planning Area

Site/Location Name	Type of Use	2004 Visits	2004 Visitor Days	Visitor Use Trend:
Agate Flats Rockhounding Area	Rock collection	1,500	676	Stable
Antelope Spring Reservoir	Fishing access	50	16	Stable
Baldwin Creek Rock Climbing	Rock climbing	300	160	Trending up
Carmody Lake	Fishing/hunting access	75	27	Stable
Cedar Ridge Multiple-Use Trail System	Hiking, equestrian, mountain biking, OHV	Unknown	Unknown	Trending up
Coal Mine Draw OHV Use Area	OHV, target practice/shooting	Unknown	Unknown	Trending up
Devil's Gate – river location	Foot access to river	5,000	1,546	Trending up
Lander Field Office Dispersed Use	All recreational activities, not in defined areas	61,400	58,530	Trending up
National Historic Trails - Dispersed Use	Historic trail segments not associated with developed recreation sites	61,607	45,982	Trending up
Silver Creek Reservoir	Fishing access	300	117	Stable
Sinks Canyon Rock Climbing	Sport rock climbing area	7,267	5,448	Trending up
Stony Point –Wind River Access	Fishing access	50	13	Stable
Whiskey Peak Hang Gliding Area	Foot launch site	100	25	Trending down

RMIS 2004

Special Recreation Permits

The amount and type of Special Recreation Permits (SRP) are indicators of the current level of use. There are four types of uses for which SRPs are required: commercial use, competitive events, organized groups, and recreation use in special areas. Most SRPs are related to hunting outfitting. Very few permanent camps and facilities are authorized on BLM-administered lands, as most permit holders request day use and conduct overnight activities on private or lands administered by a different agency (such as USFS).

There has been increased demand for SRPs over the past 20 years. Currently BLM administers 30 SRPs as multi-year permits. In addition, the office typically authorizes another 10 one-time events and organized groups.

No limits on the number or type of SRP exists; however, authorized activities along the NHTs are managed closely in order to maintain the areas cultural resources. Conflicts have arisen when SRPs are issued for activities that are out of character with the existing recreation setting such as large group use in an area with Back Country characteristics, and conflict with other resource values, such as in an area containing T&E species.

Since SRPs are a manner by which the agency delivers recreational outcomes to visitors it is important that the BLM issue SRPs to complement existing land use plan objectives. The RMP will establish broad objectives in all SRMAs that will provide a guide to administer the SRP program in a way that ensures a healthy outfitter and guide service sector, while also ensuring permitted activities extend the agency's ability to deliver targeted outcomes to visitors. SRPs are not issued as a means to enhance the agency's ability to deliver targeted outcomes to visitors but to maintain a viable outfitter and guiding industry and desirable public land settings; the issuance of SRPs should be reviewed against planning objectives.

Recreation Forecast, Trends, and Anticipated Demand

Driver and Brown (1978) proposed a hierarchical framework that specifies four distinct levels of recreational demands: 1) for activities, 2) settings (situational attributes), 3) for specific psychological outcomes--experiences and satisfactions, and 4) for benefits. This is the approach that will be used in planning for recreational opportunities.

The following existing sources will assist the BLM in making recreation decisions to address the levels of customer demand discussed above:

- Informal discussions with on-site users,
- Congressional designations and legislation the NHTs and CDNST,
- Comprehensive plans and programmatic EISs such as the comprehensive plans for the Congressionally Designated Trails,
- Surveys conducted locally and nationally such as those that have been conducted on the National Historic Trails, at developed recreation sites, and by national entities such as the Roper and Starch.
- Scoping comments on past NEPA analysis as well as this RMP process,
- Information from community Workshops such as those conducted in the Fall of 2007,
- Community planning documents such as the Dubois Gateway Community plan, community assessments by the Wyoming Business Council, and County and City plans.

Activity Demand: Nationally, participation in outdoor recreation activities has increased. Table 2-55 is adapted from Moore and Driver (2006) and summarizes the results from the 2000 Roper Starch Worldwide Inc Survey and the 1994-2001 Cordell, Betz, Green, and Mou National Survey on Recreation and the Environment (NSRE),

Table 2-55. Outdoor Recreation Survey Data

Percent of U.S. adults participating in predominant LFO outdoor recreation activities and percent change from 1994 to 2001			
Activity	**Percent participating 2000 (Roper Starch)**	**Percent participating 2000-2001 (NSRE)**	**Percent Change 1994-2001 (NSRE)**
Kayaking	5	3.46	185.66
Viewing or Photographing Fish		24.77	96.79
Snowmobiling	2	5.55	70.22
Viewing Wildlife	16	44.68	55.80
Backpacking	9	10.68	53.78
Day Hiking	19	33.25	51.80
Canoeing	5	9.73	50.65
Bicycling	24	39.49	50.00
Horseback Riding	5	9.68	47.99
Mountain Climbing		6.03	46.52
Running or Jogging	18	34.53	43.54
Coldwater fishing		13.58	42.77
Developed Camping	26	26.38	38.71
Driving off-road	7	17.46	36.50
Walking for pleasure	57	82.97	35.32
Visiting archeological sites		20.91	30.71
Bird watching	16	32.38	30.61
Big game hunting		8.41	28.92
Cross-country Skiing	2	3.82	27.59
Rock Climbing	4	4.32	26.86
Primitive Camping	8	16.01	24.75
Small Game Hunting		7.23	21.43
Picnicking	36	54.49	20.91
Migratory bird hunting		2.36	20.05
Visiting historic sites		46.20	13.91

Sightseeing	4	8.15	-0.63
Orienteering		2.00	-9.36

Throughout the RMP revision process BLM will work to further understand customer demand; this continuing input process will allow BLM to develop recreation based objectives and decisions that address customer demand and issues. Furthermore, recreation based decisions will be outcome based; allowing BLM to monitor and adjust as social and resource conditions change through the life of the plan. Based on field observations, discussions with customers, and the sources discussed above public land visitors fall into the following primary sources: national and international location, the Casper population center, and locally.

Visitors from outside of Wyoming come to the region from the US and international locations. One reason for this widespread visitation is that the area is on a popular route towards two national parks. Additionally, the town of Lander is home to the International Climber's Festival, a privately funded festival where visitors travel to celebrate the sport of climbing. The National Outdoor Leadership School is headquartered in Lander and conducts educational/recreational courses on BLM lands. Many of these students return for additional visits and courses. These are cases where non-agency marketing techniques have increased visitation to the public lands.

Field observations have found that there has been a notable increase in visitation from the adjacent states of Utah, Colorado, Idaho, and Montana. The use demographic change is a because visitors can escape the developed and sometimes crowded recreation settings of their home states while also enjoying some of the unique setting attributes (NHTs or the Wild Iris climbing area) available. This trend has been witnessed throughout the planning area, but seems to be strongest along Congressionally Designated Trails and around newly discovered climbing areas. The visitation increase around climbing areas is correlated to the increase in the activities popularity over the last 20 years.

Outside of the use season (June-August) of the Congressionally designated trails and fall big-game hunting seasons (September-November), when visitation is high everywhere, the greatest number of visitors to public land is on a daily basis near communities.

The Casper population center visitors recreate in all areas; however, this user faction typically focuses around the Rattlesnake Hills and Green Mountain areas. This regional-scale demand is generated as a result of the planning area's large acreage of public lands and the accessibility of those lands. In contrast public lands around these visitors' home area are isolated, often inaccessible tracks of public land encompassing small acreages (USDA Forest Service, 2004c).

Wyoming's population has grown in the past 10 years (Sonoran Institute, 2007) and an increasing number of people are living near public lands for a diversity of recreational opportunities

characterized by the "mountain resort or outdoor lifestyle." The region is truly a year-round place to live and work; as a result, BLM administered are absorbing increasing recreational demand and use. The towns of Lander, Hudson, Riverton, and Dubois all have public lands bordering them that are used as "backyard" recreation areas by local residents.

Outcome Demand

BLM will base planning objectives in SRMAs and to a lesser extent in ERMAs around customer demand for Outcomes. Recreational Outcomes are defined as follows: 1) realization of a satisfying recreation experience, 2) An improved change in condition, and 3) maintenance of a desired condition, prevention of an undesired condition, or reduction of an undesired condition (Driver B. L., 2008). In general the Roper Starch Survey *Outdoor Recreation in America 2000: Addressing Key Societal Concerns (2000)* documented some benefits that are important or being realized by national and local customers. The following statements are directly from the "Study Highlights":

- *Americans continue to ascribe many benefits to participation in recreation. This new research confirms motivations of fun, fitness, and family togetherness, but also shows Americans believe outdoor recreation plays a role in addressing various key social concerns, especially those related to young people. For instance, close to 8 in 10 Americans (79%) believe outdoor recreation can improve education.*
- *Americans also see outdoor recreation playing a role in reducing childhood obesity—a full three quarters of Americans see it as having a role in helping with this problem.*
- *According to most Americans, participating in outdoor recreation also can significantly aid parent—child communication, with three quarters crediting it as playing a role.*
- *Even in the case of tough social problems such as juvenile crime (71%), underage drinking (66%), and illegal drug use (64%), outdoor recreation is viewed by a strong majority as playing positive role.*
- *Overwhelmingly Americans believe that if people participated more in outdoor physical activities, the health effects would be beneficial (93%). Outdoor recreation is seen as the best way to be physically active (90%).*
- *Virtually all Americans agree that outdoor recreation is a good way to increase people's appreciation for nature and the environment (95%). Similarly, more than 9 in 10 agree that if people spent more time outdoors, they would better understand the importance of environmental protections.*

Recreation Supply or Foreseeable Development:

The recreation setting is an integral supply component of the recreation environment because seetings "not only affect the experiences and benefits", but also help to "define what type of activities might occur in an area" (Pierskalla, 2004). The setting concept recognizes that visitor attainment of desired recreational experience and benefit outcome opportunities is linked to the physical, social, and operational recreation setting. The range of possible combinations of activities, settings, and experience opportunities can be represented in terms of a spectrum or continuum. This continuum recreation setting characteristics has historically been referred to as the Recreation Opportunity Spectrum (ROS). The information provided by the ROS is both a descriptive and a land use allocation tool for recreation planning, management, and research (Clark, 1971). The existing RMP used the ROS as a tool to characterize or describe the existing environment. The new RMP will also use recreation settings (in SRMAs) as reasonable foreseeable development scenarios and desired future condition for the recreation resource. In most SRMAs, reaching and maintaining a desired setting condition requires allowable use decisions (such as No Surface Occupancy) and management actions (Hopkins, 2008).

The current BLM-specific methodology for describing the recreation setting builds on the historic ROS concept and has been termed the recreation setting. The BLM now describes the recreational setting across three main factors: the character of the natural landscape (Physical Setting); the character of recreation and tourism use (Social Setting); and how public land agencies, other land managers and private sector service providers fmanage public use (Operational Setting). These variables combine as descriptors of the recreation environment that can then be placed across a spectrum of six overall recreation settings. The six overall recreation settings moving from least developed to most developed are: Primitive, Back Country, Middle Country, Front Country (or Transition), Rural, and Urban. The BLM typically does not manage for urban settings. This methodology for describing the recreation setting builds on the historic ROS concept and is here by referred to as recreation settings.

The existing 1985 ROS map (see Map 50) utilized a mapping technique in which all three setting attributes were combined to form one recreation setting map. This technique resulted in a map that was weighted heavily toward the physical setting and less towards addressing the recreational expectation of visitors. This technique yielded accurate setting capacity descriptions; however, it does not lend itself to setting allocations or prescriptions. Moreover, it is a top-down management approach that fails to be responsive to the different populations utilizing the public lands. The new recreation setting inventory for the Physical, Social, and Operational settings is depicted on Maps 51-53. Trends in recreation setting can be garnered by comparing the new physical setting map with the existing ROS map. Recreational management recognizes four key issues when forecasting the setting changes over time:

- Population growth
- Changing public expectations and demand for outdoor recreation opportunities
- Increased energy development/exploration
- Increased occurrences of large ranches being subdivided to accommodate non-agricultural uses

The *physical* setting trend is a result of several factors including: new road development in support of recreation and other resource uses as well as route proliferation due to the rising popularity of OHVs; increasing occurrences and instances where landscapes are modified to accommodate other resource uses. These modifications include utility lines, fence lines, stock ponds/water developments, cell phone towers, oil and gas developments and an increase in new recreation facilities to accommodate user demand.

The *social* setting trend is a result of: increasing planning area population participating in outdoor recreation; and increased demand for group activities; and increased national recreation interests in the area, and increased popularity of motorized vehicles resulting in increased visibility of evidence of past users.

The *operational* setting trend is influenced by: the increase in popularity of OHVs; increased demand on public lands necessitating more onsite presence and brochures/maps; increase in private sector visitor services (i.e., private lands developed for recreation purposes or distribution of guide books detailing public land amenities); increased need to utilize signing, restrictions, and enforcement to maintain quality recreation settings and natural resources.

Overall physical, Social, and Operations settings are demonstrating an urbanizing trend which is likely to continue. At the broadest level, the physical, social, and operational recreation character of BLM public lands is quickly changing from less natural to more developed, from less crowded to more contacts with others, from less restrictive to more rules and regulations.

These changes will impact the activity opportunities that can be offered and the recreation experience and benefit opportunities that can be produced by land managers and partners.

Recreation Use Forecasts:

It is anticipated that recreational use will increase in the next 20 years. The factors influencing this trend include: a projected moderately heavy population pressure; a projected moderately heavy recreation demand pressure; and 3) the greater portion in public land ownership in comparison to eastern Wyoming (Moore, 2005). The increase in recreational use will necessitate an outcome based approach to recreation management. Such an approach provides land managers enough flexibility to adapt with the dynamic nature of the use, while also ensuring the use is guided by planning instead of the agency constantly reacting to the use. Key Features:

The SRMAs and distinct ERMAs discussed in the first part of this chapter encompass most of the key recreation features within the planning area. Also the back country settings detailed in are in short supply and therefore constitute a key feature. In general the planning process and the customer demand information will aid in further projecting new areas where potential increases in use may occur.

2.6.6 Wilderness Characteristics

Areas that are not part of proposed Wilderness Study Areas (WSAs) but have wilderness characteristics are reviewed for purposes of determining if they should be specially managed. (BLM Planning Handbook, 2005). Wilderness characteristics include naturalness, outstanding opportunities for solitude, and outstanding opportunities for primitive and unconfined recreation. Wilderness characteristics are considered in undeveloped areas of sufficient size to be practical to manage. The existing plans did not address wilderness characteristics. Areas identified to be managed as a non-WSA land containing wilderness characteristics are managed and maintained through planning decisions (not statutory or regulatory decisions associated with the Wilderness Act), the various decisions for these areas are constrained by BLM policy and guidance.

Current Condition

As part of the identification of areas for designation as Wilderness Study Areas (WSAs), the BLM conducted an inventory in 1979-1980 which included an assessment of wilderness characteristics. This is a beginning point for a current review of wilderness characteristics, since conditions on the ground may have changed or new factors have become known which were not considered in 1980, almost thirty years ago. A citizens' proposal for wilderness characteristics was received that identified areas for designation of wilderness characteristics. All of these were previously inventoried. These areas are identified on Map 54

Lysite Badlands. After review, BLM determined that the area did not meet the inventory finding for solitude, naturalness, or unconfined recreation. There was no new information that demonstrated that the BLM inventory was incorrect. The BLM determined that the area may warrant management prescriptions for other values such as recreation, visual resources, and vegetation.

- Lysite Mountain. The citizens' proposal did not include new or substantial information that demonstrates that the BLM inventory was incorrect. The area may warrant management for other values such as recreation, visual resources, and vegetation.
- Whiskey Mountain complex: Red Creek, Torrey Rim, Whiskey Mountain WSA, Glacier Trail.

  The citizens' proposal included new information on the geology in the area and identified the increase in BLM-owned land as a result of land acquisitions that took place after the 1980 inventory. All of the areas in the Whiskey Mountain complex had been considered to meet the criteria for naturalness in the 1980 inventory. The area is currently managed as an ACEC to protect the important seasonal ranges of bighorn sheep as well as the scenic values. Because this area adjoins the USFS Fitzpatrick Wilderness Area, it is appropriate for management to protect its wilderness characteristics. Current management is complimentary to maintaining the wilderness character.
- Sweetwater Rocks WSAs as one unit, including Lankin Dome WSA, Split Rock WSA, Miller Springs WSA, and Savage Peak WSA. The citizens' proposal for wilderness recommends acquisition of several state lands adjacent to the WSAs. The proposal also recommends managing for wilderness characteristics on public land extensions off of the northeast and eastern Boundaries of the Savage Peak WSA. These extensions would only be possible if state land separating the areas were acquired. The proposal also recommended encompassing the Devil's Gate area. These areas were found not to possess wilderness characteristics. In addition existing recreational use within the Devil's Gate-Martin' Cove area is not consistent with wilderness character. After review, the BLM determined that the area did not meet the inventory finding for solitude, naturalness, or unconfined recreation although the area may warrant management prescriptions for other values such as recreation, visual resources, and vegetation.
- Sweetwater Canyon WSA. The citizens' proposal for wilderness does not include new parcels or additions outside of the existing WSA.
- Copper Mountain WSA. The citizens' proposal does not include new parcels or additions outside of the existing WSA.

In many parts of the U.S. where vegetation growth is rapid, conditions on the ground can change dramatically in a 30-year period such as interval since BLM originally inventoried the planning area. That is less true in the semi-arid conditions that exist here. In other places, roads are naturally or by design reclaimed; the reverse situation exists in the planning area. "Reclaimed" or abandoned roads may be visible for many decades and never return to a primitive condition. A good example is the NHT, which was scarcely used for decades after the westward pioneer migration but retained its clearly identifiable character as a trail.

Trends

Over the last 20 years the areas containing wilderness characteristics have declined. Resource uses and recreation have decreased the amount of naturalness and opportunities for primitive and unconfined recreation. The new recreation setting inventory demonstrates that the area does not have primitive physical settings, and shows that the amount and location of backcountry physical settings is also limited. Some lands do however demonstrate primitive social and operational settings, so that contact with other visitor is low and the amount of onsite visitor services is low. Trends in recreation setting are demonstrating a trend of urbanization. These trends mean that areas containing wilderness characteristics will not be maintained without recognition and detailed management of this resource.

Forecasts

Interest in areas with wilderness characteristics has wide, although not universal, public support. As development increases in the planning area, the standards for "solitude, naturalness, and unconfined recreation" may change. In addition, the importance of protecting areas with wilderness characteristics will become even more important over time, with the stresses of increased population, public land recreation, and development.

Key Features

The citizen proposed areas constitute the key wilderness characteristic features.

2.6.7 Livestock Grazing

The BLM is responsible for administering livestock grazing on BLM-administered land. Livestock grazing is the grazing of domestic animals (cattle, sheep, horses, and goats) and is one of the most visible and established uses of BLM-administered lands. For most operators, holding a BLM grazing permit or lease provides an important component of their overall ranching operation. Public land grazing provides forage for their livestock during a critical time of year when the base ranch operations are being used to grow feed for the winter months. Livestock grazing is an authorized, discretionary use of public lands by private individuals.

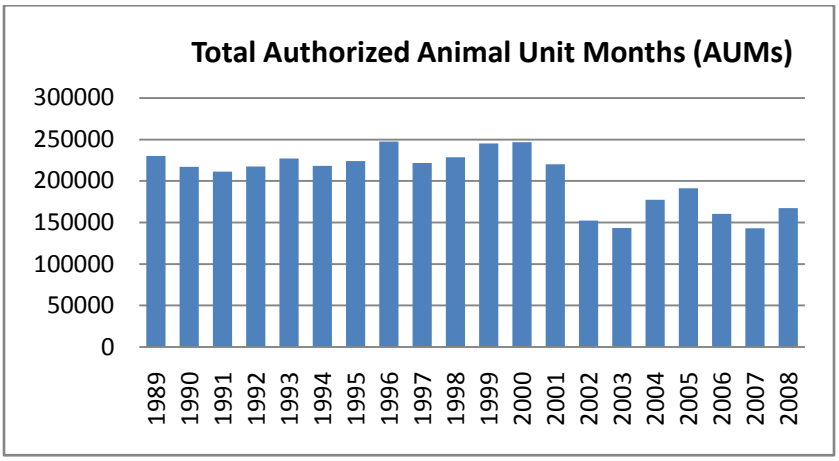
2.6.7.1 Resource Characterization

Current Condition

The BLM administers 310 grazing allotments covering 2.4 million acres with 279,000 AUMs (the amount of forage necessary to sustain one cow or its equivalent for a period of one month) allocated. The AUMs levels were allocated during the 1930s and adjustments made in 1940s - 1960s. Adjustments in allotment carrying capacities (the amount of livestock a certain area can sustain) since the late 1970s have been based on long-term monitoring and allotment evaluations. Carrying capacity does not support complete use of AUMs.

Approximately 97 percent of the public lands are available for livestock grazing. The other 3 percent are primarily lands in highway easements, very rocky areas and areas that have been mined and have little vegetation. A few allotments have had grazing removed because of other land use priorities such as the bighorn sheep wintering areas in Dubois. Figure 2-12A shows the authorized AUMs from 1989-2008.

Figure 2-12A. Total Authorized Animul Unit Months (AUMs) 1989-2008



Grazing Allotments within the Planning Area

Livestock grazing consists primarily of cattle, but also includes sheep and horses. Goats have sometimes been authorized, primarily for the purposes of suppressing noxious weeds. Map 55 shows the grazing allotments area and Appendix E identifies the allotments by categorization.

The BLM authorizes grazing under two different sections of the Taylor Grazing Act, Section 3 and Section 15. Section 3 permits are authorizations to graze areas that are within the original grazing districts as laid out in 1934. Section 3 allotments are usually larger, contiguous tracts of land and incorporate unfenced state and private lands within the allotment.

A portion of the grazing fees from these permits is available for investment in range improvements on the Section 3 allotments. Of the Section 3 grazing permits, 129 authorize cattle use; 6 authorize sheep use; and 26 authorize horses. Horse use for the purposes of supporting grazing management operations is common and has been authorized on many of the permits.

Section 15 allotments are leases, not permits, and are generally small parcels outside of the original grazing districts, primarily located on the Lander Slope or in Dubois. These leased parcels provide little opportunity for intensive grazing management due to their size and isolation from other BLM-administered lands. Section 15 parcels contribute to wildlife habitat and recreation. Section 15 lessees pay the same grazing fee (currently $1.35 per AUM) as Section 3 allotments but these funds are not available for range improvements on Section 15 leases. There are 51 grazing leases; 63 percent (34 leases) authorize cattle only; 33 percent (17 leases) are horses and none have been authorized for sheep use. Information regarding the grazing fee is provided in the Economic Section.

The size of these allotments ranges from 40 acres to more than 500,000 acres of public land (See Appendix G Allotments by Acres, AUMs, and Seasons of Use). Collectively, 24 of the largest allotments are "common allotments" such Granite Mountain and Green Mountain common allotments, shared by a number of permittees. These 24 allotments include 1,228,545 acres, or 46 percent of the total public land acreage. There are 169,679 AUMs authorized on these 27 allotments (57 percent of the total AUMs). Grazing management of these lands can have more of a positive outcome because these allotments tend to have a larger percentage of public lands within their boundaries. Allotments in which public lands provide only a minority of the forage are more difficult to manage because BLM prescriptions can only be applied to public lands which may provide a minority of the forage produced by the allotment as a whole.

The large allotments generally provide spring, summer and fall forage for local operators and are important to their operation as livestock move from winter feed grounds or pastures, to summer pastures. Winter and early spring use does occur in a limited areas east of Boysen Reservoir and northeast of the town of Shoshoni.

Although there has been no overall reduction in the number of allotments since the 1987 RMP was completed, conditions on the ground have generally not supported authorizing full AUMs (Figure 2-12B). The BLM's management focus is more directed at achieving and maintaining rangeland health. Increasingly, BLM's management and its progress on achieving rangeland health is carefully scrutinized by interested parties and the general public.

Since the last general allocation of AUMs, the size of the average cow/calf pair has changed from the 1,000 pound cow to 1,200 to 1,400 pounds requiring a commensurate additional amount of forage. Calves are being born earlier (as a result of earlier breeding) and are thus larger and consume more forage than the younger calf. However, the BLM authorizes and monitors vegetative uses and not a predetermined number of AUMs. BLM requires removal of livestock if vegetation conditions warrant it based upon monitoring and assessments.

Grazing Allotment Categorization

The 1987 RMP placed all allotments in categories "I" (Improve) which includes most of the large allotments, "M" (Maintenance), and "C" (Custodial). The BLM used this classification to identify areas where management was potentially needed and to prioritize workloads and use of range improvement dollars. Allotments containing larger tracts of public land with natural resource issues were placed in the "I" and "M" categories and allotments containing smaller tracts of public land with little to no resource issues were usually placed in the "C" category. Priority for managing these allotments was given to the I category allotments followed by the M category allotments. There are a total of 123 I allotments, 83 M allotments and 82 C allotments. Some allotments may not change category as resource uses, values and issues may not change. Even though management may have been implemented on an allotment, it may remain in the improve category as it may have resource concerns such as critical wildlife winter range.

Range Improvements

On average, the BLM has completed or reconstructed 8-20 new range improvement projects per year totaling approximately $40,000 to $150,000. These improvement projects have been constructed under funding authorized under Section 3 of the Taylor Grazing Act (1934), from grazing receipts and primarily consist of fences, reservoirs, springs, water wells, and vegetative treatments. Since 1986, Lander Field Office has installed 53 new stock reservoirs, 38 new spring developments, 76 new stock water wells, 110 miles of stockwater pipeline and 355 miles of new pasture division fence (See Appendix E Summary of Range Improvements).

Standards for Healthy Rangelands

Forage production can only be sustained with proper management of livestock-grazing activities. Subsequent to the 1987 RMP, the BLM, nationwide, recognized that many of its rangelands were in degraded condition, mainly due to decades of uncontrolled and season long grazing. The BLM issued "Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management" (SHR) as a part of Range Reform 1996. Listed below are the six standards:

- ***Standard #1.*** Within the potential of the ecological site (soil type, landform, climate, and geology), soils are stable and allow for water infiltration to provide for optimal plant growth and minimal surface runoff.
- ***Standard #2.*** Riparian and wetland vegetation has structural, age, and species diversity characteristics of the stage of channel succession and is resilient and capable of recovering from natural and human disturbance to provide forage and cover, capture sediment, dissipate energy, and provide for groundwater recharge.
- ***Standard #3.*** Upland vegetation on each ecological site includes plant communities appropriate to the site that are resilient, diverse, and able to recover from natural and human disturbance.
- ***Standard #4.*** Rangelands are capable of sustaining viable populations and a diversity of native plant and animal species appropriate to the habitats. Habitats that support or could support threatened, endangered, species of special concern, or sensitive species are to be maintained or enhanced.
- ***Standard #5.*** Water quality meets state standards.
- ***Standard #6.*** Air quality meets state standards.

The SHR describe the conditions needed to sustain public land health. The six Standards relate to all uses and are applied on a landscape scale. Standards address the health, productivity, and sustainability of the BLM-administered rangelands and represent the minimum acceptable condition. Their application will be determined as use-specific guidelines are developed. Standards are synonymous with goals and are observed on a landscape scale. They describe healthy rangelands rather than rangeland byproducts. The achievement of a standard is determined by observing, measuring, and monitoring appropriate indicators. An indicator is a component of a system whose characteristics (e.g., presence, absence, quantity, and distribution) can be observed, measured, or monitored based on sound scientific principles.

The SHR are important tools for the management of livestock grazing as they provide the tools to enhance sustainable livestock grazing while protecting habitat including upland range, watersheds, and riparian ecosystems. A team of resource managers rate a series of rangeland health indicators against a reference ecological community to make a determination regarding the relationship between livestock grazing and the Standards. Allotment-specific actions are then implemented to improve rangeland conditions in areas not meeting standards.

Appropriate actions are implemented in allotments that have been assessed if it is found that the allotment does not meet SHR, including development of range improvements and or prescribed grazing, which may or may not be part of an allotment management plan (AMP) or rangeland management agreement. Changes in livestock management practices within that allotment are implemented as terms and conditions in accordance with 43 CFR 4180.2(c)(2).

In general, rangeland health throughout the West has improved since the 1930s. (BLM, 1990). However, BLM has acknowledged that nationally, rangeland health is not at its potential. It was for this reason that the Standards were adopted in the 1990s (1997 in Wyoming.)

Rangeland health assessments have been ongoing since 1998; approximately 45 percent of the planning area (65 grazing allotments or 971,718 acres) have been assessed (See Appendix F). Of these, 44 allotments (250,461 acres or 26 percent of the acres assessed) meet all Standards or are making significant progress toward meeting the Standards.

Of the rangelands that are not meeting the Standards or not making acceptable progress because of livestock grazing, 11 allotments (584,195 acres) now have AMPs that are designed to improve them. Not all of the plans have been effective in achieving rangeland health. In some cases, there has been insufficient monitoring to determine what impacts the water development and fencing projects have had on rangeland health.

In other allotments, it appears that the grazing plan has been successful. In the Sweetwater Canyon area, a pasture in the Silver Creek Common Allotment, the permittees agreed to managed use with a five-year initial rest period. After the intial rest, managed grazing was prescribed and implemented over the last four years. The riparian condition has improved dramatically with willow growth and bank stabilization occurring within the pasture. Photographs of the progress that has been made are available in the Lander Field Office.

Seven allotments (105,291 acres) are not meeting standards. In most cases, failure to meet the Standard for riparian areas contributes to failure to meet SHR.

Three other allotments (31,771 acres) do not meet Standards; these allotments have causes other than livestock impacting the rangeland resource, such as improperly cut roads causing soil runoff. In the last 20 years, approximately 40 miles of roads have been closed because they contributed to degraded rangeland health.

There are still 250 allotments (1,422,491 acres) or approximately 59 percent of the planning area) that have not been assessed. These allotments are currently being scheduled for rangeland health assessments.

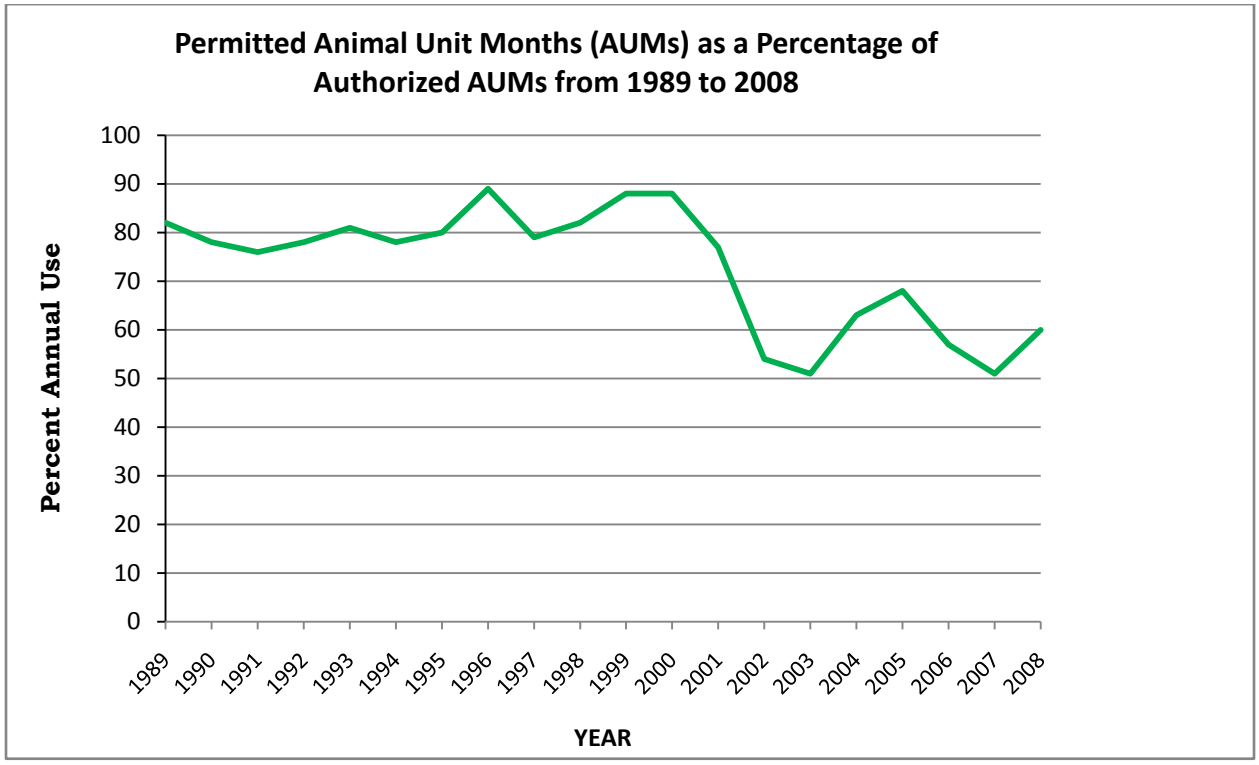
Allotment Management Plans and Rangeland Management Agreements

AMPs and rangeland management agreements have been used to improve rangeland health. These allotments were ranked as to level of importance in order to establish priorities for developing site specific objectives and implementing management changes. Through detailed planning, monitoring and implementation, many successes have been achieved. AMPs or Rangeland Management Agreements have been developed for 52 allotments covering 779,108 acres (Appendix E, Table 4). Most were developed in the 1990s.

Animal Unit Month Allocations

Since 1989, the number of AUMs authorized (Appendix E) have been approximately 73 percent of permitted AUMs. Some of this is a result of the negotiated and voluntary reductions due to a prolonged drought. Figure 2-12B depicts the permitted use as a percentage of total authorized AUMs for the period 1989-2008. The downward trend in permitted AUMs coincides with a decrease in actual cattle numbers in Fremont County during times of drought (See Appendix E6).

Figure 2.12B. LFO Permitted Animal Unit Months (AUMs) as a Percentage of Authorized AUMs 1989-2008



Regardless of annual precipitation, the seasonal availability of forage in pastures dominated by cheatgrass has been reduced because of its expansion. Cheatgrass is only palatable to livestock when it is actively growing (late winter and early spring.) Native perennial pastures have far superior production values for livestock but often cannot compete against invasive weeds, particularly under the pressure of livestock grazing (Gucker 2007). The increasingly prevalent problems caused by cheatgrass and other invasives are discussed in the Weed and Pest section.

Each allotment is evaluated for each grazing season to determine what use can be allowed. Some allotments may be unsuitable for grazing due to resource conflicts, terrain, lack of forage, distance from water, and other factors.

Particularly in the allotments near the proposed Gun Barrel-Madden Deep-Iron Horse (GMI) oil and gas field, grazing has already been impacted by development activities. The BLM does not have complete information about existing soil disturbance in this area or the impact on available AUMs. Analysis of the GMI project will include considering the impact on forage as a result of oil and gas development.

Forecasts

Management challenges facing the livestock grazing program include balancing resource conflicts such as wildlife use of forage and wildlife compatible fences; ongoing coordination with ranchers, the public, and interested stakeholders; the impact of noxious weeds on forage production; developing livestock grazing management strategies that improve allotments not meeting rangeland health standards; and addressing long-term monitoring needs.

The increase in price of private rangeland based on non-ranching valuation, high operating costs, and uncertainty because of fluctuations in precipitation and vegetative condition have all lead to uncertainties. Future events may include reduction in water available for irrigating hay private land because of changing precipitation patterns and loss of glaciers in the Wind River Mountains or the loss of confined animal feeding operation feed lots on which the majority of livestock grazed on public lands are finished (Pew 2008).

Additional factors other than rangeland health are changing the face of public land grazing. Since 2000, BLM has received an increase in permits/leases changing ownership. These permits/leases tend to be purchased by both traditional but more likely and non-traditional ranching interests averaging about 25 percent of total permits/leases authorized.

Under any scenario, reductions in AUMs or changes in grazing management will need to be evaluated as a tool to reach SHR and PFC.

Future Range Conditions: Permits and leases will continue to be analyzed and adjustments made where needed on an allotment by allotment basis. The RMP revision will identify specific lands that are and are not available for grazing resource value. Since the last RMP (1987), there are two allotments have been closed to livestock grazing within the planning area: Bragg Mountain (2241), and Little Red Creek/Miller 46 (2124) (Map 56).

Livestock grazing will continue to play a large role as it is specifically identified as an authorized multiple-use. Many of the livestock operators will continue to depend on the forage public lands grazing offers for at least part of the year. BLM does not analyze the environmental conditions of private lands that are dependent upon public-land grazing for profitability.

Oil and Gas/Mineral Development

A predicted increase in development of mineral resources will increase the presence of energy development related infrastructure and machinery (e.g., roads, pipelines, well pads processing facilities and a variety of vehicular traffic). Construction of new facilities necessary to extract mineral resources will directly reduce the availability of forage on a smaller. A typical oil or gas well pad, for example, may result in the loss of vegetation on 5 to 7 acres, not including associated access roads or pipelines. Further indirect loss of available forage may occur as the increased infrastructure and traffic constrain livestock movements. Moreover, much of the existing and expected oil and gas and mineral development is in areas with low reclamation potential making loss of forage likely, such as the Moneta-Lysite area.

Climate Change and Drought

From 2000 to 2006, the area was in a sustained hydrological drought. Through negotiations and grazing permittee cooperation, range staff specialists were able to temporarily reduce stocking levels or modify seasons of use on an allotment by allotment basis to lessen the impact of drought conditions on the soil and vegetation resources. Although this region continues to reflect a long-term hydrologic drought, the amount and timing of precipitation through this period were enough for forage growth to support reduced levels of livestock grazing. Adjusting stocking rates and time to varying climate conditions, including drought, is a normal aspect of annual grazing management.

Changing weather patterns, such as more precipitation coming in the form of rain and less as snow pack, early and warmer spring weather, less frequent but more intensive weather systems and climbing CO_2 levels have implication on vegetation types, including favoring some invasive species over natural species, as well as possible changes to growth patterns which would impact livestock season of use.

Climate change analysis also requires considering the contribution of BLM authorized activity to changing climate. The IPCC identified the contribution of livestock grazing to greenhouse gas emissions as approximately 18 percent of the total annual worldwide production, more than the transportation segment. Livestock grazing's contribution varies by location, management and many factors. Increased research may provide an accurate analysis model which can be used during environmental impact analysis of the RMP EIS. Sufficient information is currently understood to state that the BLM's mandate to promote rangeland health will have increasing importance due to its role in carbon sequestration

Key Features

Rangeland Health is a key feature that would drive management decisions. Completing standards assessments on grazing allotments would allow the Lander Field Office to focus management actions where they are most needed, resulting in a trend toward healthier rangelands. Other key features include:

- Suitability of landscapes within allotments for grazing (using factor such as forage availability, distance from water, steepness of slope, etc.)
- Impacts from invasive weeds
- Impacts from climate change as an overarching consideration for livestock grazing
- Prescribed grazing including proper stocking levels, seasons of use, turn-out dates, pasture rotation, rest, and riparian management, and accountability that these things work to make progress toward land health
- Sustainability
- Other resources uses and values such as wildlife, recreation, etc. that in some areas that may be determined to take priority over livestock grazing
- Livestock conversions

2.7 Special Designations and Other Management Areas

ACECs, Scenic or National Backcountry Byways, NHTs, WSRs, and WSAs are discussed in this section. The 1987 RMP designated nine ACECs and eight WSAs. The NHTsand the National Continental Divide Scenic Trail are designated by Congress.

2.7.1 Areas of Critical Environmental Concern and Other Management Areas

An ACEC is defined in FLPMA, Public Law 94-579, Section 103(a) as an area within the public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, and scenic values, and fish and wildlife, and other natural systems or processes. ACECs are also designated to protect life and safety from natural hazards. Designation of ACECs during revisions of land use plans is mandatory under FLPMA: "In the development and revision of land use plans, the Secretary shall …(3) give priority to the designation and protection of areas of critical environmental concern…" FLPMA, Section 202(c)(3). BLM regulations for implementing the ACEC provisions of FLPMA are found at 43 CFR 1610.7-2(b).

2.7.1.1 Resource Characterization

Current Condition

The 1987 RMP designated nine areas as ACECs (Map 28) (all acres are approximate).

Lander Slope: This area consists of 43,000 acres of high elevation slopes and drainages in mountain shrub communities located south and west of Lander. The area is important winter wildlife habitat with unique, scenic vistas threatened by development, mining, rights of way and habitat fragmentaton. The ACEC has substantial WUI issues and adjoins private lands that are being subdivided and fragmented.

Red Canyon: This area consists of 17,800 acres of foothills of the Wind River Mountains south and west of Lander with high elevation slopes and drainages. The area contains nationally recognized visual resources and important wildlife habitat and threatened by habitat fragmentation and visual intrusions. Much of the private land adjoining the ACEC has been subdivided.

Whiskey Mountain: This area consists of 11,750 acres of high elevation, wind-swept slopes and rocky cliffs south and east of Dubois. The area is important bighorn sheep habitat. Domestic sheep and goats present risk of disease transmission. The resident bighorn sheep herd is struggling against population loss and are vulnerable to additional stresses.

East Fork: This area consists of 1,392 acres of high elevation, wind-swept slopes; sagebrush draws near timber patches 5 miles northeast of Dubois in the drainages of East Fork of the Wind River, Wiggins Fork, Bear Creek, and Alkali Creek. The area is crucial winter habitat for elk and is threatened with habitat fragmentation. All of the Dubois area is threatened with subdivision and development of private lands. The area is surrounded by forests devastated by pine beetle mortality.

Dubois Badlands: This area consists of 5,000 acres with badlands characterized by extensive erosion patterns and colorful soil banding, starting 2 miles north of Dubois and extending to the east. The area is bighorn sheep habitat with high scenic values and is threatened by OHV use.

South Pass Historic Mining District (SPHMA): This area consists of 12,000 acres consisting of a historic gold mining region southwest of Lander. The ACEC has both sagebrush steppe and forested areas, with steep to rolling hills. The area contains important historic resources and geological hazards resulting from mining activities. South Pass was and still is the largest gold mining area in Wyoming. The influences of this marginal gold mining area on the early development of the Wyoming Territory and the state of Wyoming were considerable. It is threatened with ROW developments, particularly wind energy development.

Green Mountain: This area consists of 15,000 acres on the north slopes of Green Mountain and Crooks Mountain in extreme southeast Fremont County, south of Jeffrey City. The area con-

tains important elk winter range and a historic resource, the Sparhawk Cabin, which was built in the 1930's by F.O. Sparhawk, the first forest service ranger on the Shoshone National Forest. Green Mountain is threatened by mineral and ROW development.

Beaver Rim: This area consists of 6,577acres in south-central Fremont County, north and west of Sweetwater Station. The area contains scenic resources, Native American cultural and spiritual sites, unique geological and paleontological exposures, and unique plant communities. Beaver Rim is threatened by ROW developments, particularly wind energy development.

Oregon/Mormon/California/ Pony Express National Historic Trails: This area consists of approximately 25,000 acres along a linear trail running east-west, in southwestern Natrona County and southern Fremont County. This trails corridor follows the Sweetwater River for most of its length. The area contains nationally recognized historic resources and scenic resources. This area is threatened by ROW developments, particularly wind energy development.

Potential Areas for Consideration as ACECs

To date, the BLM has received 35 recommendations for areas to be considered as potential ACECs including four proposed expansions of existing ACECs. All nominated ACECs meeting relevance and importance criteria will be considered as proposed ACECs and will be assessed for special management requirements and any relevant and important values. ACEC designations and any identified special management requirements apply only to public lands.

Implications of ACEC Designation

Designation as an ACEC carries only one automatic management prescription: a Plan of Operations is required for all activities for locatable minerals regardless of size. (Without ACEC designation, a PoO is required only for mining activities greater than five acres.)

All other management prescriptions are developed on a site-specific basis, depending upon the resources to be protected or the identified threats. Although the Wind Energy ROD excluded ACECs from wind energy ROWs, subsequent BLM Guidance made ACECs available in consideration of resource values.

2.7.2 Scenic or National Backcounty Byways

The BLM began its Backcountry Byway Program in 1989 to focus on enhancing recreational opportunities. A Scenic Byway System was created two years later under Section 1047 of the Intermodal Surface Transportation Efficiency Act of 1991. This Act recognized BLM backcountry and scenic byways as components of the national scenic byway system (Section 1032, eligible projects). Objectives of the BLM byway program are stated as follows.

- Enhance opportunities for the American public to see and enjoy the unique scenic and historic opportunities on public lands.
- Foster partnerships at local, state, and national levels.
- Contribute to local economies.
- Enhance the visitor's recreation experience and communicate the multiuse management message through effective interpretative programs.
- Manage visitor use along the byway to minimize impacts on the environment and to provide protection for the visitor.
- Contribute to the national scenic byway system in a way that is uniquely suited to national public lands managed by the BLM.

2.7.2.1 Resource Characterization

Current Condition

There are no existing federal backcountry byways in the planning area although there is a State backcountry byway. None have been proposed for consideration in the RMP revision.

2.7.3 National Historic Trails and National Scenic Trails

Land use planning guidance requires special management for Congressional Designations. (Handbook 1-1601, Appendix C, page 27). There are two Congressional Designations in the planning area: the Oregon, Mormon Pioneer, California, and Pony Express National Historic Trails (NHTs) and the Continental Divide National Scenic Trail (NST).

NHT and NST designations are provided to guide management and protection of Congressionally-designated historic trails, scenic trails, and surrounding areas. In 1968, the National Trails System Act (NTSA - Public Law 90-543) provided for the development of a national system of trails in urban, rural, and wilderness settings. Originally, the Act specified three categories of National Trails: scenic trails, recreation trails, and connecting or side trails. In 1978, historic trails were added as another category. Today, only Congress can designate NHTs and NSTs.

2.7.3.1 Resource Characterization

National Historic Trails

The Oregon, Mormon Pioneer, California, and Pony Express National Historic Trails (NHTs) are four nationally-significant historic trails that traverse the southern portion of the planning area. These trails mark the mid-1800s period of mass migration for pioneering Americans who were headed west in search of a new life (Map 57) for the locations of the major emigrant trails in the western U.S.). These trails are nationally recognized as the symbols of one of the most important and influential movements of people in U.S. history.

The four NHTs share a mostly common corridor from Horse Creek, east of Independence Rock, to Burnt Ranch, south of Atlantic City (Map 58), and are considered one of the most pristine segments of these trails in the entire nation. The overall good-excellent condition of the trail corridor is due both a lack of impacts on the trails themselves, and due to the highly intact historic setting around the trails. For this reason, this stretch of NHTs has been designated by BLM and the National Park Service as a High Potential Route Segment, a designation which carries the highest priority for protection and management in the National Trails System. Map 59 depicts the location of the Trails in the the state and identifies the classification segments.

The following are the four NHTs through the planning area

The Oregon National Historic Trail

This is the famous trans-continental route that was a natural migration route for prehistoric and early historic groups, and later became the main highway for European-American emigrants looking for new land and a new beginning in the largely unsettled western territories. The emigrants were spurred on by economic hardship in the East, and a sense of destiny that American should compete with foreign powers and claim the western lands for the United States. This westward movement occurred primarily from the 1840s through the 1860s, but the Oregon Trail remained in use as a wagon trail as late as 1912. Estimates of the number of pioneers who used the trail range from 350,000 to 500,000. The majority of the emigrants traveled with wagon trains, spending an average of 6 months walking and riding over the arduous route. For many, the trials of the trail were too much. At least 20,000 died along the various emigrant trails during this time period.

A large number of Oregon Trail emigrants were interested in settling the widely available lands in Oregon and Washington or in setting up commercial pursuits to serve the settlements. Later, precious mineral discoveries became an impetus for migrations to different parts of the West and often provided the basis for settlement of lands previously by passed by the emigrants.

In the 1850s and 1860s, the Oregon Trail was used extensively by the military and commercial interests. The supply needs of settlements, travelers, and Indian tribes under treaty enabled

freighting companies to operate, while military garrisons were assigned to posts along the trail to protect the emigrants and freighters. Communication services also sprang up along the trail; the most famous was the Pony Express. Although the Pony Express was driven out of business after less than two years (in 1861) by the transcontinental telegraph, it remains etched in our national memory as an outstanding American achievement. Stage lines also operated on the Oregon Trail, but some were forced to move t the more southern Overland Trail because of fears of Indian attacks.

The contributions of the use of this early road to the settlement and the economic development of the Western United States were enormous. Congress recognized this in 1978 by designating the Oregon Trail as a National Historic Trail. Under national trail status, the federally administered portions of the trail are protected from unwarranted impacts and are maintained for public enjoyment and use.

The Mormon Pioneer National Historic Trail

In the midst of the migration to Oregon and California, there was a smaller migration headed toward Utah. Most of these emigrants were Mormons (members of the Church of Jesus Christ of Latter-Day Saints), which was founded in 1830. The Mormon emigrant's goal was to get to the Great Salt Lake Valley where the new center of the Mormon Church had been established.

In 1846 to 1847, an advance party, led by church leader Brigham Young, headed west from Illinois and finally chose their new home in the Great Salt Lake Valley. The route these first pioneer Mormons used is the Mormon Pioneer National Historic Trail. In the two decades following the pioneering trek, thousands of Mormons, from the eastern U.S. and Europe, traveled to Utah to live in the "promised land."

The route the Mormons used to get as far as mid-Nebraska differed from the Oregon Trail. The two trails then met on the Platte River and from there to Fort Bridger (in southeast Wyoming), the two trails basically followed the same route. The Mormon Pioneer Trail compliments the Oregon Trail as a major symbol of our nation's expansion. Whereas the Oregon Trail contributed more to the far western states, the Mormon trail was one of the major factors in the initial development of the interior West. Congress observed the importance of the Mormon Pioneer Trail by designating it as a National Historic Trail in 1978. As with the Oregon Trail, the Mormon Pioneer Trail is now afforded protection from unwarranted disturbances and is maintained for public enjoyment and use.

The California National Historic Trail

Emigrants trekking also began to settle in California. Using the Oregon Trail until Fort Bridger, and then heading through Utah and Nevada, a small number of emigrants blazed trails into California as early as 1841. By 1846, the number of people headed to California is estimated to be around 1,500, including the ill-fated Donner Party trapped for the winter in the High Sierras. In 1848, however, gold was discovered in the Sierra Nevada Mountains of California, and the trickle of emigrants turned into a flood. By 1849, those moving to California greatly exceeded those headed for Oregon; it is estimated that 44,000 emigrants arrived in California in 1850. It is estimated that 250,000 people travelled the California Trail from 1841-1868.

Some segments of the California Trail followed different routes than the Oregon or Mormon Pioneer Trails. These cut-offs and short cuts were generally blazed to enable hurried travelers to by-pass the slow wagon trains so prevalent on the other trails.

The California Trail also compliments the Oregon Trail as a major symbol of our nation's expansion. These rails were major factors in the settlement of the far western states. Congress observed the importance of the California Trail by designating it as a National Historic Trail in 1999. As with the Oregon Trail and Mormon Pioneer Trails, the California Trail is now afforded protection from unwarranted disturbances and is maintained for public enjoyment and use.

The Pony Express National Historic Trail

By 1860, the population of the West had grown dramatically, and better communication between the eastern states and the west became an important need. Earlier mail contracts using freight or stagecoach lines proved to be too slow, so a new method was instituted. Using the concept of mounted courier service to quickly deliver mail, the firm of Russell, Majors and Waddell, with U.S. Government assistance, created the Pony Express. Using a system of riders, stations, and stock handlers spread over almost two thousand miles, the first riders left on April 3, 1860 from St. Joseph, Missouri, and arrived in Sacramento, California ten days later.

Although the Pony Express was efficient and popular, it was not profitable due to high overhead costs. It was also not competitive with transcontinental telegraph route, which was substantially finished in 1861 and the Pony Express was forced to discontinue service in November of 1861, after only a year and a half.

Nevertheless, the Pony Express earned a significant place in American History. As the National Park Service has noted (1999), it created a new and faster communication link between the East and the Pacific Coast; it demonstrated the viability of the overland route from Missouri to California; it played an important role in maintaining communication between the federal government and California immediately before and during the Civil War; and it has come to symbolize America's rapid expansion to the Pacific in the mid-19th Century.

The Pony Express Trail follows the Oregon Trail through the planning area. Although short-lived, this venture captured the imagination of the American people. Congress observed the importance of the Pony Express Trail by designating it as a National Historic Trail in 1999. As with the other historic trails, the Pony Express National Historic Trail is now afforded protection from unwarranted disturbances and is maintained for public enjoyment and use.

Current Management of the NHTs

After the NHTs' heyday, most of the trail corridor reverted to minimal used by ranchers, recreationists, hunters, etc. However, commemorative anniversary wagon trains in the 1990s increased the popularity of the NHTs, and use began to increase. By 2000, use in the western part of the planning area segment (especially by Mormon groups) had increased dramatically, and the trails there began to be adversely impacted. By 2005, the BLM had developed better management strategies to protect the historical values of the NHTs. At present, most of the Trail in still in good to excellent condition, and the impacted parts may be starting to heal (see Map 60 for details on the present condition of the NHTs).

The NHTs are managed for cultural and recreational values. The portions of Trails in the planning area have been designated a High Potential Route Segment by the National Park Service and the BLM. A corridor ¼ mile on each side of the NHTs is NSO for leasable minerals, locatable mineral exploration (occasional withdrawals and Plans of Operations requirements), utility systems (avoided), wind development and other ROWs (avoided), and OHV use (limited and closed at Rocky Ridge). The NHTs corridor is also an ACEC.

Associated NHT Sites

Associated with the NHTs are a number of sites on BLM-administered lands that figured prominently in their history. These sites sometimes occur outside of the current NHT corridor, but are included in this section because they are integral parts of the NHT system. The sites are shown on Map 61, and include Martin's Cove, Devil's Gate, Split Rock, Ice Slough, Rocky Ridge, Rock Creek Hollow, and Gilespie Place described below:

Martin's Cove

Martin's Cove is a historic site associated with the Mormon Pioneer NHT located in the southeastern part of the planning area. The Cove is a sheltered recess among the Sweetwater Rocks where Mormon emigrants took refuge from a winter storm in 1856. The cove is located next to the bare granitic hills of the Sweetwater Rocks, just north of the Sweetwater River, about 2 miles west of Devil's Gate and 1 mile north of the Oregon/Mormon Pioneer Trail.

The setting of this disaster involved Captain Edward Martin's 6th Handcart Company, a large group of Mormon converts who were headed to the Salt Lake Valley of Utah. The company originated in England, and they planned to walk across the interior of the United States, while pulling two-wheeled handcarts. A winter storm caught them weak and unprepared, and the emigrants took refuge in Martin's Cove. The company was eventually rescued and brought to Salt Lake City, but not before 145 people in the company died from exposure and starvation.

Until recently, the site was only casually used by local ranchers and occasional history buffs. However, in the 1990s, the Mormon Church purchased the ranch that controlled access into the Cove. Visitation immediately jumped, and the BLM and the Church jointly developed a walking path, interpretive stations, and other facilities to handle the surge in visitors. Although these modern facilities diminished the historical integrity of the Cove, they have kept the impacts from an estimated 40,000 visitors per year to an acceptable level.

Current Management: Martin's Cove is listed on the NRHP and is managed for cultural and recreational values. This site has been designated a High Potential Historic Site by the National Park Service and the BLM. Martin's Cove is jointly managed by the BLM and the LDS Church. The site is protected from NSO for leasable minerals, withdrawn from locatable minerals, avoided for utility systems, wind development, and other ROWs, fenced from grazing, andlimited OHV use. Martin's Cove is not part of an ACEC, but is within the area nominated to become part of an expanded NHT ACEC.

The condition trend for Martin's Cove was down, but has now stabilized. Martin's Cove is one of several NHTs sites associated where heavy use has caused measurable damage. Intensive management has stopped the downward trend, with healing of earlier damage being observed.

Devil's Gate

Devil's Gate is a historic site associated with the NHTs located just east of Martin's Cove. It is one of the most well-known landmarks along the NHTs. Devil's Gate is a unique geological feature where the Sweetwater River has cut through the Sweetwater Rocks leaving a narrow cleft measuring about 370 feet deep, 2,500 feet long, and less than 50 feet wide in places. Located 5 miles southwest of Independence Rock, Devil's Gate lies near the point where the NHTs begin to parallel the Sweetwater River. Many diaries of the pioneers include remarks about Devil's Gate, and some of the emigrants wrote or carved their names on the cliffs around this landmark. Devil's Gate appears mostly as it did in the mid-1800s, except for an irrigation canal built along the river cut, and some modern ranching developments near it. For more than a century, use of Devil's Gate was minimal. The site is accessible from the Martin's Cove complex, and increased use has occurred in recent years without much of an effect on the site.

Current Management: Devil's Gate is part of the Tom Sun National Historic Landmark and is managed for cultural and recreational values. This site has been designated a High Potential Historic Site by the National Park Service and the BLM. The site is NSO for leasable minerals (NSO), withdrawn from locatable mineral exploration, avoided for utility systems, wind development, and other ROWs, and limited OHV use. Devil's Gate is only partly within the current NHT ACEC, but is within the area nominated to become part of an expanded NHT ACEC. The condition trend for Devil's Gate is stable; surprisingly, heavy use at nearby Martin's Cove has not caused an increase in impact.

Split Rock

Split Rock is a geological feature with historical associations to all four of the NHTs. Located about 15 miles west of Martin's Cove and Devil's Gate, Split Rock is a prominent and highly visible landmark and served as a geographical guide for Indians, fur traders and emigrants. This high cleft in the granite of the Sweetwater Rocks could be seen soon after the emigrants left Devil's Gate, and the area near Split Rock was a favorite camping spot. During the 1860s, the Pony Express, Overland Stage Line, and the Eleventh Ohio Cavalry maintained post in the local area. Although some agricultural development has occurred near the Sweetwater River, the general area is little changed from its 19th century historical setting.

Current Management: Split Rock is listed on the NRHP and is managed for cultural and recreational values. This site has been designated a High Potential Historic Site by the National Park Service. The site is NSO for leasable mineral , withdrawn from locatable minerals, avoided for utility systems, wind development, and other ROWs, and closed or limited OHV use. Split Rock is only partly within the current NHT ACEC, but is within the area nominated to become part of an expanded NHT ACEC. The condition trend for Split Rock is stable because it is not easily accessible and does not receive heavy use.

Ice Slough

Ice Slough is another historic site associated with the four NHTs. Ice Slough is a wide, shallow, swampy drainage that was often mentioned by the emigrant travelers on the Oregon/Mormon Pioneer Trail. This spring-fed boggy area, about 23 miles west of the Split Rock Landmark, was paralleled by the trail for a several miles before the trail crossed it. The emigrants used the slough for grass, water, camping, and reportedly for a source of summertime ice. The ice, found underneath peat and water layers, could be obtained even in the hot summer months, and this oddity was a constant and welcome surprise to the pioneers. Along the banks of the slough was a stage/Pony Express station, which operated in the 1860s. U.S. Highway 287 crosses the slough, and ditches have been cut in it in places, but otherwise the site still appears mostly as it did in the 19th century. Heavy grazing within Ice Slough was recently controlled by the installation of an electric fence, which was designed to be hardly visible from the Trail.

Current Management: Ice Slough is eligible for listing on the NRHP and is managed for cultural, recreational, and grazing values. This site has been designated a High Potential Historic Site by the National Park Service and the BLM. The site is NSO for leasable minerals, avoided for utility systems, wind development, and other ROWs, and closed or limited OHV use and a a Plan of Operations is required for locatable minerals. Ice Slough is only partly within the current NHT ACEC, but is within proposed expanded NHT ACEC. The condition trend for Ice Slough was down, but has now stabilized. A riparian fence was built several years ago to relieve grazing pressure on the Slough, and this has markedly improved the site's condition.

Rocky Ridge

Rocky Ridge is a historic site associated with all four of the NHTs, and is located in the south-western part of the planning area. Rocky Ridge was a landmark of a different sort for the emi-grants. This area, about 19 miles west of Ice Slough, was a spot where the emigrants were forced to leave the lowlands along the Sweetwater River and cross a high, barren and rocky ridgeline located north of the river. Many of the pioneers' diaries speak of the rough jarring ride they endured and the difficulty of the steep climb over the ridge. The area today still exhi-bits rust stains on the rocks from the iron-tire wheels of the early wagons. Rocky Ridge area is isolated and still retains much of its historical and natural character.

After the 1870s, Rocky Ridge reverted to minimal used by ranchers, hunters, and trail enthu-siasts. However, commemorative anniversary wagon trains in the 1990s increased the popular-ity of the NHT and Rocky Ridge, and use began to increase. By 2000, use of Rocky Ridge (espe-cially by Mormon groups) had increased dramatically, and the site began to be adversely im-pacted. By 2005, vehicle use over Rocky Ridge had been prohibited, and non-vehicular use was beginning to be better managed to protect the historical character of Rocky Ridge. At present, use is being carefully monitored, and the site may be starting to heal. Part of Rocky Ridge is within the current NHT ACEC, and part is not.

Current Management: Rocky Ridge is eligible for listing on the NRHP and is managed for cultural and recreational values. This site has been designated a High Potential Historic Site by the Na-tional Park Service and the BLM. The site is NSO for leasable minerals (NSO), withdrawn from locatable mineral exploration, avoided for utility systems, wind development, and other ROWs, and limited OHV use. Rocky Ridge is only partly within the current NHT ACEC, but is within the area nominated to become part of an expanded NHT ACEC. The condition trend for Rocky Ridge was down, but has now stabilized. Rocky Ridge is one of several sites associated with the NHTs where heavy use has caused measurable damage. Intensive management has stopped the downward trend, with some healing of earlier damage being observed.

Rock Creek Hollow

Rock Creek Hollow is a historic site associated with the Mormon Pioneer NHT. This site (formerly known as Willie's Handcart Rescue Site) was one of the locations where the Willie's Handcart Company took shelter after being rescued in the fall/winter of 1856. The hollow, located about 6 miles west of Gilespie Place, lies in the narrow floodplain of Rock Creek, near the spot where the Oregon Trail crosses the creek.

Rock Creek Hollow commemorates the disaster that befell the Willie's Handcart Company in October and November of 1856. The same storm that trapped Martin's Handcart Company also overtook the Willie's Company. The Willie's Company, having gotten a slightly earlier start on their trek from Iowa to Utah, was over-taken by the storm and took shelter in several different areas, including Rock Creek. Over 70 people from this company died during the disaster, including several people at Rock Creek. The LDS church has developed the private land at this site, but the BLM portion to the south is mostly untouched, and appears much as it did in the 1850's. Under the 1987 Lander RMP, mining activities within 1/8 mile of Rock Creek Hollow are required to have a Plan of Operations, and part of the site is within the NHT ACEC.

Current Management: Rock Creek Hollow is eligible for listing on the NRHP and is managed for cultural and recreational values. The site is protected from oil and gas development (NSO), other leasable minerals (NSO), locatable mineral exploration (Plans of Operations requirements), utility systems (avoided), wind development and other ROWs (avoided), and OHV use (limited). Rock Creek Hollow is only partly within the current NHT ACEC, but is within the area nominated to become part of an expanded NHT ACEC.

The condition trend for Rock Creek Hollow is down, mostly due to overdevelopment. Rock Creek Hollow is one of several sites associated with the NHT where excessive development and use has caused measurable damage. However, the BLM-administered portion of the site remains in stable to only slightly down condition due to restrictions on its use.

Gilespie Place

Gilespie Place is a historic site associated with the four NHTs as well as later mining and settlement history of the area. This site is located along the Oregon/Mormon Pioneer Trail, just east of the historical mining camp of Lewiston. Gilespie Place consists of two standing structures, several foundations with wall remains, and a flowing spring. The site, located along a major transportation route, was associated with several historical events of Wyoming's early territorial and state history.

The earliest historical use of the site probably occurred during the Oregon/Mormon Pioneer Trail era, when early emigrants passed through the region in the 1840s. Although no emigrant diary accounts of this site are known to exist, the site's spring was probably often used as a convenient water source. Some overnight emigrant camping probably also occurred here.

Radium Spring probably continued to be used by travelers over the entire emigrant trail era. In the 1880s, mineral exploration began in earnest in the Lewiston Mining District, which included the Radium Spring area. Although no records are available, some small-scale exploration probably occurred in the local area.

After the turn of the century, the structures were built on the site. Presently, we do not know exactly when they were constructed, but artifactual evidence points to pre-1920s dates of occupation for at least some of the structures. This evidence corresponds to newspaper accounts of a Mrs. S.F. Gilespie having settled on 160 acres in the immediate area sometime around 1910 (Wyoming State Journal 1918). Touted as "Wyoming's Copper Queen", Mrs. Gilespie seems to have been heavily involved in mining ventures in the local area around Lewiston. During this period, the spring was claimed to have radium in its waters and was advertised to have healthful properties.

Several structures in fair-good condition still exist at the site. Under the 1987 RMP, mining activities within 1/8 mile of Gilespie Place were required to have a Plan of Operations.

Current Management: Gilespie Place is eligible for listing on the NRHP and is managed for cultural and recreational values. The site is protected from oil and gas development (NSO), other leasable minerals (NSO), locatable mineral exploration (Plans of Operations requirements), utility systems (avoided), wind development and other ROWs (avoided), grazing and OHV use (fence and limited to existing roads and trails). Gilespie Place is only partly within the current ACEC, but is within the area nominated to become part of an expanded NHT ACEC. The condition trend for Gilespie Place was down, stabilization of the standing structures at the site was done several years ago which stopped the downward trend.

Oregon Trail Withdrawals

There are several existing Oregon Trail Withdrawals along the NHTs that were approved in the 1970's when the Oregon Trail was established as an NHT. These mineral withdrawal areas were chosen because they included emigrant inscriptions, campsites, or were places where NHT-related historical events happened. They comprise three separate parcels that cover 1240 acres. They were carried forward in the 1987 Lander RMP and are still relevant today.

Current Management**:** These withdrawals are managed for cultural and recreational values. The sites are protected from oil and gas development (NSO), other leasable minerals (NSO), locatable mineral exploration (withdrawn), utility systems (avoided), wind development and other ROWs (avoided), and OHV use (limited). The Oregon Trail withdrawals are only partly within the current NHT ACEC, but are within the area nominated to become part of an expanded NHT ACEC.

The condition trend for the NHTs is stable or down, depending on the location. The portion of NHTs between 6th Crossing and Rock Creek Hollow has experienced heavy use and measurable damage. More intensive management has slowed the downward trend, with some healing of earlier damage being observed.

Forecasts

Pressures on NHTs will likely increase from continued development pressures, and indirect and cumulative impacts will continue to degrade a portion of the trails' historic and natural landscape. Impacts to NHT resources that *cannot* be mitigated are expected to occur and the historic integrity of these resources is expected to continue to degrade as time goes on. The demand for consumptive use of NHT resources through tourism is fairly high and is anticipated to increase through time. This reflects an increasing interest in history and heritage tourism. Maintaining the historic setting is critical to providing a quality experience for visitors. The setting is an essential component in determining whether a particular trail segment contributes to the trail's overall significance.

Collecting, looting, and vandalism of NHT historic sites, which are difficult to quantify, is nevertheless forecast to continue to be a problem in the planning area. Certain types of sites, especially historic station locations and structures will continue to suffer damage from these kinds of activities.

New types of motorized and non-motorized vehicles have increased the utilization of more remote parts of the NHTs. This factor has accordingly increased the vulnerability of remote NHT segments and sites through human-caused activities and degradation.

Climate Change

Climate change predictions include increased duration and frequency of droughts and an increase in extreme precipitation events. Drought can be relatively short term (seasonal) or long term (multiple years). Climate changes that result in increased erosion, fire, or mass wasting of rock outcrops could have direct impacts on the NHTs' historic resources.

Key Features for the NHTs are the resource features are significant enough to guide land use allocations and/or management decisions.

Continental Divide National Scenic Trail

The National Trails System Act (P.L. 90-543) provides for the designation of national scenic trails "so located as to provide for maximum outdoor recreation potential and for the conservation and enjoyment of the nationally significant scenic, historic, natural, or cultural qualities of the areas through which such trails may pass." Section 3(a)(2)).

The Continental Divide National Scenic Trail (CDNST) is a 3,100-mile trail extending from Canada to Mexico and passing through the Rocky Mountain States of Montana, Idaho, Wyoming, Colorado, and New Mexico. An 89-mile on-the-ground route of the Continental Divide National Scenic Trail was designated through the planning area in 1999, followed by an additional 3 miles of route in 2001. These 92 miles of the Continental Divide National Scenic Trail include 2 miles of hiking trail, 10 miles of cross-country travel, 4 miles of gravel roads, and 76 miles of primitive two-track roads (Map 62). A cooperative agreement with the Wyoming State Lands & Investment office provides for joint management of approximately 3 miles of scattered state lands in the 92 miles of route.

After the passage of the National Trails System Act, the Bureau of Outdoor Recreation (in accordance with the Act) conducted a study that endorsed designation of the CDT as a national scenic trail. The overall vision for the Continental Divide National Scenic Trail, as stated in the 1976 Study Report follows:

"The primary purpose of this trail is to provide a continuous, appealing trail route, designed for the hiker and horseman, but compatible with other land uses…To provide hiking and horseback access to those lands where man's impact on the environment has not been adverse to a substantial degree and where the environment remains relatively unaltered. Therefore, the protection of the land resource must remain a paramount consideration in establishing and managing the trail. There must be sufficient environmental controls to assure that the values for which the trail is established are not jeopardized….The basic goal of the trail is to provide the hiker and rider an entrée to the diverse country along the Continental Divide in a manner which will assure a high quality recreation experience while maintaining a constant respect for the natural environment."

Similarly, the Comprehensive Management Plan for the CDNST established the following goal:

"Provide users with opportunities to view, experience, and appreciate examples of prehistoric and historic human use of the resources along the Continental Divide; examples of the ways these resources on public lands are being managed in harmony with the environment, as an asset to the existing character of the Continental Divide, and which will not detract from the overall experience of the trail."

In recognition of the above, the Comprehensive Management Plan emphasized the importance of visual management as a key factor to ensure user enjoyment of the CDNST. The plan directed the BLM to consider the Trail a high sensitivity travel route. Importantly, the Trail corridor across the planning area encompasses diverse landscapes. A portion of the Trail landscape encompasses areas of "high absorption capacity," meaning activities along these could be easily located out of view. Conversely, another portion of the trail crosses a landscape that does not readily absorb contrasting activities, that is observers traveling along this section of trail would be particularly sensitive to activities that altered the characteristic landscape.

The portion of the CDNST in the planning areas travels through numerous differing landscapes. The trail enters south of Green Mountain and travels northwest towards Crooks Gap. In the Crooks Gap area the Trail travels through a more industrialized zone with many resource uses including major pipeline ROWs, reclaimed uranium mining, major motorized travel routes, and an oil field on top of Crooks Mountain. Continuing in a northwesterly direction, the trail travels into a zone with very little development or resource use. This zone contains some of the most wide-open and undeveloped landscapes available on the entire CDNST. After crossing the Bison Basin Road, the Trail connects to the NHTs and travels across an area known as the Antelope Hills. Within the Antelope Hills landscape are numerous granite outcrops and features that draw the observer's attention. The trail eventually crosses the Sweetwater River at the Phelps Dodge Bridge; here the trail travels toward South Pass City State Historic Park and the South Pass Mining ACEC. This section contains numerous cross country sections and eventually drops the user into South Pass City. Continuing on from the Willow Creek trailhead, the trail heads cross country for some time before returning to a primitive two track and eventually encountering Wyoming Highway 28.

The diversity of landscapes and features encountered on each section of trail has corresponding different visual resource classes. The existing RMP visual resource allocation for the trail is Class 2-4. These were established several years before the trail was designated; as a result, most of the visual resource classes do not consider the trail corridor. The most recent visual resource inventory was conducted in partnership with the University of Wyoming and considered the Trail designation; as a result, inventory classes displayed a higher visual value then those considered in 1987. The new inventory found that the trail travels through inventory classes 2-4, with a very high amount in Class 3 or higher.

Visitor use by through-hikers is on a slight upward trend. Use in both 2003 and 2004 was in the range of 40 to 60 through-hikers from May through September (RMIS 2003 and 2004). Non-through-hiker day-use and multiple-day use of the Trail is low. Other recreational uses on the designated route include hiking, hunting, mountain biking, and driving for pleasure, but are not considered uses tied directly to the Trail.

A Trail trailhead was developed in the parking area of the South Pass City State Historic Site in 2002. The Trail uses the main site roadway before entering public land to follow the Volksmarch Trail for approximately 2 miles. It then follows a series of two-track roads and cross-country travel toward the Sweetwater River and beyond.

Further analysis of the recreation and visual trends of the Trail are contained in the Visual and Recreation section. Currently, no allowable use decisions exist on or adjacent to the CDNST; this situation creates conflicting mandates for managers and members of the public. A change in management is needed in order to provide a diversity of trail landscapes that meet the demands of the National Trails System Act, the Comprehensive Report, and the subsequent Comprehensive Management Plan. This National Conservation System landscape is not currently protected under standard mitigation guidelines or other planning decisions. Prescriptions to maintain this congressionally designated resource need to address the following: activities under the 1872 Mining Law, management of Rights of Ways, Oil and Gas development, management of Off Highway Vehicles, historical resource protection, as well as the management of recreational use and enjoyment of the trail.

2.7.4 Wild and Scenic Rivers

The National WSR System is a system of nationally designated rivers preserved in a free-flowing condition, as well as their immediate environments recognized for outstanding scenic, recreational, geologic, fish and wildlife, historic, cultural, and other similar values. The system consists of three types of rivers:

Recreation—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 impoundments or diversion in the past.

Scenic—rivers or sections of rivers free of impoundments with shorelines or watersheds still largely undeveloped but accessible in places by roads.

Wild—rivers or sections of rivers free of impoundments and generally inaccessible except by trails, with essentially primitive watersheds or shorelines, and unpolluted waters.

The BLM is responsible for evaluating all rivers located on BLM-administered land to determine if they are appropriate for addition to the National WSR System. The BLM also makes, as appropriate, recommendations for legislative actions to accomplish such additions. This RMP process will finalize recommendation to Congress

2.7.4.1 Resource Characterization

Current Condition

Currently, no congressionally designated WSRs exist within the planning area; however, nine waterways have been found to meet the eligibility requirement for WSR designation, and it has been determined that two of these areas meet tentative suitability requirements. These determinations are a result of the findings contained in the Final Report of Lander Field Office Review of Potential WSRs in the Lander RMP (BLM 2002), which is available at the Field office and on the office's planning website.

The public will be given the opportunity to comment on the WSR review as part of this planning process. Reports and recommendations to Congress for inclusion of BLM administered public lands in the WSR National System will be based on waterways meeting established eligibility criteria and suitability factors, professional judgment, and broad public participation.

Table 2-58 contained below summarizes the review of all waterways found to be eligible for inclusion in the WSR System. Baldwin Creek Canyon was found to meet suitability factors for wild and scenic

Table 2-58. Wild and Scenic River Suitability Review Summary

Waterway Reviewed	Determination	Justification
Baldwin Creek (includes Baldwin Creek and an unnamed tributary)	Public lands found suitable. Tentatively classified as wild and scenic	Scenic, recreational, and wildlife values; unique land and resource diversity
Ice Slough	Public lands not suitable	Land ownership conflicts; manageability
Little Popo Agie River	Public lands not suitable	Not a worthy addition to NWSRS; manageability
North Popo Agie River	Public lands not suitable	Not a worthy addition to NWSRS; land ownership conflicts; manageability
Rock Creek	Public lands not suitable	Land ownership conflicts; potential use conflicts; manageability; WSR designation is inappropriate
Sweetwater River (includes Granite, Mormon, Strawberry, and Willow Creeks)	Public lands suitable. Tentatively classified as wild.	Scenic, recreational, historical, and ecological values; unique land and resource diversity
Warm Springs Creek	Public lands not suitable	Land ownership conflicts; potential use conflicts; manageability
Willow Creek	Public lands not suitable	Land ownership conflicts; potential use conflicts; manageability
Wind River	Public lands not suitable	Land ownership conflicts; manageability

BLM LFO Wild and Scenic River Report (BLM, 2002)

The Final Report of Lander Field Office Review of Potential WSRs (BLM, 2002) also contains interim management prescriptions for all waterways meeting tentative suitability classifications. This RMP process will revise and finalize interim management prescriptions for all eligible waterways recommended for inclusion in the WSR National System.

2.7.5 Wilderness Study Areas

2.7.5.1 Resource Characterization

Current Condition

There are eight WSAs (see Table 2-58 and Map 63) in the planning area. With the increase in demand for consumptive and non-consumptive resources, and with increased housing and subdivision development near natural and primitive areas, the WSAs preserve unique ecosystem niches that can support desired outcomes.

An important distinction between WSAs and Wilderness areas lies in the fact that WSAs are areas that have been found to possess wilderness characteristics. The Wyoming BLM made recommendations to Congress (1991) in regards to which areas met the criteria to be managed as wilderness. To date, no Wyoming BLM has been designated or released from the wilderness system by Congress. For a WSA to become Wilderness, Congress must so designate those land; until Congress acts on these areas BLM is obligated to manage these lands so as not to impair Congress' ability to designate the area as Wilderness. See the *Interim Management Policy (IMP) for Lands Under Wilderness Review* (H-8550-1).

Overall management of WSAs is in compliance with the IMP; the LFO has no documented IMP violations on file. For the most part the IMP has been adequate to protect the resource; therefore this planning process will not explore diverse alternatives for managing these areas. Alternatives will be formed around motorized vehicle management and WSA specific actions that can be taken to enhance the Wilderness experience for visitors. The WSA specific information will be discussed in that specific WSAs section, while the motorized vehicle management limitations apply to all WSAs and are directed by the IMP and following statement from the Land Use Planning Handbook:

"At a minimum, the travel management area designation for wilderness study areas must be limited to ways and trails existing at the time the area became a WSA. Open areas within WSAs are appropriate only for sand dune or snow areas designated as such prior to October 21, 1976. Existing roads, ways and trails must be fully documented and mapped. This applies to both motorized and mechanized transport."

Whiskey Mountain WSA (WY-030-110)

The Whiskey Mountain WSA includes 487 acres of public land about 5 miles south of Dubois bordering the USFS Fitzpatrick Wilderness Area. The WSA is on the north-facing slope of Whiskey Mountain in the Wind River Mountains. A fire in 1931 burned quite a large area, including the WSA, so the WSA is not distinguishable from the remainder of the north slope of the Wind River Mountains. The terrain is rough and mountainous, and the dominant vegetation is limber pine and Douglas- fir, interspersed with burnt-over snags. The Whiskey Mountain WSA is bounded by the Ross Lake trail on the east, the Fitzpatrick Wilderness Area on the south and west, and private lands to the north. The area is scenic and provides opportunities for solitude and primitive recreation. The topography, scenic vistas, and wildlife attract visitors. The area is used for a variety of recreational activities.

Dubois Badlands WSA (WY-030-109)

The western boundary of the Dubois Badlands WSA lies about 2 miles east of the town of Dubois. The WSA is approximately 4 miles long and varies from 1 to 2 miles wide. The WSA lies just north of the Wind River and can be seen by motorists on Highway 287 south of Dubois. The topography of the WSA consists of badlands – flat-topped hills which are extensively eroded and separated by numerous and intricate drainage patterns. The colors of the sedimentary rock bandings are reds and tans and are quite striking, particularly when the vegetation along the Wind River is lush and green. Eroded pinnacles and spires rise about the river; total relief above the river is about 400 feet. The WSA is approximately 4,520 acres.

Sweetwater Canyon WSA (WY-030-101)

Sweetwater Canyon is in Fremont County, approximately 15 miles east of South Pass City . The Sweetwater Canyon WSA contains 9,056 acres of public land; there are no private or state inholdings. The boundary is defined by roads and by state and private lands.

There are two basic types of topography in the WSA: the canyon and its tributary draws, and the gently rolling hills that surround the canyon. The canyon, which is 6 to 7 miles long, is a water-carved gorge nearly 500 feet deep; in places the walls are almost vertical. Bare rock outcrops exist throughout the gorge. Outcrops along the canyon walls are interspersed with sagebrush, grasses, other shrubs, and pockets of aspen and willow, all of which provide considerable variety in the landscape. The contrast between the WSA and surrounding hills is abrupt and striking. The terrain above the gorge is mostly flat with low, gently rolling hills and a few scattered rock outcrops.

The river offers high-quality brown and rainbow trout fishing. The WGFD has classified the river as an important trout water of regional importance. This high-quality fishing attracts recreationists from Wyoming and nearby states. Other visitors float the watercourse.

The canyon was fenced from livestock grazing in the mid 1990s; as part of this fencing process the local grazing permitees agreed to rest the canyon from livestock grazing for 5 years. Since the reinstitution of grazing in this canyon BLM has received input from recreationists in the canyon who feel the livestock grazing use conflicts with the wilderness experience. Visitors camping or recreating in the WSA riparian areas have reportedly encountered livestock in several different manners: in or near dispersed camps, in riparian areas, in meadows, manure in camp, tracks in riparian areas, and odors. Johnson et al 1997 found these factors to strongly detract from the wilderness experiences. Fishermen seem to view livestock grazing especially negatively. This field observation is validated by Sanderson et al. 1986 who found fishermen to be the "most sensitive to the relationship between livestock grazing and the riparian environment", finding that nearly 70% of fisherman indicated their recreational experience would be altered by management activities that they thought had a negative impact on riparian vegetation. Consequently Sanderson et al 1986 also found that fishermen reacted more positively to fences than other groups because fences are considered vital to the maintenance of the fishery by excluding cattle. The WSA contains the only blue ribbon fishery in the area.

Additionally livestock impacts in wilderness areas are considered by surveyed natural resource specialists "most severe in aquatic ecosystems and riparian vegetation, especially in arid regions where these ecosystems are most rare" (McClaran, 2000). This RMP will explore alternatives to resolving this complex and multifaceted management issue.

Lankin Dome WSA (WY-030-120)

The topography of the Lankin Dome WSA in the eastern portion of the planning area is in two basic forms: the uplifted mountains of reddish granite rocks, slabs, and exfoliating domes; and the flats of Noel Pocket north and west of the rocks. Elevations in the area range from about 6,200 feet at the western boundary road to about 7,700 feet on Lankin Dome. Vegetation varies with the two landforms. The rocks support little vegetation; however, the drainages among them support fairly dense pockets of limber pine, juniper, aspen, and sagebrush. These scenic green areas contrast sharply with the reddish granite.

BLM has received multiple comments on the recreational value of the Sweetwater Rocks and Granite Mountains. These comments reaffirm the need for better access throughout the Granite Mountains. In the areas surrounding the WSAs, any access will need to be developed in such a way that insures visitation increases and impacts don't conflict with the IMP and travel management designations. Additionally, BLM also recognizes the need to ensure visitors are aware of the land pattern in the area and respectful to the adjacent private landowners.

Split Rock WSA (WY-030-122)

The Split Rock WSA is part of the Granite Mountain Uplift, a large east-west uplift that separates the greater Green River Basin from the Wind River Basin. These mountains of reddish, decomposing granite are divided by numerous small drainages or pockets. Many of the granite uplifts form gigantic slabs, domes, and/or piles of broken rocks from the exfoliated areas above; the slope exceeds 100 percent in places. Elevations range from about 6,200 feet in Beaton Pocket to above 8,500 feet on McIntosh Peak. Total relief in the unit is about 1,800 feet.

The WSA has 12,789 acres of public land. The isolated area provides broad values in addition to scenary. The historic features of the area include Miller Cabin, fields of arrowhead and thumb scraper chippings and a buffalo jump used by prehistoric people. Within the pockets, mini-forests provide visitors with solitude within relatively short distances. The contrast of green trees and the reddish peaks of granite enhances the visitor's experience.

Savage Peak WSA (WY-030-123a)

Most of the Savage Peak WSA is rugged and mountainous and contains great vertical relief; large expanses of bare rock predominate. Vegetation is generally sparse, but there are some stands of Douglas-fir, limber pine, aspen, and cottonwood in drainages. Juniper is scattered through the unit. Large pockets of open grass and sagebrush on the west are surrounded by steeply rising slopes. The 7,041-acre unit is located in the immediate vicinity of Savage Peak. Large expanses of bare granite are not found elsewhere in central Wyoming; here they form a natural and highly scenic backdrop for the Sweetwater River Valley, which has a long history related to the exploration and early European settlers.

Miller Springs WSA (WY-030-123b)

Topography in the Miller Springs WSA, part of the Sweetwater Rocks complex, is characterized almost entirely by rough, broken granite domes and outcrops. Sagebrush flats make up about 10 to 15 percent of the WSA. Parts of the unit resemble a pile of huge monolithic rock masses. The Miller Springs WSA is 6,429 acres with juniper and scattered limber pine on the rocky slopes, and aspen along the base of the rocks.

Copper Mountain WSA (WY-030-111)

The Copper Mountain WSA is in Fremont County, about 10 miles north of Shoshoni. It lies east of the Boysen Dam, at the upper end of the Wind River Canyon. The topography of the entire WSA is mountainous, with rugged mountains rising 5,000 feet to 6,400 feet. Steep canyons and rocky slopes dominate the unit. Total relief in the unit is 1,400 feet. The Copper Mountain WSA contains 6,858 acres, more than 10 square miles of contiguous public land.

The Wind River Basin and Boysen Reservoir, which are south and west of the WSA, offer spectacular views. From the mountain peaks, the view extends 10 to 50 miles and includes the Wind River Mountains and Beaver Rim.

Recommendation for Wilderness Designation

The BLM is required by Congress to manage WSAs to preserve the wilderness characteristics under the non-impairment standard until Congress designates the lands under wilderness review as wilderness, or releases the lands to uses other than wilderness. The BLM performs inventories of these areas and makes recommendations regarding the areas and acreages that it recommends for designation as wilderness. These recommendations are based on factors such as the manageability of the area, how well it meets the characteristic of wilderness, conflicts or potential for conflicts with other users and uses, and other relevant factors. Table 2-59 shows the current acreages for WSAs in the planning area and the BLM's recommendations for the number of acreages that should be designated as wilderness.

Table 2-59. Current WSA Acreages in the Planning Area and BLM-Recommended Acreages for Wilderness Areas

Lands managed as wilderness	Wilderness Study Areas (acres)	Recommended for Wilderness (acres)
Whiskey Mountain	487	0
Dubois Badlands	4,520	0
Sweetwater Canyon	9,056	5,538
Lankin Dome	6,316	0
Split Rock	12,789	0
Savage Peak	7,041	0
Miller Springs	6,429	0
Copper Mountain	6,858	0
Total	53,496	5,538

(U.S. Department of the Interior: Bureau of Land Management, 1991)

2.8 Socioeconomics Resources

2.8.1 Social Conditions

2.8.1.1 Resource Characterization

Decisions made for management of the BLM-administered lands have the potential to impact surrounding communities and state and privately owned lands. The BLM is directed to consider these impacts. The Socioeconomic Resources section provides a framework for that analysis.

Current Conditions

Social Conditions

Social conditions that concern human communities include towns, cities, rural areas, and the custom, culture, and history of the area as well as current social values. BLM management actions can impact social conditions in the planning area and in nearby communities. For this reason, an area larger than the planning area is studied. The study area is comprised of the entire counties of Carbon, Fremont, Hot Springs, Natrona, and Sweetwater. While the planning area crosses all five counties, it contains only small portions of Natrona, Carbon, Hot Springs, and Sweetwater counties and primarily lies within Fremont County. Therefore, the social conditions within Fremont county maymost accurately reflect the social conditions in the planning area. An additional important component of the study area is the WRIR which lies within Fremont and Hot Springs counties, and data presented in this section for those counties include people living on the WRIR. Some information specific to the WRIR is also presented in this section.

This section provides a summary of demographic information; custom and social trends, current conditions; and public services. Social conditions often are based on a wide range of community and demographic characteristics and involve broad areas of community interest.

Population and Demographics

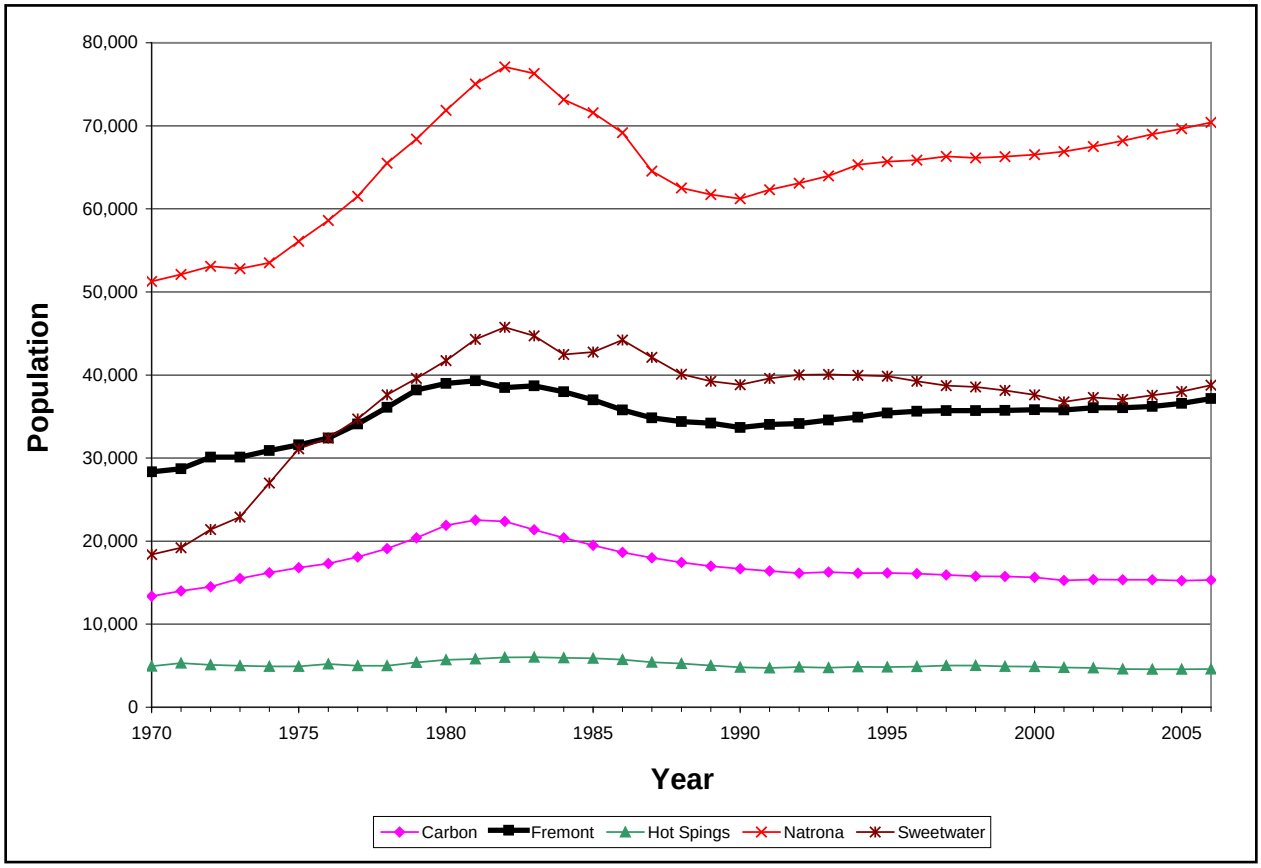
In 2006, Natrona was the most populous county in the study area with 70,401 people, Carbon County had 15,325 people, Fremont County had 37,163 people, Hot Springs County had 4,588 people, and Sweetwater County had 38,763 people (Wyoming Economic Analysis Division 2007a). With the exception of Hot Springs County, the counties experienced rising populations in the late 1970s and early 1980s during the oil and gas boom and population decreases following the oil bust in the mid-1980s.

Since 1990, the population has stayed relatively constant in Hot Springs County, increased steadily in Natrona and Fremont counties, decreased slightly in Carbon County, and, until 2000, decreased steadily in Sweetwater County (Sweetwater County has recently seen an increase in

population (BEA 2006; Wyoming Economic Analysis Division 2007a). Figure 2-13 provides a visual summary of population trends for the five counties from 1970 to 2006.

The WRIR encompasses 2.2 million acres, primarily in Fremont County with a portion in Hot Springs County. The 2000 Census reported a population of about 23,000 people living within the boundary of the WRIR, including about 6,500 Native Americans (Headwaters Economics 2009). About two-thirds of the Native American population is Northern Arapaho, while about one-third is Eastern Shoshone (Massey 2004). It is likely these figures understate the population. The location of the WRIR boundaries are in litigation as of 2009.

Figure 2-13. Population Trends in Carbon, Fremont, Hot Springs, Natrona, and Sweetwater Counties, Wyoming, from 1970 to 2006



Source: Wyoming Economic Analysis Division 2007a (data for 2000-2006); Wyoming Economic Analysis Division 2002a (data for 1990-1999); Wyoming Economic Analysis Division 2002b (data for 1980-1989); Wyoming Economic Analysis Division 2002c (data for 1970-1979).

Table 2-60 provides a tabular summary for each county and the incorporated cities and towns in each county. The largest city in the study area is Casper, the county seat of Natrona County; the next largest is Rock Springs, the county seat of Sweetwater County – neither of which are in the planning area. The only incorporated towns and cities in the planning area are located in Fremont County. The largest city in the planning area is Riverton.

Table 2-60. Population for Counties and Towns in the Study Area Over Time

Area	1990	2000	2006	Percent Change (1990-2000)	Percent Change (2000-2006)	Percent Change (1990-2006)
Fremont County	33,662	35,804	37,163	+6.4%	+3.8%	+10.4%
Dubois town	895	964	1,018	+7.7%	+5.6%	+13.7%
Hudson town	392	407	421	+3.8%	+3.4%	+7.4%
Lander city	7,023	6,907	7,047	-1.7%	+2.0%	+0.3%
Pavillion town	126	165	166	+31.0%	+0.6%	+31.7%
Riverton city	9,202	9,259	9,728	+0.6%	+5.1%	+5.7%
Shoshoni town	497	635	668	+27.8%	+5.2%	+34.4%
Unincorporated Areas[1]	15,527	17,467	18,115	+12.5%	+3.7%	+16.7%
Carbon County	16,659	15,639	15,325	-6.1%	-2.0%	-8.0%
Baggs town[2]	272	348	367	+27.9%	+5.5%	+34.9%
Dixon town[2]	70	79	80	+12.9%	+1.3%	+14.3%
Elk Mountain town[2]	186	192	194	+3.2%	+1.0%	+4.3%
Grand Encampment town[2]	490	443	442	-9.6%	-0.2%	-9.8%
Hanna town[2]	1,076	873	857	-18.9%	-1.8%	-20.4%
Medicine Bow town[2]	389	274	264	-29.6%	-3.6%	-32.1%
Rawlins city[2]	9,380	9,006	8,621	-4.0%	-4.3%	-8.1%
Riverside town[2]	85	59	60	-30.6%	+1.7%	-29.4%
Saratoga town[2]	1,969	1,726	1,721	-12.3%	-0.3%	-12.6%
Sinclair town[2]	500	423	403	-15.4%	-4.7%	-19.4%
Unincorporated Areas[1]	2,242	2,216	2,316	-1.2%	+4.5%	+3.3%
Hot Springs County[2]	4,809	4,882	4,588	+1.5%	-6.0%	-4.6%

Table 2-60. Population for Counties and Towns in the Study Area Over Time

Area	1990	2000	2006	Percent Change (1990-2000)	Percent Change (2000-2006)	Percent Change (1990-2006)
East Thermopolis town[2]	221	274	261	+24.0%	-4.7%	+18.1%
Kirby town[2]	59	57	55	-3.4%	-3.5%	-6.8%
Thermopolis town[2]	3,247	3,172	2,942	-2.3%	-7.3%	-9.4%
Unincorporated Areas[1]	1,282	1,379	1,330	+7.6%	-3.6%	+3.7%
Natrona County	61,226	66,533	70,401	+8.7%	+5.8%	+15.0%
Bar Nunn town[2]	835	936	1,527	+12.1%	+63.1%	+82.9%
Casper city[2]	46,765	49,740	52,089	+6.4%	+4.7%	+11.4%
Edgerton town[2]	247	169	173	-31.6%	+2.4%	-30.0%
Evansville town[2]	1,486	2,255	2,313	+51.7%	+2.6%	+55.7%
Midwest town[2]	495	408	428	-17.6%	+4.9%	-13.5%
Mills town[2]	2,267	2,632	2,890	+16.1%	+9.8%	+27.5%
Unincorporated Areas[1]	9,131	10,393	10,981	+13.8%	+5.7%	+20.3%
Sweetwater County	38,823	37,613	38,763	-3.1%	+3.1%	-0.2%
Bairoil town[2]	228	97	97	-57.5%	0.0%	-57.5%
Granger town[2]	126	146	146	+15.9%	0.0%	+15.9%
Green River city[2]	12,711	11,808	11,933	-7.1%	+1.1%	-6.1%
Rock Springs city[2]	19,050	18,654	19,324	-2.1%	+3.6%	+1.4%
Superior town[2]	273	244	240	-10.6%	-1.6%	-12.1%
Wamsutter town[2]	240	261	267	+8.8%	+2.3%	+11.3%
Unincorporated Areas[1]	6,195	6,403	6,756	+3.4%	+5.5%	+9.1%

Source: Wyoming Economic Analysis Division 2007a (2000 and 2006 data); Wyoming Economic Analysis Division 2002a (1990 data).

[1]May include some people who live in the county but outside the planning area.

[2]These cities are outside the Lander planning area, but within the study area.

A substantial proportion of the population of the study area lives outside incorporated cities and towns. For instance, about 18,115 people in Fremont County, or about 49 percent of the county's population, lived outside incorporated areas in 2006. Similarly, 15 percent in Carbon County, 29 percent in Hot Springs County, 16 percent in Natrona County), and 17 percent in Sweetwater County lived outside cities and towns in 2006 (Wyoming Economic Analysis Division 2007a). This population pattern contributes to the largelysmall-town character of the area.

Changes have occurred with respect to the distribution of different age groups. Since 1990, the proportion of people aged 60 and over and those aged 40 to 59, have increased in all five counties. However, the proportion of people age 20 to 39 and the proportion of school age children (age 5 to 19) have decreased. One implication of this change is declining enrollments in primary and secondary schools; this trend is addressed later in this section. Table 2-61 provides a summary of the changing demographics in each county. As the table shows, the trend toward an older population (higher percentage of residents over age 40) is also a statewide trend.

Table 2-61. Change in Population Age Groups in Study Area Counties, 1990 to 2000

	Fremont			Carbon			Hot Springs		
Percent of population in age group	**1990**	**2000**	**2006**	**1990**	**2000**	**2006**	**1990**	**2000**	**2006**
Percent aged 0-4	8	7	7	7	6	6	5	5	5
Percent aged 5-19	26	24	21	25	21	18	23	20	16
Percent aged 20-39	28	23	24	31	25	24	24	18	19
Percent aged 40-59	22	28	29	23	31	33	23	30	30
Percent aged 60 and over	16	18	19	14	17	18	25	27	30

	Natrona			Sweetwater			Wyoming		
Percent of population in age group	**1990**	**2000**	**2006**	**1990**	**2000**	**2006**	**1990**	**2000**	**2006**
Percent aged 0-4	8	6	7	8	7	7	8	6	7
Percent aged 5-19	24	23	20	29	26	22	25	23	20
Percent aged 20-39	31	26	27	32	26	26	31	26	27
Percent aged 40-59	21	28	29	21	30	32	21	29	30
Percent aged 60 and over	15	17	17	10	11	13	14	16	17

Source: Wyoming Economic Analysis Division 2007b (data for 2006); Wyoming Economic Analysis Division 2007c

The median age on the WRIR is 20.4 years based on data from the 2000 U.S. It is likely that population trends since 2000 have resulted in a lowering of the median age.

Housing

Because boom and bust cycles can impact the demand for housing, it is important to know the supply of housing in the study area. Table 2-62 shows the number of housing units over time in the study area. From 2000 to 2006, the number of housing units in all five counties has increased only slightly (by two percent in Carbon County, one percent in Hot Springs County, and four percent in the remaining counties). As the table shows, the growth in housing units has been generally consistent compared to the changes in population within each county.

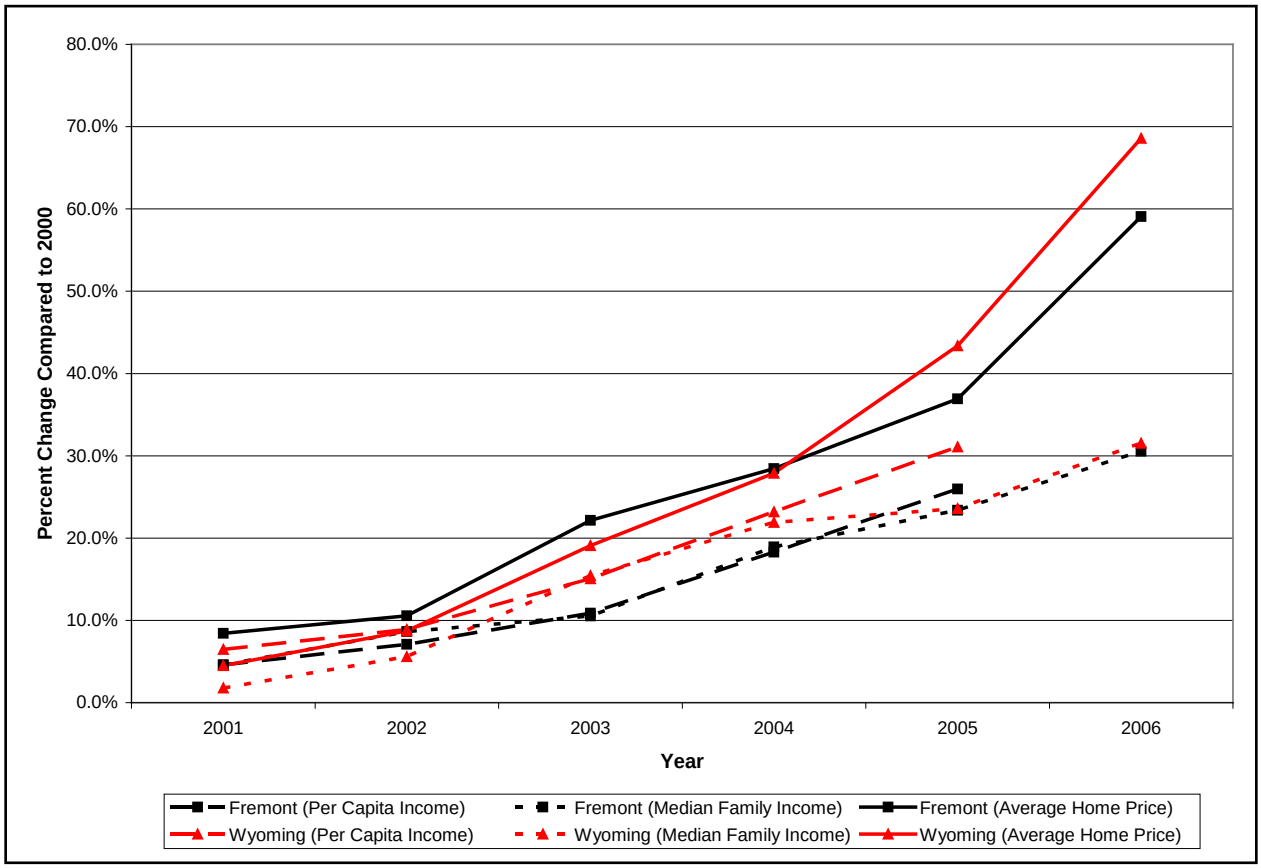
Table 2-62. Housing and Population Over Time in the Study Area

Measure	2006 (number)	Percent change since 2000					
		2001	2002	2003	2004	2005	2006
Fremont (Population)	37,163	0%	1%	1%	1%	2%	4%
Fremont (Housing Units)	16,185	1%	1%	2%	3%	4%	4%
Carbon (Population)	15,325	-2%	-2%	-2%	-2%	-3%	-2%
Carbon (Housing Units)	8,501	1%	1%	1%	1%	2%	2%
Hot Springs (Population)	4,588	-2%	-3%	-6%	-6%	-6%	-6%
Hot Springs (Housing Units)	2,569	0%	0%	1%	1%	1%	1%
Natrona (Population)	70,401	1%	1%	2%	4%	5%	6%
Natrona (Housing Units)	31,047	1%	1%	1%	2%	3%	4%
Sweetwater (Population)	38,763	-2%	-1%	-1%	0%	1%	3%
Sweetwater (Housing Units)	16,484	0%	1%	1%	1%	2%	4%

Source: Population from Wyoming Economic Analysis Division 2007a; Housing units from Wyoming Economic Analysis Division 2007d.

Housing costs have also increased in recent years. Figure 2-14 shows how median family income, per capita income, and average home sales price have changed since 2000 for Fremont County and Wyoming. Increases in the average home sales price have generally outpaced increases in per capita and family income in Fremont County and in Wyoming as a whole. This observation is especially true in recent years. For example, from 2000 to 2005 median family income and per capita income increased by 23 percent and 26 percent in Fremont County, respectively, while the average home sales price increased by 37 percent.

Figure 2-14. Change in Median Family Income and Average Home Price Since 2000 in Fremont County and Wyoming



Source: Wyoming Housing Database Partnership 2007. All percent changes are based on nominal income and price, because the intent of the figure is to show how income has changed relative to one element of the cost of living (housing for purchase).

Figure 2-14 underscores how growth in average home prices has generally outpaced growth in income. However, note that per capita income has grown at a faster rate than median family income and, in some cases, comparably to average home sales price. Similar to home prices, monthly rents have generally increased faster than median family income in some places within the study area. Table 2-63 shows monthly rents in 2006 and changes since 2000, with changes in median family income for the same period for comparison. Median family income increased from 2000 to 2006, but rents increased as well in all areas, apartment rents increased faster than median family income, and in all areas, except Hot Springs, house rents also increased substantially faster than median family income. Rent for mobile homes generally increased more than median family income or increased at the same pace except for in Fremont where mobile home rents increased slightly slower than median family income and in Hot Springs where mobile rents have remained constant since 2000.

Rent for mobile home lots grew faster, or at the same pace, compared to median family income for all counties with data (2007 data was not disclosed for Hot Springs County). The area experiencing the largest rise in rents relative to median income was Carbon County followed by Sweetwater County then Natrona County. While rents in Fremont County outpaced median family income, the increase was less than surrounding counties (except Hot Springs County) as well as compared to the state as a whole.

Table 2-63. Monthly Rent and Median Family Income 2006, and Change from 2000 in the Study Area

	Median Family Income		Apartment Rent[1]		House Rent[2]		Mobile Home Rent[3]		Mobile Home Lot Rent[4]	
Area[5]	2006 ($)	Change From 2000	2006 ($)	Change From 2000	2006 ($)	Change From 2000	2006 ($)	Change From 2000	2006 ($)	Change From 2000
Fremont	48,100	+30.0%	510	+42.9%	645	+40.5%	188	+26.2%	508	+56.8%
Carbon	53,400	+19.2%	740	+117.6%	800	+84.3%	288	+161.8%	575	+112.2%
Hot Springs	50,300	+28.3%	397	+36.0%	464	+25.4%	150	0.0%	NA	--
Natrona	60,100	+36.3%	542	+50.6%	945	+80.7%	215	+42.4%	525	+36.0%
Sweetwater	69,100	+19.1%	709	+93.2%	1013	+109.3%	261	+32.5%	741	+90.0%
Wyoming	58,500	+30.9%	578	+50.5%	853	+56.5%	224	+32.5%	554	+38.2%

Source: Wyoming Housing Database Partnership 2007 (median family income); Wyoming Economic Analysis Division 2007e (rental costs for 2006); Wyoming Economic Analysis Division 2000 (rental costs for 2000).

NA: Not disclosed due to limited observations.

1. Two bedroom, unfurnished unit; excludes gas and electric.

2. Single wide mobile home lot, including water.

3. Two or three bedroom single family house; excludes gas and electric.

4. Total monthly rental expense, including lot rent.

5. Rents are based on a sample in communities that meet certain population thresholds. Carbon is based on Rawlins; Fremont is based on Lander and Riverton; Hot Springs is based on Thermopolis; Natrona is based on Casper; and Sweetwater is based on Green River and Rock Springs. Data for Wyoming as a whole is based on 28 communities across the state, including the largest community in each county and other communities with over 5,000 people or with a population of at least 85 percent of the county's largest city or town.

Table 2-64 shows rental vacancy rates by county. The Wyoming Housing Database Partnership (2006) reported on a survey of rental vacancy rates by county. Across all counties, the vacancy rates have generally decreased over the seven years reviewed. In general, the vacancy rates in 2007 are especially low. Carbon, Fremont, and Natrona counties all had vacancy rates below one percent; Sweetwater County was slighter above one percent. Hot Springs County had the

highest vacancy rate (5.4 percent) in 2007, which was still generally lower than previous periods in the county. Based on the data, there does not appear to be a clear seasonal variation of vacancy rates in any of the counties. Because the data are based on a sample, it is not certain whether these rates represent a trend toward lower rental vacancy rates or sampling error. It is important to note that Table 2-41 shows only rental vacancy rates. Comprehensive vacancy data (including properties for sale) from the 2000 Census indicates that vacancy rates in Carbon, Fremont, Hot Springs, Natrona, and Sweetwater counties were 26 percent, 13 percent, 17 percent, 10 percent, and 11 percent; respectively (Census 2007a).

Table 2-64. Housing Vacancies Over Time in the Study Area

	Fremont		Carbon		Hot Springs		Natrona		Sweetwater	
Year	June/July	Dec.	June/July	Dec.	June/July	Dec.	June/July	Dec.	June/July	Dec.
2001	6.6%	5.4%	5.7%	16.1%	5.4%	6.4%	2.5%	1.9%	8.2%	4.5%
2002	16.1%	8.5%	15.0%	9.6%	11.0%	11.7%	3.6%	4.5%	6.1%	4.5%
2003	3.5%	5.7%	11.9%	11.0%	10.6%	9.9%	2.7%	3.4%	2.1%	0.9%
2004	4.6%	2.9%	8.4%	14.5%	6.8%	4.7%	2.6%	2.8%	0.9%	1.6%
2005	1.2%	1.9%	7.6%	3.7%	8.3%	6.8%	2.7%	2.0%	2.4%	2.4%
2006	2.5%	1.4%	2.4%	1.0%	4.4%	8.5%	1.6%	1.7%	1.9%	0.6%
2007	0.8%	n/a	0.8%	n/a	5.4%	n/a	0.6%	n/a	1.2%	n/a

Source: Wyoming Housing Database Partnership (2006); Wyoming Housing Database Partnership (2005).

n/a = Not available.

Custom, Culture, and Social Trends

Approximately 58 percent of land in Fremont County is administered by state and federal agencies, including the planning area. The BLM administers relatively small portions of Hot Springs, Carbon, Natrona, and Sweetwater counties, although other field offices administer lands within these counties. BLM also administers federal mineral estate in all five counties; thus, the BLM's management decisions can impact social conditions in all five counties. However, with respect to social conditions related to public lands ranching, where surface ownership is the primary consideration, management decisions of the Lander RMP have more potential to impact conditions in Fremont County than Carbon, Hot Springs, Natrona, and Sweetwater counties.

Land use, resource development, community values, and economic development are closely intertwined, and the BLM's land and resource management decisions can impact social and

economic conditions for all of the communities in the area. Community values with respect to land and resource management are central to social issues in the study area because they are closely tied to issues of economic development, custom and culture, and quality of life. Understanding the development, culture, and history of the area provides valuable insight into how changes to the study area might impact the livelihood and quality of life of residents.

Prior to European settlement, the planning area was inhabited by the Eastern Shoshone tribe. The Eastern Shoshone were confined to the original boundary of the reservation in 1863. In 1877, the surviving members of the Northern Arapaho tribe were placed on the reservation, and in 1878, the original reservation of 44 million acres was reduced in size to approximately 2.3 million acres (Massey 2004). In 1906, the tribal representatives of the WRIR ceded reservation lands north and west of the "big bend of the Wind River" to the U.S. government. This cessation resulted in the opening of these lands for European American settlement under the Homestead Act, the establishment of Non Native-owned farming areas near the big bend of Wind River, and the founding of the town of Riverton (Riverton Museum 2007).

Historically, economic development has been based on resource extraction and tourism. Agriculture, particularly sheep and cattle ranching, has contributed to the economy as well as the social fabric of communities since the first Non-Native settlement. Sugar beet production also contributed to development historically, but little continues in the planning area today. Tourism has historically represented a significant economic generator, primarily in Dubois and Lander. Timber played an important role in the development in Fremont County from the 1910s through the 1940s. Oil and gas development and mining has also played a role, with uranium from 1953 to the 1980s constituting the main mineral "boom".

Oil was discovered near Riverton in approximately 1918. There has always been some oil and gas development, but historically uranium contributed more to mineral development in the area. The discovery of uranium in the Gas Hills near Riverton in 1953 brought a new boom to the Riverton area. According to the Riverton Museum (2007), the uranium industry transformed Riverton from a quiet farming community of 2,500 people into a bustling commercial center of more than 10,000. Although market forces brought dramatic cutbacks in area mining during the 1980s – and now most of the land is in reclamation – during the uranium boom Riverton became the largest community in west-central Wyoming, and today it continues to have a relatively diversified commercial economy and attracts people from a wide area. Lands outside the planning area, but in the five counties, also represent important areas for mining and mineral development. For example, Sweetwater County is the only county in the state that produces trona (soda ash), which is used in glassmaking and other industries.

Starting in 1914, railroad ties in the forests north and west of Dubois were cut and floated down the Wind River to Riverton, where they were delivered to the Chicago & Northwestern

Railroad; see discussion of the Warm Springs Flume cultural resource. This operation was one of the principal suppliers of ties for the C & N Railroad until the late 1940s. Many of the tie hacks were Scandinavian immigrants, some of whose descendants continue to live in the area.

As early as the 1920s Lander was known as "where the rails end and the trails begin" – a reference to the freight and passenger rail service that extended from Casper to Lander in 1906 as part of the Wyoming & North Western Railway Company. The rail service never extended west of Fremont County, but the line to Lander contributed to the development of the towns of Riverton, Hudson, and Shoshoni, all of which had depots. In the early 20th century, commercial bus service provided access from Lander to Yellowstone National Park; Lander also provided recreational opportunities in its own right. Tourists would also frequently visit dude ranches in Dubois; the height of this dude ranch activity was in the 1930s and 1940s (Jost, 2007).

Agriculture has contributed to the local economy since the domestic livestock industry began in the 1860s and 1870s. Around the turn of the century, the open range sheep industry was more significant than the cattle industry (Jost 2007). Today, there are still significant numbers of both cattle and sheep grazed in the planning area, a portion of which rely upon public lands grazing. The development of irrigation water supplies, sped up in the 1920s when the U.S. Bureau of Reclamation took over the project, helped to speed agricultural development in the planning area. Within the planning region, irrigated crop farming is most prominent near Pavilion and Riverton and, to a lesser degree, in Lander (Jost 2007).

Although ranching today has a relatively small contribution to the economy of the study area, it is an important part of its culture and history. Historically, and today, ranching has provided direct and indirect employment, maintenance of scenic vistas, stewardship of remote privately owned lands, wildlife habitat, and the continuation of a way of life that helps draw tourists to the state. However, livestock grazing has not occurred without its critics. Overgrazing has caused the degradation of the health of some of the public lands. As a result, there is an ongoing dialog between the BLM and some of the livestock operators focusing on stocking levels and seasons of use. At the present time, approximately 97% of the planning area is available for livestock grazing under 310 permits; some permittees have multiple permits.

With mounting economic pressures on the livestock sector, some ranch owners have raised money for their retirement by subdividing portions of their land into "ranchettes" that are then sold to individuals, often "amenity retirees" who chose the area for its open spaces, recreational opportunities, and other lifestyle issues. The sale of these ranchettes provides liquidity to ranchers who frequently have most of their assets in land. This trend is reflected in both the increase in value of farm land and the decrease in farmed acres discussed below.

Because of these sales, there are often more fences and road development on private land that can have adverse impacts on open views near developed communities, wildlife habitat, and

rangeland health amenities valued by many residents including many of those who live on ranchettes themselves. This trend is important to note because of the potential for BLM's actions to affect the profitability of ranching and thereby increase the trend of subdividing lands that have been traditionally part of operating livestock operations. The sale of the privately owned land does not, however, impact the open spaces and views of the approximately 2.7 million acres of public land. The development of "ranchettes" on the hills around the town of occurs on subdived ranches for the most part.

The availability of a wide spectrum of recreational opportunities on public lands is another important component of many lifestyles and communities. Many towns in the planning area continue to serve as "gateway cities" for recreational activities in Yellowstone and Teton National Parks and as well as recreational destinations in their own right. Because recreation involves diverse groups with activities that are sometimes competing, changes in management of public lands can impact the various recreational sectors and interests differently.

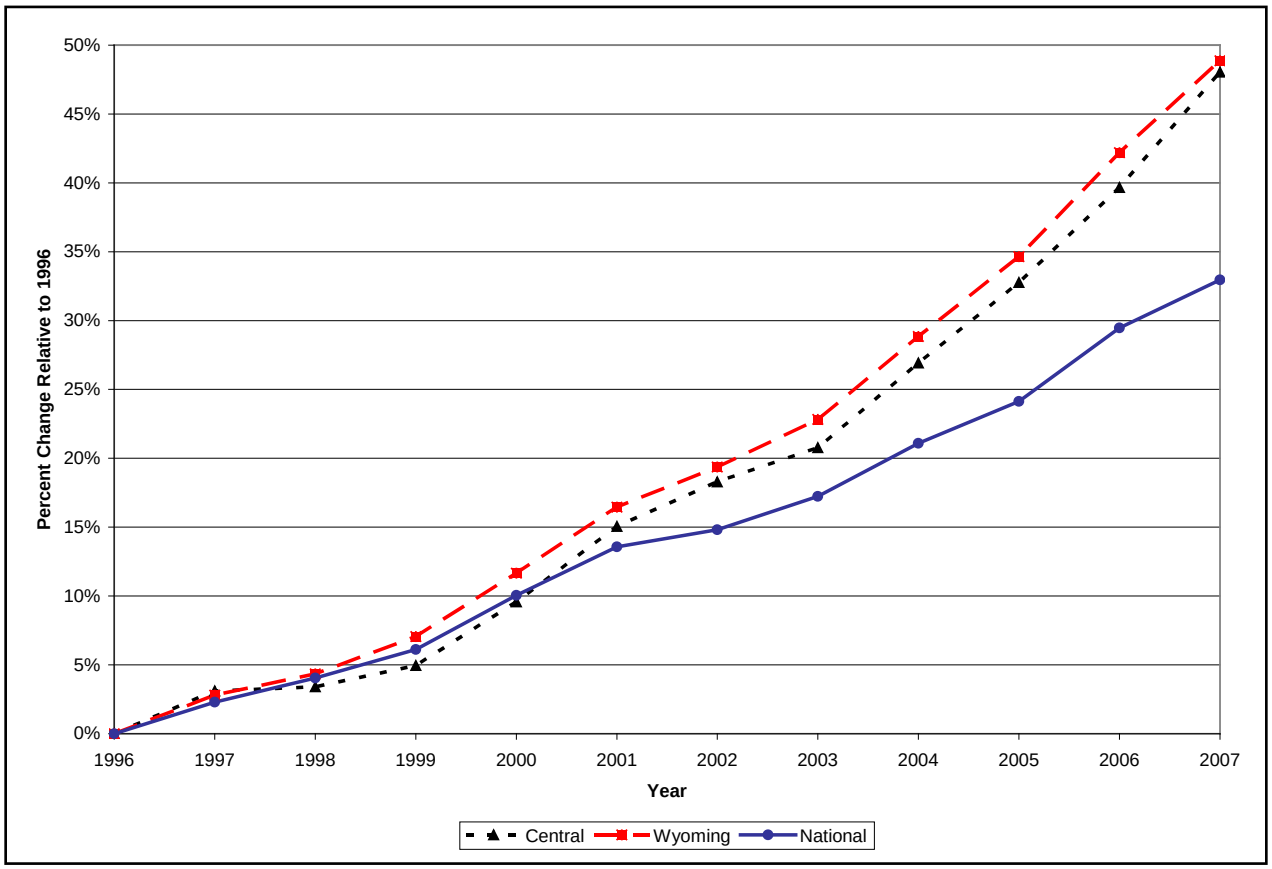
The land itself has influenced the social fabric of the communities. The land has provided hunting and fishing opportunities for people from the Native American inhabitants prior to European settlement to today's residents. It has also provided job opportunities related to tourism. Tourists travel to the area to enjoy scenic vistas and historic places that appeal to not only nonlocal travelers but also permanent residents. In addition to tourism, the Economic Conditions section provides information on the contributions of mining and other sectors to current employment, earnings, and tax revenues.

One factor that affects the custom, culture, and social trends within the communities is the cost of living. The Wyoming Economic Analysis Division calculates relative changes in cost of living over time by estimating the cost of a set of goods and services that represents the average consumer's purchases for housing, food, health care, travel costs, and other items. If the cost of living for a particular area increases faster than average income, that may mean that long-time residents, especially those on fixed incomes, may find their lifestyle less affordable over time. Over the long-term, a higher cost of living may encourage people to relocate from a community and discourage migration into a community by households not seeking to relocate in conjunction with employment opportunities. Overall migration into the area will likely decrease and the demographic and socioeconomic characteristics of those who move in will be determined partially by the cost of living in the area.

Wyoming Economic Analysis Division (2007e) calculates the change in the cost of living over time for a three-county region in central Wyoming, consisting of Converse, Fremont, and Natrona counties. Thus, Figure 2-15 shows how the cost of living in central Wyoming has changed relative to the cost of living in Wyoming generally and in the U.S. Starting around 2000, the

cost of living in the Central Region and Wyoming as a whole began to increase at a greater rate than the nation. However, it is important to note that the three-county region defined by Wyoming Economic Analysis Division (2006e) differs from the planning area in several ways, including the inclusion of Converse County as well as all of Natrona County and excluding Carbon, Hot Springs, and Sweetwater counties. Therefore, it is possible that trends observed in the Central Region deviate slightly from the actual trends in the planning area.

Figure 2-15. Cost of Living Change in the Study Area, 1996-2006



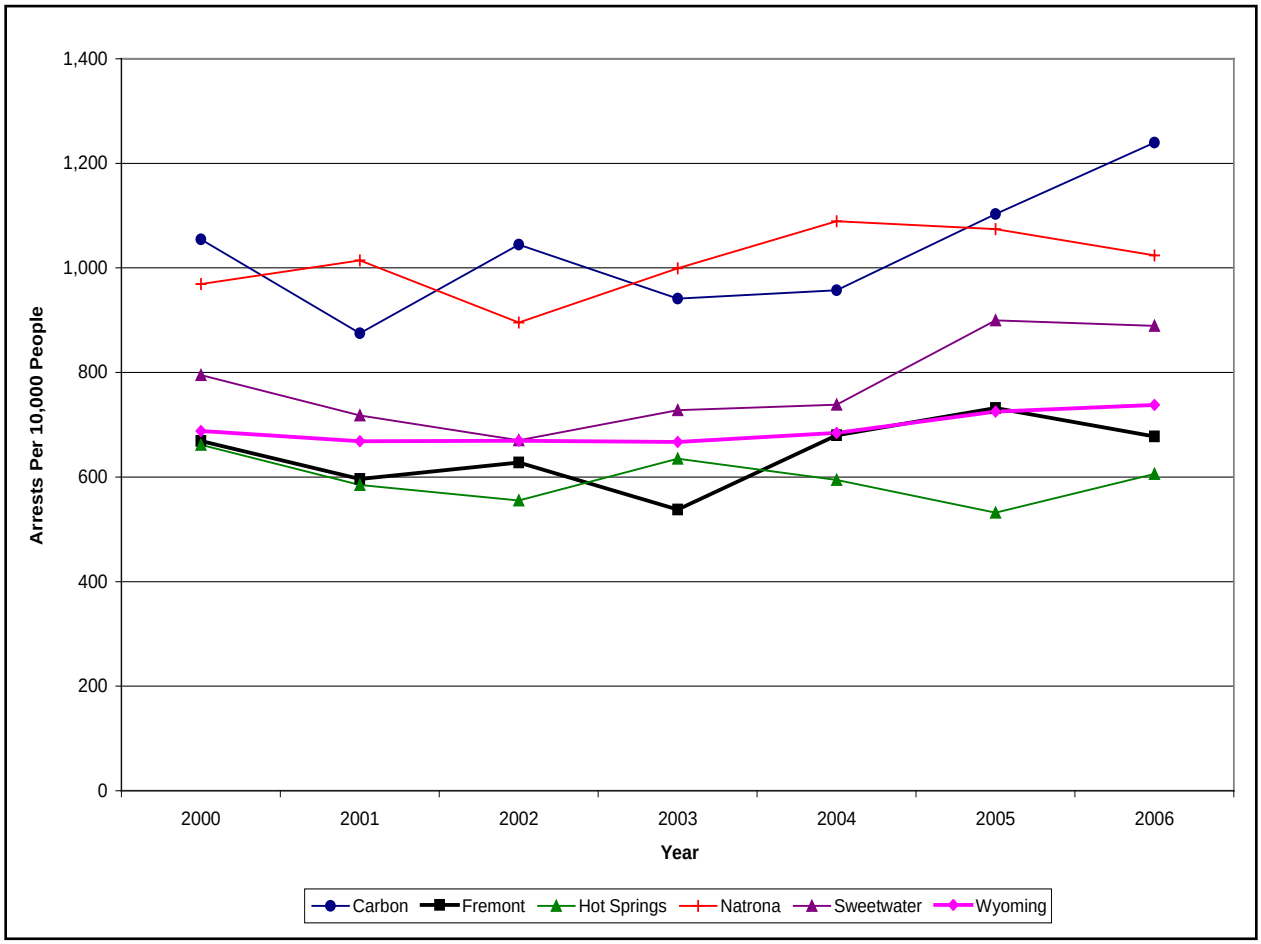
Source: Wyoming Economic Analysis Division 2006e

Public Safety

This section presents recent trends in crime rates and vehicle traffic which may be impacted by management actions. Figure 2-16 provides a visual summary of arrests per 10,000 people for each of the counties in the study area and for the state. Since 1999, the crime rate for Wyoming has been generally constant around 700 arrests per 10,000 people. Over the same period, the rate in Fremont County has been below or approximately equal to Wyoming. The crime rate in Carbon, Natrona, and Sweetwater counties have been consistently higher then Wyoming and especially higher in Carbon and Sweetwater counties. The crime rate in Carbon County

increased approximately 60 percent between 1999 and 2006 and has been consistently increasing since 2003. The crime rate in Sweetwater County decreased between 2004 and 2006.

Figure 2-16. Arrests Per 10,000 Persons in the Study Area, 2000-2006



Source: Wyoming Division of Criminal Investigation 2001, Wyoming Division of Criminal Investigation 2002, Wyoming Division of Criminal Investigation 2003, Wyoming Division of Criminal Investigation 2004, Wyoming Division of Criminal Investigation 2005, Wyoming Division of Criminal Investigation 2006, Wyoming Division of Criminal Investigation 2007.

Table 2-65 shows more detail on arrests, including arrests for crimes of different types. Drug-related crimes, including sale, manufacture and possession, increased significantly since 2000 in all five counties, more than doubling in Sweetwater and Hot Springs counties, and outpaced population growth substantially. In the study area in general, the greatest increase in drug-related crimes occurred between 2000 and 2004 and then either stabilized or decreased between 2004 and 2005. Sweetwater County experienced increases through 2005, and Hot Springs County observed a spike in drug-related crimes between 2005 and 2006.

Table 2-65. Arrests by Type in the Study Area and for Wyoming, 2000-2006

Area	Arrests by Year								% Change in Population 2000-2006
	2000	2001	2002	2003	2004	2005	2006	% Change 2000-2006	
Fremont County									
Total Arrests	2,395	2,135	2,263	1,939	2,463	2,677	2,519	+5.2%	
Index Crimes[1]	226	246	238	196	211	337	183	-19.0%	
Drug Crimes[2]	105	169	179	178	249	227	196	+86.7%	+3.8%
DUI[3]	402	422	501	438	470	540	556	+38.3%	
All Other Crimes	1,662	1,298	1,345	1,127	1,533	1,573	1,584	-4.7%	
Carbon County									
Total Arrests	1,649	1,335	1,606	1,444	1,468	1,680	1,900	+15.2%	
Index Crimes[1]	167	101	168	135	114	128	129	-22.8%	
Drug Crimes[2]	117	136	123	126	165	162	153	+30.8%	-2.0%
DUI[3]	193	187	176	153	136	176	228	+18.1%	
All Other Crimes	1,172	911	1,139	1,030	1,053	1,214	1,390	+18.6%	
Hot Springs County									
Total Arrests	323	279	262	292	272	243	278	-13.9%	
Index Crimes[1]	34	30	22	18	13	21	19	-44.1%	
Drug Crimes[2]	20	42	24	35	33	38	48	+140.0%	-6.0%
DUI[3]	20	26	14	42	63	50	65	+225.0%	
All Other Crimes	249	181	202	197	163	134	146	-41.4%	
Natrona County									
Total Arrests	6,448	6,786	6,047	6,815	7,515	7,482	7,208	+11.8%	
Index Crimes[1]	642	510	564	689	573	605	448	-30.2%	
Drug Crimes[2]	397	469	372	546	693	612	622	+56.7%	+5.8%
DUI[3]	616	645	454	575	611	582	718	+16.6%	
All Other Crimes	4,793	5,162	4,657	5,005	5,638	5,683	5,420	+13.1%	
Sweetwater County									
Total Arrests	2,990	2,640	2,499	2,698	2,773	3,421	3,447	+15.3%	
Index Crimes[1]	447	290	331	341	387	344	323	-27.7%	
Drug Crimes[2]	181	202	223	295	336	484	401	+121.5%	+3.1%
DUI[3]	313	369	306	317	364	527	519	+65.8%	
All Other Crimes	2,049	1,779	1,639	1,745	1,686	2,066	2,204	+7.6%	

Table 2-65. Arrests by Type in the Study Area and for Wyoming, 2000-2006

Area	Arrests by Year								% Change in Population 2000-2006
	2000	2001	2002	2003	2004	2005	2006	% Change 2000-2006	
ming									
Total Arrests	33,981	33,016	33,396	33,459	34,592	36,898	37,992	+11.8%	
Index Crimes[1]	3,496	3,191	3,190	3,077	2,972	3,225	2,884	-17.5%	
Drug Crimes[2]	2,307	2,566	2,675	2,624	2,906	3,234	3,117	+35.1%	+4.3%
DUI[3]	4,466	4,438	4,232	4,278	4,548	5,011	5,280	+18.2%	
All Other Crimes	23,712	22,821	23,299	23,480	24,166	25,428	26,711	+12.6%	

Wyoming Division of Criminal Investigation 2001, Wyoming Division of Criminal Investigation 2002, Wyoming Division of Criminal Investigation 2003, Wyoming Division of Criminal Investigation 2004, Wyoming Division of Criminal Investigation 2005, Wyoming Division of Criminal Investigation 2006, Wyoming Division of Criminal Investigation 2007.

[1] Index crimes include homicide, rape, robbery, aggravated assault, burglary, larceny-theft, and motor vehicle theft.

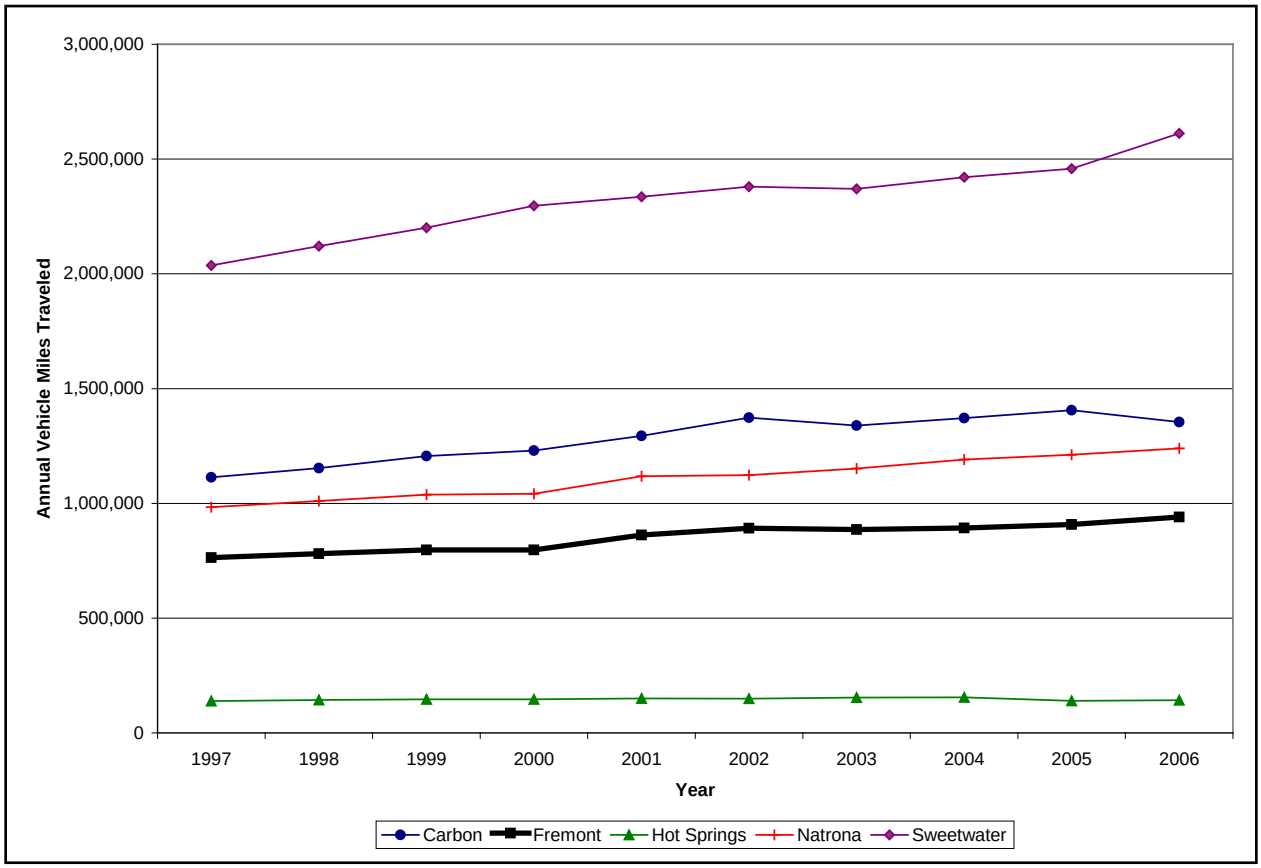
[2] Drug crimes include sale, possession, and manufacture.

[3] DUI = Driving Under the Influence.

All five counties saw decreases in index crimes (i.e., homicide, rape, robbery, aggravated assault, burglary, larceny-theft, and motor vehicle theft) since 2000. Driving under the influence increased between 2000 and 2006 in all five counties. In Fremont County, driving under the influence increased approximately 40 percent compared to the state average increase of approximately 18 percent.

Figure 2-17 provides trend data on vehicular traffic on roads in each of the five counties. The data in the figure refers to vehicle miles per year; vehicle miles represent the product of the number of vehicles and the number of miles. Thus, increasing vehicle miles may be due to a larger number of vehicles, more miles driven per vehicle, or both. As Figure 2-7 shows, vehicular traffic in all five counties has increased over the last ten years. In all three counties, vehicular traffic has increased more than population since 1997. Specifically, vehicle miles traveled increased 23 percent, 22 percent, three percent, 26 percent, and 28 percent in Fremont, Carbon, Hot Springs, Natrona, and Sweetwater counties between 1997 and 2006. Over the same ten years, population increased approximately four percent in Fremont, six percent in Natrona, stayed virtually constant in Sweetwater, and decreased by four percent and eight percent in Carbon and Hot Springs counties, respectively. At the state level, vehicle miles traveled increased 24 percent between 1997 and 2006 (14.1 million miles to 17.5 million miles), whereas, the population only increased by 5.2 percent over the same period.

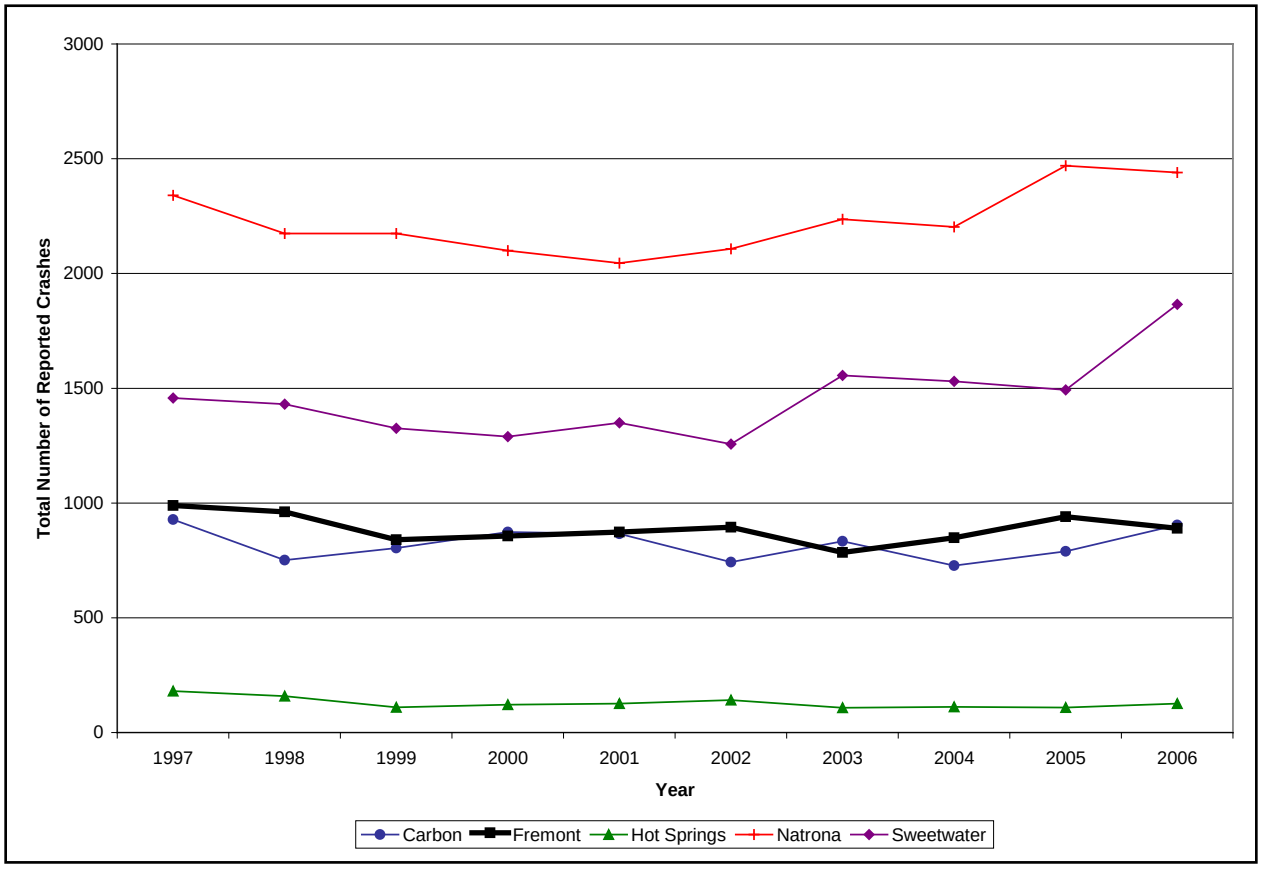
Figure 2-17. Annual Vehicle Miles Traveled Per County in the Study Area, 1997-2006



Source: WYDOT 2007a

Figure 2-18 provides data on the number of reported vehicle crashes since 1997. With the exception of Sweetwater County, compared to the increase in vehicle miles traveled shown above, the number of crashes has either declined or increased by smaller margin in the last ten years. Specifically, the number of crashes dropped 10 percent drop in Fremont County, 3 percent in Carbon County, 30 percent in Hot Springs County, and increased only 4 percent in Natrona County. In Sweetwater County, both the vehicle miles traveled and the number of crashes increased by 28 percent. At the state level, the number of crashes only increased by 2 percent between 1997 and 2006 (16,663 to 17,429 crashes) compared to a 24 percent increase in vehicle miles traveled.

Figure 2-18. Reported Vehicle Crashes Per County in the Study Area, 1997-2006



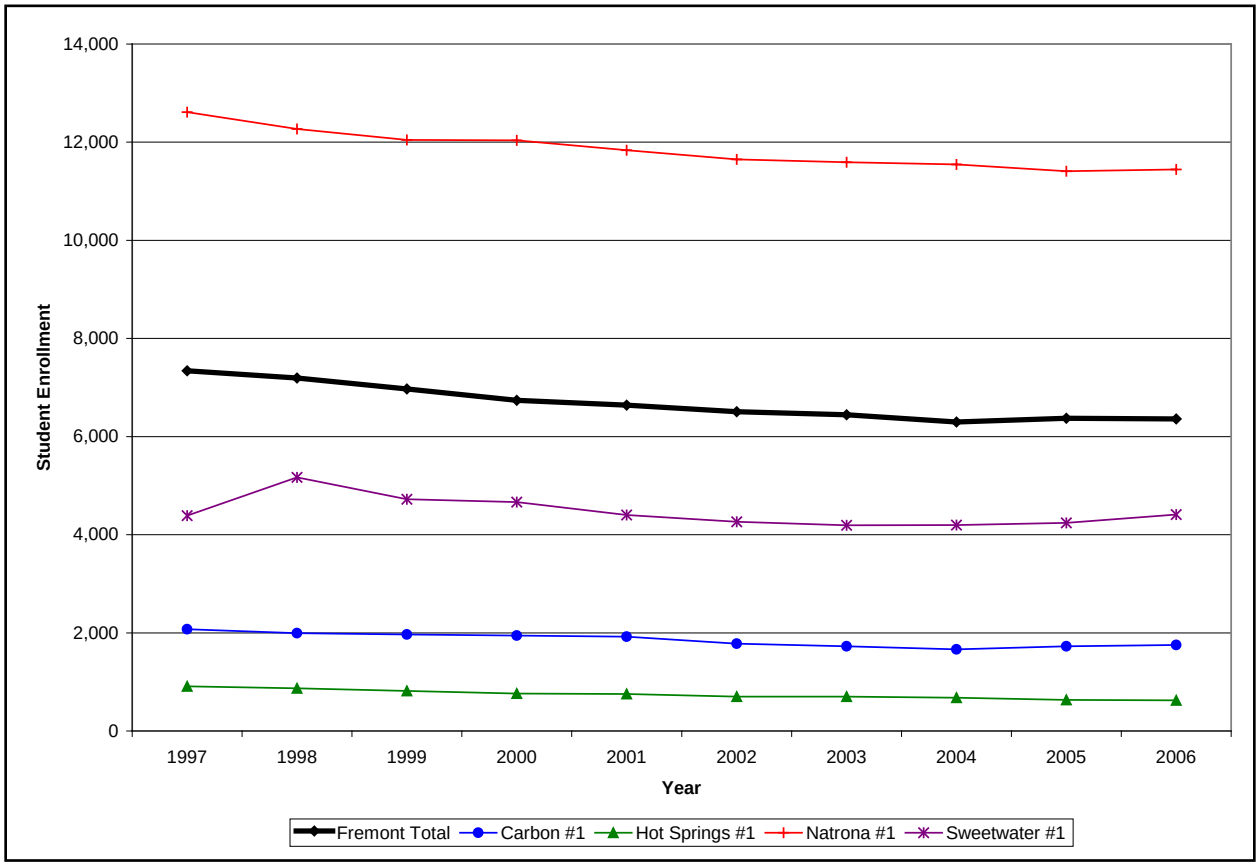
Source: WYDOT 2007b. Reported crashes include those that result in injury, death, or property damage of at least $500 (prior to June 1999) or at least $1,000 (since June 1999).

Educational Services

BLM management of public lands has the potential to directly affect many of the economic sectors within the study region. As a result, the local tax revenues are correspondingly impacted, which in turn impacts local services funded by these revenues. But in the case of the school districts, funding is a function of what is defined as "Local Resources" and "Entitlements". In general, Wyoming school districts have a "Guarantee" with regard to funding. The guaranteed level of district funding is a function of the number of students and the number of schools in the district. And if the "Local Resources" exceed the "Entitlement" the excess is "Recaptured" and made available to other school districts throughout the state. On the other hand, if the "Local Resources" are less than the "Guarantee", that difference is made of from the "Entitlements". So while education funding is not directly affected by local revenues, because of the "Recapture" component, changes in local tax revenues do affect education funding from a statewide perspective.

Figure 2-19 shows historical school enrollment trends by county based on data compiled by the Wyoming Department of Education (Wyoming Department of Education 2007a). Consistent with the trends for the school-age population shown previously in Table 2-37, Figure 2-9 shows the school enrollment level in 2006 have declined from the enrollment levels in 2000 for all five counties. However, school enrollment levels level out or increased slightly starting in 2003 or 2004. . Enrollment decreases steadily at the state-level between 1997 and 2005 and increased slightly in 2006.

Figure 2-19. School Enrollment Trends by County, 1997-2006

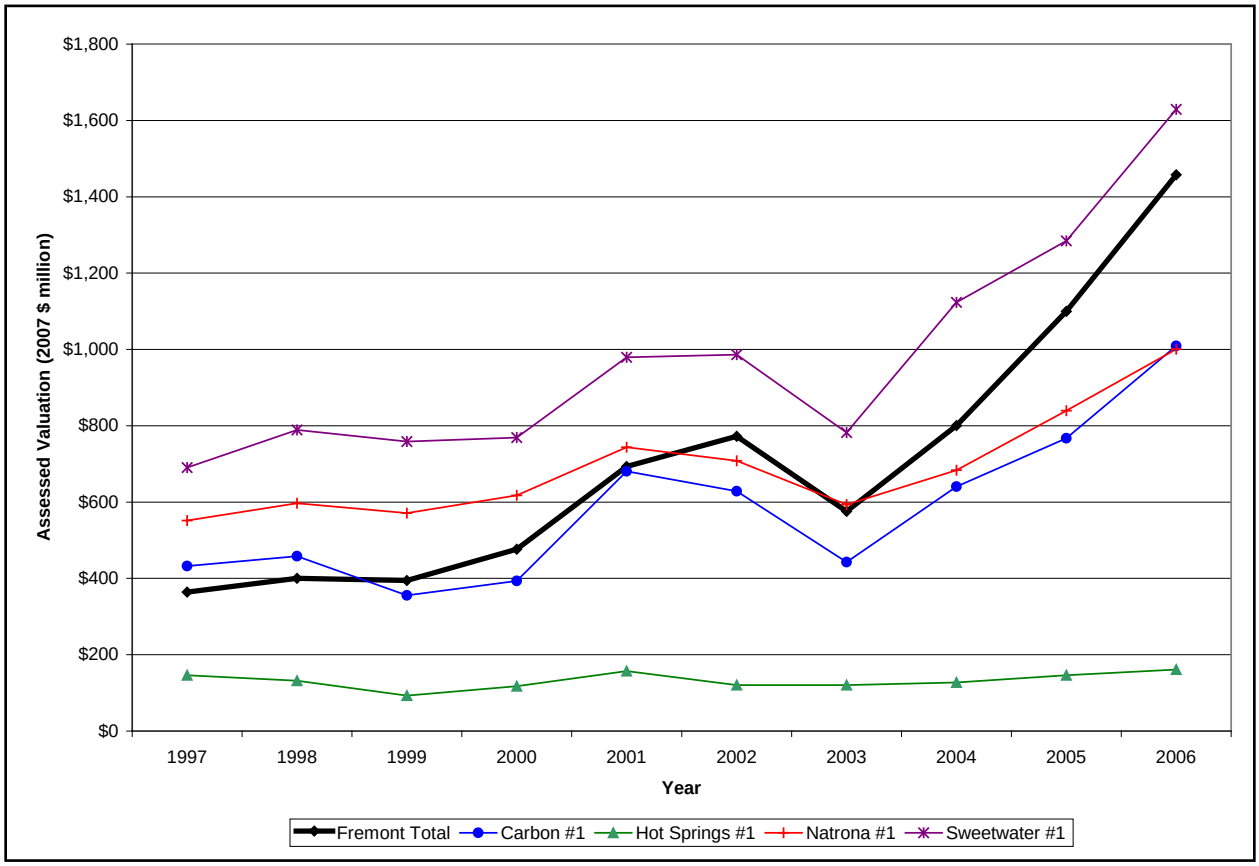


Source: Wyoming Department of Education 2007a
Notes: Enrollment figures are those measured on October 1 of each year.

Figure 2-20 shows recent trends in assessed property valuation by county, based on inflation-adjusted 2007 dollars. Assessed property valuation in Hot Springs has remained relatively constant with a slight increase in recent years, but well below the valuation in the other four counties. The trend in assessed property valuation in Fremont, Carbon, Natrona, and Sweetwater counties are similar. Assessed property valuation for these school districts experienced a sharp decrease between 2002 and 2003 followed by a steady and substantial increase in assessed property valuation between 2003 and 2006. As shown in the Table 2-44 the trend at the state level is consistent with the trend observed in these four counties. Overall assessed property

valuation has increased substantially between 1997 and 2006 in these four counties and the state as a whole (Wyoming Department of Education 2007b).

Figure 2-20. Assessed Property Valuation Trends by County, 1997-2006



Source: Wyoming Department of Education 2007b; adjusted for inflation using the Wyoming Cost of Living Index for central Wyoming (Wyoming Economic Analysis Division 2007e).

Because people have different values with respet to changes in demographics and communities, residents may have different opinions and values with respectto the decline in school enrollment and property evaluations. Part of BLM's mission is to work with local governments to ensure that its management decisions support local goals and plans, community values and needs of residents as well as to regional and national issues.

2.8.2 Economic Conditions

2.8.2.1 Resource Characterization

Current Condition

Economic conditions relate to the analyses of production, distribution, and consumption of goods and services. Economic conditions describe how individuals and communities participate in the exchange of goods and services by earning a living and consuming products and services they need and want. The BLM has the capacity, through its decision-making responsibilities, to manage resource development within the Lander planning area and thereby influence the economy of the wider region. As for social conditions, the study area for economic conditions is comprised of all of Carbon, Fremont, Hot Springs, Natrona, and Sweetwater counties. This section provides a summary of demographic and economic information, including trends and current conditions. It also identifies and describes major economic sectors in the study area that could be impacted by the BLM management actions.

Economic Activity and Output

Industries most affected by BLM land management policies and programs in the study area are mining (including oil and gas), tourism and recreation, and agriculture production. [Insert information about harvesting of forest products – still working on how to characterize extent of harvest or whether there is only local demand, or also regional or national demand, for timber products from public lands in the study area. Refer to Vegetation – Forests, Woodlands, and Forest Products section.]

Mining and Mineral Production

Mining and mineral production, including oil and gas exploration and development, constitutes a significant economic activity in the study area. Table 2-66 provides a summary of the quantity and value of mineral production in the counties in the study area and the State of Wyoming. Economically, the largest contributors to mining activity are oil and gas exploration and development in all five counties, most significantly in Sweetwater and Fremont. Coal and trona mining are also substantial in Sweetwater County. The Mineral Resources section contains additional information about mineral resources produced in the study area.

Table 2-66. Estimated Mineral Production Value by County in the Study Area, Production Year 2006

Mineral	Carbon	Fremont	Hot Springs	Natrona	Sweetwater	Wyoming
Production or Sales (units)						
Oil (bbls sold)	1,544,959	3,028,376	3,259,735	3,600,892	4,919,785	50,105,955
Gas (mcf sold)	96,944,831	182,100,779	46,484	38,907,442	193,633,107	2,019,805,318
Coal (tons produced)	0	0	1,087	0	9,733,263	445,296,513
Trona (tons produced)	0	0	0	0	19,375,595	19,375,595
Bentonite (tons)	0	0	2,258	57,616	0	4,489,452
Sand and Gravel (tons)	799,686	501,997	79,871	940,018	1,335,244	15,371,852
Uranium (lbs)	0	0	0	0	1,132	2,045,008
Decorative Stone (tons)	62	0	0	0	0	2,438
Taxable Valuation ($ million)						
Oil (bbls sold)	$89	$131	$135	$197	$300	$2,533
Natural Gas	$586	$735	$0.24	$207	$1,057	$8,770
Coal (tons produced)	$0	$0	$0.02	$0	$131	$2,885
Trona (tons produced)	$0	$0	$0	$0	$299	$299
Bentonite	$0	$0	$0.02	$1	$0	$45
Sand and Gravel	$1	$1	$0.09	$2	$2.1	$25
Uranium	$0	$0	$0	$0	$0.01	$17
Decorative Stone	$0.01	$0	$0	$0	$0	$0.13

Source: Production and valuation are for July 1, 2006, through June 30, 2007, from Wyoming DOR (2007). Valuation is not adjusted from the values indicated in the report; thus, it is generally in January 2006 dollars (based on the reporting dates).

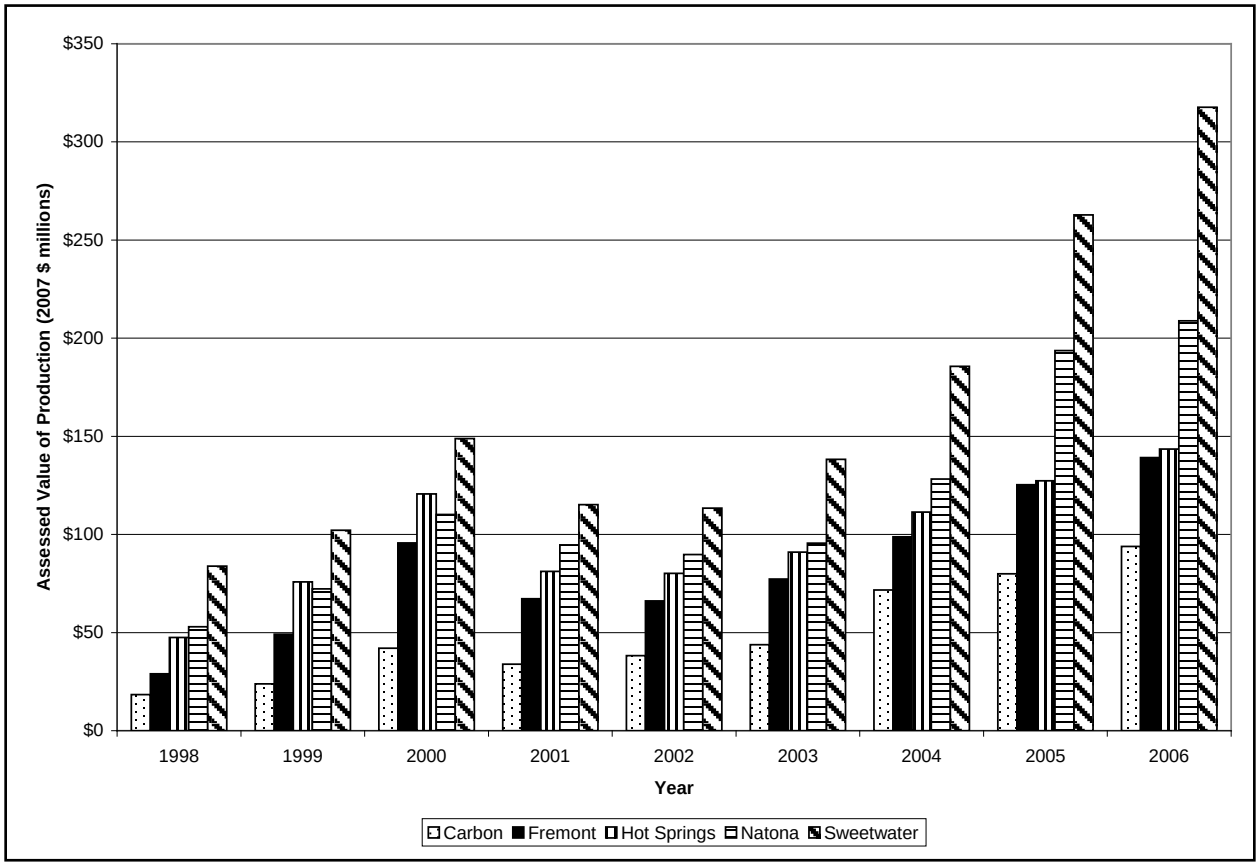
Notes: Taxable valuation may differ from market or sales value because it excludes certain costs of production. This table includes all minerals for which Wyoming DOR (2007) provides data on production from the counties in the study area.

$ dollar
bbl barrel
DOR Department of Revenue
lb pound
mcf thousand cubic feet

Figures 2-21 through 2-24 show the trends in the value of mineral production over recent years for the study area counties for oil, gas, coal, and trona production. The assessed valuation in the figures is adjusted for inflation using the Wyoming Cost of Living Index for the central region as defined by the Wyoming Economic Analysis Division (2007e) (i.e., Converse, Fremont, and

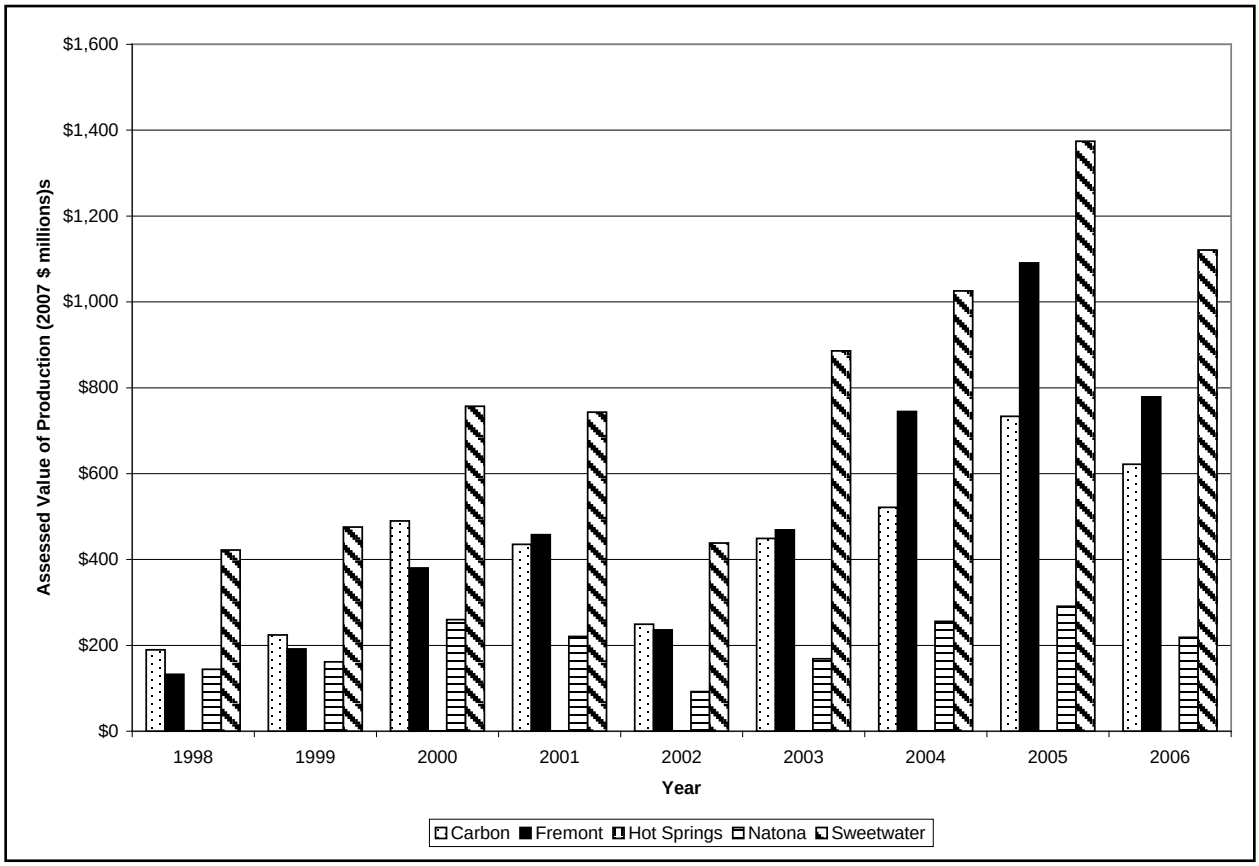
Natrona counties). The trend for the same period of this index is illustrated in Figure 2-22. As Figure 2-21 shows, oil production value has generally risen since 2002, but the largest rise has been in Fremont and Sweetwater counties. Gas production value has also substantially risen in Carbon, Fremont, and Sweetwater counties since 1998; however, gas production value fell in 2002 and again in 2006 for these three counties. Gas production rose moderately in Natrona County and the small production in Hot Springs has shrunk further since 1998.

Figure 2-21. Assessed Valuation of Oil Production by County in the Study Area



Source: Wyoming DOR 1999, Wyoming DOR 2000. Wyoming DOR 2001a, Wyoming DOR 2002, Wyoming DOR 2003, Wyoming DOR 2004a, Wyoming DOR 2005, Wyoming DOR 2006, Wyoming DOR 2007. Adjusted for inflation using Wyoming Economic Analysis Division 2007e.

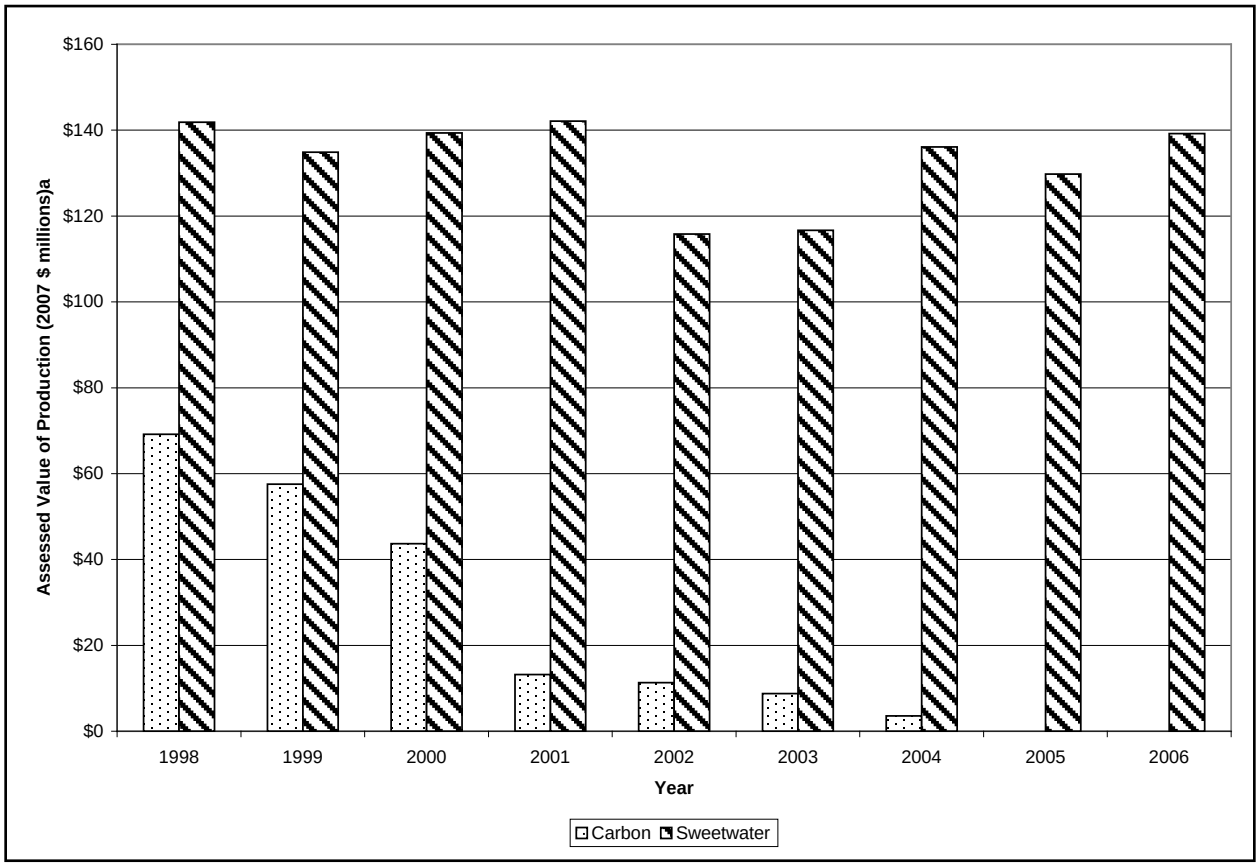
Figure 2-22. Assessed Valuation of Gas Production by County in the Study Area



Source: Wyoming DOR 1999, Wyoming DOR 2000. Wyoming DOR 2001a, Wyoming DOR 2002, Wyoming DOR 2003, Wyoming DOR 2004a, Wyoming DOR 2005, Wyoming DOR 2006, Wyoming DOR 2007. Adjusted for inflation using Wyoming Economic Analysis Division 2007e.

Coal production (Figure 2-23) value (adjusted for inflation) in Sweetwater County was approximately the same in 2006 as it was in 1998; production during these years fluctuated below this level. In Carbon County, coal production value steadily decreased and reached zero by 2005.

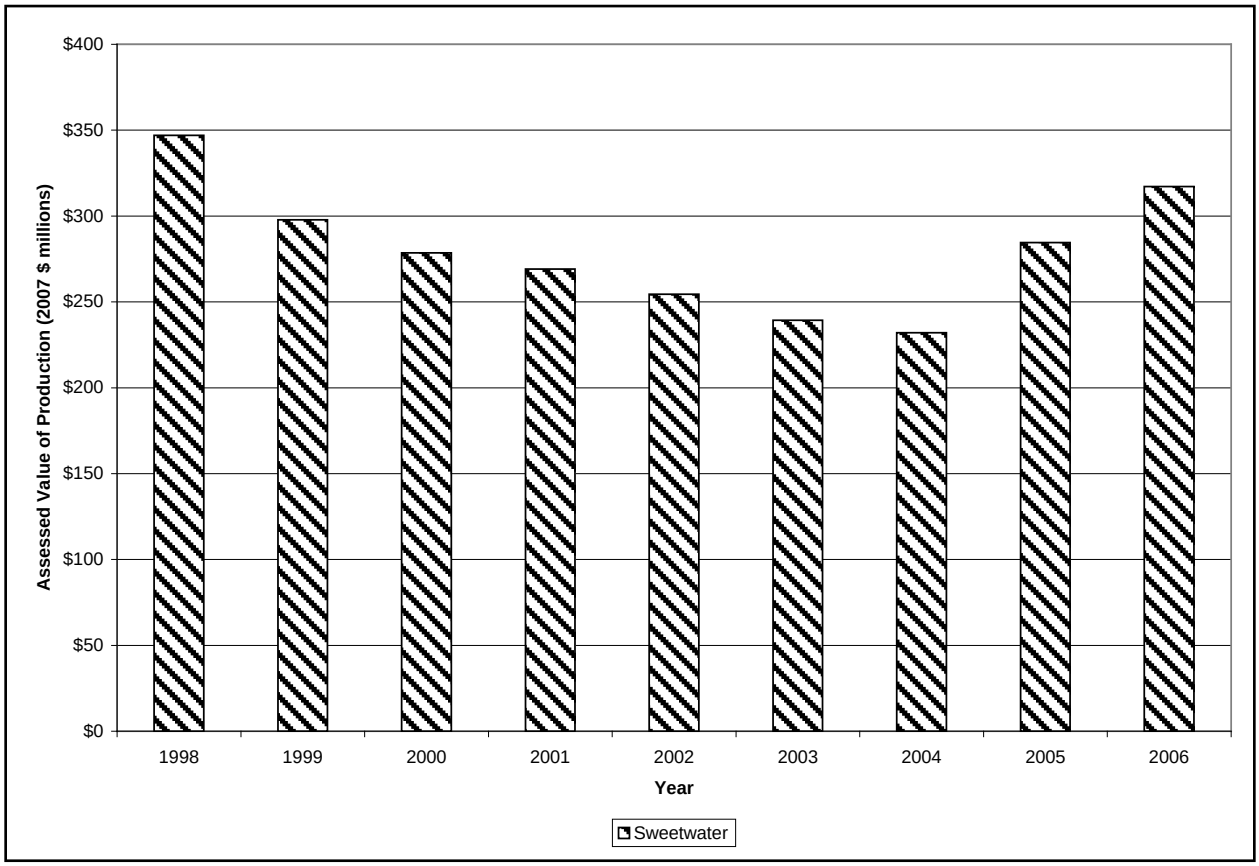
Figure 2-23. Assessed Valuation of Coal Production by County in the Study Area



Source: Wyoming DOR 1999, Wyoming DOR 2000. Wyoming DOR 2001a, Wyoming DOR 2002, Wyoming DOR 2003, Wyoming DOR 2004a, Wyoming DOR 2005, Wyoming DOR 2006, Wyoming DOR 2007. Adjusted for inflation using Wyoming Economic Analysis Division 2007e.

Trona production value (Figure 2-24), adjusted for inflation, in Sweetwater County declined from 1997 through 2004, but rose in both 2005 and 2006.

Figure 2-24. Assessed Valuation of Trona Production in the Study Area



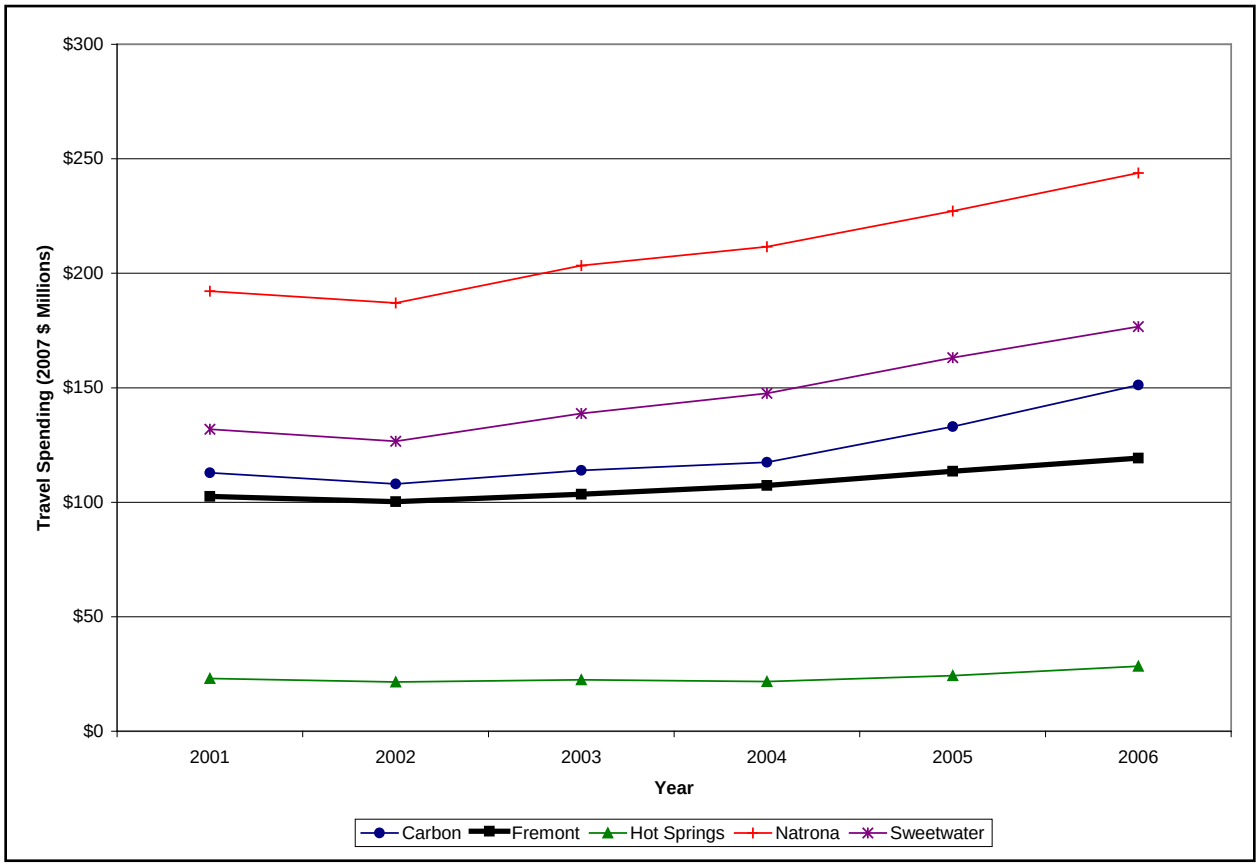
Source: Wyoming DOR 1999, Wyoming DOR 2000. Wyoming DOR 2001a, Wyoming DOR 2002, Wyoming DOR 2003, Wyoming DOR 2004a, Wyoming DOR 2005, Wyoming DOR 2006, Wyoming DOR 2007. Adjusted for inflation using Wyoming Economic Analysis Division 2007e.

Recreation

Recreation activities also contribute to the region's economy. In 2003, the WGFD found that direct expenditures from hunting, fishing, and wildlife watching in the counties in the study area totaled $26.6 million (WGFD 2003). About $10.3 million of these expenditures were attributable to activities on surface area managed by the BLM in the Lander planning area (WGFD 2003). Direct expenditures include visitor spending on lodging, food and groceries, gasoline, motor vehicle repairs and service, outfitters and guides, access fees, entertainment, souvenirs, equipment, and other categories.

The WGFD has not undertaken a more recent survey of expenditures from hunting, fishing, and wildlife watching by Lander planning area (Stewart 2008). However, trend data for 2000-2005 (Figure 2-25) shows that travel and tourism spending generally (i.e., including recreation as well as other travel-related spending), adjusted for inflation, has increased recently in all five counties. The figure shows that inflation-adjusted spending remained the same or decrease between 2001 and 2002 and has increased steadily since 2002.

Figure 2-25. Travel and Tourism Spending in the Study Area, 2001-2006



Source: Dean Runyan Associates 2007. Adjusted for inflation using Wyoming Economic Analysis Division 2007e.

Note that travel and tourism spending includes all travel to the counties, except for commuting and other routine travel; thus, trips for non-recreational purposes are also included. The Wyoming State Office of Travel and Tourism reported that over 90 percent of all trips to Wyoming were for pleasure; this percentage may differ for specific counties (WTT 2007).

The data for travel do not consider any portion of the current recession.

Livestock Grazing

There are 310 grazing allotment covering approximately 2.7 million surface acres of public land in the planning area. As of 2008, the BLM administered 60 grazing leases and 144 permits, consisting of approximately 280,372 AUMs. While the majority of AUMs are used by cattle, sheep and horses also are grazed on BLM lands.

BLM-administered lands are important to local ranch operations using allotments in all five counties, particularly Fremont County. BLM-administered grazing allotments are leased at low-

er fees on average than state or private lands: federal grazing fees in Wyoming were $1.56 per AUM in 2006 and $1.35 per AUM in 2007 (BLM 2007). For comparison, grazing fees on state land were $4.78 per AUM in 2006, $5.17 per AUM in 2007, are currently $5.21, and expected to be $5.13 in 2009 (Pannell 2008). The average grazing rate on privately owned nonirrigated land in Wyoming was $15.10 per AUM in 2006 and $16.10 per AUM in 2007 (Shepler 2008).

However, the lower lease fees correspond to potentially greater use restrictions and responsibilities for the lessee. Federal grazing leases typically restrict the number and species of animals that may be grazed, while on private leases, there is normally no penalty for grazing more animals other than potential non renewal of the lease. Federal leases tend to be less flexible than private leases regarding turnout and roundup dates. Differences exist in terms of construction and maintenance of rangeland improvements, although a perfect comparison is not possible because there are different specifications that vary for private leases. On federal leases, construction of improvements can be done in a variety of ways, and expenses other than materials may be the responsibility of the lessee who is generally responsible for maintaining the improvements. On private leases, the landowner typically bears a substantial part of the cost of major range improvements and typically pays for revegetation (USFS and BLM 1992).

Although statewide, the number of farms has remained constant, in Fremont County the number of farms has increased while the total acreage devoted to agriculture decreased. Figure 2-26 depicts the total number of farms in Fremont County 1992-2007 (USDA NASS, 2008).

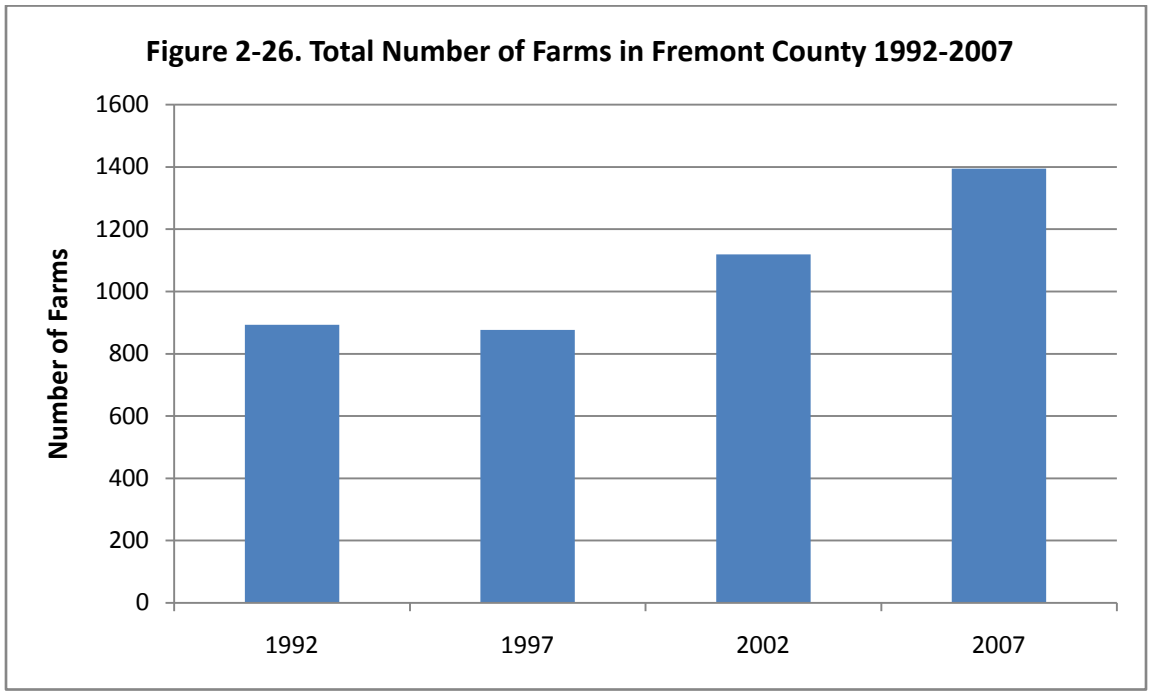
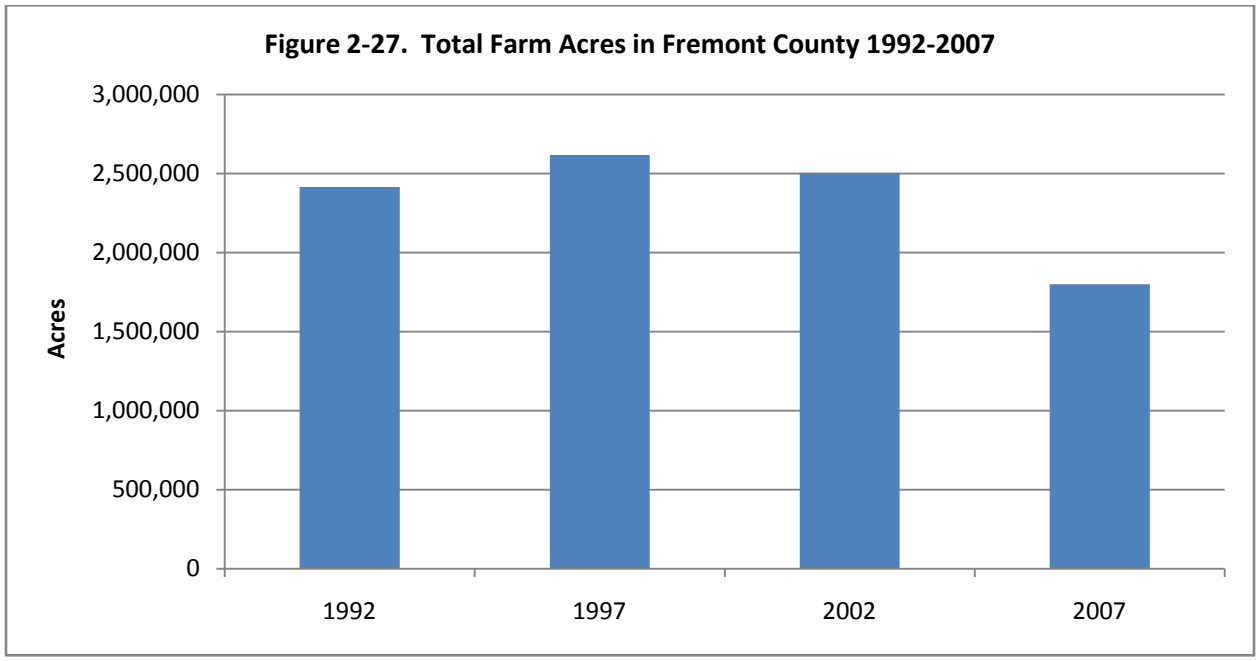


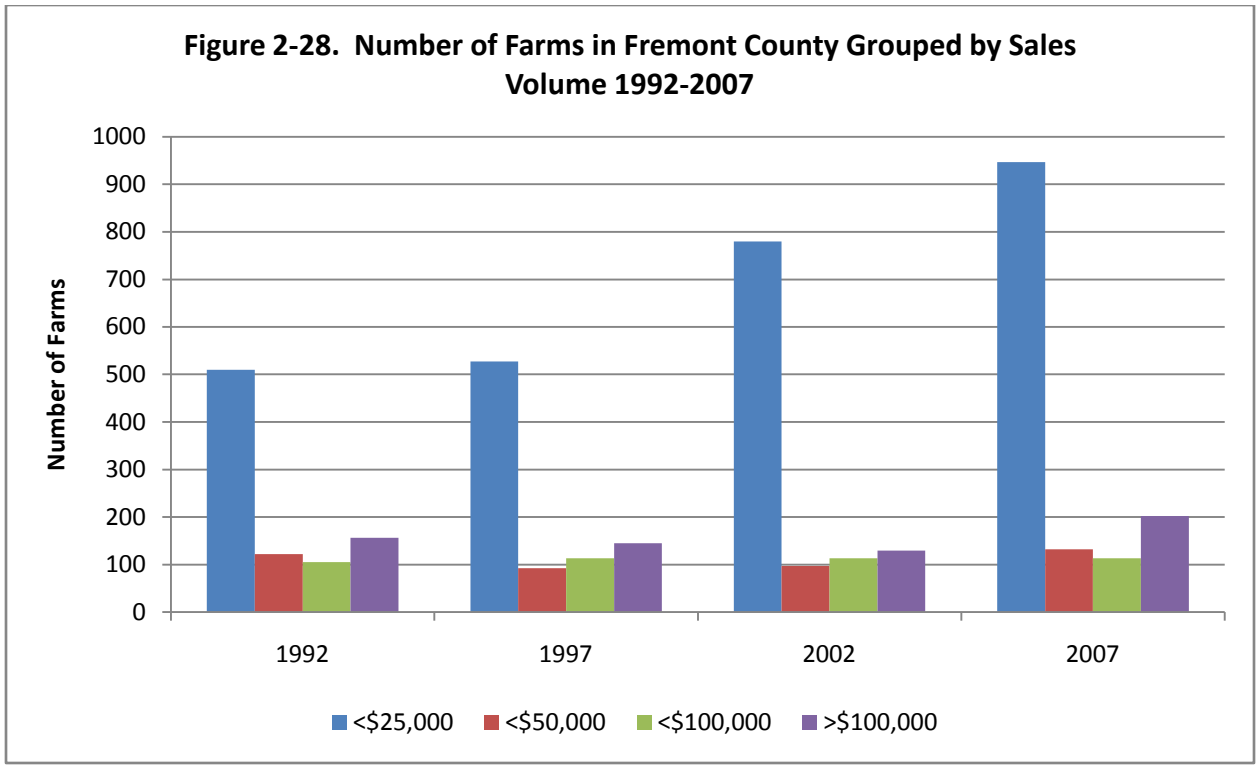
Figure 2-27 depicts the total number of acres (private, state, and federal) used for farming in Fremont County 1992-2007.



Source of data: USDA NASS 2007

There were changes in number of farms of all sizes as measured by sales of farm products, but the most significant change was in the number of farms with less than $25,000 in sales. Figure 2-28 depicts the change in number of farms in Fremont County grouped by sales volume 1992-2007. The growth in number of farms with smaller output is in accord with the pattern of increasing number of farms with decreasing acreages of farm lands.

Tables 2-26 – 2-28 include all fams in Fremont County, not just those with public land grazing. Aas noted above, there are only 310 public land allotments, with some permittees holding more than one permit. At least six permittees hold ten or more allotments.



Data source: USDA NACC, 2008

Cattle inventories in the study area declined steadily from 2000 to 2003, rose slightly in 2004, and fluctuated between 2005 and 2007. Overall, the number of cattle decreased from 330,000 in 2000 to 303,000 in 2007. Fremont County had the highest inventory of 105,000 in 2007.

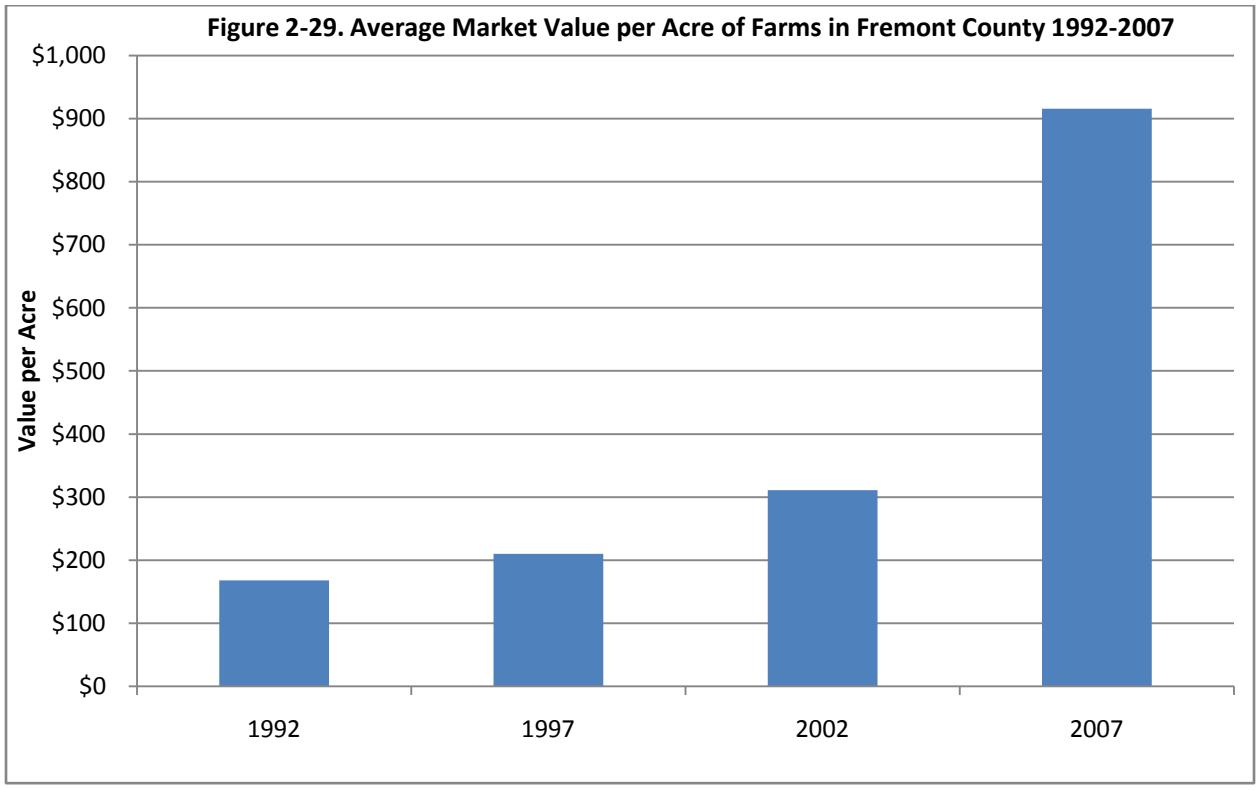
Breeding-sheep inventories declined steadily between 2000 and 2004, stabilized in 2005, but again fell slightly in 2006. The overall decrease was from 90,000 in 2000 to 59,000 in 2008 (USDA - NASS 2008). An extended multi-year drought across much of the Rocky Mountain west was a contributing factor to the declines. The presence and magnitude of drought may also affect the portion of permitted grazing area utilized by permittees. For example, between 1980 and 2006, the proportion of permitted land actually used for grazing by Green Mountain Common Allotment ranged from 16.3 percent to 73.1 percent; low levels of usage correspond with periods of drought.

A 1991 study by economists at the University of Wyoming revealed that agriculture is an important source of export income for the state's economy, since many agricultural products produced within the state are sold outside elsewhere. The study also showed that the great majority of inputs to agricultural production come from within the state, and that profits and other income from agricultural production tend to stay within the state. Taken together, these findings indicate that agricultural production is an important contributor to the state's economy (Moline et al. 1991).

It is not known if these trends are still valid today in light of the increase in ranching operations owned by other than the family operations, the closure of all federally licensed slaughter house in the State of Wyoming, and the increase in use of out of state CAFOs.

In a 2000 study, economists at the University of Wyoming compared the income provided to county governments and public schools to the financial demands on community services by agricultural and residential developments. The study shows that on average in Wyoming, ranching activity generates nearly twice as much income for community services as it requires in expenditures on community services, whereas residential development generates about half as much income as it requires in expenditures (Taylor and Coupal 2000). The study did not assess the cost to the communities to support the subdivision of private ranches into "ranchettes" or the cost of the resulting loss of wildlife habitat.

The trend in Fremont County for taking land out of farm production depicted in Figure 2-25 is coupled with the price of farm land rising significantly. Figure 2-29 depicts the rise in fair market value of farm land in Fremont County from 1992-2007 (source USDA NACC 2008).



Income

Fremont County had the lowest per capita personal income in 2005 of the five counties in the study area; residents of Fremont County had an average income of $29,125, including wages, salaries, income from investments and rent, and transfer payments such as social security (BEA 2007a; Wyoming Economic Analysis Division 2007e). This reflects the very high unemployment rate on the WRIR which was 32.2% in 1999 (WDOE, 1999).

Table 2-67 provides a summary of the sources of personal income by county in the year 2005. Among the sectors for which data are available, government, mining, and construction are substantial contributors to income in all five counties. The Bureau of Economic Analysis (BEA) did not disclose the 2005 income contribution from mining in Carbon County for confidentiality reasons; however, in 2004, the income contribution from mining was relatively small in Carbon County (BEA 2007b).

Table 2-67. Personal Income by Source of Income in Study Area Counties for the Year 2005 (Percentage of Total)

Source	Personal Income				
	Carbon	Fremont	Hot Springs	Natrona	Sweetwater
Farm Earnings	2.5	1.0	1.6	0.2	0.01
Forestry, Fishing, and Other	0.4	0.2	N/A	N/A	0.04
Mining	N/A	5.0	14.1	20.2	32.9
Utilities	0.8	N/A	N/A	N/A	N/A
Construction	6.7	5.0	2.5	4.9	7.7
Manufacturing	N/A	1.4	1.6	3.5	7.9
Wholesale Trade	2.1	N/A	N/A	6.4	N/A
Retail Trade	4.1	5.1	2.5	5.2	4.9
Transportation and Warehousing	6.4	1.9	1.9	N/A	5.7
Information	0.6	1.1	0.5	0.8	0.5
Finance and Insurance	1.3	1.3	1.5	2.3	1.4
Real Estate and Rental and Leasing	1.1	1.5	0.8	3.1	2.4
Professional and Technical Services	1.8	2.5	2.6	3.6	2.3
Management of Companies and Enterprises	N/A	0.1	N/A	0.3	0.3
Administrative and Waste Services	N/A	0.7	N/A	1.6	1.5

Table 2-67. Personal Income by Source of Income in Study Area Counties for the Year 2005 (Percentage of Total)

Source	Personal Income				
	Carbon	Fremont	Hot Springs	Natrona	Sweetwater
Educational Services	0.0	N/A	0.1	0.1	0.1
Health Care and Social Assistance	3.4	N/A	6.2	8.6	2.8
Arts, Entertainment, and Recreation	0.8	1.1	1.8	0.6	N/A
Accommodation and Food Services	2.8	2.2	2.4	1.7	2.6
Other Services, Except Public Administration	1.7	2.0	1.3	2.3	1.7
Government and Government Enterprises	18.7	20.0	14.7	9.4	12.4
Categories for which Data were Not Disclosed	10.8	9.0	1.8	3.3	5.8
Non-Labor Income[1]	34.5	36.8	38.0	22.2	14.5
Residence Adjustment [2]	-0.8	2.0	4.2	-0.2	-7.7
Total Personal Income ($ million)	472	1,065	145	2,888	1,446

Source: BEA 2007b.

N/A = Not available (data were not disclosed due to confidentiality reasons; BEA does not report data when there are three or fewer employers in a sector). The line item "Categories for which Data were Not Disclosed" shows the total income attributable to these categories for each county.

[1]Non-labor income includes dividend, interest, and rental income, as well as net transfer payments (retirement, disability, insurance, Medicare, and welfare, less contributions for government social insurance, which are included in earnings for each sector but not included in total personal income). See the text for detail.

[2]Residence adjustment represents the net inflow of the earnings of inter-area commuters (here, expressed as a percentage of total personal income). A positive number indicates that on balance, county residents tend to commute outside the county to find jobs; a negative number indicates that on balance, people from other counties tend to commute in to find jobs. See the text for detail.

The farming, ranching, and agricultural/forestry services sector contribution in all five counties is relatively low, but most significant in Carbon (2.9%), Fremont (1.2%), and Hot Springs (1.6%) counties (BEA 2007b). The 2002 USDA Census of Agriculture reported that the majority of farming and ranching income in Carbon (98%), Fremont (75%), and Hot Springs (87%) counties is from livestock and livestock products (USDA - NASS 2004b).

The Census County Business Patterns (U.S. Census Bureau 2005a) provides additional data on mining related earnings and employment. Table 2-68 shows mining-related earnings and employment for the counties in the study area from this source.

Table 2-68. Earnings and Employment for Mining Activities in Study Area Counties for 2005

Industry Description	Carbon		Fremont		Hot Springs	
	Employees	Payroll (1000$)	Employees	Payroll (1000$)	Employees	Payroll (1000$)
Mining (Payroll in 1000$ if available)	151	7,767	493	29,235	216	11,018
Oil and Gas Extraction	20-99	N/A[2]	100-249	N/A[2]	20-99	N/A[2]
Crude Petroleum and Natural Gas Extraction	20-99	N/A[2]	100-249	N/A[2]	20-99	N/A[2]
Natural Gas Liquid Extraction	0-19	N/A[2]	--	N/A[2]	0-19	N/A[2]
Mining (except Oil and Gas)	0-19	N/A[2]	0-19	N/A[2]	0-19	N/A[2]
Metal Ore Mining	0-19	N/A[2]	0-19	N/A[2]	--	--
Gold Ore and Silver Ore Mining	--	--	0-19	N/A[2]	--	--
Gold Ore Mining	--	--	0-19	N/A[2]	--	--
Other Metal Ore Mining	0-19	N/A[2]	0-19	N/A[2]	--	--
Uranium-Radium-Vanadium Ore Mining	0-19	N/A[2]	0-19	N/A[2]	--	--
Nonmetallic Mineral Mining and Quarrying	0-19	N/A[2]	0-19	N/A[2]	0-19	N/A[2]
Sand, Gravel, Clay, and Ceramic and Refractory Minerals Mining	0-19	N/A[2]	0-19	N/A[2]	0-19	N/A[2]
Construction Sand and Gravel Mining	0-19	N/A[2]	0-19	N/A[2]	0-19	N/A[2]
Support Activities for Mining	20-99	N/A[2]	326	14,774	100-249	N/A[2]
Drilling Oil and Gas Wells	20-99	N/A[2]	20-99	0	0-19	N/A[2]
Support Activities for Oil and Gas Operations	20-99	N/A[2]	271	12,366	100-249	N/A[2]
Support Activities for Coal Mining	--	--	0-19	0	--	--

Table 2-68. Earnings and Employment for Mining Activities in Study Area Counties for 2005 (Continued)

Industry Description	Natrona		Sweetwater	
	Employees	Payroll (1000$)	Employees	Payroll (1000$)
Mining	1572	101,757	1884	118,377
Oil and Gas Extraction	441	21,952	100-249	N/A[2]
Crude Petroleum and Natural Gas Extraction	250-499	N/A[2]	20-99	N/A[2]
Natural Gas Liquid Extraction	0-19	N/A[2]	118	8184
Mining (except Oil and Gas)	80	4,119	500-999	N/A[2]
Coal Mining	--	--	500-999	N/A[2]
Bituminous Coal and Lignite Surface Mining	--	--	500-999	N/A[2]
Metal Ore Mining	0-19	N/A[2]	--	--
Other Metal Ore Mining	0-19	N/A[2]	--	--
Uranium-Radium-Vanadium Ore Mining	0-19	N/A[2]	--	--
Nonmetallic Mineral Mining and Quarrying	20-99	N/A[2]	250-499	N/A[2]
Sand, Gravel, Clay, and Ceramic and Refractory Minerals Mining and Quarrying	20-99	N/A[2]	--	--
Construction Sand and Gravel Mining	0-19	N/A[2]	--	--
Clay and Ceramic and Refractory Minerals Mining	20-99	N/A[2]	--	--
Other Nonmetallic Mineral Mining and Quarrying	--	--	250-499	N/A[2]
Potash, Soda, and Borate Mineral Mining	--	--	250-499	N/A[2]
All Other Nonmetallic Mineral Mining	--	--	0-19	N/A[2]
Support Activities for Mining	1,051	75,686	702	37,400
Drilling Oil and Gas Wells	288	27,473	20-99	N/A[2]
Support Activities for Oil and Gas Operations	732	46,979	500-999	N/A[2]
Support Activities for Coal Mining	0-19	N/A[2]	--	--
Support Activities for Metal Mining	0-19	N/A[2]	--	--

Source: Census 2007b. Number of employees is for weekending March 12, 2005. Payroll data are for the entire year.

[1]For some sectors and subsectors, the data source reveals only a range for the number of employees so as not to disclose confidential business information (there are very few employers in the sector).

[2]The data source does not reveal data on payrolls for this subsector due to confidentiality requirements (there are relatively few employers in the sector).

Although Census (2007b) does not make available all data on employee counts and payrolls due to confidentiality requirements, the data that are provided help to show the economic importance of mineral commodities. Table 2-69 shows that oil and gas extraction and operations support activities substantially contribute to mining-related earnings in all five counties. Oil and gas extraction and operations support contributes at least 40 jobs in Carbon County (at least 27 percent of mining-related jobs), at least 493 jobs in Fremont County (at least 75 percent of mining-related jobs), at least 120 jobs in Hot Springs County (at least 56 percent of mining-related jobs), 1,173 jobs in Natrona County (at least 75 percent of mining-related jobs), and at least 600 jobs in Sweetwater County (at least 32 percent of mining-related jobs).

Transfer payments such as Social Security, disability, insurance, Medicare, and welfare, as well as income from dividends, interest, and rent, make up a substantial portion of income in all five counties. Figure 2-30 shows the trend in percentage of income from these sources over time. As the figure indicates, the share of total income from unearned income has remained relatively constant in Fremont County between 1996 and 2005, starting and ending at 44 percent of income. The trend in Fremont County followed a similar path as the state. In Sweetwater County, the percentage of total income from unearned income rose from 1996 to 2002, then declined in 2002 to 2005 and as of 2005, was about 2 percent lower than the 1996 level. The percentage of income fell 8 percent in Natrona County between 1996 and 2006, decreased 2 percent in Hot Springs County, and increased 2 percent in Carbon County. In Wyoming as a whole, the percentage remained relatively constant, decreasing one percent from 37 percent to 36 percent between 1996 and 2005. Note, however, that the absolute amount (adjusted for inflation) of unearned income has increased in all five counties (Figure 2-30) and the state.

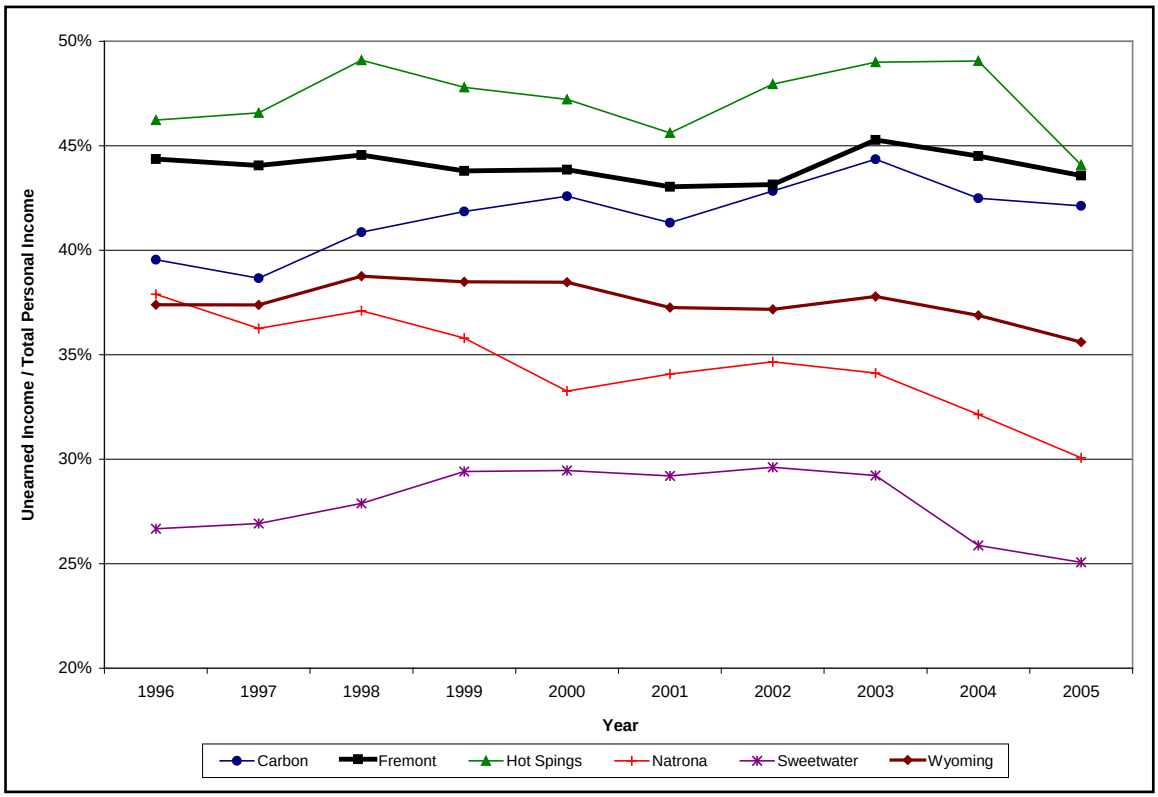
Most of the counties had a greater amount of non-labor income than the U.S. in 2005 (nationally, the rate was 31 percent). A higher proportion of income from dividends, interest, rent, and transfer payments could result from several factors, including a higher proportion of families whose income is derived from assets such as stocks and real estate, or a higher proportion of people receiving income from government payments such as Social Security.

At a regional level, a greater share of non-labor income can lead to changing views that are different from those that have traditionally been held by an area dominated by extractive industries. In addition, these changes in views often tend to support preservation policies that favor a less intense dependence on the extractive industries.

Studies done by the Sonoran Institute and Headwaters Economics (2008) indicate that regional economies in the west that are located next to protected public lands that are diverse and based on multiple sectors tend to do better from an economic standpoint compared to those that are primarily reliant on the extractive industries. In addition to being more stable, some

evidence suggests that more diverse economic regions also tend to generate faster growth over the long run. A recent study by a nonprofit research group (Headwaters Economics 2008) compared long-term growth in "energy-focusing" counties in the western U.S. with "peer counties" of similar size and found that over the long run, employment and income grew measurably faster in the peer counties. The study identified 26 "energy-focusing" counties, rural counties with fewer than 57,000 people and over 7 percent of private sector employment from energy-related industries, and compares their growth with 254 "peer counties" (comparable counties with lower energy-related employment). The study found that from 1990 to 2005, inflation-adjusted personal income in the energy-focusing counties grew at an average rate of 2.3 percent, compared to 2.9 percent for the peer counties; employment in energy-focusing counties grew 1.8 percent on average, compared to 2.3 percent for peer counties. The analysis period for long-term growth studies must be chosen carefully so as not to bias the results by choosing an ending year that coincides with an energy bust, but in this case the timeframe is well chosen: the starting year for the analysis coincides with both a national recession and a relative low point for energy development, and the ending year coincides with the approximate peak of the most recent economic expansion, which included an energy boom.

Figure 2-30. Percent of Total Personal Income from Dividends, Interest, Rent, and Transfer Payments



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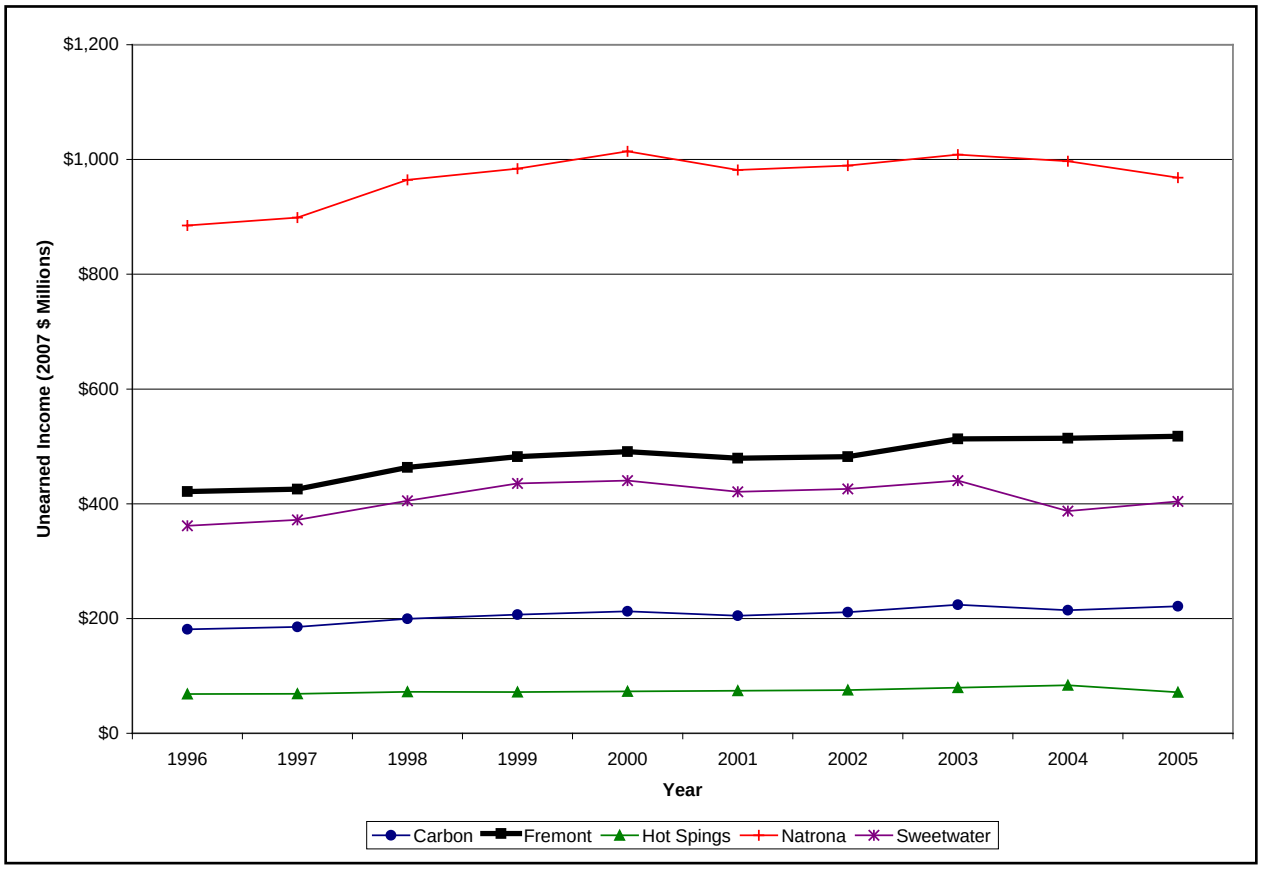
Source: BEA 2007a.

Figure 2-31. Amount of Dividends, Interest, Rent, and Transfer Payments

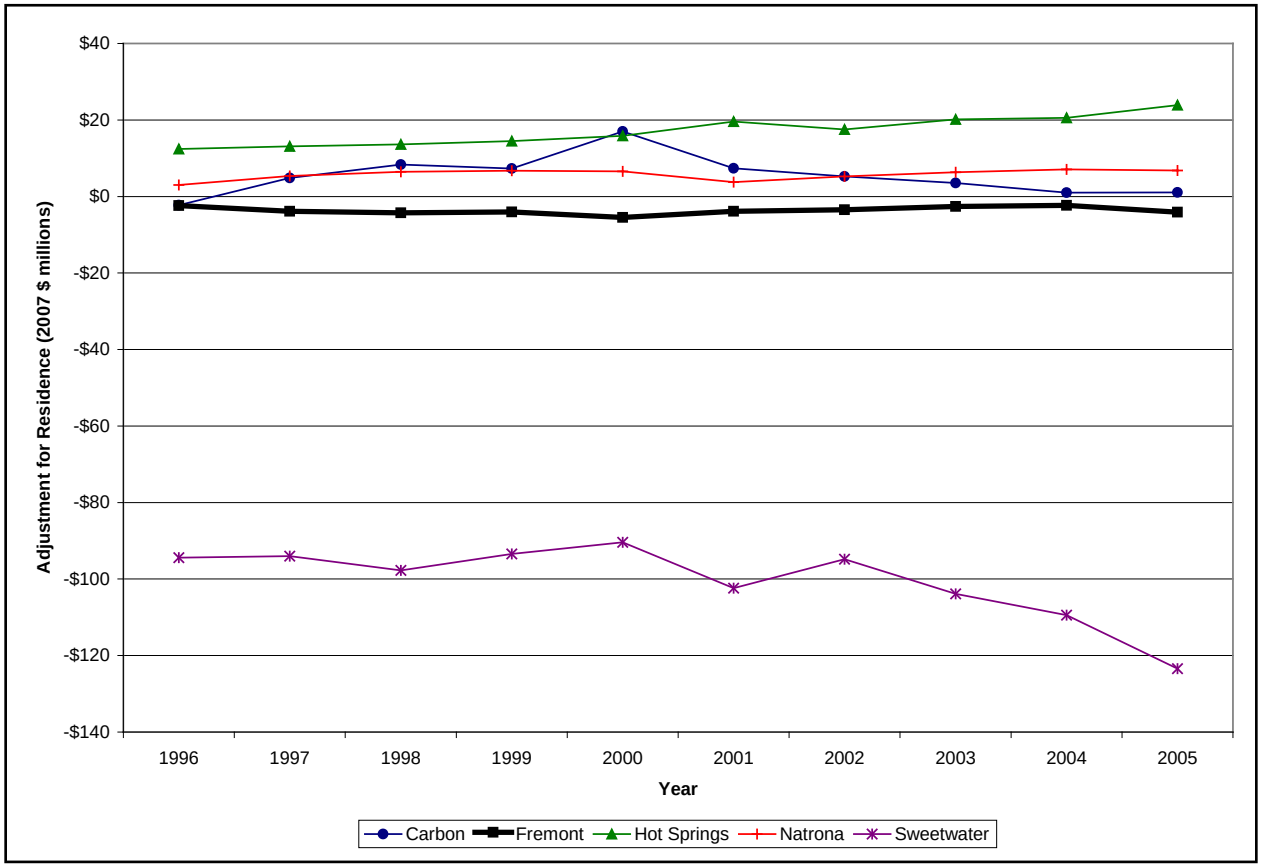


Source: BEA 2007a. Adjusted for inflation using the Wyoming Cost of Living Index for the central region (Converse, Fremont, and Natrona counties) (Wyoming Economic Analysis Division 2007e).

Another indicator of income is the residence adjustment, which measures cross-county flows of income and earnings. While many people live and work in the same county, other people work outside the county in which they live (i.e., they commute across county boundaries). For each county, the net residence adjustment represents the net inflow of earnings due to cross-county income flows, or the difference between the income of those who reside in the county and those who work in the county. Thus, a residence adjustment greater than zero indicates that on balance, the flow of income due to inter-county commuting is positive; that is, people tend to commute outside the county to find jobs. Similarly, a county with a residence adjustment less than zero indicates that people from other counties tend to commute in to find jobs. Figure 2-30 shows the residence adjustment factors for each of the five counties, in real terms (adjusted for inflation). As the figure shows, the residence adjustment in Sweetwater County is far more substantial than the other four counties in the study area. The highly negative residence adjustment (-$123 million in 2005) indicates that there are a large number of people commuting into Sweetwater to work. In 2005, Fremont County was the only other county with a net influx of workers into the county with a residence adjustment of -$4 million. The residence ad-

justment was $1 million for Carbon, $24 million in Hot Springs, and $7 for Natrona; therefore, Hot Springs had the largest income generate by jobs outside its county.

Figure 2-32. Residence Adjustment Over Time



Source: BEA 2007a; adjusted for inflation using Wyoming Economic Analysis Division 2007e.

Employment

The breakout of employment by industry shows a pattern similar to that of the personal income statistics, highlighting the importance of the mining, government, construction, and services in all five counties (excluding mining for Carbon County). Table 2-69 provides a summary of total employment by sector for the counties in the study area. Note that data on employment for a finer breakout of the mining sector are shown above in Table 2-68.

Table 2-69. Employment by Industry in Study Area Counties for the Year 2005 (Percentage of Total)

Source	Personal Income					
	Carbon	Fremont	Hot Springs	Natrona	Sweetwater	Wyoming
Farm Employment	5.3	5.1	6.3	0.9	0.7	3.4
Forestry, Fishing, and Other	1.5	0.9	N/A	N/A	0.2	0.8
Mining	N/A	2.8	5.7	9.3	18.9	7.1
Utilities	0.6	N/A	N/A	N/A	N/A	0.7
Construction	8.1	7.7	5.9	7.0	8.2	8.1
Manufacturing	N/A	2.7	1.8	3.9	4.5	3.1
Wholesale Trade	2.3	N/A	N/A	5.4	N/A	2.4
Retail Trade	10.2	11.3	9.0	12.6	11.2	11.1
Transportation and Warehousing	5.5	2.5	2.6	N/A	5.4	3.6
Information	1.0	1.8	1.5	1.3	0.9	1.4
Finance and Insurance	2.3	2.4	3.0	3.6	2.0	3.1
Real Estate and Rental and Leasing	3.9	3.9	3.7	4.5	3.1	3.8
Professional and Technical Services	3.0	3.7	4.4	4.8	2.6	4.4
Management of Companies and Enterprises	N/A	0.1	N/A	0.2	0.4	0.3
Administrative and Waste Services	N/A	2.2	N/A	4.7	3.3	3.3
Educational Services	0.3	N/A	(L)	0.7	0.5	0.8
Health Care and Social Assistance	5.9	N/A	12.4	11.3	4.6	7.4
Arts, Entertainment, and Recreation	2.4	1.9	3.1	1.8	N/A	1.8
Accommodation and Food Services	10.9	7.6	10.2	6.9	8.4	8.9
Other Services, Except Public Administration	5.6	6.3	7.6	6.0	4.4	5.4
Government and Government Enterprises	20.7	23.3	18.1	11.6	15.4	19.0
Data were Not Disclosed	10.3	13.8	4.7	3.4	5.3	0.0
Total Employment (2005)	10,015	22,766	3,124	50,149	27,628	360,558

Source: BEA 2007c.

(L) Less than 10 jobs, but the estimates for this item are included in the totals.

Average earnings per job in 2005 were lower than the national and state average in Carbon, Fremont, and Hot Springs counties. Sweetwater County had an average earning per job higher than both the nation and state, while Natrona County exceeded the state. Table 2-70 shows the average earnings per job by county.

Table 2-70. Average Earnings Per Job for Study Area Counties, Wyoming, and U.S. in 2005

Locality	Average Earnings Per Job
Carbon County	$31,183
Fremont County	$28,636
Hot Springs County	$26,830
Natrona County	$44,923
Sweetwater County	$48,738
Wyoming	$37,967
United States	$45,817

Source: BEA 2007d

It is important to consider how different average wages can affect the ability of different employers to attract workers. For example, a study in nearby Sublette County (Jacquet 2006) found that wages for jobs in gas development and exploration are higher than in any other sector and are high for both unskilled and skilled workers. Depending on the need for labor in relatively high-paying sectors, this could have adverse effects on the ability of other employers (in relatively low-paying sectors) to attract workers. Table 2-71 provides recent data (from the second quarter of 2007) on relative earnings by sector, as well as total employees, for the five counties. As the table shows, with the exception of Sweetwater and Carbon counties, the mining sector (including oil and gas development) has the highest average weekly wage of any sector. This observation is also true for the state as a whole. In Carbon County, construction, manufacturing, and wholesale trade have high, albeit comparable, average weekly wages compared to the mining sector. Furthermore, in Sweetwater County, average weekly wages in the manufacturing sector are slightly higher than the mining sector.

Table 2-71. Second-Quarter 2007 Average Monthly Employment and Average Weekly Wage

Sector	Carbon		Fremont		Hot Springs	
	Average Monthly Employment	Average Weekly Wage	Average Monthly Employment	Average Weekly Wage	Average Monthly Employment	Average Weekly Wage
Agriculture, Forestry, Fishing, and Hunting	199	$488	131	367	N/A[1]	N/A[1]
Animal Production	184	$504	74	388	N/A[1]	N/A[1]
Mining	244	$948	732	$1,332	174	$1,090
Oil and Gas Extraction	N/A[1]	N/A[1]	N/A[1]	N/A[1]	N/A[1]	N/A[1]
Mining, Except Oil and Gas	N/A[1]	N/A[1]	N/A[1]	N/A[1]	N/A[1]	N/A[1]
Support Activities for Mining	187	$888	485	$1,059	113	1,023
Construction	1,103	$991	1,214	$597	93	595
Manufacturing	442	$1,079	436	$505	N/A[1]	N/A[1]
Wholesale Trade	235	$1,174	321	$615	22	$651
Retail Trade	772	$441	2,044	$463	182	$329
Transportation and Warehousing	246	$941	387	$803	67	$787
Information	75	$533	313	$512	40	$357
Finance and Insurance	144	$669	316	$697	51	$683
Real Estate and Rental and Leasing	86	$375	373	$688	8	$224
Administrative and Waste Services	111	$534	172	$579	N/A[1]	N/A[1]
Health Care and Social Assistance	404	$620	1,723	$624	266	$504
Arts, Entertainment, and Recreation	110	$414	111	$243	77	$161
Accommodation and Food Services	976	$249	1,498	$228	309	$200
Other Services, Except Public Administration	163	$497	465	$589	50	$286
Total Government	2,121	$761	5,242	$745	572	$571

Table 2-71. Second-Quarter 2007 Average Monthly Employment and Average Weekly Wage

Sector	Carbon		Fremont		Hot Springs	
	Average Monthly Employment	Average Weekly Wage	Average Monthly Employment	Average Weekly Wage	Average Monthly Employment	Average Weekly Wage
All Private Sectors (Non-Government)	5,495	$684	11,026	$631	1,500	$490
All Sectors	7,616	$705	16,267	$668	2,072	$513
Agriculture, Forestry, Fishing, and Hunting	133	$426	N/A[1]	N/A[1]	2,366	$470
Animal Production	N/A[1]	N/A[1]	N/A[1]	N/A[1]	1,675	$469
Mining	3,598	$1,362	5,632	$1,370	27,192	$1,339
Oil and Gas Extraction	726	$1,147	322	$1,555	4,257	$1,570
Mining, Except Oil and Gas	87	1,168	2,247	1,439	9,155	$1,381
Support Activities for Mining	2,786	1,423	3,063	1,300	13,779	$1,240
Construction	2,921	769	2,222	1,000	26,508	$804
Manufacturing	1,948	835	1,266	1,413	10,067	$866
Wholesale Trade	2,624	$1,002	770	$967	8,819	$929
Retail Trade	5,102	$496	2,548	$516	31,654	$458
Transportation and Warehousing	1,030	$845	1,279	$1,063	9,047	$788
Information	562	$668	210	$516	4,034	$669
Finance and Insurance	1,060	$955	437	$849	6,942	$853
Real Estate and Rental and Leasing	1,082	$769	464	$921	4,446	$668
Administrative and Waste Services	1,459	$435	735	$679	8,418	$488
Health Care and Social Assistance	4,800	$758	886	$583	20,839	$663
Arts, Entertainment, and Recreation	497	$251	N/A[1]	N/A[1]	2,928	$304
Accommodation and Food Services	3,537	$266	2,373	$284	30,560	$275

Table 2-71. Second-Quarter 2007 Average Monthly Employment and Average Weekly Wage

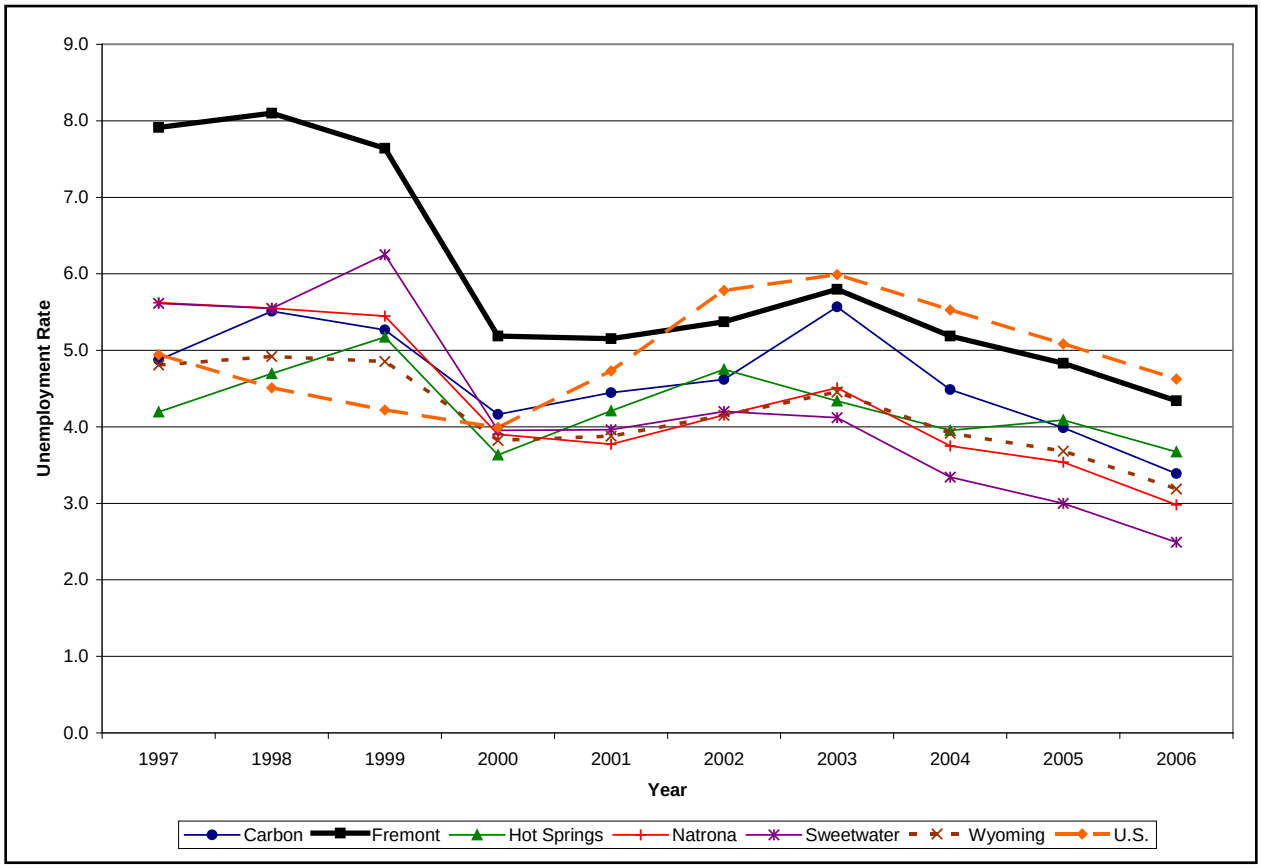
Sector	Carbon		Fremont		Hot Springs	
	Average Monthly Employment	Average Weekly Wage	Average Monthly Employment	Average Weekly Wage	Average Monthly Employment	Average Weekly Wage
Other Services, Except Public Administration	1,706	$607	894	$1,018	8,734	$610
Total Government	5,590	$964	4,126	$777	62,521	$809
All Private Sectors (Non-Government)	33,771	$741	20,950	$960	216,717	$719
All Sectors	39,361	$773	25,076	$930	279,238	$739

Source: BEA 2007d

All five counties follow the general unemployment trend observed that the national and state level over the period between 1997 and 2006. In 2006, all five counties had lower unemployment in than the national average of 4.6 percent. Fremont County had an unemployment rate of 4.3 percent, Carbon County had a rate of 3.4 percent, Hot Springs County had a rate of 3.7 percent, Natrona County had a rate of 3.0 percent, and Sweetwater County had 2.5 percent unemployment; Wyoming had 3.2 percent unemployment overall (BLS 2006a; BLS 2006b). Figure 2-33 shows unemployment rates in recent years for the three counties, Wyoming, and the U.S. Unemployment in the study area has been lower than the national rate since at least 2002, and has been decreasing since 2003 in all five counties (and since 2002 in Sweetwater and Hot Springs counties). Unemployment in Fremont County has been greater than the four other counties and the state throughout the period.

Unemployment statistics are shifting rapidly due to economic turndown which began in December, 2007. While Wyoming appears to have been affected by the rescession less than other states, it has not been immune. Actual employment figures for the period subsequent to 2006 will be considered as data become available.

Figure 2-33. Unemployment Rates, 2000 to 2006



Source: BLS 2008a, BLS 2008b

Tax Revenue

Activities on public lands contribute to the fiscal well-being of federal, state and local governments. BLM management actions have the potential to affect tax revenues from mining and mineral production; travel, tourism, and recreation; and livestock grazing.

Mining, Including Oil and Gas

The mining industry contributes very substantially to state and local tax revenues and explains in part why Wyoming has no income tax. The Wyoming State Auditor reported that state mineral severance taxes and federal mineral royalties returned to the state represented 31 percent of total state revenues in Fiscal Year 2007—a total of $1.45 billion. Sales and use taxes represented another 11 percent of total state revenues (Wyoming State Auditor 2007). The Wyoming Legislative Service Office (WLSO 2003) indicated that the mining sector paid about $806 million in state and local tax revenues in Fiscal Year 2002. This represents 54 percent of total state and local tax revenues from major tax sources (severance, *ad valorem*, sales and use, cigarette, gross receipts, liquor, and franchise taxes) for Fiscal Year 2002 (WLSO 2003).

Oil and gas production on federal lands in Wyoming is subject to state, federal, and local taxes. *Ad valorem* production and production equipment taxes are payable to the county where the production occurs. Since oil and gas are produced from all five study area counties, *ad valorem* production and production equipment taxes are important for these counties.

State severance taxes are levied on current production at the rate of 6 percent of the taxable value of crude oil and natural gas, and at 7 percent of taxable value for surface coal, 4 percent for trona, and 2 percent for most other minerals. The taxable value is defined as the gross sales value minus certain allowable deductions for royalties, transportation, and natural gas processing. Rates are lower for less productive stripper wells and new wells (Wyoming DOR 2007). State and local taxes, including the *ad valorem* tax, also apply for coal and trona mining. Using the data from Table 2-72 along with state severance tax rates, it is possible to estimate state severance tax collections for each county for the different mineral products. Table 2-72 shows estimated state severance tax collections for the counties for Production Year 2006.

Table 2-72. Estimated State Severance Tax Collections on Mineral Production in the Study Area Counties, Production Year 2006

Mineral	Carbon	Fremont	Hot Springs	Natrona	Sweetwater
Crude Oil	$4,889,400	$6,704,500	$5,111,600	$2,199,500	$17,928,000
Stripper Oil	$283,600	$781,000	$2,009,200	$6,412,400	$35,700
Natural Gas	$35,188,800	$44,097,400	$14,100	$12,391,600	$63,431,000
Surface Coal	$0	$0	$1,500	$0	$8,664,100
Underground Coal	$0	$0	$0	$0	$282,600
Trona	$0	$0	$0	$0	$11,969,100
Bentonite	$0	$0	$400	$12,900	$0
Sand and Gravel	$25,400	$13,800	$1,800	$48,800	$41,800
Uranium	$0	$0	$0	$0	$300
Decorative Stone	$100	$0	$0	$0	$0
Total	$40,387,300	$51,596,700	$7,138,600	$21,065,200	$102,352,600

Source: Calculated from data in Wyoming DOR 2006.

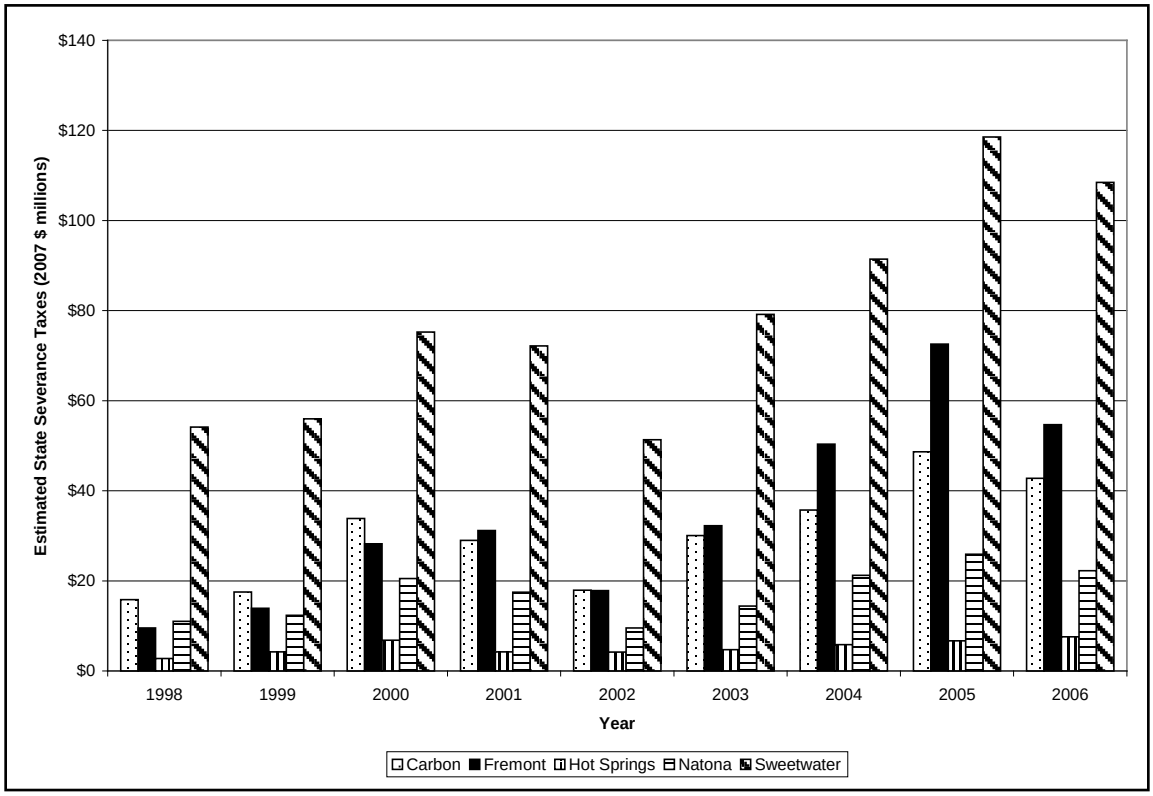
Note: Estimated using state severance tax rates of 6 percent of taxable valuation for crude oil and natural gas, 4 percent for stripper oil and trona, and uranium, 7 percent for surface coal, 3.75 percent for underground coal, and 2 percent for all other minerals shown. Rounded to the nearest hundred dollars.

DOR Wyoming Department of Revenue

As the table shows, state severance taxes based on production within the counties in the study area were greatest in Sweetwater County, which is consistent with the relative importance of mining for employment and earnings in the county. Natural gas was the largest contributor to state severance taxes for all counties except Hot Springs (crude oil).

The Table 2-72 also shows the gas, oil, coal, and trona accounted for most of the state severance tax collections in the study area counties in 2006. Figure 2-20 shows historical trends in estimated state severance taxes based on production of these commodities within the counties in the study area (i.e., the data on assessed valuation shown in Figures 2-11 through 2-14). Severance taxes on natural gas, coal, trona and other minerals are then distributed according to a legislatively approved formula. The majority of the revenues are transferred to the state general fund, the state's budget reserve account, and the Permanent Wyoming Mineral Trust Fund. In recent years less than 4 percent of the total has been distributed to cities, towns, and counties across state.

Figure 2-20. Estimated State Severance Taxes, 1998-2006



Source: Calculated using data in Wyoming DOR 1999, Wyoming DOR 2000. Wyoming DOR 2001a, Wyoming DOR 2002, Wyoming DOR 2003, Wyoming DOR 2004, Wyoming DOR 2005, Wyoming DOR 2006, Wyoming DOR 2007. Adjusted for inflation using Wyoming Economic Analysis Division 2007e.

Local *ad valorem* production taxes are levied on sales of oil and gas. *Ad valorem* production tax rates vary by county and within counties. In 2007, average tax rates on mineral production were about 6.2 percent in Carbon County, 7.1 percent in Fremont County, 7 percent in Hot Springs County, 6.6 percent in Natrona County, and 6.6 percent in Sweetwater County (Wyoming DOR 2007). Based on these tax rates and the total taxable value of mineral production, it is possible to estimate *ad valorem* production tax assessments in the counties. According to Wyoming DOR (2007), total taxable value of mineral production for Production Year 2006 was $676 million in Carbon County, $876 million in Fremont County, $136 million in Hot Springs County, $407 million in Natrona County, and $1,790 million in Sweetwater County. Thus, applying the 2007 tax rates to 2006 mineral production, Wyoming DOR (2006) calculated *ad valorem* mineral production tax assessments of $41.8 million in Carbon County, $61.4 million in Fremont County, $9.5 million in Hot Springs County, $26.9 million in Natrona County, and $117.1 million in Sweetwater County. The relative importance of different minerals in the counties in contributing to these tax assessments is illustrated by the data in Table 2-48 which shows taxable valuation for the different minerals within the counties.

Local *ad valorem* property taxes are levied on the taxable valuation of oil and gas equipment. Rates are the same as those for *ad valorem* production, but the taxable valuation of oil and gas equipment is 11.5 percent of the assessed value (Grenvik 2005; Wyoming DOR 2001b).

Federal royalties on oil, gas, and coal production are levied at 12.5 percent of the value of production, after allowable deductions. Half the royalties collected, net of a 1 percent administrative processing fee, are returned to Wyoming and a portion of the royalties received by the state are disbursed to cities and towns (State of Wyoming 2004). Federal mineral royalties are also collected on production of other minerals. The rate on trona production has been 6 percent since 1995, but in the fall of 2006 was reduced to 2 percent, which will be the effective rate for at least the next 5 years (Hardy 2006). According to the Wyoming Consensus Revenue Estimating Group, the portion of federal mineral royalties for production in the state that accrued to the state (i.e., 50% of total federal mineral royalties for production in Wyoming, net of the administrative processing fee) were $1,068 million in Fiscal Year 2006 and $927 million in Fiscal Year 2007 (CREG 2008). This includes royalties from oil, gas, coal, trona, and other minerals.

The state sales tax applies to retail purchases of goods and some services in Wyoming, while the use tax applies to a retail purchase of goods outside Wyoming by firms in Wyoming. (Wyoming DOR 2006). In terms of the oil and gas industry, for instance, a firm with operations in Wyoming that purchases equipment from outside the state for use in-state would remit use taxes to the state of Wyoming for the purchase.

Travel, Tourism, and Recreation

BLM management actions also affect travel and tourism, both directly (through decisions that affect recreation access) and indirectly (e.g., through decisions that affect wildlife populations). The State Office of Travel and Tourism estimates that in 2006, travel and tourism accounted for $103 million in tax revenues, including $62 million (rounded figure) in state revenues and $41 million (rounded figure) in local revenues (2006 dollars), not including property tax collections related to recreation infrastructure (WTT 2007). Most trips (an estimated 98 percent) are due to tourism for pleasure (WTT 2007). Table 2-73 shows tax receipts for the counties in the study area. This study does not include spending by local residents on recreation.

Table 2-73. Local and State Tax Receipts Due to Travel and Tourism in Study Area Counties and Wyoming in 2006 ($ million)

County	Local Tax Receipts	State Tax Receipts	Total Tax Receipts
Fremont	$0.9	$2.8	$3.7
Carbon	$2.3	$4.3	$6.6
Hot Springs	$0.5	$0.7	$1.2
Natrona	$3.1	$6.0	$9.1
Sweetwater	$2.8	$4.5	$7.3
Wyoming	$40.9	$61.6	$102.5

Source: WTT 2007

Livestock Grazing and Ranching

Livestock grazing and ranching, and agriculture more generally, contribute directly to local and state tax revenues from local *ad valorem* property taxes and local and state sales and use taxes. According to a 2003 report on state and local tax revenues, agriculture along with forestry, fishing, and hunting brought in $9.2 million in state and local tax revenues due to *ad valorem* property taxes, and $1.4 million due to sales and use taxes, for a total of over $10.6 million (WLSO 2003).

2.8.3 Health and Safety

The BLM addresses a variety of potential hazards on public surface to reduce risks to visitors and employees. Hazards may include hazardous materials; mine shafts and adits; abandoned equipments and structures; explosives and munitions; and spills from pipelines, tankers, and storage tanks. Activities directed toward health and safety concerns in the planning area primarily address AMLs and hazardous wastes and materials. Naturally occurring geological hazards include areas prone to landslides. A wide range of permitted uses that occur on public lands administrated by the BLM have the potential to introduce hazardous substances and petroleum products into the environment. There are no identified debris

While not required by BLM Guidance, additional health and safety issues are discussed below because of their importance in considering appropriate land use management.

2.8.3.1 Resource Characterization

Current Condition

Abandoned Mine Lands (AML)

Abandoned mines are a common feature on BLM-administered lands. AML sites are identified in a data base maintained by WDEQ. Wyoming DEQ, AML Division is conducting a quality assurance review to update information on AML sites that have undergone reclamation; the location and number of reclaimed sites within the planning area cannot be accurately assessed at this time. The BLM is currently inventorying abandoned mines that present an open safety hazard which is hoped will be available prior to the issuance of the revised RMP. LFO has identified some of the most dangerous AMLs which have been remediated in some fashion. The current status of AMLs projects are found at : http://www.blm.gov/wy/st/en/programs/aml/projects.html

BLM has identified 934 AML sites of "undetermined" status throughout the State of Wyoming. Of these, only nine have been started as projects. Three of these are in the planning area: the Gas Hills Haul Road which was completed in 2004, the South Pass area, some of which have been completed, and the Copper Mountain mines, which are pending. Source: http://www.blm.gov/wo/st/en/prog/more/Abandoned_Mine_Lands/abandoned_mine_site.html

Extreme physical hazards are common at AMLs, often not apparent. AMLs have proven to be a luring and sometimes life-threatening attraction for both children and adults. Serious injury or death may occur at these sites. Common hazards include open vertical shafts, unstable overhead rock and decayed support structures, deadly gases and lack of oxygen, remnant explosives and toxic chemicals, open pits and drill holes. Visitors may become lost and disoriented while underground. Subsidence at abandoned coal mines and coal fires pose additional hazards.

In 2004 and 2005, the BLM signed cooperative agreements with the Wyoming DEQ-AML authorizing joint reclamation projects. The agreement gives lead on AML reclamation projects to the Wyoming DEQ-AML. The state program, as required by the Surface Mining Control and Reclamation Act of 1977, focuses on public safety hazards.

There are numerous abandoned hard rock mine sites on public lands which have possible impacts on water. These watersheds were prioritized on the basis of assessments undertaken by the BLM and WDEQ-AML. Six of such sites are located in the South Pass mining district and thirteen are located in the Copper Mountain mining district. Priority physical safety hazard sites include nine sites at South Pass and nine at Copper Mountain. There mines also have significant disturbed areas and mine wastes that require re-grading, capping, and re-vegetation, and in some cases removal and relocation of the mining wastes to an off-site repository.

The most significant type of mine hazard features are open shafts and adits and high-walls remaining at AML sites in the South Pass mining district (recreation concerns), and at the Copper Mountain mining district (high use area). In 2008, a programmatic EA was developed for addressing sites that posed a physical safety threat. These sites were prioritized on the basis of severity of hazard (falling, entrapment), proximity to population centers, and likelihood of access (recreation). Final reclamation of these sites has not yet been accomplished, and therefore a fencing program was created to immediately address safety concerns at least on a temporary basis. Fencing at over ten sites was completed in late fall 2008. Further work is planned for the future in fencing additional sites and bringing hazardous and abandoned sites to closure through a final reclamation solution.

The areas around Willow Creek and Rock Creek in the South Pass mining district have been administratively closed due to high levels of mercury and other contaminants left from 19th Century Mining activities.

Impacts to watershed were one of the issues in the Gas Hills Haul Road project, which remediated erosional impacts. Dramatic before and after photographs can be found at:

http://www.blm.gov/wy/st/en/programs/aml/projects/gashills.html

Hazardous Materials

Hazardous materials are used and stored in connection with permitted activities including oil and gas drilling and mining. Air, soil, surface water, and groundwater contamination can be found at such sites.

Management of hazardous materials, substances, and waste is governed by state and federal laws. These regulations provide the minimum level of best BMPs that will be required for all permitted activities. Regulations limit the amount of hazardous material that can be produced or stored on site by permitted activities, but hazardous waste materials still present a health and safety risk in the case of accidents or misuses.

Hazardous Material Production

Hazardous materials and wastes are also a byproduct of well development. Oils and additives are used during well development and well debris is produced during the process. Additives contained in mud systems used during drilling are often kept in sacks or drums at the sites. As the demand for oil, gas, and mineral resources increases, so does the potential for petroleum and hazardous substance spills. With rises in uranium and gold prices, more mining activity is anticipated. Extensive damage from earlier booms in these minerals is extant (see reclaimed mining in the South Pass area) with pools of water leaching through potentially toxic tailings.

While an increase in proposals for uranium mining raises concerns about the production of extremely hazardous materials, the type of uranium likely to be mined in the planning area is not the highly radioactive gamma form. Nonetheless, the potential for either perceived or actual exposure to dangerous uranium dust or contamination is an issue to be addressed in mining operation plans.

Water quality issues related to oil and gas and uranium development are discussed in the Mineral Resources sections. Some *in situ* mines have not been rehabilitated promptly. See Wyoming DEQ, Violation #4314-08, July 17, 2008 and Violation #4231-08, March 7, 2008.

Within the planning area, spills, illegal dumping, and hazardous material releases are investigated to determine the need for immediate cleanup or other long-term remediation actions. This often involves working with the EPA, Wyoming DEQ, and potentially responsible parties to fund and expedite the cleanup of hazardous sites and disposal activities that result from recreational use and industrial activities such as oil and gas development. The Lander Field Office has an effective Hazard Management and Resource Restoration program.

Management of Hazardous Materials

Increased awareness on the part of mineral development companies and their employees and the public has led to an increased reporting of hazardous material (hazmat) incidents, resulting in the cleanup of old dump sites and abandoned facilities. However, increased recreational activities on BLM-administered lands will put visitors at a greater risk of encountering the hazards previously discussed.

The BLM's Hazard Management and Resource Restoration Program, managed through the Wyoming BLM State Office will continue to manage and respond to hazards on BLM-administered lands. The program will continue to emphasize protection of public health, safety, and the environment, as well as cleanup and restoration actions and compliance with all laws, policies, and regulations.

Hydrogen sulfide

Hydrogen sulfide (H_2S), known as sour gas, swamp gas, or rotten egg gas, can be emitted during the exploration and production of oil and gas. It is formed from the decomposition of organic matter and is a byproduct of various chemical reactions. H_2S is a highly toxic and colorless gas. When the amount of gas absorbed into the blood system exceeds that which is readily oxidized, systemic poisoning results, with a general action on the nervous system. When inhaled in high concentration it can cause almost immediate death. Because of its rapid action, H_2S is considered one of the most dangerous industrial gases. To reduce its hazards, H_2S is burned at flares to convert it to the less toxic sulfur dioxide (SO_2)

Where H_2S is present at concentrations above 100 ppm, oil and gas operators are required to comply with regulations found in Onshore Oil and Gas Order Number 6, Hydrogen Sulfide Operations. The Order is applicable to all onshore federal and Indian (except Osage Tribe) oil and gas leases when drilling, completing, testing, reworking, producing, injecting, gathering, storing, or treating operations are being conducted in zones that are known or could reasonably be expected to contain H_2S, or which, when flared, could produce SO_2 in such concentrations that could constitute a hazard to human life.

West Nile Virus

West Nile Virus is predominantly a mosquito-borne virus that can cause a potentially serious or fatal infection in humans, some species of birds and in some animals. Mosquitoes spread West Nile Virus after they feed on infected birds and then bite people, other birds, and animals. West Nile Virus is not spread by contact with infected humans or birds.

People with a mild infection, called West Nile fever, may experience a wide range of symptoms, including those similar to a minor flu with fever, headache, skin rash, body aches, fatigue, and swollen lymph glands. Some people may experience nausea and vomiting. A more serious version of West Nile (neuroinvasive disease, meningitis, or poliomyelitis) can cause high fever, headache, neck stiffness, disorientation, coma, tremors, convulsions, paralysis, or respiratory paralysis. People who have mild infections of West Nile fever generally recover after about 30 days. The more serious forms of West Nile Virus can result in significant long-term illness, serious brain damage, or even death.

In 2006, of the 65 cases detected in Wyoming statewide, 45 were in Fremont County. The next highest number of detected cases was three in Big Horn County. In 2007, the situation was worse: Wyoming as a whole reported 185 human cases of West Nile Virus. Of these, 118 were in Fremont County. In comparison, Campbell County had 18 cases; Sheridan and Goshen both had nine cases (Wyoming Department of Health www.badskeeter.com).

As a mosquito-borne disease, West Nile Virus is promoted by standing or stagnant water, which provides a breeding ground for mosquitoes. There is no irrigation on lands administered by the Lander Field Office and there are only a few water ditches. However, water developments associated with range or with oil and gas development need to be evaluated for their contribution to the spread of West Nile Virus.

Formerly Used Defense Sites

There are two formerly used defense sites (FUDS) in the planning area: a very small site near the Wyoming National Guard and a larger site in the southwest corner of the planning area near Split Rock (Map 64). This area was used as a target site by the army and air force in the 1940s and 1950s, and .50 BMG caliber bullet casings and 20 mm clips have been recovered .

Although there is no documented recovery of unexploded ordnance from these areas, that possibility exists because of the earlier target practice. Other BLM field offices have NSO limitations for identified FUDS but the absence of discovery of explosive material in Lander has supported the current RMP plan, which does not have special surface management for FUDS. If unexploded ordinance were to be discovered (more likely as the remote parts of the planning area are more readily accessed with motorized OHVs), it would be necessary to reconsider management requirements and the use of NSO restrictions to preserve health and safety.

Nationally, some FUDS are determined to be dangerous to health and safety because of the toxic materials associated with range uses, separate from unexploded ordnance. The FUDS in the planning area have not been identified as requiring cleanup for that reason but the possibility may arise in the future if toxic materials are found. No inventory of the planning area's two FUDS has been undertaken by the U.S. Army Corps of Engineers, the agency responsible for carrying out the FUDS program.

Natural Geological Hazards

Earthquakes

Seismic activity in the Greater Yellowstone area has been documented as having occurred throughout geologic history. While most of the planning area is in a moderate earthquake zone the likelihood of seismic activity increases with proximity to the Tetons. Earthquakes of varying severity have been recorded d have ranged between 5.0 and 5.9 on the Richter scale.

(While the Richter scale may be somewhat obsolete in scientific analysis, it is widely understood by the public and is offered to illustrate the generally widespread incidences of seismic activity.)

Fault lines have been identified in the area, particularly in the southeastern corner and along the Wind River fault. In Wyoming, existence of a fault line is a predictor for the existence of developable oil and gas. See further details in the Leasable Minerals - Oil and Gas section. There is no identified need for special construction or development requirements as a result of the existence of fault lines. In the mostly rural planning area, there is no currently identified need to consider the potential for future seismic activity in land use planning.

Rockslides

There is a potential for dangerous rockslides (Map 65). Factors contributing to the potential for rock slides are rock type and steepness. This potential has been identified in isolated areas along Beaver Rim and Green Mountain, for example. The highest potential for rockslides is in the Dubois area. Any proposal that involves excavation, road building, or recreation improvements in these areas, particularly Dubois, will need to consider the potential of the project to trigger rock slides and also the vulnerability of the project to random rock slides.

2.8.4 Environmental Justice

2.8.4.1 Resource Characterization

Environmental justice pertains to the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socio-economic groups, should bear a disproportionate share of the adverse environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and Tribal programs and policies (BLM 2005a).

The BLM does not manage environmental justice resources; rather, it manages public lands and the resources and uses that occur on them. However, the BLM does incorporate environmental justice into its planning process both as part of the environmental analysis and in making sure minority and low-income populations have a meaningful role in the decision-making process.

In considering environmental justice, it is important to recognize that both local residents and transitory low-income and minority populations may be users of public lands. BLM does not have data for non-area users of the public land identified as low-income and minority population.

For example, he Outdoor Recreation Survey data (Table 2-55) is not broken down by ethnicity or income. Because of the lack of good data concerning low-income and minority populations from resident outside of the planning area, this section focuses on residential demographics since these are the data available in the profiles that comprise the AMS.

Instructional Memorandum [IM] 2002-164 defines minority persons as "Black/African American, Hispanic, Asian and Pacific Islander, American Indian, Eskimo, Aleut, and other nonwhite persons." Furthermore, IM 2002-164 indicates that an area should be considered to contain a minority population where either the minority population of the affected area exceeds 50 percent, or the percentage of minority population in the affected area is meaningfully greater than the percentage in the general population.

Table 2-74 shows the percent of minority and low-income populations in the four counties in the planning area, compared to the United States and Wyoming. The majority of the population in the planning area resides in Fremont County. As discussed above, Fremont County's median per capita income is below Wyoming's and the nation as a whole (Figure 2-14) with trend showing an increasing disparity.

The economic data for the WRIR influence the data for Fremont County as a whole. Unemployment is far higher on the Reservation as is the poverty levels (Table 2-74).

The Council on Environmental Quality (CEQ) guidance for environmental justice analysis under NEPA defines a "low-income population" as "either a group of individuals living in geographic proximity to one another, or a set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions of environmental exposure or effect" (CEQ 1997).

Although CEQ guidance does not provide a quantitative threshold (e.g., a limit on the percent of persons in poverty) for determining whether a population should be considered a low -income population, typically the percent of persons in poverty in the study area is compared to that in a comparison area such as the state. Quantitative criteria for what constitutes a low-income population are not specified in the BLM, CEQ, or EPA guidance.

Table 2-74 shows the percent minority populations and populations in poverty by county in the planning area.

Table 2-74. Minority and Low Income Populations by County 1990-2000

County	Percent Minority Population in 2000	Percent Minority Population in 1990	Percent in Poverty in 2000	Percent in Poverty in 1990
Fremont	25%	27%	18%	13%
Hot Springs	5%	4%	11%	11%
Sweetwater	6%	5%	13%	9%
Natrona	8%	10%	12%	10%
Wind River Indian Reservaton*	34%	n/a**	21%	n/a**
Wyoming	11%	9%	11%	12%
United States	31%	24%	12%	13%

Sources: United States Census Bureau 2000; United States Census Bureau 1990

* The Census Bureau defines the WRIR as including the towns of Riverton, Shoshoni, Pavillion, and Hudson

** Date for 2008 for the WRIR are not available.

Consideration of economic justice is particularly important in the planning area because much of the high and medium potential for oil and gas is located either on the WRIR or in close proximity (Maps 10 and 11). In fact, the WRIR is the center part of the Wind River Oil and Gas Basin (Map 3) and many of the oil and gas fields are located near to the WRIR (Map 10).

The WRIR lies downstream of public lands in the north western and southern Wind River drainages (Map 7) and would be impacted by RMP decisions that affect water quality orquantity. A wide range of activities have the potential to impact the WRIR such as activities affecting air quality or which could impact the WRIR gaming industry and the livestock grazing operations.

The Affected Environment will look at impacts to minorities and low-income populations utilizing the subtracts of the WRIR to provide data more specific to those sections of the WRIR near reasonably foreseeable developments including poverty rates and minority status.

2.8.5 Tribal Treaty Rights

A treaty is a formal agreement between the government of the United States and a Native American Tribe or Tribes that cedes land or reserves rights to the tribe(s). Executive Order 13084, Consultation with Indian Tribal Governments, and Executive Order 13007, Indian Sacred Sites, provide the framework for involving Native American Tribes in the BLM planning process. Additional guidance is provided under BLM Manual 8120 (Tribal Consultation) (BLM 2002b).

Tribal roles and responsibilities are not well defined within the 1987 RMP. BLM land use plans must address the protection of any treaty rights. Wyoming's only reservation, the Wind River

Reservation, is located in Fremont County and is an integral part of the planning area. BLM works closely with the WRIR with regard to planning issues. Because of the fiduciary responsibilities the BLM holds for Tribal mineral rights, BLM is particularly cognizant of Tribal and Treaty obligations.

3.0 CURRENT MANAGEMENT

This chapter describes management direction from the existing RMP and amendments by program. This will later become the basis for the No Action Alternative, what management would likely be going forward without any change.

3.1 Relevant Resource Management Plans and Amendments

The decision on the Lander RMP is based on consideration of four planning issues (Grazing Management, Oil and Gas Leasing and Development, Landownership Adjustment, and Forest Management), the environmental impacts of the alternatives, public comments, and consultation with government agencies at the federal, state, and local levels. The attached plan represents the environmentally preferred alternative found in the RMP/Final EIS. All practicable means to avoid or minimize environmental damage are included.

The Lander RMP was adopted through a ROD in 1987. Subsequent Maintenance Actions have been taken but the Plan has not been amended. The Lander RMP was adopted through a ROD in 1987. Subsequent Maintenance Actions have been taken but the Plan has not been amended. The RMP did include the provisions of the Standards for healthy Rangelands and Guidelines for Livestock Grazing Management (BLM, 1997), the programmatic Wind Energy ROD, the programmatic Geothermal ROD, and the programmatic Westwide Transportation Corridor ROD.

The actions listed in each resource area will be tracked to determine if the objectives of the RMP are being met and also to evaluate the effectiveness of the plan determinations and related management prescriptions. If the evaluation indicates that the RMP is not working as expected or the situation in the resource area has changed, it may be necessary to amend or revise the RMP.

3.2 Management Decisions

Management decisions for resources in the planning area are provided in the table below. Each management decision has been assigned a planning decision number. These numbers carry over into Chapter 4, which allows for comparison between the current decisions in this Chapter and the analysis of management opportunities. A discussion of the status of each decision is also included. If a decision references a table, figure, or appendix, it is referencing the original document from which the decision was pulled.

3.2.1 Physical Resources

Table 3-1. Air Quality: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
A-1	Lander RMP, Clean Air Act	No current objectives or decisions on air quality are included in the RMP. BLM complies on a project-by-project basis with Federal air quality laws and regulations.		Implemented on all actions, addressed on a case-by-case basis.
A-2	Lander RMP, Clean Air Act, WY Fire Regulations	All BLM-initiated or authorized actions, such as the use of prescribed fire, avoids violation of Wyoming and national air quality standards. This is accomplished through the coordination of BLM-managed activities with the Wyoming DEQ and the EPA.		Implemented on all actions, addressed on a case-by-case basis.
A-3		Air quality standards are monitored by the Wyoming DEQ. Air quality permits will be obtained from Wyoming DEQ before prescribed fires are set on public land. Smoke and pollution will be minimized as described in the Smoke Management Guidebook (BLM 1985).		Implemented on all actions, addressed on a case-by-case basis.
A-4		The Lander Field Office will coordinate with the Wyoming DEQ and the EPA on developing air quality standards and guidelines as needed.		Implemented on all actions, addressed on a case-by-case basis.

Table 3-2. Geologic Resources: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Geo 1		No current objectives or decisions for geologic resources are included in the RMP except to the extent that they are addressed in ACECs, such as Red Canyon and Beaver Creek.		Implemented.

Table 3-3. Soil Resources: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Soil-1		No current objectives or decisions for soils are included in the RMP except to the extent that these are addressed in ACECs or WSAs. The EIS considered soils as part of the existing environment.		Ongoing.
Soil-2		BLM Guidance ("Standard Lease Surface Disturbance Stipulations") limits some types of soil disturbance. Disturbance on slopes in excess of 25 percent. Construction during periods when the soil material is saturated, frozen, or when watershed damage is likely to occur.		Ongoing.
Soil-3		On a case-by-case basis, soil resources are addressed in other resources and uses, such as water quality, surface disturbance, and rangeland health.		Ongoing; vegetation and soil reclamation is addressed under vegetation resources. Current management has not been adequate to achieve adequate soil stabilization or to reestablish vegetation as habitat.
Soil-4		Improving soil condition is a management objective; enhancement opportunities should not be overlooked. Soil erosion monitoring will be conducted as necessary to track the effectiveness of management.		Ongoing.

Table 3-4. Water Resources: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Water-1		No objectives or decisions on water resource management are included in the RMP. Water quality is addressed in other programs, such as livestock grazing and mineral resources. The SHR, including the protection of water and riparian resources, are part of every management action.		Ongoing.
Water-2		PFC is considered in all management actions.		Ongoing.
Water-3		Surface-disturbing activities are prohibited within 500 feet of surface water and/or riparian areas, except when such activities are necessary and when their impacts can be mitigated or avoided.		Ongoing.
Water-4		See Appendix XX and other management decisions in this RMP for other restrictions on surface-disturbing activities that apply to watershed protection.		Ongoing.
Water-5		To protect watershed values, roads and trails will be closed and reclaimed if they are heavily eroded or washed out, or if roads in better condition are available. These management actions are addressed under other programs, such as travel management.		Ongoing.
Water-6		To protect watershed values, vehicular travel is prohibited on wet soils and on slopes greater than 25 percent, when and where unnecessary damage to vegetation, soils, or water quality would result.		Ongoing.
Water-7		In accordance with the 2008 Statewide Water Quality Management Plan for Wyoming, the BLM will cooperate with Wyoming DEQ and EPA in the application of watershed conservation practices and State of Wyoming BMPs to reduce sediment-caused water pollution.		Ongoing.
Water-8		To reduce the amount of nonpoint pollution entering waterways, pollution prevention plans will be developed for actions that qualify under the "Wyoming Storm Water Discharge Program."		Ongoing.
Water-9		Riparian area condition will be monitored and evaluated as part of site-specific rangeland health parts of HMP. Management of riparian areas that are not properly functioning will emphasize strategies identified in BLM technical references TR 1737-4 and TR 1737-6.		Ongoing.
Water-10		To protect water quality, fire retardant drops by air tankers are prohibited within 200 feet of water.		Ongoing.

Table 3-4. Water Resources: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Water-11		Produced water will be disposed of in accordance with Onshore Oil and Gas Order No. 7.		Ongoing.
Water-12		The BLM may acquire mineral exploratory wells and drill holes that produce water. These acquired wells will be developed for multiple use purposes if they meet the criteria listed in Appendix I for water well conversion.		Ongoing. The Lander Field Office has not entertained applications for the conversion of old mineral wells to water wells for quite some time due to water quality and liability reasons.
Water-13		BLM is a signatory to the Wyoming Governor's Drought Plan of 2003. This plan is directed at raising drought awareness, prediction, monitoring, and contingency planning.		Not implemented.

Table 3-5. Cave and Karst Resources: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
C&K-1		No current objectives or decisions on cave and karst resources are included in the RMP. This resource is not addressed in the RMP and no inventory for cave and karst resources has been conducted.		Not implemented.
C&K-2		Other important caves or cave passages identified in the future will be protected.		N/A
C&K-3		AML projects will be wildlife (bat) friendly.		Implemented.

3.2.2 Mineral and Energy Resources

Table 3-6. Locatable: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Loc-1		All federal lands within the resource area will be open to locatable mineral exploration and development unless specifically withdrawn or segregated from appropriation under the mining laws (see map 2). At the present time, approximately 1 percent of the federal mineral estate within the resource area is closed to locatable mineral exploration and development.		Ongoing.
Loc-2	Green Mountain	The entire Green Mountain area will be open for locatable mineral exploration and development. Maintain opportunities for exploration and development of locatable mineral resources.		Ongoing.
Loc-3	Green Mountain	Locatable mineral exploration and development activities on Green Mountain which could cause unacceptably high adverse impacts to other significant resource values are restricted. 120 acres surrounding BLM and county campgrounds and picnic sites on Green Mountain are closed to locatable mineral exploration and development.		Ongoing.
Loc-4	Green Mountain	A Plan of Operations is required for all locatable mineral exploration and development within 350 feet of Sparhawk Cabin.		Ongoing.
Loc-5	Green Mountain	Crucial elk winter range is designated an ACEC.		Ongoing.
Loc-6	Beaver Creek	The entire Beaver Creek area is open for locatable mineral exploration and development. Opportunities for exploration and development of locatable mineral resources are maintained.		Ongoing.
Loc-7	Beaver Creek	Locatable mineral exploration and development in the Beaver Creek area where activities could cause unacceptably high adverse impacts to other significant resource values are restricted.		Ongoing.
Loc-8	Beaver Creek	The 1,710 acres surrounding Split Rock Landmark, Rocky Ridge, the Split Rock Interpretive Site, the Aspen Grove Site and an additional 280 acres proposed for withdrawal around Rocky Ridge are closed to locatable mineral exploration and development.		Not implemented. If this is withdrawn (pending or otherwise), suggest saying so. “Closed” does not mean anything.

Table 3-6. Locatable: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Loc-9	Beaver Creek	A Plan of Operations is required for all locatable mineral exploration and development within 1/8 mile of the Gilespie Place Historic Site and Willies Handcart Site, Beaver Rim, and Ice Slough.		Not implemented.
Loc-??	Beaver Creek	Require a Plan of Operations for all locatable mineral exploration and developments along Oregon/Mormon Pioneer Trails corridor.		Implemented.
Loc-10	Lander Slope	The Lander Slope area is designated an ACEC. The entire management unit (MU) is open to locatable mineral exploration and development. A Plan of Operations is required for all locatable mineral exploration and development within areas of highly steep slopes and important wildlife habitat within the Lander Slope.		Implemented.
Loc-11	Red Canyon	The Red Canyon ACEC is open to locatable mineral exploration and development. A Plan of Operations for all locatable mineral exploration and development operations within the highly visible steep slopes and areas with important wildlife habitat is required.		Implemented.
Loc-12	South Pass	The South Pass area is open for locatable minerals exploration and development. There are 1,727 acres which will continue to be segregated from appropriation under the mining laws. The majority of the management unit is a designated ACEC, and a Plan of Operations is required for locatable mineral exploration and development.		Ongoing.
Loc-13	Gas Hills	The Gas Hills management area is open to locatable mineral exploration and development and management should maximize opportunities for the exploration and development of locatable mineral resources. Few restrictions on locatable mineral exploration and development are placed and only in those areas where these activities could cause significant adverse impacts on other resources.		
Loc-14	Gas Hills	80 acres around Castle Gardens will be segregated from appropriation under mining laws.		Ongoing.
Loc-15	Gas Hills	830 acres are withdrawn around Devil's Gate landmark, Devil's Gate Interpretive Site, and fragile lands along the Oregon/Mormon Pioneer Trail.		
Loc-16	Gas Hills	680 acres around Martin's Cove NRHP site are proposed for withdrawal from appropriations.		
Loc-17	Gas Hills	Require a Plan of Operations for all locatable mineral exploration and developments along Oregon/Mormon Pioneer Trails corridor.		Implemented.

Table 3-6. Locatable: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Loc-18	Gas Hills	Designate ACECs for significant sites and segments along Oregon/Mormon Pioneer Trails.		Implemented.
Loc-19	East Fork	Close approximately 13,855 acres to locatable mineral exploration and development for the East Fork ACEC. Withdraw approximately 10,423 acres of mineral estate from mining laws for implementation of USFWS/WGFD/BLM plan for elk crucial winter range. 3,432 acres have been withdrawn under mining laws and made available for elk crucial winter range.		Implemented.
Loc-20	Dubois Badlands	The entire Dubois Badlands area is open for exploration and development. A Plan of Operations for all locatable mineral exploration and development for the area within Dubois Badlands WSA is required.		Implemented.
Loc-21	Whiskey Mountain	Whiskey Mountain Bighorn Sheep Winter Range is closed to locatable mineral exploration and development. The entire 6,630 acres of federal mineral estate in the Whiskey Mountain ACEC will be withdrawn from appropriation.	See ACEC-9	Implemented
Loc-22	Dubois	The entire Dubois management area will be open for locatable mineral exploration and development except for 190 acres in Warm Springs Canyon, which will be withdrawn from appropriation.		Withdrawal not implemented.

Table 3-7. Leasable Coal: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Coal-1		The coal screening process (as identified by 43 CFR 3420.1-4) has not been conducted in the planning area, and coal leasing has not been analyzed. If an application for a coal lease should be received in the future, an appropriate land use and environmental analysis, including the coal screening process, will be conducted to determine whether or not the coal areas applied for are acceptable for development and for leasing (43 CFR 3425). The RMP will be amended as necessary.		N/A

1

Table 3-8. Leasable Geothermal: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Thermal-1		Although Geothermal resources were not analyzed in the RMP, and the RMP does not contain any provisions for geothermal leasing, the Programmatic Geothermal ROD amended the RMP. It did not identify any high potential in the planning area, which was confirmed in the Geothermal RFD. Consequently, geothermal energy development will not be analyzed in detail. If an application for a geothermal lease is received, an appropriate land use analysis and RMP amendment would be required.		N/A

2

Table 3-9. Leasable Oil and Gas: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
O&G-1		Public lands will be made available for oil and gas leasing and development to the maximum extent possible, while giving due consideration to the protection of other significant resource values. The potential for the occurrence of oil and gas and the significance and sensitivity of other resource values present in the resource area were used as management tools to aid in the determination of detailed management prescriptions for each MU.		Implemented

Table 3-9. Leasable Oil and Gas: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
O&G-2		Less than 1 percent of the slightly more than 2.7 million acres of federal mineral estate within the planning area are closed to leasing (see Map XX). All but approximately 12,000 acres of the open acreage will be managed under a management prescription that will allow for enhanced management of the oil and gas resources by being less restrictive of oil and gas development related to other surface resource values in known geologic structures and areas rated as having a high potential for the occurrence of oil and gas. This would be accomplished over the life of this plan as analyses are done to determine where the restrictions can be modified and still avoid significant impacts to other resources. In addition, as new information on the potential occurrence of oil and gas in any given area is obtained or new discoveries of oil and gas reserves are made, the potential rating for the area will be revised to reflect the new data. New leases issued in these areas will be issued under the management prescription for that new rating.		Status?

Table 3-9. Leasable Oil and Gas: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
O&G-3		Oil and gas leases issued within the resource area will be conditioned with stipulations to protect other important resource values. These restrictions will provide needed protection to other resources and at the same time allow for as much opportunity as possible to explore for and develop the oil and gas reserves within the resource area.		Implemented.
O&G-4		Geophysical activities associated with oil and gas exploration will generally be restricted in the same manner as other oil and gas exploration and development activities. Geophysical activities don't necessarily have the same impacts on surface resources as do other oil and gas exploration activities, but because of the wide variety of methods and the even wider variety of impacts associated with them, it will be impossible to predict all possible combinations of methods and resources potentially impacted and to develop a management prescription that will be detailed enough to cover all possibilities. If a particular method of geophysical exploration could be conducted within the constraints necessary to protect other resources, it would be allowed.		Ongoing.
O&G-5	Green Mountain	The entire Green Mountain area is open for oil and gas leasing with maximum management flexibility; enhanced management of surface resources is allowed while providing opportunities for exploration and development of the oil and gas reserves. New leases in high-potential areas will be conditioned with NSO and seasonal restrictions only when necessary to avoid significant adverse impact(s) to other resources. Lease restrictions may be waived if the lessee demonstrates that adverse impacts to other resources could be acceptably mitigated. NSO restrictions in areas of low and moderate potential are applied with seasonal closures to protect wildlife and soils.		Ongoing.
O&G-6	Beaver Creek	The entire Beaver Creek area is open for oil and gas leasing with maximum management flexibility; enhanced management of surface resources is allowed while providing opportunities for exploration and development of the oil and gas reserves. New leases in high-potential areas will be conditioned with NSO and seasonal restrictions only when necessary to avoid significant adverse impact(s) to other resources. Lease restrictions may be waived if the lessee demonstrates that adverse impacts to other resources could be acceptably mitigated. NSO restrictions in areas of low and moderate potential will be applied with seasonal closures to protect wildlife and soils.		Ongoing.

Table 3-9. Leasable Oil and Gas: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
O&G-7	Lander Slope	The Lander Slope is open to oil and gas leasing, but the majority of the area will have restrictions, including NSO and seasonal restriction to protect crucial wildlife habitat areas, to protect other resources when necessary. The entire unit has been determined to have low oil and gas potential. Sensitive visual resources, crucial wildlife habitats, and fragile areas are protected while allowing exploration and development of oil and gas resources in area.		Ongoing.
O&G-8	Red Canyon	The Red Canyon is open to oil and gas leasing with restrictions; new oil and gas leases will include NSO where necessary and seasonal restrictions to protect sensitive visual resources, crucial wildlife habitats, fragile areas, and the Red Canyon National Natural Landmark (NNL), while providing for opportunities to explore and develop oil and gas resources. The Red Canyon has been determined to have low oil and gas potential.		Ongoing.
O&G-9	South Pass	The South Pass area is open to oil and gas leasing with restrictions. New leases will include NSO restriction and wildlife seasonal closures when necessary.		Ongoing.
O&G-10	South Pass	The South Pass NRHP Mining District boundary will be redefined to exclude all areas devoid of significant historical resources after completion of historical resource inventories. Historical resources in the proposed NRHP District are protected.		Not implemented.
O&G-11	Gas Hills	The entire Gas Hills area is open for oil and gas leasing with maximum management flexibility; enhanced management of surface resources is allowed while providing opportunities for exploration and development of the oil and gas reserves. New leases in high-potential areas will be conditioned with NSO and seasonal restrictions only when necessary to avoid significant adverse impact(s) to other resources. Lease restrictions may be waived if lessee demonstrates that adverse impacts to other resources could be acceptably mitigated. NSO restrictions in areas of low and moderate potential are applied with seasonal closures to protect wildlife and soils.		Implemented.
O&G-12	East Fork	The entire East Fork area is designated as a no-lease area.		Implemented.
O&G-13	Dubois Badlands	The Dubois Badlands management area is open to oil and gas leasing with restrictions to protect significant surface resource values including natural and visual characteristics of Dubois Badlands, crucial wildlife habitats, and fragile areas. All new oil and gas leases have NSO stipulations. Exploration activities are seasonally restricted in important wildlife habitat areas.		Implemented.

Table 3-9. Leasable Oil and Gas: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
O&G-14	Whiskey Mountain	6,630 acres on Whiskey Mountain are closed to oil and gas leasing unless drainage of reserves occurs on adjacent private or state lands. If leasing occurs, then they will include NSO stipulations with no exceptions to NSO restriction. Leasing must be consistent with cooperative management efforts.		Implemented.
O&G-15	Dubois	The entire Dubois management area is open for oil and gas leasing with maximum management flexibility; enhanced management of surface resources is allowed while providing opportunities for exploration and development of the oil and gas reserves. New leases in high-potential areas will be conditioned with NSO and seasonal restrictions only when necessary to avoid significant adverse impact(s) on other resources. Lease restrictions may be waived if lessee demonstrates that adverse impacts to other resources could be acceptably mitigated. NSO restrictions in areas of low and moderate potential are applied with seasonal closures to protect wildlife and soils.		Implemented.

Table 3-10. Leasable Other Solids: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Lease-other-1	Other lease-1	Surface-disturbing activities associated with all types of minerals and geophysical exploration and development and are subject to application of the Wyoming BLM Standard Mitigation Guidelines for Surface-Disturbing Activities.		Implemented.

Table 3-10. Leasable Other Solids: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Lease-other-2	Beaver Creek	The Beaver Creek area is open for exploration and development of phosphate reserves subject to minor constraints. All exploration permits and leases issued within the unit will include NSO stipulations when necessary to protect water quality, fisheries, riparian area, sage grouse leks, steep slopes, T&E species, important scenic areas, and significant cultural sites. In addition, seasonal restrictions will be applied to prospecting and exploration as needed to protect crucial wildlife habitat areas.		Implemented.
Lease-other-3	Lander Slope	Phosphate prospecting, exploration, and leasing are allowed on the Lander Slope subject to major constraints.. Phosphate activities on the Lander Slope are restricted to prevent significant adverse impacts to scenic values and important wildlife habitat. In some cases, these restrictions may impede or prevent the economic recovery of the phosphate.		Implemented.
Lease-other-4	Red Canyon	The NNL is closed to phosphate leasing and the crucial elk winter range is open to phosphate prospecting and leasing with major constraints. The phosphate resources within the unit have low development potential.		Implemented.

Table 3-11. Mineral Materials (Salables): Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Salable-1		Exploration and development of other minerals, such as sand and gravel, building stone, and other common-variety mineral materials will be provided on a demand basis and in consistency with the limitations and restrictions imposed on oil and gas, locatable minerals, and phosphate exploration and development within the resource area.		Implemented.
Salable-2		Sales and extraction of mineral materials from existing mineral sites will be allowed. Establishment of new mineral sites will be evaluated individually.		Implemented.

3.2.3 Fire and Fuels Management

Table 3-12. Unplanned/Wildland Fire: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Fire-1		All wildland fire actions will comply with the 2001 Federal Wildland Fire Management Policy (Update of 1995 Federal Fire Policy) and the 2003 Interagency Strategy for the Implementation of Federal Wildland Fire Management Policy as guiding principles and policy in the Northern Wyoming Fire Zone.		Implemented.
Fire-2		A FMP (FMP 2004 update) is on record to identify fire suppression strategies within all FMUs within the planning area. The FMP contains criteria for protecting high resource values, such as significant cultural resources, crucial winter range for big game, high priority watersheds, and WUI areas. The FMP also identifies resources that would benefit or be enhanced by wildfire. The FMP includes operational aspects of implementing suppression strategies. A wildland fire situation analysis will be conducted whenever the fire escapes initial attack to establish objectives and constraints for the management of the fire. A Wildland Fire Implementation Plan will be completed when a fire is determined to be a Wildland Fire Use candidate fire.		Implemented.
Fire-3		Firefighter and public safety is the highest priority in every fire management activity.		Implemented.
Fire-4		Fire suppression efforts are concentrated in areas containing high resource and/or human values and in areas with intermingled landownership patterns.		Implemented.
Fire-5		The Northern Wyoming Fire Zone provides for an AMR on all wildland fires occurring in the Lander planning area. Responses include full to limited suppression, monitoring, and/or wildland fire use. Responses to each wildland fire will be initiated in a timely manner and will be based upon established fire management direction as documented in the Northern Wyoming Zone FMP, which is tiered onto this RMP. The use of AMR will allow land managers to tailor preplanned wildland fire responses to meet objectives established in this RMP and associated implementation plans.		Implemented.
Fire-6	Green Mountain FMU	Limited use of bulldozers and graders on wildfires, and use Minimum Impact Suppression Tactics when possible.		Implemented.

1

Table 3-12. Unplanned/Wildland Fire: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Fire-7	ALL FMU's	Fire suppression personnel will avoid aerial or ground application of fire chemicals within 300 feet of waterways and will avoid dipping from rivers or lakes with a helicopter bucket containing residual fire chemicals. An adjacent reload site will be established, and fire chemicals will be managed with portable tanks. Deviation from these limits is allowed when life or property is threatened and the use of fire chemicals can be reasonably expected to alleviate the threat.		Implemented.
Fire 7.5	ALL FMU's	Where aquatic T&E species or their habitats are potentially affected by aerial application of retardant or foam, the following additional procedures apply: • As soon as practical, determine whether the aerial application has caused any adverse effect on the T&E species or their habitat. • When aerial application of fire chemicals within 300 feet of a waterway have been applied, the unit administrator will determine whether there have been any adverse effects to the T&E species. • If an adverse effect is determined, the agency must consult with the USFWS.		Implemented.
Fire-8		The Lander planning area (which is part of the Southern Wyoming Fire Zone) will conduct all wildland fire actions in compliance with the 2001 Federal Wildland Fire Management Policy (2001 Federal Fire Policy).		Implemented.
Fire-9	Green Mountain	Full suppression of fires on Green Mountain will be employed as quickly as possible with as little surface disturbance as possible, with limited or restricted use of heavy equipment, and with an aggressive initial attack. Prescribed fire will be utilized to enhance range and wildlife habitat.		Implemented.
Fire-10	Sweetwater Valley FMU	Within the Sweetwater Valley FMU, AMR would most likely result in full suppression of fires with limited use of bulldozers and graders on wildfires. Use Minimum Impact Suppression Tactics when possible.		Implemented.
Fire -12	Lander Slope, FMU	Within the Lander Slope FMU, AMR would most likely result in full suppression of fires with limited use of bulldozers and graders on wildfires. Use Minimum Impact Suppression Tactics when possible.		Implemented.
Fire-12.5	East Fork Dubois FMU	Within the Dubois FMU, AMR would most likely result in full suppression of fires with limited use of bulldozers and graders on wildfires. Use Minimum Impact Suppression Tactics when possible.		Implemented.
Fire -13	Gas Hills	Fire management in the Gas Hills area will protect private and state lands. Management is designed to reduce suppression costs and environmental damage due to heavy equipment in limited suppression areas.		Implemented.

Table 3-12. Unplanned/Wildland Fire: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Fire-14	Gas Hills	Gas Hills: Zone 1: Full suppression with limited use of heavy equipment. Zone 2: Limited suppression. Zone 3: Full suppression with limited use of heavy equipment. No heavy equipment is used in Sweetwater Rocks Area.		Implemented.
Fire-15		Wildland fire and fuels practices are managed to promote, maintain, and enhance resources. Wildland fire is allowed to function in its ecological role when appropriate for the site and situation, while providing for firefighter and public safety as well as local communities and economic interests.		Status?

Table 3-13. Planned/Prescribed Fire: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Fire-16		As appropriate, prescribed burns and non-fire tools, such as mechanical and chemical treatments, will be used achieve a number of fuels management goals, such as improvements to wildlife habitats, hazardous fuels reduction, and overall ecological health. All vegetation treatment methods will be used to achieve management objectives such as those for AMPs and HMPs. Due to potential erosion problems on steep slopes, fire management decisions state “Full suppression with limited or restricted use of heavy equipment” will be utilized during fires.” Prescribed burns will also be utilized. There is nothing about “mechanical and chemical treatments” in the ROD.		Implemented with coordinated rangeland mowing with Sweetwater Valley FMU to benefit wildlife habitat and increase herbaceous production.

Table 3-13. Planned/Prescribed Fire: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Fire-18		All fire and non-fire vegetation management proposals will be considered on a case-by-case basis to ensure environmental integrity and consistency with the multiple resource objectives and activity plans.		Implemented.
Fire-19		Prescribed burn planning will include obtaining proper smoke permits from the Wyoming DEQ in compliance with the Wyoming Ambient Air Quality Standards.		Implemented.
Fire-20	All	Fuels management treatments within the WUI are the highest planned/prescribed fire priority for implementation with the planning area.		Implemented.

Table 3-14. Stabilization and Rehabilitation: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Fire-21		Reclamation and soil stabilization practices are applied to burned areas on a case-by-case basis. Additionally, livestock grazing will be controlled on burned areas on a case-by-case basis through the use of such methods as fencing or resting from livestock grazing.		Status?

3.2.4 Biological Resources

Table 3-15. Vegetation – Forests, Woodlands, and Forest Products: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Forest-1		No current objectives or decisions on forest/woodland habitat are in the RMP. The resource was not addressed in the current RMP as an independent resource, but was included as part of the existing environment in the EIS.		
Forest-2		Hand cutting and mechanical methods are used to reduce the extent and density of juniper and limber pine woodlands. Where appropriate, use prescribed burning to reduce the density of juniper and limber pine in sagebrush steppe and mountain shrub habitat.		Continue work on limber pine woodlands within the Green Mountain, Copper Mountain, Lander Slope and Twin Creek areas to remove diseased and dying trees with goal of improving woodland health, maintaining sagebrush steppe habitat and reducing hazardous fuels.
Forest-3		Identify and preserve old-growth stands of juniper and limber pine.		Not implemented.
Forest-4	Dubois	Small timber sales are offered in Dubois on a demand basis to improve the timber conditions on small areas by regenerating harvested areas.		Implemented.
Forest-5	South Pass	Small timber sales in South Pass are offered where appropriate to help maintain wildlife cover and to protect watersheds. Timber cuts are limited to harvesting dead and dying trees to improve stand regeneration.		Implemented.
Forest-6	South Pass	In the South Pass area, harvest aspen stands in clear cuts or use prescribed fire to remove competing conifers; use woven wire fencing or brush to protect regenerating stands until aspen are 6 to 8 feet tall. Use artificial regeneration if natural regeneration is not successful.		Not implemented due to lack of demand and BLM personnel to implement. Updated forest stand inventory needed.
Forest -7	Lander Slope	Sales of up to 10 million board feet (MMBF) are available on the Lander Slope, followed by no activity for 10 years during which logging roads are closed. Irregularly shaped clear cuts of up to 25 acres are available, with only partial cutting allowed within 100 feet of perennial streams.		Not implemented due to lack of demand.

Table 3-15. Vegetation – Forest, Woodlands, and Forest Products: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Forest-8	Lander Slope	No harvesting with conventional logging equipment is allowed in the Lander Slope area on slopes greater than 45 percent. A ratio of 40-60 percent cover to forest ratio is maintained for optimum elk habitat. Piling and burning of unusable debris is required to prepare harvested sites for regeneration. Artificial regeneration is used if natural regeneration is unsuccessful.		Partially implemented, though lack of BLM forestry personnel as well as lack of local and regional demand for timber sales.
Forest-9	Green Mountain	200 MMBF of saw timber products is authorized on Green Mountain. 0.5 MMBF is authorized for minor forest products. Green Mountain is managed on a 17 compartment basis and rotated every 5-6 years.		Not fully implemented due to lack of local and regional demand for timber sales. Minor forest product sales are active on Green Mountain.
Forest-10	Green Mountain	Prescribed burning or other techniques are utilized on Green Mountain following sale. Each adjacent compartment is segregated in time to aid forest progression to move to an uneven-aged condition. A 40-60 percent cover to forage ratio is maintained within each compartment.		Not fully implemented as intended in the management decision due to lack of local and regional demand for timber sales. Implemented on a forest health treatment basis, but not specifically according to compartment management.
Forest-11	Green Mountain	Clearcut blocks up to 25 acres with irregular shapes to achieve an edge effect are used on Green Mountain. There are no clearcuts within 100 feet of perennial streams. Conventional logging equipment is not allowed on slopes greater than 45 percent.		Not implemented due to lack of local and regional demand for timber sales.
Forest-12	Green Mountain	On Green Mountain, clear cut aspen stands or use prescribed fire to remove competing conifers. Use woven wire fencing or brush to protect regenerating stands until aspen are 6–8 feet tall. Use artificial regeneration if natural is not successful.		Currently being successfully implemented.
Forest-13	Green Mountain	Piling and burning of unusable debris is required on Green Mountain to prepare harvested sites for regeneration. Artificial regeneration is used if natural regeneration is unsuccessful. Pre-commercial or commercial thinning in younger stands are considered as required.		Currently being implemented on a forest health basis.
Forest-14	Red Canyon	Utilize timber sales and prescribed burning in Red Canyon to improve wildlife habitat.		Not implemented due to lack of local and regional demand for timber sales and lack of BLM forestry personnel. Updated forest stand inventory needed.

Table 3-15. Vegetation – Forest, Woodlands, and Forest Products: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Forest-15	Red Canyon	Aspen woodlands in Red Canyon are managed to create healthy wildlife habitat and alter landscape-level wildfire behavior. Harvest aspens in partial or clearcuts up to 5 acres. Conifer stand harvesting is limited to partial cutting to remove dead and dying trees.		Not implemented due to lack of local and regional demand for timber sales and BLM forestry personnel. Updated forest stand inventory needed.
Forest-16	Red Canyon	Some artificial regeneration is employed in Red Canyon if natural regeneration is unsuccessful.		Ongoing.
Forest-17	South Pass	Timber sales are allowed in the South Pass area where appropriate to help maintain wildlife cover and to protect watersheds. Small timber sales are allowed to local cutters.		Ongoing.
Forest-18	South Pass	Aspen woodlands are managed in the South Pass area to create healthy wildlife habitat and to alter landscape-level wildfire behavior. Harvest aspens in partial or clearcuts up to 5 acres. Conifer stand harvesting is limited to partial cutting to remove dead and dying trees.		Not implemented. Not implemented due to lack of local and regional demand for timber sales and lack of BLM forestry personnel. Updated forest stand inventory needed.
Forest-19	South Pass	Some artificial regeneration is employed in the South Pass area if natural regeneration is unsuccessful.		Not implemented.
Forest-20		Surface-disturbing and disruptive activities associated with all types of forest management will be subject to appropriate mitigation developed through use of the mitigation guidelines.		Implemented.

Table 3-16. Vegetation – Grassland and Shrubland: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Grass-1		Vegetation is addressed in the RMP as a subpart of livestock grazing and by the SHR.		See livestock grazing management.

Table 3-17. Vegetation – Riparian/Wetland Resources: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Rip-1		Riparian areas are managed as part of livestock grazing. Standard 2 of the Wyoming SHR addresses riparian condition and improvement.		Ongoing
Rip-2		The condition of uncommon and important wildlife habitats are maintained or improved through vegetative manipulations or other habitat improvement projects, and application of the Wyoming BLM Standard Mitigation Guidelines for Surface-Disturbing Activities.		Ongoing.
Rip-3		Surface disturbing activities within 500 feet of surface water and/or riparian areas, aquatic habitats and 100 year floodplains are prohibited.		Ongoing.
Rip-4		Access (including 4-wheel drive, snowmobile, horseback, and pedestrian access) will be limited in areas of crucial habitats, sensitive species habitats and wetland/riparian habitat. The type of limitation will depend on the kind of resource value being protected.		Ongoing.
Rip-5		No new permanent facilities are permitted in floodplains, riparian areas, or wetlands, except to benefit watershed health or vegetation. Linear watercourse crossings are considered on a case-by-case basis.		Not fully implemented. Many areas still not in PFC.
Rip-6		Wetlands are managed to maintain and improve habitat through the implementation of changes in livestock grazing systems		Ongoing.
Rip-7		OHV and recreational use is managed to maintain and improve riparian/wetland habitat.		Ongoing.

Table 3-18. Invasive Species: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Weeds-1		Noxious weeds and other undesirable vegetation will be controlled in conjunction with local counties; the USDA, APHIS; and other agencies and affected interests, consistent with the Wyoming ROD for the Final EIS Addressing Vegetation Treatment on BLM Lands in the 13 Western States (BLM 1991).		Ongoing.

Table 3-18. Invasive Species: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Weed-2		Control of noxious weeds may include manual, mechanical, biological, or chemical methods. If herbicides are proposed for use, those that are effective on the target weed species and that have minimum toxicity to wildlife and fish, will be selected. As appropriate, buffer zones will be provided along streams, rivers, lakes, and riparian areas, including riparian areas along ephemeral and intermittent streams.		Ongoing.
Weed-3		Treatments will avoid raptor and upland game bird nesting seasons and other times when loss of cover or disturbance by equipment could be detrimental.		Ongoing.
Weed-4		Projects that may affect T&E plants or animals will be postponed or modified to protect the presence of these species. In such cases, the BLM will consult with the USFWS as required by the ESA.		Ongoing.
Weed-5		Consistent with the Decision Record for Implementation of Noxious Weed-Free Forage on Public Lands in the Worland District (BLM 1997), the use of certified noxious weed-seed free vegetative products is required on all BLM-administered public lands in the Grass Creek planning area.		Ongoing.

Table 3-19. Fish: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Fish-1	Green Mountain	Routine fish habitat improvement projects are developed and maintained in the Green Mountain area after appropriate review and where consistent with capabilities and priorities. Selected tree and shrub sites are manipulated to improve beaver, fisheries and other species habitat.		Ongoing.
Fish-2	Green Mountain	The Green Mountain area is a moderate priority area for development of aquatic (fisheries, beaver, riparian) HMP. The vigor of, expanding the size of, and reestablishing aspen/willow stands to stabilize forage and material base for beavers and dam complexes is prioritized.		HMP not completed due to decision to incorporate aquatic habitat objectives into AMPs. Projects are Ongoing.
Fish-3	Beaver Creek	Special management projects are undertaken in this area to improve fisheries and associated riparian drainages.		Ongoing.

1

Table 3-19. Fish: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Fish-4	Beaver Creek	Routine fish habitat improvement projects are developed and maintained in the Beaver Creek area after appropriate review and where consistent with capabilities and priorities.		Ongoing.
Fish-5	Lander Slope	Routine fish and wildlife habitat improvement projects are developed and maintained on the Lander Slope after appropriate review and where consistent with capabilities and priorities.		Ongoing.
Fish-6	Lander Slope	BLM will initiate prescribed burns and other practices to rehabilitate fisheries and riparian habitat on the Lander Slope.		Ongoing.
Fish-7	Red Canyon	Routine fish improvement projects are developed and maintained after appropriate review and where consistent with capabilities and priorities in Red Canyon.		Ongoing.
Fish-8	Red Canyon	Prescribed burns and other practices to rehabilitate elk, mule deer, moose, bighorn sheep, fish, and riparian habitat are used in Red Canyon in limited ways.		Ongoing.
Fish-9	Red Canyon	In-stream structures and fencing in Barret Creek drainage will be used to improve fisheries and riparian habitat.		Not implemented.
Fish-10	South Pass	Aquatic habitat management for fisheries, beaver, and riparian species use is improved in the South Pass area. Routine fish habitat improvement projects are developed and maintained after appropriate review and where consistent with capabilities and priorities.		Ongoing.
Fish-11	Gas Hills, Dubois, Dubois Badlands	Routine fish and wildlife habitat improvement projects are developed and maintained after appropriate review and where consistent with capabilities and priorities in the Gas Hills, Dubois, and Dubois Badlands areas.		Ongoing.

2

Table 3-20. Wildlife: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Wildlife-1	Green Mountain	Routine wildlife habitat improvement projects are developed and maintained in the Green Mountain area after appropriate review and where consistent with capabilities and priorities.		Ongoing.
Wildlife-2	Green Mountain	Major habitat improvement objectives for elk/mule deer are incorporated into comprehensive timber management plan and grazing AMPs in the Green Mountain area.		Ongoing.
Wildlife-3	Green Mountain	Promote aspen and willow regeneration to create diversity in size, age-class, and edge-effect in conifer stands while maintaining elk cover requirements in the Green Mountain area.		Ongoing.
Wildlife-4	Green Mountain	Green Mountain MU is a moderate priority area for development of aquatic (fisheries, beaver, riparian) HMP. The vigor of, expanding the size of, and reestablishing aspen/willow stands to stabilize forage and material base for beavers and dam complexes is prioritized.		Ongoing.
Wildlife-5	Beaver Creek	Routine wildlife habitat improvement projects are developed and maintained in the Beaver Creek area after appropriate review and where consistent with capabilities and priorities.		Ongoing.
Wildlife-6	Lander Slope	Routine wildlife habitat improvement projects are developed and maintained after appropriate review and where consistent with capabilities and priorities on the Lander Slope.		Ongoing.
Wildlife-7	Lander Slope	The Lander Slope area is a high-priority area for development of a terrestrial HMP, with elk as the primary species. BLM will initiate prescribed burns and other cultural practices to rehabilitate elk, mule deer, moose, bighorn sheep, and riparian habitat.		Ongoing.
Wildlife-8	Red Canyon	Routine wildlife habitat improvement projects are developed and maintained in Red Canyon after appropriate review and where consistent with capabilities and priorities.		Ongoing.
Wildlife-9	Red Canyon	Red Canyon is a high-priority area for development of a terrestrial HMP with elk as the primary species. The MU is managed to continue to make available 500 AUMs of forage for elk.		Ongoing.

1

Table 3-20. Wildlife: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Wildlife-10	Red Canyon	Prescribed burns and other practices to rehabilitate elk, mule deer, moose, bighorn sheep, and riparian habitat are used in limited ways in Red Canyon.		Ongoing.
Wildlife-11	South Pass	Aquatic habitat management for beaver and riparian use is improved in the South Pass area. Routine wildlife habitat improvement projects are developed and maintained after appropriate review and where consistent with capabilities and priorities.		Ongoing.
Wildlife-12	Gas Hills	In conjunction with interested publics and partners, develop a workable bighorn sheep reintroduction program for Sweetwater Rocks.		Not implemented.
Wildlife-13	Gas Hills, Dubois and Dubois Badlands	Routine fish and wildlife habitat improvement projects are developed and maintained after appropriate review and where consistent with capabilities and priorities in the Gas Hills, Dubois, and Dubois Badlands areas.		Ongoing.
Wildlife-14	East Fork	Continue with cooperative habitat improvement projects to improve elk habitat in the East Fork area. Prescribed burning, seeding, pitting, herbicide treatment, and water development are utilized for the benefit of the elk.		Ongoing.
Wildlife-15	East Fork	Projects initiated in the East Fork area will be designed to improve habitat for wintering elk.		Ongoing.
Wildlife-16	Whiskey Mountain	Use all habitat and animal management techniques and improvement projects for direct/indirect benefit of Whiskey Mountain bighorn sheep population and habitat.		Ongoing.
Wildlife-17	Whiskey Mountain	Any projects used to improve habitat for other species (besides bighorn sheep) in the Whiskey Mountain area will reduce the competition of these animals with bighorns or to not cause significant negative effects on bighorn sheep.		Ongoing.
Wildlife-18		Activities and surface use will be prohibited within 0.25 mile of Greater sage-grouse strutting grounds (leks) or as appropriate unless an exception is authorized.		Ongoing.
Wildlife-19		A seasonal restriction will be applied to surface-disturbing and disruptive activities and land uses during nesting/brooding periods within a 2-mile radius of active Greater sage-grouse leks or as appropriate on a case-by-case basis.		Ongoing.

Table 3-20. Wildlife: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Wildlife-20		BLM will consult with the WGFD before waiving, allowing exceptions to, or modifying wildlife-related land use restrictions and mitigations.		Ongoing.
Wildlife-21		Seasonal restrictions will be applied as appropriate to surface-disturbing and disruptive activities and land uses on big game crucial habitat, including winter ranges and elk calving areas.		Ongoing.
Wildlife-22		Wildlife escape ramps would be installed in all water troughs to prevent birds and small mammals from drowning.		Ongoing.
Wildlife-23	N/A	No planning decisions address protecting wildlife migration routes.		Never addressed.

Table 3-21. Special Status Species – Plants: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
SSP-1	Beaver Creek	A management plan is implemented to identify, protect, and maintain the habitat and population of rare plants, the Beaver Rim cushion plant (Phlox pungens) and limber pine/bluebunch wheatgrass (Pinus flexilis/Agropyron spicatum) communities in the Beaver Creek area.		A survey of the Beaver Rim ACEC was completed in 1989. A survey for Beaver Rim phlox (Circium aridum) was completed in 1994. Desert yellowhead, Bevaer Rim phlox, Barneby's clover and Porter's sagebrush were mapped. Desert yellowhead was designated a T&E plant by USFWS. Critical habitat has been designated and the area is withdrawn from mineral entry.
SSP-2	Red Canyon	A management plan is implemented to identify, protect, and maintain the habitat of Barneby's clover (Trifolium barnebyi) in Red.		Barneby's clover and Fremont bladderpod (Lesquerella fremontii) were inventoried. The Nature Conservancy purchased the Red Canyon Ranch in 1993 and has been monitoring sensitive plant species and providing the information to the BLM.

Table 3-21. Special Status Species – Plants: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
SSP-3	South Pass	A management plan is implemented to identify, protect, and maintain the habitat and population of Meadow pussytoes (Antennaria arcuata), Williams rock cress (Arabis Williamsii), and Small rock cress (Arabis pusilla) in the South Pass area.		The area was inventoried and no populations of Williams rock cress or Small rock cress were found.
SSP-4		Conservation Measures and BMPs as described in USFWS Amended Consultation Memorandum ES-61411/W.02/WY9485 for the management of the Desert Yellowhead (Yermo xanthocephalus) and its critical habitat are incorporated by reference, per BLM Instruction Memorandum WY-2005-052.		Implemented.
SSP-5		Conservation Measures and BMPs described in USFWS Biological Opinion Memorandum ES-61411/W.02/WY06F0205b for the management of the Ute Ladies'-tresses orchid are incorporated by reference, per BLM Instruction Memorandum WY-2007-020.		Implemented.

Table 3-22. Special Status Species – Fish: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
N/A	N/A	No current objectives or decisions for special status fish species are included in the RMP; however, all management decisions relating to fish species, and many management actions relating to water quality, riparian and wetland resources, livestock grazing, fire and fuels management, locatable mineral resources, and management of invasive/non-native species, would also apply to or have an impact on special status fish species.		
SSF-1		Consultation is required as described in the USFWS Memorandum concerning Federal Agency Actions Resulting in Minor Water Depletions to the Platte River System dated June 13, 1996.		Ongoing.

Table 3-23. Special Status Species – Wildlife: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
SSW-1		No current objectives or decisions for special status wildlife species as they were not discussed as a group in the RMP. Several current special status species were discussed under general wildlife in current RMP. Threatened and Endangered wildlife is managed in accordance with the requirements of the Endangered Species Act. There was no discussion of the Wyoming Game and Fish Department's list of Species of Greatest Concern.		
SSW-2		The BLM will participate with the FWS in the evaluation and designation of critical habitat for T&E species on BLM-administered lands. If proposed surface-disturbing or disruptive activities could affect these species, the BLM will consult with the FWS as required by the Endangered Species Act.		Ongoing.
SSW-3		Conservation Measures and BMPs described in attachment 2 of USFWS Informal Conference Memorandum ES-61411/W.02/WY8797 for the management of potential gray wolf habitat are incorporated by reference, per BLM Instruction Memorandum WY-2005-046.		Implemented.
SSW-4		Conservation Measures and BMPs described in attachment 2 of USFWS Informal Conference Memorandum ES-61411/W.02/WY9669c for the management of potential Canada lynx habitat are incorporated by reference, per BLM Instruction Memorandum WY-2005-058.		Implemented.
SSW-5		Conservation Measures and BMPs described in attachment 2 of USFWS Informal Conference Memorandum ES-61411/W.02/WY9741d for the management of potential Black-footed ferret habitat are incorporated by reference, per BLM Instruction Memorandum WY-2006-037.		Implemented.
SSW-6		Conservation Measures and BMPs as described in attachment 2 of USFWS Informal Conference Memorandum ES-61411/W.02/WY07FA0408 for the management of white-tailed prairie dog habitat are incorporated by reference, per BLM Instruction Memorandum WY-2008-025.		Implemented.
SSW-7		Conservation Measures and BMPs described in attachment 2 of USFWS Conference Memorandum ES-61411/W.02/WY9751d for the management of grizzly bear are incorporated by reference, per BLM Instruction Memorandum WY-2006-049.		Implemented.
SSW-8		Conservation recommendations as described in the USFWS Biological Opinion for the Wyoming BLM RMPs and Their Effects to the Bald Eagle transmitted by USFWS Memorandum ES-61411/W.02/WY7682b are incorporated by reference, per BLM Instruction Memorandum WY-2004-051.		Implemented.

SSW-9		Habitat preservation measures as identified in the Wyoming BLM Statewide Programmatic Biological Assessment for Whooping Cranes *(Grus Americana)* and USFWS concurrence as transmitted by Memorandum ES-61411/W.02/(BIO-OPIN.WPD) are incorporated by reference, per BLM Instruction Memorandum WY-2004-032.		Implemented.
SSW-10		Conservation Measures and BMPs described in attachment 2 of USFWS Informal Conference Memorandum ES-61411/W.02/WY07FA0290 for the management of mountain plover habitat are incorporated by reference, per BLM Instruction Memorandum WY-2007-018.		Implemented.
SSW-11		For the protection of prey bases essential to the peregrine falcon or other T&E birds, spraying of insecticides will not be allowed until after the completion of site-specific environmental analyses.		Implemented.

Table 3-24. Wild Horses: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
WH-1		Wild horse are managed under interim decisions until the Decision Record from the Evaluation of Wild Horse Herd Areas and Capture Environmental Assessments, which implemented the recommendations from the 1992 Evaluation of Wild Horse HMAs and the USDI-BLM 1992 Strategic Plan for Management of Wild Horses and Burros on Public Lands.		Ongoing.
WH-2		Wild horse gathers are implemented to control population size, diversity, and habitat values.		Ongoing.
WH-3		Public education about wild horses is implemented as part of management and used to generate support for the wild horse program.		Ongoing.

3.2.5 Heritage and Visual Resources

Table 3-25. Cultural Resources: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Cult-0.1		Site-specific inventories for cultural resources are required before the start of surface-disturbing activities. Adverse effects on significant resources will be mitigated, or the resources themselves will be avoided by surface-disturbing activities.		Status?
Cult-0.1		Sites listed on the NRHP are appropriately protected. Any violations of the Archaeological Resources Protection Act are investigated.		Status?
Cult-0.1		The BLM's consultation with the Advisory Council for Historic Preservation and the Wyoming State Historic Preservation office is consistent with the cultural resources programmatic agreement signed in 1995.		Status?
Cult-0.2		Rock art, as well as other prehistoric and historic archaeological sites and districts associated with specific time periods or cultures, are managed for scientific, public, and socio-cultural use. General areas will be managed for research, with emphasis on interpreting former ecosystems. Specific sites or areas will be preserved for future study and use. Near rock art, the use of heavy equipment to construct fire lines and the use of chemical and dye retardants will be restricted or prohibited.		Status?
Cult-0.3		As appropriate, specific sites on public lands will be managed for their traditional Native American cultural values.		Status?
Cult-0.4		Adverse effects are avoided on public lands and resource values listed in National Park Service inventories of possible NNL. These lands and resources include paleontological and scenic values at Beaver Rim and Red Canyon.		Status?
Cult-0.5		Protective measures will be implemented for all important cultural sites, either known or identified in the future.		Status?
Cult-1	Beaver Creek	All management actions in the Beaver Creek area are consistent with the Oregon/Mormon Pioneer NHT Management Plan. Pursue designation and enrollment of the Beaver Rim NNL.		The trails are managed in accordance with the Plan. Experience has shown that the ¼ mile protection zone does not comply with the National Historic Preservation Act and does not adequately protect the Trail. The Beaver Rim NNL was not implemented.

Table 3-25. Cultural Resources: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Cult-2	Red Canyon	The Red Canyon NNL's natural character and qualities are protected. Protect future appreciation of classic natural history resource.		The ACEC provisions have adequately protected the NNL values. An educational interpretive sign at the highway turn off has been provided.
Cult-3	South Pass	The South Pass area is managed to protect fragile and important historic sites. Prevent deterioration of 19th and 20th century historical resources.		A Cultural RMP was approved in the early 1990s and some measures have been implemented. Some stabilization work has been done at Miner's Delight Townsite and Cemetery, Lemley Mill, Carrie Shield Mine and a few unnamed cabins. The Carrissa Mine has been stabilized and developed as an interpretive site.
Cult-4	South Pass	The South Pass area is managed to deter destruction of historical sites.		Yearly site patrols have been done over the area.
Cult-5	South Pass	The South Pass area is managed to preserve all significant sites within the historic district.		As much preservation as staff time and money allows has been done.
Cult-6	South Pass	The South Pass area's historical setting is maintained around South Pass City.		The historic setting around South Pass City has been improved. Although some modern intrusions have been allowed, mostly for infrastructure, they have not significantly impacted the setting of the site.
Cult-7	South Pass	Miner's Delight is managed to improve understanding of its history. Test excavations will be made to facilitate interpretation.		A historical context was written and accepted for Miner's Delight in the late 1990s but it has not been implemented do to funding constraints. Excavations were conducted at Miner's Delight resulting in much new data about the occupation and use of the townsite.
Cult-8	Gas Hills	A management plan will be developed for Castle Gardens including walkways and other fencing to halt deterioration of the site.		A new management plan has not been implement, although one is being prepared at the time of the RMP revision.
Cult-9	Gas Hills	The NHT Management Plan is incorporated into the RMP and used for management decisions in the Gas Hills area.		Proposed development near the Trail was made consistent with the Management Plan. However, experience has showed that the ¼ mile protection zone does not comply with the National Historic Preservation Act and is not adequate to protect historic trail values.
Cult-10	Gas Hills	Pursue a protective withdrawal for the Martin's Cove site.		The withdrawal was not pursued.

Table 3-25. Cultural Resources: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Cult-11	Dubois	Conduct a study of stabilization needs of the Warm Spring Canyon Flume in the Dubois area.		A stabilization study was written in the early 2000s but not implemented due to funding.
Cult-12	Dubois	Develop a management plan for the Warm Springs Canyon Flume.		Due to funding constraints, this has not been pursued.
Cult-13		Manage regional trails on a case-by-case basis.		Partially implemented. Activity plans need to be implemented to protect visual resources.
Cult-14		Review the ACEC nominations and the cultural resource alternatives.		

Table 3-26. Paleontological Resources: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Paleo-1		No objectives or management decisions on paleontological resources are included in the RMP. The resources included under cultural resources.		Status?
Paleo-2		Important paleontological resources are managed for scientific and public use.		Implemented.
Paleo-3		Potential effects on paleontological resources are considered in site-specific environmental analyses before the authorization of surface-disturbing activities. As appropriate, site-specific inventories are required where significant fossil resources are known or anticipated to occur.		Implemented.
Paleo-4		Closing lands or restricting uses to protect paleontological resources will be evaluated on a case-by-case basis.		Implemented.
Paleo-5		Important paleontological sites are protected through the use of surface and subsurface protection stipulations and discretionary management authority.		Implemented.

Table 3-27. Visual Resources: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
VRM-1		No current objectives and decisions for Visual Resources are included in the RMP. Visual resources were considered primarily in ACEC designations.		Not adequate.
VRM-2		Visual resources are managed in accordance with objectives for VRM classes that have been assigned to the planning area (Map XX).		Sometimes implemented.
VRM-3		Visual resource values are considered before authorizing land uses that may affect visual resource quality.		Sometimes implemented.
VRM-4		Surface-disturbing activities will be prohibited in Class I or II VRM areas, unless adverse impacts can be mitigated or avoided.		Sometimes implemented.
VRM-5		See Appendix XX and other management decisions in this RMP for other restrictions on surface-disturbing activities that apply to protection of visual resources.		Sometimes implemented.
VRM-7		Visual resources are considered before authorizing land uses that may affect them. VRM requirements are applied on public lands or to BLM-approved mineral development on split-estate lands.		Sometimes implemented.
VRM-8		Facilities or structures, such as power lines, oil wells, and storage tanks are screened, painted, and otherwise designed to blend with the surrounding landscape. Facilities or structures proposed in or near WSAs will be designed so as not to impair wilderness suitability.		Sometimes implemented.
VRM-9		The construction or modification of ROW along Wyoming highways are evaluated individually to assure that adverse effects on scenic values are not increased.		Sometimes implemented.
VRM-10		VRM objectives are considered in the evaluation of all proposals for activities on the public lands in the planning area and are incorporated into design features. Impacts to visual resources will be mitigated by applying the guidance for mitigating surface-disturbing activities in the Wyoming BLM Standard Oil and Gas Lease Stipulations or by mitigations developed through the environmental analysis process.		Sometimes implemented.

3.2.6 Land Resources

Table 3-28. Lands and Realty: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Realty-1		The preferred method of disposal or acquisition of lands by BLM is through exchange.		Status?
Realty-2		Acquired lands and/or interests in acquired lands will be managed in a manner consistent with adjacent or nearby public lands if applicable. Acquired lands within an ACEC or other special management area will be managed in accordance with the special management area's activity plan.		Status?
Realty-3		Proposals for disposal of any BLM-administered lands in the planning area not identified for disposal in the RMP will be considered on a case-by-case basis. Before a disposal action could be implemented, the RMP would have to be amended.		Status?
Realty-4		Tracts 134 and 135 in the Green Mountain area (see map) are identified for disposal and will be considered on a case-by-case basis.		Implemented; sold.
Realty-5		Twenty-five isolated tracts in the Beaver Creek area are identified for disposal and will be considered on a case-by-case basis.		0 Disposed of – All still available.
Realty-6		Ten full tracts and four partial tracts in the Lander Slope area are identified for disposal and will be considered on a case-by-case basis.		3 Full tracts and 1 partial tract have been disposed of.
Realty-7		No public lands are identified for disposal in the Red Canyon area.		Status?
Realty-8		No public lands are identified for disposal in the South Pass area.		Status?
Realty-9		Forty tracts are identified for disposal in the Gas Hills area and will be considered on a case-by-case basis.		4 Tracts have been disposed of.
Realty-10		In the East Fork area, tracts 24, 25, 26, and 27 (totaling 961 acres) are identified for disposal but only to private or public agencies which will use the lands in consistency with management objectives for elk winter range. Future exchanges will be considered on a case-by-case basis.		Status?

Table 3-28. Lands and Realty: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Realty-11		In the Dubois Badlands area, parcels 33, 34, and 35 are identified for disposal with exchange as the preferred method, and will be considered on a case-by-case basis.		2 Tracts have been disposed of.
Realty-12		In the Whiskey Mountain area, landownership adjustments will be allowed only when the Bighorn Sheep Interagency Technical Committee has analyzed and recommended such adjustments.		
Realty-13		Tracts 1, 4, 5, 7, 8, 11, 14, 16, 17, 20, 21, 22, 23, 28, 30, 32, 37, and 168 in the Dubois area are identified for disposal and will be considered on a case-by-case basis.		8 Tracts have been disposed of.
Realty-14		Agricultural trespass on public land generally will be resolved by prohibiting the unauthorized use; however, land sales, exchanges, or leases could resolve agricultural trespass in some cases. Leases might be used to develop the lands as wildlife food and cover areas.		Trespass has not been one of the top priorities to be completed in the Lander Field Office.
Realty-15		R&PPs leases and patents are considered on a case-by-case basis.		Implemented.
Realty-16		The acquisition of non-BLM-administered lands to achieve management objectives will be considered on a case-by-case basis.		Implemented.
Realty-17		Existing stock driveway withdrawals will be retained, although the BLM reserves the right to modify historic trailing routes and use, to mitigate any impacts associated with trailing, or to deny trailing use if the impacts cannot be adequately mitigated.		Implemented.
Realty-18		The BLM access policy in Wyoming is to acquire permanent exclusive easements (BLM controls and includes rights for the public) over mainline roads in the BLM transportation plan. A BLM mainline road is considered the principal access into larger blocks of BLM-administered public lands or into tracts of BLM administered lands with high resource values.		Implemented.
Realty-19		The BLM will seek to acquire administrative access to areas identified as important for resource and resources uses.		Implemented.
Realty-20		The BLM will pursue public access on important roads and trails identified in the BLM transportation plan. The transportation plan will be updated as necessary and implemented to provide access to large blocks of public land or to smaller parcels of land having high public values.		Implemented.

Table 3-28. Lands and Realty: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Realty-21		Access to specific areas may be closed or restricted to protect public health and safety. Before access is upgraded in the vicinity of important cultural, paleontological, natural history, wildlife habitat, or other sensitive resources, the security and protection of these resources will be carefully considered.		Implemented.
Realty-22		As of 1985, easements in the Green Mountain area will be negotiated for Willow Creek Road (via Cooper Creek Road), Crooks Mountain Road, and Taggart Meadows Road.		Taggart Meadows Rod is partially completed (Ellen Fox portion).
Realty-23		In the Beaver Creek area, negotiate with landowners for easements or initiate appropriate route alternatives to secure public access on East Beaver Creek, Twin Creek, Government Draw, Signor Ridge, Hudson-Atlantic City, Beaver Rim, and Dilabaugh Butte roads.		Not implemented.
Realty-24		In the Green Mountain area, public access is provided for forest, wildlife, recreation, and livestock management. Existing necessary roads will be maintained. Additional easements or appropriate route alternatives will be negotiated to secure public access.		Implemented.
Realty-25		In the Lander Slope area, negotiate for easements or initiate appropriate route alternatives to secure public access on the Shoshone Lake Road to Mormon Basin.		Not implemented.
Realty-26		In the Gas Hills area, negotiate with landowners for administrative access and easements for Copper Mountain Road, Wolf Gap, Beef Gap, and Beaver Rim Road. Consider other alternatives for easements.		Not implemented.
Realty-27		Negotiations with landowners for easements across Tappan Creek Road will be pursued.		Not implemented.

Table 3-29. Renewable Energy: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Renew-1		No current objectives and decisions for renewable energy are included in the RMP. Any non-wind renewable energy proposal will require a plan amendment to implement.		Status?
Renew-2		The Wind Energy Programmatic ROD (2005) is incorporated into the RMP. Any wind energy proposals will require a plan amendment to implement except for those activities authorized by the ROD, such as meteorological towers. The provisions of IM-2009-043 are followed in processing applications for wind energy development.		Implemented.

Table 3-30. Rights-of-Way and Corridors: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
ROW-1		Most of the planning area is open for the location of utility and transportation systems. Proposals will be addressed on an individual basis with emphasis on avoiding identified potential conflict areas.		Implemented.
ROW-2		Utility, pipelines, and ROWs will be co-located whenever possible.		Implemented.
ROW-3		To protect scenic quality, placement of aboveground facilities, such as power lines, will be avoided along major transportation routes.		Implemented.
ROW-4		If restricted types of ROWs are required in avoidance areas or when such areas cannot reasonably be avoided, the adverse effects of construction will be intensively mitigated.		Implemented.
ROW-5		No utility and pipeline corridors or communication site windows are designated in the RMP. The Whiskey Peak area is identified as a location where a communication tower exists.		Implemented.

Table 3-30. Rights-of-Way and Corridors: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
ROW-6		Public lands in the Green Mountain area will be open for the location of utility and transportation systems and concentrated in existing corridors whenever possible.		Implemented.
ROW-7		Construction of major utility systems in the Beaver Creek will be allowed and concentrated in existing corridors whenever possible, except for the Oregon/Mormon Pioneer Trails corridor, Sweetwater Canyon, and Sweetwater Rocks. ROWs might be granted in the exception areas if no feasible alternative route or designated corridor is available.		Implemented.
ROW-8		The Lander Slope is avoided when locating major utility systems; locating these systems in the Lander Slope is only allowed when no feasible alternative route or designated ROW corridor is available. The BLM will consider lowlands near Hwy 28-287 for utility systems before allowing them on slopes of the mountain.		Implemented.
ROW-9		Red Canyon is avoided for placement of major utility systems. Major utility system ROWs may be granted only when no feasible alternative route or designated corridor is available.		Implemented.
ROW-10		South Pass, East Fork, Dubois Badlands, and Whiskey Mountain are avoided for placement of major utility systems. Major utility system ROWs may be granted only when no feasible alternative route or designated corridor is available.		Implemented.
ROW-11		Major utilities are allowed in the Gas Hills area. No utilities will be allowed along the Oregon/Mormon Pioneer Trails corridor and the Sweetwater Rocks. Utility systems will be concentrated in existing corridors whenever possible. ROW might be granted if no feasible alternative route or designated ROW corridor is available.		Implemented.
ROW-12		Major utility systems will be allowed in the Dubois area, but utility systems will be concentrated in existing corridors whenever possible.		Implemented.
ROW-13		Power line construction will be required to incorporate standard or special design features to reduce bird collisions and reduce impacts to habitat. Additional power line construction limitations will be applied on a case-by-case basis in special situations to reduce bird collisions.		Implemented
ROW-14		Existing transportation and utility routes for roads, pipelines, and power lines will be designated as preferred ROW corridors, which would be the preferred location for existing and future ROW grants (map 6).		Implemented.

Table 3-31. Trails and Travel Management: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Travel-1		Unless otherwise specified, vehicular use on BLM-administered public lands in the general planning area is designated as limited to existing roads and trails (Map XX). "Existing" roads and trails apply only to roads and trails in existence when these designations were identified for the Lander planning area in the Federal Register on August 29, 1990. Roads or trails created after this date are not "existing" within the intent of the RMP and will be closed as time and funding allow.		Ongoing.
Travel-2		Except for areas designated as closed to vehicular use, performance of necessary tasks requiring off-road use of a vehicle is authorized. Examples of necessary tasks include picking up big game kills and constructing or repairing authorized range improvements.		Ongoing.
Travel-3		See Appendix __ and other management decisions in this RMP for other restrictions on surface-disturbing activities that may apply to OHV or general vehicular use.		Ongoing.
Travel-4		Until activity planning specifically addresses the use of over-the-snow vehicles, they are subject to the same requirements and limitations as all other vehicles.		Ongoing.
Travel-5		No open area for OHV "play" or other cross-country vehicular use is designated.		Ongoing.
Travel-6		Motorized vehicle use is prohibited on wet soils and on slopes greater than 25 percent, when and where unnecessary damage to vegetation, soils, or water quality would result.		Ongoing.
Travel-7	Green Mountain	Unnecessary roads in the Green Mountain area, such as the Cooper Creek fire access road, will be removed and rehabilitated.		Ongoing.
Travel-8	Green Mountain	OHV use in the Green Mountain area is limited to designated roads and trails with seasonal (December 1-June 15) road closure above 7,000 feet to protect roadbed and surrounding watershed values.		Ongoing.
Travel-9	Beaver Creek	Existing BLM roads and easements in the Beaver Creek area are maintained to BLM standards. Roads in the area of the Sweetwater Rocks will not be upgraded.		Ongoing.
Travel-10	Beaver Creek	OHV use in the Beaver Creek and Gas Hills area are limited to existing roads and trails. The Castle Gardens withdrawal area is closed to OHV use, but the BLM road to Castle Garden's picnic area is open.		Ongoing.

Table 3-31. Trails and Travel: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Travel-11	Lander Slope	OHV use in the Lander Slope is limited to designated roads and trails with seasonal closures (December 1-June 15) except for snowmobiles.		Ongoing.
Travel-12	Red Canyon	The existing transportation system in Red Canyon is maintained. No new roads or easements are identified.		Ongoing.
Travel-13	Red Canyon	OHV use is limited to designated roads and trails with seasonal closures (December 1-June 15).		Ongoing.
Travel-13.1	Whiskey	Motorized use in the Whiskey Mountain Area is limited to designated roads and trails with seasonal travel limitations (Closed December 1-June 15).		Ongoing
Travel-14	South Pass	Existing transportation system is adequate for recreational use and will be maintained.		Ongoing.
Travel-15	South Pass	OHV use is limited to existing roads and vehicle routes, except for casual use, such as loading game animals during hunting season.		Ongoing.
Travel-16	Gas Hills	Existing roads are maintained, including Castle Gardens access road.		Ongoing.
Travel-17	East Fork, Dubois Badlands, Whiskey Mountain	In the East Fork, Dubois Badlands, and Whiskey Mountain areas, the existing transportation systems are maintained.		Ongoing.
Travel-18	East Fork.	OHV use in the East Fork area is limited to existing roads and trails.		Ongoing.
Travel-19	Dubois Badlands	The Dubois Badlands area is closed to OHV to protect outstanding scenery and natural values.		Ongoing.
Travel-20	Whiskey Mountain	OHV use is limited to designated roads and trails. Seasonal closures are imposed in some area. Some roads will be rehabilitated to put areas back into production for wildlife habitat; other roads will be kept open for wildlife viewing opportunities.		Ongoing.
Travel-21	Dubois	OHV use in the Dubois area is limited to existing roads and trails.		Ongoing.

Table 3-32. Recreation: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Rec-1	Green Mountain, Lander Slope, Red Canyon	The Green Mountain Area, Lander Slope, and Red Canyon are managed as ERMAs where dispersed recreation is encouraged and with freedom of recreational choice with minimal regulatory constraint. A 14-day limit on camping is imposed. Commercial use quotas will be established. Management emphasizes resolution of competing uses with resource protection and enhancement.		Implemented.
Rec-2	Lander Slope	No major recreational developments are planned in the Lander Slope ERMA.		Implemented.
Rec-3	Red Canyon	An interpretive marker will be developed for Red Canyon. The Red Canyon elk winter range is closed to all winter sport activities.		Implemented.
Rec-4		The NHTs are managed as a SRMA. Existing campgrounds and facilities are maintained and intensively managed, but no new facilities are developed except to protect visitor safety and visual resources. Recreation opportunities for rustic, open-space settings are maintained. An SRMA plan will be developed in conjunction with cultural resource plan for South Pass area. Miner's Delight Townsite and Peabody Ridge Overlook are intensively managed.		Implemented.
Rec-5		The Continental Divide National Scenic Trail is managed as an SRMA. Existing campgrounds and facilities are maintained and intensively managed, but no new facilities are developed except to protect visitor safety and visual resources. Recreation opportunities for rustic, open-space settings are maintained.		Implemented.
Rec-6		The South Pass Historic Mining Area is managed as an SRMA. Existing campgrounds and facilities are maintained and intensively managed, but no new facilities are developed except to protect visitor safety and visual resources. Recreation opportunities for rustic, open-space settings are maintained. An SRMA plan will be developed in conjunction with the cultural resource plan for South Pass area. Miner's Delight Townsite and Peabody Ridge Overlook are intensively managed.		Implemented.

Table 3-32. Recreation: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Rec-7	Dubois Badlands	The Dubois Badlands will be designated an ERMA and managed in its natural state. Resolving user conflicts and providing resource protection is emphasized.		Implemented.
Rec-8	Dubois	The Dubois area is managed as an ERMA where dispersed recreation is encouraged and with freedom of recreational choice with minimal regulatory constraint.		Implemented.

Table 3-32. Recreation: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Rec-9	Beaver Creek	Management in the Beaver Creek area emphasizes resolution of competing uses with resource protection and enhancement. Existing developments are maintained. Management and maintenance are minimal, but public safety hazards will be reduced.		Implemented.
Rec-10	Gas Hills	In the Gas Hills area, dispersed recreation is encouraged. Resolving user conflicts and providing resource protection is emphasized. Existing developments at Devil's Gate Interpretive Site and at Castle Gardens picnic site are maintained. More interpretation and resource protection at Castle Gardens will be added.		Implemented.
Rec-11	East Fork	Minimal recreation management is provided. Resolving user conflicts and providing resource protection is emphasized.		Implemented.
Rec-12	Whiskey Mountain	In cooperation with the WGFD, non-consumptive wildlife visitor use management is emphasized. No commercial hunting camps are permitted if they are not compatible with management of the bighorn sheep herd. There is a 14-day camping limit.		Implemented.
Rec-13		All remaining portions of the planning area are designated as ERMAs.		Implemented.
Rec-14		SRPs authorizing organized recreational use are issued as a tool to achieve recreation goals and objectives.		Implemented.

Table 3-33. Wilderness Characteristics: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Wilderness-1	N/A	No current objectives or decisions for wilderness characteristics are included in the RMP.		

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Table 3-34. Livestock Grazing: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Grazing-1		Livestock grazing use in the planning area will be continued. Livestock grazing will also be managed to provide for protection or enhancement of other resource values. Actions will be consistent with the Guidelines for Livestock Grazing Management for public lands administered by the BLM in the State of Wyoming.		Ongoing.
Grazing-2		This plan incorporates the "Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management for Public Lands Administered by the BLM in the State of Wyoming" approved August 12, 1997. Please see Appendix XX.		Ongoing.
Grazing-3		High-intensity monitoring will be conducted on top-priority Category I allotments, on allotments with AMPs. Low intensity monitoring will be conducted on the other Category I allotments and on Category M and C allotments.		Ongoing.
Grazing-4		The current amounts, kinds, and seasons of livestock grazing use will continue to be authorized until monitoring indicates a grazing use adjustment is necessary or that a class of livestock or season of use modification can be accommodated.		Ongoing.
Grazing-5		The decisions for the Gas Hills Study Area and the Green Mountain Rangeland Programs Summary were developed from the Lander RMP/EIS.		Ongoing.
Grazing-6		Decisions will be made when monitoring data are sufficient to support decisions. Decisions may include changing livestock numbers, changing periods of use, or both. Monitoring will be a continuous process to assure management objectives are being met. If further modification of periods of use, livestock numbers, classes of livestock or grazing systems, adjustments will be made only after consultation with livestock operators and other affected parties.		Ongoing.
Grazing-7		Grazing allotments are grouped into three categories. Category I allotments are managed to improve existing resource conditions and to reduce or eliminate resource use conflicts. Category M allotments are managed to maintain or improve present satisfactory resource condition and allotment management. Category C allotments are managed to prevent deterioration of current resource conditions by managing the lands in a custodial manner.		Implemented.
Grazing-9		Based on available monitoring data, management actions will be implemented, beginning with Category I allotments needing the most improvement. AMPs will be developed for allotments in the planning area on a priority basis. The intensity of the AMPs will depend on allotment condition and resource conflicts.		Ongoing.

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Table 3-34. Livestock Grazing: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Grazing-10		The remaining grazing allotments in the planning area are the "M" and "C" category allotments. They will be monitored at a lower intensity level to ensure no significant adverse changes are taking place as a result of ongoing management.		Implemented.
Grazing-11		Stock driveway withdrawals will be retained, although the BLM reserves the right to modify historic trailing routes and use, to mitigate any impacts associated with trailing, or to deny trailing use if the impacts cannot be adequately mitigated. Portions of grazing allotments that are outside withdrawn stock driveways and that are affected by trailing will be monitored to determine whether the allotment can accommodate trailing without unacceptable effects on resources.	See Realty-17	Implemented.
Grazing-12		The level of livestock grazing on public lands, when combined with all other public land uses, will not be allowed to exceed the carrying capacity of the land. Meeting the SHR is the most important requirement of livestock grazing management.		Ongoing.
Grazing-13	Gas Hills Study Area	Management actions will address known resource problems. The following rangeland improvements will be made: • 45 to 55 miles of fence will be constructed. • Ten reservoirs will be constructed. • 57 other water improvement projects will be built. • Reduce livestock grazing 13-19 percent in Category I allotments (cumulative target: 114,298-144,101 AUMs; overall change between 4 percent decrease to 21 percent increase).		Ongoing.
Grazing-14	Gas Hills Study Area Category M Allotments	Present resource management will be retained and, if possible, improved. The following management will be utilized: • Authorize current livestock use under a 10-year permit. • Authorize increases in livestock use, when appropriate, that will be consistent with multiple-use objectives and will not be detrimental to other resources; increases range from 10-55 percent. • Consult with permittees to develop flexibility in livestock operations. • Authorize and construct range improvements to meet multiple-use management objectives. • Monitor trends in range condition and productivity to ensure conditions of the basic renewable resources will remain satisfactory.		Ongoing.

Table 3-34. Livestock Grazing: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Grazing-15	Gas Hills Study Area Category I Allotments	Use all management actions as necessary to reverse downward trends in range conditions, increase productivity of vegetation resources, improve wildlife habitat and improve soil and watershed conditions. Funding is allocated to Category I allotments first.		Ongoing.
Grazing-16	Gas Hills Study Area Category I Allotments	Develop monitoring program to evaluate effectiveness of present management situation. Develop AMPs and incorporate any/all specific management actions if objective(s) are not being met. The following actions may be taken for Category I allotments not meeting Standard of Rangeland Health 1-3: • Adjust stocking levels of grazing animals; include increases/ decreases in livestock grazing and/or wildlife. • Implement grazing systems. • Conduct vegetation manipulation projects. • Adjust turn-out dates/seasons of use.		Ongoing.
Grazing-17	Gas Hills Study Area Category I Allotments	The following actions may be taken for Category I allotments. • Develop water projects where livestock distribution problems have been caused by lack of water. • Use grazing systems and/or range improvements to solve problems where large grazing animals are concentrating on riparian areas. • Adjust turn-out dates and/or season of use based on plant phenology and range readiness. • Implement grazing systems to provide for the physiological needs of the key forage plants. • Where land-use conflicts have been causing a loss of forage production because of surface disturbance, rehabilitation efforts will be conducted and monitored for effectiveness. • Where land-use conflicts have been damaging structural improvements or causing a livestock trespass situation, identify the agent causing the problem and correct it. • For land-use conflicts involving damage to public and private lands by off-road vehicle use during wet weather, BLM will develop sign program and/or seasonal site-specific road closures.		Ongoing.

Table 3-34. Livestock Grazing: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Grazing-18	Gas Hills Study Area Category C Allotments	Deterioration of current resource conditions will be prevented by managing lands in a custodial manner. Livestock use will be permitted as authorized under a 10-year permit/lease. BLM will conduct low-intensity use supervision and monitoring. Adjustments will be made in numbers and season of use where necessary to prevent deterioration of present resource conditions.		Ongoing.
Grazing-19	Green Mountain Study Area	Livestock grazing is managed to provide enough forage on a sustained-yield basis to satisfy at least the present demands of livestock, wild horses, and wildlife and to maintain range condition at a level that would provide for sustained yield of forage production. Terrestrial, aquatic and riparian ecosystems are maintained or improved to provide wildlife with adequate amounts of forage and habitat for planned population levels.		Ongoing.
Grazing-20	Green Mountain Study Area Economic Analysis	Final Rangeland Improvement Policy requires an economic analysis for proposed range improvements. As improvement projects are proposed from allotment monitoring and consultation process, benefit/cost evaluations are done. For allotments that may have potential for economic return on public investment, BLM will conduct benefit/cost analyses on AMPs or grazing system plans and related range improvements before they are implemented.		Benefit cost analysis was done on a project by project basis. BLM Management removed the requirement to do cost/benefit analysis.
Grazing-21	Green Mountain Study Area Category M allotments	Maintain or improve the allotment condition. Consult with all affected interests to establish a mutual understanding of the management flexibility for livestock operations given to individual livestock operators; a change in category may be necessary if a significant change in management occurs.		Ongoing.
Grazing-22	Green Mountain Study Area Category M allotments	Current livestock active preferences are authorized under a 10-year permit/lease with the following management: • Conduct low-level monitoring of actual use, climate and trend. • Allow increases in grazing use by any or all types of grazing animals if monitoring indicates this will be consistent with multiple-use objectives. • Conduct low-intensity use supervision consisting of periodic consultation with livestock operator(s); occasional counts of livestock numbers may be conducted. • Authorize any range improvements that meet multiple-use objectives for the allotment. • Encourage livestock operator(s) to fund installation of range improvements; some range betterment funds may be made available as budges permit.		Ongoing.

Table 3-34. Livestock Grazing: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Grazing-23	Green Mountain Study Area Category M allotments Monitoring	The following are the monitoring priorities: • Conduct low-level monitoring of actual use, climate and trend with priority given to those allotments that have marginally met the categorization criteria. • Conduct low-intensity use supervision consisting of periodic consultation with livestock operators and occasional counts of livestock numbers.		Ongoing.
Grazing-24	Green Mountain Study Area Category I Allotments	Manage livestock grazing to improve existing resource conditions and to reduce or eliminate resource conflicts. Take corrective measures in response to the existing problems. Help to better define the problems, provide for input from all interested parties to find solutions to the problems, and implement measures determined to be beneficial in achieving multiple use objectives.		Ongoing.
Grazing-25	Green Mountain Study Area Category I Allotments	Conduct monitoring of allotments which are not satisfactory for the range trend, utilization, actual use, and climate.		Ongoing.

Table 3-34. Livestock Grazing: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Grazing-26	Green Mountain Study Area Category I Allotments	The following factors are considered in managing Category I allotments: • Actions may include development of grazing systems, changes in turnout dates and season of use, development of additional water to improve distribution and adjustments in stocking levels. • Implement adjustments in stocking levels of all grazing animals if range condition/vegetation production is deteriorating. • HMAs will be a priority for development of management plans. • Development of water sources will be priority in allotments where lack of water is the primary problem. • Implement grazing systems and/or fencing if cattle concentrate in riparian areas, even though there's sufficient water in allotment. • Use flexibility for turnout dates and season of use in allotments that may be unsatisfactory. • Rehabilitate areas where land-use conflict(s) has caused loss of forage production; this may include adjustments in stocking levels of grazing animals. • Where livestock grazing is causing adverse conditions for another land use, alternative management actions will be considered on a case-by-case basis. • Management actions will be dependent on manpower capability and improvement funding; concentrate limited resources in the allotments with most problems and the ones that offer the prospect for maximum return on public investment. • Monitoring on Category I allotments will be conducted in accordance with a list of procedures (p. 85 of ROD).		Ongoing.
Grazing-27	Green Mountain Study Area C Allotments	Prevent deterioration of current resource conditions by managing lands in a custodial manner. Category C allotments will be redesignated or eliminated by the following methods: • Changing fence locations. • Exchanging land to block up public land. • Selling public land.		Ongoing.

Table 3-34. Livestock Grazing: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Grazing-28	Green Mountain Study Area C Allotments	Manage the allotments are follows: • Authorize current livestock active preference under a 10-year permit/lease. • Consult with all affected interests to establish a mutual understanding of the management flexibility given to the individual livestock operations. • Conduct low-level monitoring of actual use, climate and trend, with priority given to those allotments designated for fence location changes. • Conduct low-intensity use supervision consisting of periodic consultation with livestock operators; occasional counts of livestock numbers may be conducted. • Authorize any range improvements that meet multiple-use objectives of the allotment. • Encourage livestock operator(s) to fund installation of range improvements (some range betterment funds may be made available). • Decisions on Category C allotments will be issued as land is sold or exchanged or fence locations are changed.		Ongoing.
Grazing- 29		Appendix XX identifies the various types of management actions including grazing systems, land treatments, range improvements, and development of AMPs that will be implemented throughout the planning area. These actions will be directed toward resolving or reducing such concerns as continuous spring grazing and conflicts between livestock grazing and wildlife uses, and toward improvement of wetland/riparian areas and overall vegetative ground cover and production. If these measures fail to accommodate the livestock grazing preference, while concurrently providing for protection of other resource values, reductions in livestock grazing use may become necessary.		Ongoing.
Grazing-30		Any adjustments in livestock grazing use, either short-term or long-term, will be made as a result of monitoring and consultation with grazing permittees or through negotiation with grazing permittees and other affected interests. Adjustments may also result from land use planning decisions to change the allocation of land uses or from transfers of BLM-administered public lands to other agency jurisdictions or into nonfederal ownerships.		Ongoing.
Grazing-31		The level of livestock grazing on public lands, when combined with all other public land uses, will not be allowed to exceed the carrying capacity of the land. (See Glossary.)		Ongoing.

Table 3-34. Livestock Grazing: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Grazing-32		The placement of salt and mineral supplements on public lands is allowed outside riparian areas and reclaimed or reforested areas, in locations designed to improve livestock distribution.		Ongoing.
Grazing-33		If grazing management techniques are not adequate to meet the objectives of resource management, livestock grazing will be reduced or eliminated on some allotments, especially around sources of springs, reservoirs, other riparian wetland, aspen stand regeneration areas, and crucial big game winter ranges.		Ongoing.

3.2.7 Special Designations and Other Management Areas

Table 3-35. ACECs and Other Management Areas: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
ACEC-1		The plan designates approximately 117,000 acres as ACECs. This represents about 4.7 percent of the planning area.		Implemented.
ACEC-2	Green Mountain	Designate 18,000 acres for the Green Mountain ACEC, which includes crucial elk winter range and the area within a 350-foot radius of Sparhawk Cabin.		Implemented. Sparhawk Cabin has been protected from development impacts and was partially stabilized in 2005 and 2006.
ACEC-3	Beaver Creek	Designate about 7,000 acres in the Beaver Creek area as an ACEC along Beaver Rim to protect natural values.		Implemented.
ACEC-4	Beaver Creek and Gas Hills MU	Designate about 22,600 acres in the Beaver Creek and Gas Hills areas as an ACEC along the Oregon/Mormon Pioneer Trail (expanded to include the California and Pony Express Trails).		Implemented. Proposed development near the Trail was made consistent with the Management Plan; ¼ mile zone dies not comply with the NHPAt and is not adequate to protect trail values.
ACEC-5	Beaver Rim	Beaver Rim ACEC: Designate about 7,000 acres in the Beaver Creek area along Beaver Rim as an ACEC.		Implemented

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Table 3-35. ACECs and Other Management Areas: Current Management (Continued)

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
ACEC-6	Lander Slope	Designate about 25,000 acres as ACEC to protect the important wildlife habitat and scenic quality of the Lander Slope		Implemented.
ACEC-7	Red Canyon	Designate 15,000 acres within the Red Canyon area as an ACEC for protection of highly visible steep slopes and areas of important wildlife habitat.		Implemented.
ACEC-8	South Pass	Designate 12,000 acres in the South Pass area as ACEC to protect significant cultural values, which will include the Historic Mining District. Improve habitat for the Lander moose herd winter range and other species. Develop special management actions for aspen and beaver management, in-stream structure developments and fencing projects, and protecting willow regeneration. Emphasize improvement of conifer, aspen, willow-riparian, and other shrub stands.		Implemented.
ACEC-9	East Fork	Designate 1,000 acres in the East Fork area surface as an ACEC to protect crucial elk winter range.		Implemented. Also completed mineral entry withdrawal on 10,525 acres for 20 years. Withdrawal expires in 2013.
ACEC-10	Dubois Badlands	Designate approximately 5,000 acres in the Dubois Badlands as ACEC to protect bighorn sheep habitat, scenic quality and protect against the erosive nature of the badlands.		Implemented
ACEC-11	Whiskey Mountain	Designate approximately 4,000 acres as an ACEC to protect the Whiskey Mountain Bighorn Sheep Winter Range.		Implemented. Acquired 4,173 acres through land exchanges in 1990, 1991, 1993, 1997, and 1998 for inclusion into the Whiskey Mountain Bighorn Sheep Winter Range. These acres were added to the ACEC. Also completed mineral withdrawal on 11,041 acres for 20 years.
ACEC-12		See appendix B for other restrictions that may be applied to surface-disturbing activities, as appropriate.		Identify surface disturbance prescriptions.
ACEC-13		Identify wildfire prescriptions for each ACEC that advances the values for which the ACEC is designated.		Prescribed fire will be used as appropriate to accomplish multiple use objectives.

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Table 3-36. Scenic or Backcountry Byways: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
N/A	N/A	No current management decisions for scenic or backcountry byways are included in the RMP.		

Table 3-37. National Historic Trails and National Scenic Trails: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Cong Des-1		Management activities for the NHTs were addressed in the ACEC designation and in other management actions, such as ROW avoidance zones.		Current management does not comply with the National Historic Preservation Act or BLM guidance for management of Congressionally designated trails. Current management is not adequate, including the ¼ mile prescription, visual resource surface disturbance, recreation, and other management prescriptions are not adequate.

Table 3-38. National Scenic Trails: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
Cong Des-2		The Continental Divide National Scenic Trail is managed as a Congressionally-designated trail.		Current management does not comply with the Trail planning or BLM guidance for management of Congressionally designated trails. Current management is not adequate, including the ¼ mile prescription, visual resource surface disturbance, recreation, and other management prescriptions are not adequate.

Table 3-39. Wild and Scenic Rivers: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
N/A	N/A	No current objectives and decisions for WSRs are included in the RMP.		

Table 3-40. Wilderness Study Areas: Current Management Decisions

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
N/A	N/A	No current objectives and decisions for WSAs are included in the RMP.		
	Dubois Badlands	A portions of the Dubois Badlands MU are presently designated a WSA and will remain under BLM's Wilderness Interim Management Policy until Congress makes the final decision on wilderness designation.		Status?
	Whiskey Mountain	A portions of the Whiskey Mountain MU are presently designated a WSA and will remain under BLM's Wilderness Interim Management Policy until Congress makes the final decision on wilderness designation.		Status?

3.2.8 Socioeconomic Resources

Table 3-41. Social Conditions: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
N/A	N/A	No current objectives and decisions for social conditions are included in the RMP.		

Table 3-42. Economic Conditions: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
N/A	N/A	No current objectives and decisions for economic conditions are included in the RMP.		

Table 3-43. Health and Safety: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
N/A	N/A	No current objectives and decisions for health and safety are included in the RMP. Other management actions for other resources, such as fire or recreation, addressed public safety as a part of those programs.		

Table 3-44. Environmental Justice: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
N/A	N/A	No current objectives and decisions for environmental justice are included in the RMP.		

Table 3-45. Tribal Treaty Rights: Current Management

Planning Decision Number	Decision Source	Current Management Decision	Duplication with Other Resource Areas	Status
N/A	N/A	No current objectives and decisions for tribal treaty rights are included in the RMP.		

4.0 MANAGEMENT OPPORTUNITIES

This chapter analyzes the ability of current management direction to achieve desired conditions and address resources and demands for use of the resources. It describes resource management activities that may or may not, under current management, be meeting the goals specified in the RMP. This chapter serves a starting point for alternative formulation by identifying management opportunities for consideration during the alternative development process.

4.1 Desired Conditions and Ability to Address Resource Demands

Management decisions from the 1987 Lander RMP are identified in the following table. Each management decision has been assigned a planning decision number.

4.1.1 Physical Resources

Table 4-1. Air Quality: Management Opportunities

Planning Decision Number	Current Management Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
A-1	No current objectives or decisions on air quality are included in the RMP. BLM complies on a project-by-project basis with Federal air quality laws and regulations.	No	Increased mineral development, population growth, and cumulative impacts from other activities along with policy have raised issues that the Lander Field Office must address.	Obtain better background data such as being done as part of the Gun Barrel, Madden Deep and Iron Horse, and Beaver Creek EISs. Work with partners to obtain a better perspective on air quality and potential impacts.
A-2	All BLM-initiated or authorized actions, such as the use of prescribed fire, avoids violation of Wyoming and national air quality standards. This is accomplished through the coordination of BLM-managed activities with the Wyoming DEQ and the EPA.	Unknown	Lander Field Office coordinates with the Wyoming DEQ and EPA as appropriate, but with little background data, it is difficult to determine the impacts to air quality.	Obtain better background data such as being done as part of the Gun Barrel, Madden Deep and Iron Horse and Beaver Creek EISs. Work with partners to obtain a better perspective on air quality and potential impacts.
A-3	Air quality standards are monitored by the Wyoming DEQ. Air quality permits will be obtained from Wyoming DEQ before prescribed fires are set on public land. Smoke and pollution will be minimized as described in the Smoke Management Guidebook (BLM 1985).	Yes		
A-4	The Lander Field Office will coordinate with the Wyoming DEQ and the EPA on developing air quality standards and guidelines as needed.	Yes	As mineral developments in the planning area increase, monitoring and guidelines will become more important.	Ensure that full field developments and large scale mining operations consider air resources impacts, especially cumulative impacts/

Table 4-2. Geologic Resources: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Geo1	No current objectives or decisions for geologic resources are included in the RMP except to the extent that they are addressed in ACECs, such as Red Canyon and Beaver Creek.	Yes		

Table 4-3. Soil Resources: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Soil 1	No current objectives or decisions for soils are included in the RMP except to the extent that these are addressed in ACECs or WSAs. The EIS considered soils as part of the existing environment.	No	Soil resources support other resources and uses and can be addressed in those sections. An analysis of oil suitability as part of permitting decisions is needed. Soils with low reclamation potential (LRP) need to be identified and managed. Soil suitability is not directly addressed.	Incorporate soil suitability into each permitted activity. Consider soil site potential. Address impacts to erosion.
Soil 2	BLM Guidance ("Standard Lease Surface Disturbance Stipulations") limits some types of soil disturbance. • Disturbance on slopes in excess of 25 percent. • Construction during periods when the soil material is saturated, frozen, or when watershed damage is likely to occur.	No	The 25% slope limitation is a rough guide and does not address all soil types, some of which are vulnerable at less than 25% slope. The soil type determines acceptable steepness.	Make soil type (along with other factors such as vegetation health) determine when and how soils may be disturbed.

Table 4-3. Soil Resources: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Soil 3	On a case-by-case basis, soil resources are addressed in other resources and uses, such as water quality, surface disturbance, and rangeland health.	Yes	This is adequate with the caveat that disturbed soil is protected through reclamation and stabilization. Existing soil surveys need to be completed (approximately 200,000 acres have not been surveyed). Surveys that are dated or too broad should be improve.	Vegetation and soil reclamation is addressed under vegetation resources. Current management has not been adequate to achieve adequate soil stabilization or to reestablish vegetation as habitat in some areas. Review adequacy of reclamation requirements. BLM reclamation policy is discussed in Vegetation. The Wyoming Storm Water Discharge Program has reduced erosion from surface disturbance. The anticipated increase in mineral development in areas vulnerable to erosion, such as Green Mountain, require strict compliance with the Wyoming Storm Water Discharge Program.
Soil-4	Improving soil health is a management objective; enhancement opportunities should not be overlooked. Soil erosion monitoring will be conducted as necessary to track the effectiveness of management.	No	If more fully implemented, this management action would improve soil. Very limited monitoring is done.	GIS technology could make implementation of this decision far more effective. Using GIS data (slopes, LRP, distance from water, etc.) as a planning tool for locating surface disturbing activities will improve soil management.

Table 4-4. Water Resources: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Water-1	No objectives or decisions on water resource management are included in the RMP that are not already current Bureau policy. According to current policy: See Wyoming Water rights fact Sheet at: http://www.blm.gov/nstc/WaterLaws/wyoming.html . Also, see Bureau national water policy at: http://www.blm.gov/nstc/WaterLaws/blmwaterpolicy.html . Water quality is addressed in other programs, such as livestock grazing and mineral resources. The SHR, including the protection of water and riparian resources, are part of every management action.	No	Water resources are very scarce in the planning area and are under increasing competing uses and drought. The health of the public lands depends on appropriate water quality and quantity.	Ensure that water is part of every management action, both in terms of impacts of the action to water quality and also managing for drought conditions. Wyoming DEQ has primacy on compliance with the Clean Water Act. Opportunities to partner to improve water quality should be explored.
Water-2	PFC is considered in all management actions.	No	More progress towards PFC needs to be achieved.	Make achieving progress towards PFC more important in management decisions. PFC is a critical element in achieving Rangeland health.
Water-3	Surface-disturbing activities are prohibited within 500 feet of surface water and/or riparian areas, except when such activities are necessary and when their impacts can be mitigated or avoided.	No	Management needs to be extended to riparian/wetlands. Mining activities can be allowed in riparian areas.	Consider more focused site specific keep out zones where needed for resource protection. Locatable minerals: Because of rights granted to claimants under the mining laws, the BLM may impose only those surface use restrictions that are necessary to prevent undue and unnecessary degradation.
Water-4	Non-RMP decisions restrict ssurface-disturbing activities that apply to watershed protection.	No	Many areas are not meeting PFC or making progress. There is not adequate monitoring of riparian conditions. Reclamation is not being achieved in some areas which has increased erosion and degraded water quality.	See Riparian and Soil section.
Water-5	To protect watershed values, roads and trails will be closed and reclaimed if they are heavily eroded or washed out, or if roads in better condition are available. These management actions are addressed under other programs, such as travel management.	Yes	The management decisions are appropriate but implementation has not been fully realized due to funding limitations and lack of staff.	Partnerships with interested publics may provide the best tools to address issue.

Table 4-4. Water Resources: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Water-6	To protect watershed values, vehicular travel is prohibited on wet soils and on slopes greater than 25 percent, when and where unnecessary damage to vegetation, soils, or water quality would result.	No	Looking through the NRCS soil interpretations, the general slope break where uses encounter Severe restrictions for slope is 15%. Generally, Bureau-engineered roads are restricted to using slopes under 8 percent.	The 25 % figure was more of a vehicle limitation than an erosion concern. A more appropriate slope figure for protecting soil resources from erosion would be 15% slope.

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Water-9	Riparian area condition will be noted as part of rangeland health assessments. Management of riparian areas that are not properly functioning will emphasize strategies identified in BLM technical references TR 1737-4 and TR 1737-6. Monitoring and evaluation will track progress toward meeting RHSs.	No	Funding, other workload priorities, and staffing constraints have limited the BLM's ability to monitor which, coupled with the impacts of the drought, has resulted in little progress towards PFC being made and insufficient on the ground data.	Partner with interested publics to better monitor and improve rangeland health. Make livestock grazing plans that have to flexibility to respond to changing riparian conditions, particularly in light of drought and climate change.
Water-10	To protect water quality, fire retardant drops by air tankers are prohibited within 200 feet of water.	Yes	See Fire and Fuels section.	
Water-11	Produced water will be disposed of in accordance with Onshore Oil and Gas Order No. 7.	Yes	See Oil and Gas.	
Water-12	The BLM may acquire mineral exploratory wells and drill holes that produce water. These acquired wells will be developed for multiple use purposes if they meet the criteria listed in Appendix I for water well conversion.	Yes	Minerals.	

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Water-13	BLM is a signatory to the Wyoming Governor's Drought Plan of 2003. This plan is directed at raising drought awareness, prediction, monitoring, and contingency planning.	Yes	BLM has never incorporated the monitoring procedures detailed in the Plan. Livestock grazing has not been modified to incorporate management systems that would better address the impacts of drought. Drought impacts reclamation of all surface disturbing activities.	See livestock grazing, riparian, and vegetation sections regarding the impacts of drought on adequacy of management actions and options for management change.

Table 4-5. Cave and Karst Resources: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
C&K-1	No current objectives or decisions on cave and karst resources are included in the RMP. This resource is not addressed in the RMP and no inventory for cave and karst resources has been conducted.	No	No cave and karst inventory has been undertaken.	Work with partners to develop inventory.
C&K-2	Other important caves or cave passages identified in the future will be protected.	N/A		
C&K-3	AML projects will be wildlife (bat) friendly.	Yes		

4.1.2 Mineral and Energy Resources

Table 4-6. Locatable Minerals: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Loc-1	All federal lands within the resource area will be open to locatable mineral exploration and development unless specifically withdrawn or segregated from appropriation under the mining laws (see map 2). At the present time, approximately 1 percent of the federal mineral estate within the resource area is closed to locatable mineral exploration and development.	No	Important resource values are not protected such as visual, recreational, and cultural resources . Examples include Castle Gardens, areas near the NHTs and Continental Divide National Scenic Trail, near the Warm Springs Canyon Flume, regional historic trails and highways, and tribal sacred areas.	See OHV, Cultural Resources, Visual Resources, Wildlife and other areas.
Loc-2	The entire Green Mountain area will be open for locatable mineral exploration and development. Maintain opportunities for exploration and development of locatable mineral resources.	No	Riparian areas and water recharge areas are not adequately protected.	See water quality and riparian areas.
Loc-3	Locatable mineral exploration and development activities on Green Mountain which could cause unacceptably high adverse impacts to other significant resource values are restricted. 120 acres surrounding BLM and county campgrounds and picnic sites on Green Mountain are closed to locatable mineral exploration and development.	No	See above under water and soil quality.	Withdraw the conflict areas from locatable minerals or provide other restrictions.
Loc-4	A Plan of Operations is required for all locatable mineral exploration and development within 350 feet of Sparhawk Cabin.	No	Sparhawk should be withdrawn from mineral entry to fully protect it.	Withdraw the area from locatable mineral entry.
Loc-5	Crucial elk winter range is designated an ACEC.	Yes	See Wildlife and ACEC.	
Loc-6	The entire Beaver Creek area is open for locatable mineral exploration and development. Opportunities for exploration and development of locatable mineral resources are maintained.	No	Protections for greater sage-grouse may not be adequate. The area has potential for phosphate development could threaten visual resources.	See ACEC.

Table 4-6. Locatable Minerals: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Loc-7	Locatable mineral exploration and development in the Beaver Creek area where activities could cause unacceptably high adverse impacts to other significant resource values are restricted.	No	See Loc-6.	Identify areas of high resource values, utilizing tools such as the visual resources inventory, sage grouse locations and other current data to identify other significant resources. Jon needs to understand what is meant by restricted. We can have seasonal restrictions, or modify access, or whatever, but we cannot make areas off-limits unless we have a withdrawal.
Loc-8	The 1,710 acres surrounding Split Rock Landmark, Rocky Ridge, the Split Rock Interpretive Site, the Aspen Grove Site and an additional 280 acres proposed for withdrawal around Rocky Ridge are closed to locatable mineral exploration and development.	No	This action was only partially implemented.	See Cultural resources and the NHT sections.
Loc-9	A Plan of Operations is required for all locatable mineral exploration and development within 1/8 mile of the Gilespie Place Historic Site and Willies Handcart Site, Beaver Rim, and Ice Slough.	No	To totally protect these sites and trails, the areas should be protected by a minerals withdrawal.	See Cultural resources and the NHT sections.
Loc-10	The Lander Slope area is designated an ACEC. The entire management unit (MU) is open to locatable mineral exploration and development. A Plan of Operations is required for all locatable mineral exploration and development within areas of highly steep slopes and important wildlife habitat within the Lander Slope.	No	A minerals withdrawal would protect the visual resources, slopes vulnerable to erosion, and wildlife habitat.	See Lander Slope ACEC.
Loc-11	The Red Canyon ACEC is open to locatable mineral exploration and development. A Plan of Operations for all locatable mineral exploration and development operations within the highly visible steep slopes and areas with important wildlife habitat is required.	No	A minerals withdrawal would protect the visual resources, slopes vulnerable to erosion, and wildlife habitat.	See Red Canyon ACEC.
Loc-12	The South Pass area is open for locatable minerals exploration and development. There are 1,727 acres which will continue to be segregated from appropriation under the mining laws, as a designated ACEC.	No	Not enough area is withdrawn to protect the historic site.	See South Pass Historic Mining District ACEC.

Table 4-6. Locatable Minerals: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Loc-13	The Gas Hills management area is open to locatable mineral exploration and development and management should maximize opportunities for the exploration and development of locatable mineral resources. Few restrictions on locatable mineral exploration and development are placed and only in those areas where these activities could cause significant adverse impacts on other resources.	No	Management is not adequately protective of other resources.	Identify areas of conflict and consider surface occupancy restrictions or other protections.
Loc-14	80 acres around Castle Gardens will be segregated from appropriation under mining laws.	No	Area is not large enough to protect other resources.	See ACECs and Cultural sections.
Loc-15	830 acres are withdrawn around Devil's Gate landmark, Devil's Gate Interpretive Site, and fragile lands along the Oregon/Mormon Pioneer Trail.	No	Area is not large enough to protect other resources.	See ACECs and Cultural sections.
Loc-16	680 acres around Martin's Cove NRHP site are proposed for withdrawal from appropriations.	No	..The original withdrawal proposal for Martin's Cove was never done, but subsequent action by Congress for the Martin's Cove lease included withdrawal of 1240 acres.	Because of Congressional actions, there is no need for further withdrawals
Loc-17	Require a Plan of Operations for all locatable mineral exploration and developments along Oregon/Mormon Pioneer Trails.	No	Does not protect the visual and cultural resources associated with the Trails and their setting.	See ACECs, Cultural and NHTs sections. There are NO options here with respect to locatable minerals other than withdrawing the trail corridor.
Loc-18	Designate ACECs for significant sites and segments along Oregon/Mormon Pioneer Trails.	No.	Narrow width of existing ACEC does not protect the visual and cultural resources associated with the Trails and their setting.	See ACECs, Cultural and NHTs sections.
Loc-19	Close approximately 13,855 acres to locatable mineral exploration and development for the East Fork ACEC. Withdraw approximately 10,423 acres of mineral estate from mining laws for implementation of USFWS/ WGFD/BLM plan for elk crucial winter range. 3,432 acres have been withdrawn under mining laws and made available for elk crucial winter range.	Yes	See ACEC.	

Table 4-6. Locatable Minerals: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Loc-20	The entire Dubois Badlands area is open for exploration and development. A Plan of Operations for all locatable mineral exploration and development for the area within Dubois Badlands WSA is required.	No.	See ACEC.	
Loc-21	Whiskey Mountain Bighorn Sheep Winter Range is closed to locatable mineral exploration and development. The entire 6,630 acres of federal mineral estate in the Whiskey Mountain ACEC will be withdrawn from appropriation.	Yes	See ACEC.	
Loc-22	The entire Dubois management area will be open for locatable mineral exploration and development except for 190 acres in Warm Springs Canyon, which will be withdrawn from appropriation.	No	Decision never implemented	The RMP revisions could have language about the area still needing a mineral withdrawal. See Cultural resources section.

Table 4-7. Leasable Coal: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Coal-1	The coal screening process (as identified by 43 CFR 3420.1-4) has not been conducted in the planning area, and coal leasing has not been analyzed. If an application for a coal lease should be received in the future, an appropriate land use and environmental analysis, including the coal screening process, will be conducted to determine whether or not the coal areas applied for are acceptable for development and for leasing (43 CFR 3425). The RMP will be amended as necessary.	Yes		

Table 4-8. Leasable Geothermal: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Thermal-1	Although Geothermal resources were not analyzed in the RMP, and the RMP does not contain any provisions for geothermal leasing, the Programmatic Geothermal ROD amended the RMP. It did not identify any high potential in the planning area, which was confirmed in the Geothermal RFD. Consequently, geothermal energy development will not be analyzed in detail. If an application for a geothermal lease is received, an appropriate land use analysis and RMP amendment would be required.	Yes		..

Table 4-9. Leasable Oil and Gas: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
	Public lands will be made available for oil and gas leasing and development to the maximum extent possible, while giving due consideration to the protection of other significant resource values. The potential for the occurrence of oil and gas and the significance and sensitivity of other resource values present in the resource area were used as management tools to aid in the determination of detailed management prescriptions for each MU.	No	The 1987 RMP did not analyze or consider the extensive development that would occur in the planning area and in surrounding areas. Therefore, impacts to other resources such as sage-grouse were not considered.	Re-analyze conflicts to other resources while supporting the production of oil and gas.

Table 4-9. Leasable Oil and Gas: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
O&G-2	Less than 1 percent of the slightly more than 2.7 million acres of federal mineral estate within the planning area are closed to leasing. All but approximately 12,000 acres of the open acreage will be managed under a management prescription that will allow for enhanced management of the oil and gas resources by being less restrictive of oil and gas development related to other surface resource values in known geologic structures and areas rated as having a high potential for the occurrence of oil and gas. This would be accomplished over the life of this plan as analyses are done to determine where the restrictions can be modified and still avoid significant impacts to other resources. In addition, as new information on the potential occurrence of oil and gas in any given area is obtained or new discoveries of oil and gas reserves are made, the potential rating for the area will be revised to reflect the new data. New leases issued in these areas will be issued under the management prescription for that new rating.	No	Additional limits on surface occupation are imposed by other resource constraints.	See O&G-1
O&G-3	Oil and gas leases issued within the resource area will be conditioned with stipulations to protect other important resource values. These restrictions will provide needed protection to other resources and at the same time allow for as much opportunity as possible to explore for and develop the oil and gas reserves within the resource area.	Yes	Responsive in most cases. Sensitive areas for wildlife, etc. may cause resource conflicts.	Plan to extend controlled surface use stipulations, time limiting stipulations, or conditions of approval through the maintenance and operation activity in highly sensitive habitats for BLM special status species, T&E, wildlife, and wild horses.
O&G-4	Geophysical activities associated with oil and gas exploration will generally be restricted in the same manner as other oil and gas exploration and development activities. Geophysical activities don't necessarily have the same impacts on surface resources as do other oil and gas exploration activities, but because of the wide variety of methods and the even wider variety of impacts associated with them, it will be impossible to predict all possible combinations of methods and resources potentially impacted and to develop a management prescription that will be detailed enough to cover all possibilities. If a particular method of geophysical exploration could be conducted within the constraints necessary to protect other resources, it would be allowed.	No	Not sufficiently protective of other resources. Geophysical exploration, particularly when repeatedly done, has potential for damaging other resources.	Consider imposing limits on geophysical exploration as necessary to protect other resources.

Table 4-9. Leasable Oil and Gas: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
O&G-5	The entire Green Mountain area is open for oil and gas leasing with maximum management flexibility; enhanced management of surface resources is allowed while providing opportunities for exploration and development of the oil and gas reserves. New leases in high-potential areas will be conditioned with NSO and seasonal restrictions only when necessary to avoid significant adverse impact(s) to other resources. Lease restrictions may be waived if the lessee demonstrates that adverse impacts to other resources could be acceptably mitigated. NSO restrictions in areas of low and moderate potential are applied with seasonal closures to protect wildlife and soils.	No	See O&G-1	See O&G-1
O&G-6	The entire Beaver Creek area is open for oil and gas leasing with maximum management flexibility; enhanced management of surface resources is allowed while providing opportunities for exploration and development of the oil and gas reserves. New leases in high-potential areas will be conditioned with NSO and seasonal restrictions only when necessary to avoid significant adverse impact(s) to other resources. Lease restrictions may be waived if the lessee demonstrates that adverse impacts to other resources could be acceptably mitigated. NSO restrictions in areas of low and moderate potential will be applied with seasonal closures to protect wildlife and soils.	No	See O&G-1	See O&G-1
O&G-7	The Lander Slope is open to oil and gas leasing, but the majority of the area will have restrictions, including NSO and seasonal restriction to protect crucial wildlife habitat areas, to protect other resources when necessary. The entire unit has been determined to have low oil and gas potential. Sensitive visual resources, crucial wildlife habitats, and fragile areas are protected while allowing exploration and development of oil and gas resources in area.	Yes	See ACEC.	

Table 4-9. Leasable Oil and Gas: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
O&G-8	The Red Canyon is open to oil and gas leasing with restrictions; new oil and gas leases will include NSO where necessary and seasonal restrictions to protect sensitive visual resources, crucial wildlife habitats, fragile areas, and the Red Canyon National Natural Landmark (NNL), while providing for opportunities to explore and develop oil and gas resources. The Red Canyon has been determined to have low oil and gas potential.	Yes	See ACEC.	
O&G-9	The South Pass area is open to oil and gas leasing with restrictions. New leases will include NSO restriction and wildlife seasonal closures when necessary.	Yes	See ACEC.	
O&G-10	The South Pass NRHP Mining District boundary will be redefined to exclude all areas devoid of significant historical resources after completion of historical resource inventories. Historical resources in the proposed NRHP District are protected.	No	Additional inventory and study determined that the boundaries should not be reduced but expanded.	See South Pass Historic Mining ACEC.
O&G-11	The entire Gas Hills area is open for oil and gas leasing with maximum management flexibility; enhanced management of surface resources is allowed while providing opportunities for exploration and development of the oil and gas reserves. New leases in high-potential areas will be conditioned with NSO and seasonal restrictions only when necessary to avoid significant adverse impact(s) to other resources. Lease restrictions may be waived if lessee demonstrates that adverse impacts to other resources could be acceptably mitigated. NSO restrictions in areas of low and moderate potential are applied with seasonal closures to protect wildlife and soils.	No	See O&G-1	See O&G-1
O&G-12	The entire East Fork area is designated as a no-lease area.	Yes		See ACEC.
O&G-13	The Dubois Badlands management area is open to oil and gas leasing with restrictions to protect significant surface resource values including natural and visual characteristics of Dubois Badlands, crucial wildlife habitats, and fragile areas. All new oil and gas leases have NSO stipulations. Exploration activities are seasonally restricted in important wildlife habitat areas.	Yes		See ACEC

Table 4-9. Leasable Oil and Gas: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
O&G-14	6,630 acres on Whiskey Mountain are closed to oil and gas leasing unless drainage of reserves occurs on adjacent private or state lands. If leasing occurs, then they will include NSO stipulations with no exceptions to NSO restriction. Leasing must be consistent with cooperative management efforts.	Yes		Whiskey Mountain Area will need analysis to see if area of no leasing could be expanded based on acquisitions of lands and expansion of Big Horn Sheep use areas.
O&G-15	The entire Dubois management area is open for oil and gas leasing with maximum management flexibility; enhanced management of surface resources is allowed while providing opportunities for exploration and development of the oil and gas reserves. New leases in high-potential areas will be conditioned with NSO and seasonal restrictions only when necessary to avoid significant adverse impact(s) on other resources. Lease restrictions may be waived if lessee demonstrates that adverse impacts to other resources could be acceptably mitigated. NSO restrictions in areas of low and moderate potential are applied with seasonal closures to protect wildlife and soils.	Yes		

Table 4-10. Leasable Other Solids: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Lease-other-1	Surface-disturbing activities associated with all types of minerals and geophysical exploration and development and are subject to application of the Wyoming BLM Standard Mitigation Guidelines for Surface-Disturbing Activities.	No	See Soils and Vegetation-reclamation.	See O&G-1
Lease-other-2	The Beaver Creek area is open for exploration and development of phosphate reserves subject to minor constraints. All exploration permits and leases issued within the unit will include NSO stipulations when necessary to protect water quality, fisheries, riparian area, sage grouse leks, steep slopes, T&E species, important scenic areas, and significant cultural sites. In addition, seasonal restrictions will be applied to prospecting and exploration as needed to protect crucial wildlife habitat areas.	No	Some potential for resource conflict with phosphate leasing may occur.	Review protections for visual resources and ACEC. See ACEC.
Lease-other-3	Phosphate prospecting, exploration, and leasing are allowed on the Lander Slope subject to major constraints.. Phosphate activities on the Lander Slope are restricted to prevent significant adverse impacts to scenic values and important wildlife habitat. In some cases, these restrictions may impede or prevent the economic recovery of the phosphate.	No	Some potential for resource conflict with phosphate leasing may occur.	Review protections for visual resources and ACEC. See ACEC.
Lease-other-4	The NNL is closed to phosphate leasing and the crucial elk winter range is open to phosphate prospecting and leasing with major constraints. The phosphate resources within the unit have low development potential.	No	Some potential for resource conflict with phosphate leasing may occur.	Review protections for visual resources and ACEC. See ACEC.

Table 4-11. Mineral Materials (Salables): Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Salable-1	Exploration and development of other minerals, such as sand and gravel, building stone, and other common-variety mineral materials will be provided on a demand basis and in consistency with the limitations and restrictions imposed on oil and gas, locatable minerals, and phosphate exploration and development within the resource area.	Yes	Areas suitable for mineral materials sales should be identified so as to make the process more efficient and improve resource protection.	Identify sale areas and make known to the public. Reduce process associated with mineral material sales for the convenience of the public and the efficiency of the BLM.
Salable-2	Sales and extraction of mineral materials from existing mineral sites will be allowed. Establishment of new mineral sites will be evaluated individually.	Yes	See record above.	See record above

4.1.3 Fire and Fuels Management

Table 4-12. Unplanned/Wildland Fire: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Fire-1	All wildland fire actions will comply with the 2001 Federal Wildland Fire Management Policy (Update of 1995 Federal Fire Policy) and the 2003 Interagency Strategy for the Implementation of Federal Wildland Fire Management Policy as guiding principles and policy in the Northern Wyoming Fire Zone.	Yes		
Fire-2	A FMP (FMP 2004 update) is on record to identify fire suppression strategies within all FMU within the planning area. The FMP contains criteria for protecting high resource values, such as significant cultural resources, crucial winter range for big game, high priority watersheds, and WUI areas. The FMP also identifies resources that would benefit or be enhanced by wildfire. The FMP includes operational aspects of implementing suppression strategies. A wildland fire situation analysis will be conducted whenever the fire escapes initial attack to establish objectives and constraints for the management of the fire. A Wildland Fire Implementation Plan will be completed when a fire is determined to be a Wildland Fire Use candidate fire.	Yes		
CO-008	Firefighter and public safety is the highest priority in every fire management activity.	Yes		
Fire-3	Fire suppression efforts are concentrated in areas containing high resource and/or human values and in areas with intermingled landownership patterns.	Yes		

Table 4-12. Unplanned/Wildland Fire: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Fire-4	The Northern Wyoming Fire Zone provides for an AMR on all wildland fires occurring in the Lander planning area. Responses include full to limited suppression, monitoring, and/or wildland fire use. Responses to each wildland fire will be initiated in a timely manner and will be based upon established fire management direction as documented in the Northern Wyoming Zone FMP, which is tiered onto this RMP. The use of AMR will allow land managers to tailor preplanned wildland fire responses to meet objectives established in this RMP and associated implementation plans.	Yes		
Fire-5	Limited use of bulldozers and graders on wildfires, and use Minimum Impact Suppression Tactics when possible.	Yes		
Green Mountain FMU	Fire suppression personnel will avoid aerial or ground application of fire chemicals within 300 feet of waterways and will avoid dipping from rivers or lakes with a helicopter bucket containing residual fire chemicals. An adjacent reload site will be established, and fire chemicals will be managed with portable tanks. Deviation from these limits is allowed when life or property is threatened and the use of fire chemicals can be reasonably expected to alleviate the threat.	Yes		
Fire-7	Where aquatic T&E species or their habitats are potentially affected by aerial application of retardant or foam, the following additional procedures apply: • As soon as practical, determine whether the aerial application has caused any adverse effect on the T&E species or their habitat. • When aerial application of fire chemicals within 300 feet of a waterway have been applied, the unit administrator will determine whether there have been any adverse effects to the T&E species. If an adverse effect is determined, the agency must consult with the USFWS.	Yes		

Table 4-12. Unplanned/Wildland Fire: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Fire 7.5	The Lander planning area (which is part of the Southern Wyoming Fire Zone) will conduct all wildland fire actions in compliance with the 2001 Federal Wildland Fire Management Policy (2001 Federal Fire Policy).	Yes	Note: Fire management policy must follow the IM for management of WSAs.	
Fire-8	Full suppression of fires on Green Mountain will be employed as quickly as possible with as little surface disturbance as possible, with limited or restricted use of heavy equipment, and with an aggressive initial attack. Prescribed fire will be utilized to enhance range and wildlife habitat.	Yes	Note: Fire management policy must follow the IM for management of WSAs.	
Fire-9	Within the Sweetwater Valley FMU, AMR would most likely result in full suppression of fires with limited use of bulldozers and graders on wildfires. Use Minimum Impact Suppression Tactics when possible.	Yes	Note: Fire management policy must follow the IM for management of WSAs.	
Fire-10	Within the Lander Slope FMU, AMR would most likely result in full suppression of fires with limited use of bulldozers and graders on wildfires. Use Minimum Impact Suppression Tactics when possible.	Yes	Note: Fire management policy must follow the IM for management of WSAs.	
Lander Slope FMU	Within the Dubois FMU, AMR would most likely result in full suppression of fires with limited use of bulldozers and graders on wildfires. Use Minimum Impact Suppression Tactics when possible.	Yes	Note: Fire management policy must follow the IM for management of WSAs.	
Fire-12.5	Fire management in the Gas Hills area will protect private and state lands. Management is designed to reduce suppression costs and environmental damage due to heavy equipment in limited suppression areas.	Yes	Note: Fire management policy must follow the IM for management of WSAs.	
Fire-13	Gas Hills: Zone 1: Full suppression with limited use of heavy equipment. Zone 2: Limited suppression. Zone 3: Full suppression with limited use of heavy equipment. No heavy equipment is used in Sweetwater Rocks Area.	Yes	Note: Fire management policy must follow the IM for management of WSAs.	

Table 4-12. Unplanned/Wildland Fire: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Fire-14	Wildland fire and fuels practices are managed to promote, maintain, and enhance resources. Wildland fire is allowed to function in its ecological role when appropriate for the site and situation, while providing for firefighter and public safety as well as local communities and economic interests.	Yes		
Fire-15	All wildland fire actions will comply with the 2001 Federal Wildland Fire Management Policy (Update of 1995 Federal Fire Policy) and the 2003 Interagency Strategy for the Implementation of Federal Wildland Fire Management Policy as guiding principles and policy in the Northern Wyoming Fire Zone.	Yes		

Table 4-13. Planned/Prescribed Fire: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Fire-16	As appropriate, prescribed burns and non-fire tools, such as mechanical and chemical treatments, will be used achieve a number of fuels management goals, such as improvements to wildlife habitats, hazardous fuels reduction, and overall ecological health. All vegetation treatment methods will be used to achieve management objectives such as those for AMPs and HMPs. Due to potential erosion problems on steep slopes, fire management decisions state "Full suppression with limited or restricted use of heavy equipment" will be utilized during fires." Prescribed burns will also be utilized. There is nothing about "mechanical and chemical treatments" in the ROD.	Yes		Implemented and ongoing with coordinated rangeland mowing with treatments such as those within the Sweetwater Valley FMU, Copper Mountain FMU, Lander Slope FMU, Dubois FMU, and Green Mountian FMU to benefit wildlife habitat,increase herbaceous production, and achieve hazardous fuels loading.
Fire-18	All fire and non-fire vegetation management proposals will be considered on a case-by-case basis to ensure environmental integrity and consistency with the multiple resource objectives and activity plans.	Yes		
Fire-19	Prescribed burn planning will include obtaining proper smoke permits from the Wyoming DEQ in compliance with the Wyoming Ambient Air Quality Standards.	Yes		
Fire-20	Fuels management treatments within the WUI are the highest planned/prescribed fire priority for implementation with the planning area.	Yes		

Table 4-14. Stabilization and Rehabilitation: Management Opportunities

Planning Decision Number	Planning Decision	Duplication with Other Resource Areas	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Fire-21	Reclamation and soil stabilization practices are applied to burned areas on a case-by-case basis. Additionally, livestock grazing will be controlled on burned areas on a case-by-case basis through the use of such methods as fencing or resting from livestock grazing.		No	Additional management needed as reclamation has not been uniformly successful.	Implement planning area wide reclamation policy and standards.

4.1.4 Biological Resources

Table 4-15. Vegetation – Forests, Woodlands, and Forest Products: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Forest-1	No current objectives or decisions on forest/woodland habitat are in the RMP. The resource was not addressed in the current RMP as an independent resource, but was included as part of the existing environment in the EIS.	No	The drought and pine beetle infestation need to be addressed. The absence of any demand for local timber requires that management outside of timber sales will be required.	Partner with other land managers in planning for opportunities to improve health of the forest. Determine if there are stewardship opportunities available to address tree mortality.
Forest-2	Hand cutting and mechanical methods are used to reduce the extent and density of juniper and limber pine woodlands. Where appropriate, use prescribed burning to reduce the density of juniper and limber pine in sagebrush steppe and mountain shrub habitat.	No	There are not enough resources to address the forest problems with small efforts. A programmatic approach is needed.	Continue work on limber pine woodlands within the Green Mountain, Copper Mountain, Lander Slope and Twin Creek areas to removed diseased and dying trees with goal of improving woodland health, maintaining sagebrush steppe habitat and reducing hazardous fuels.
Forest-3	Identify and preserve old-growth stands of juniper and limber pine.	No	Funding and staff limitations have prevented this from being implemented.	Identify opportunities to do a complete inventory including old-growth.
Forest-4	Small timber sales are offered in Dubois on a demand basis to improve the timber conditions on small areas by regenerating harvested areas.	No	Fails to address both the absence of demand in sufficient amount to make improvements in forest health and does not address the wide-spread death of the local forest.	Work with partners including the community of Dubois and the USFS Shoshone National Forest to develop forest wide approaches for addressing beetle and drought kill trees.
Forest 5	Small timber sales in South Pass are offered where appropriate to help maintain wildlife cover and to protect watersheds. Timber cuts are limited to harvesting dead and dying trees to improve stand regeneration.	No	Cutting in South Pass for firewood needs to be controlled so that resource objectives are protected.	Work with stakeholders to develop appropriate cutting areas to satisfy local demand for firewood and Christmas trees while improving resource conditions.

Table 4-15. Vegetation – Forest, Woodlands, and Forest Products: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Forest-5	In the South Pass area, harvest aspen stands in clear cuts or use prescribed fire to remove competing conifers; use woven wire fencing or brush to protect regenerating stands until aspen are 6 – 8 feet tall. Use artificial regeneration if natural regeneration is not successful.	Yes	The 1987 RMP appropriately addressed South Pass aspen. However, there has been little interest in aspen harvest and no funding to protect stands. New opportunities to protect aspen need to be addressed.	Not implemented due to lack of demand and BLM personnel to implement. Updated forest stand inventory needed. Partnership and funding opportunities need to be pursued to address aspen health.
Forest-6	Sales of up to 10 million board feet (MMBF) are available on the Lander Slope, followed by no activity for 10 years during which logging roads are closed. Irregularly shaped clear cuts of up to 25 acres are available, with only partial cutting allowed within 100 feet of perennial streams.	Yes	The 1987 RMP appropriately addressed South Pass aspen. However, there has been little interest in aspen harvest and no funding to protect stands. New opportunities to protect aspen need to be addressed.	Not implemented due to lack of demand and BLM personnel to implement. Updated forest stand inventory needed. Partnership and funding opportunities need to be pursued to address aspen health.
Forest-7	No harvesting with conventional logging equipment is allowed in the Lander Slope area on slopes greater than 45 percent. A ratio of 40-60 percent cover to forest ratio is maintained for optimum elk habitat. Piling and burning of unusable debris is required to prepare harvested sites for regeneration. Artificial regeneration is used if natural regeneration is unsuccessful.	Yes	This management is appropriate (with perhaps a reconsideration of allowable slope of less than 45% to bring more n line with other surface disturbing activities. There has been no interest in commercial logging and little funding for forest health treatments. There has been no staff time or funding for artificial regeneration.	Treatment is undertaken as funding allows.
Forest-8	200 MMBF of saw timber products is authorized on Green Mountain. 0.5 MMBF is authorized for minor forest products. Green Mountain is managed on a 17 compartment basis and rotated every 5-6 years.	No	The commodity approach to forest health (i.e., relying on commercial sales of forest products to improve forest health) has not been successful because of lack of demand.	Partnership and funding opportunities need to be pursued to address aspen health.

Table 4-15. Vegetation – Forest, Woodlands, and Forest Products: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Forest-9	Prescribed burning or other techniques are utilized on Green Mountain following sale. Each adjacent compartment is segregated in time to aid forest progression to move to an uneven-aged condition. A 40-60 percent cover to forage ratio is maintained within each compartment.	No	Lack of demand for sawtimber or wood products and funding. Because of steep slopes and the risk of accelerated erosion, harvesting on Green Mountain is expensive. Not fully implemented due to lack of local and regional demand for timber sales. Minor forest product sales are active on Green Mountain.	Minor forest treatments are undertaken but there has not been staff time or budget to do the full treatment needed.
Forest-10	Clearcut blocks up to 25 acres with irregular shapes to achieve an edge effect are used on Green Mountain. There are no clearcuts within 100 feet of perennial streams. Conventional logging equipment is not allowed on slopes greater than 45 percent.	No	See Record 9. Not fully implemented as intended in the management decision due to lack of local and regional demand for timber sales. Implemented on a forest health treatment basis, but not specifically according to compartment management.	
Forest-11	On Green Mountain, clear cut aspen stands or use prescribed fire to remove competing conifers. Use woven wire fencing or brush to protect regenerating stands until aspen are 6–8 feet tall. Use artificial regeneration if natural is not successful.	No	See Record 9 Not fully implemented as intended in the management decision due to lack of local and regional demand for timber sales. Implemented on a forest health treatment basis, but not specifically according to compartment management.	See Record 9.
Forest-12	Piling and burning of unusable debris is required on Green Mountain to prepare harvested sites for regeneration. Artificial regeneration is used if natural regeneration is unsuccessful. Pre-commercial or commercial thinning in younger stands are considered as required.	Yes	Currently being successfully implemented.	Continue with projects.
Forest-13	Utilize timber sales and prescribed burning in Red Canyon to improve wildlife habitat.	No	Currently being implemented on a forest health basis.	Continue with projects.

Table 4-15. Vegetation – Forest, Woodlands, and Forest Products: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Forest-14	Aspen woodlands in Red Canyon are managed to create healthy wildlife habitat and alter landscape-level wildfire behavior. Harvest aspens in partial or clearcuts up to 5 acres. Conifer stand harvesting is limited to partial cutting to remove dead and dying trees.	No	Not implemented due to lack of local and regional demand for timber sales and lack of BLM forestry personnel. Updated forest stand inventory needed.	Undertake inventory as funding allows.
Forest-15	Some artificial regeneration is employed in Red Canyon if natural regeneration is unsuccessful.	No	Not implemented due to lack of local and regional demand for timber sales and BLM forestry personnel. Updated forest stand inventory needed.	Undertake inventory as funding allows.
Forest-16	Timber sales are allowed in the South Pass area where appropriate to help maintain wildlife cover and to protect watersheds. Small timber sales are allowed to local cutters.	Yes		
Forest-17	Aspen woodlands are managed in the South Pass area to create healthy wildlife habitat and to alter landscape-level wildfire behavior. Harvest aspens in partial or clearcuts up to 5 acres. Conifer stand harvesting is limited to partial cutting to remove dead and dying trees.	Yes	But see record 9 above.	
Forest-18	Some artificial regeneration is employed in the South Pass area if natural regeneration is unsuccessful.	No	Not implemented due to lack of local and regional demand for timber sales and lack of BLM forestry personnel. Updated forest stand inventory needed.	Undertake inventory as funding allows.
Forest-19	Surface-disturbing and disruptive activities associated with all types of forest management will be subject to appropriate mitigation developed through use of the mitigation guidelines.	Yes		Wyoming Standard Surface Disturbing Guidelines need to be applied consistently to Forest Management Activities.
Forest-20	No current objectives or decisions on forest/woodland habitat are in the RMP. The resource was not addressed in the current RMP as an independent resource, but was included as part of the existing environment in the EIS.	Yes	implemented.	

Table 4-16. Vegetation – Grasslands and Shrublands: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Grass-1	Vegetation is addressed in the RMP as a subpart of livestock grazing and by the SHR.	No	We have addressed vegetative objectives and goals in AMPs, Rangeland Management Agreements and other cooperative agreements. However, very few of the allotments have been identified as moving from I to C or M categories. Little progress towards PFC has been identified and even allotments with AMPs are not meeting SHR.	The RMP is re-analyzing vegetation in this RMP and needs to address how management moving forward will be more successful than in the period since the 1987 RMP was adopted..
Grass 2	Vegetative communities within the planning area were the Green Mountain.(1979) and Gas Hills (1983) inventories. They determined frequency, density and species composition as outlined in the NRCS range site guides.	Yes	Data is antiquated.	Current inventories are dated. A new Ecological Site Inventory or comparable inventory needs to be completed for the planning area.
Grass 3	Vegetative communities are managed in accordance with SHR under standard #3 & 4.	Yes	About 1/3 of our allotments have been analyzed under the SHR.	Complete large blocks of rangeland by managing and assessing on a watershed or landscape basis.
Grass 4	Crucial wildlife habitats have special vegetation management prescriptions to benefit individual species of wildlife.	No	Data is not current.	Complete desired plant community prescriptions and implement vegetative treatments on these crucial wildlife habitat areas to attain desired outcomes.
Grass 5	Manage vegetation with treatments to attain healthy rangeland ecosystems that meet SHR.	Yes	We have started implementing projects in areas under the “pilot program” approach.	Need to implement vegetative treatments throughout the planning area to restore diversity of perennial plant communities.

Table 4-17. Riparian/Wetland Resources: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Rip-1	Riparian areas are managed as part of livestock grazing. Standard 2 of the Wyoming SHR addresses riparian condition and improvement.	No	Progress towards achieving Standard 2 is slow and, in some cases, riparian/wetland degradation is occurring.	Review S&Gs to determine success. Develop cooperative partnerships to address riparian health. In consideration of drought and climate change, approach livestock grazing management to improve riparian health.
Rip-2	The condition of uncommon and important wildlife habitats are maintained or improved through vegetative manipulations or other habitat improvement projects, and application of the Wyoming BLM Standard Mitigation Guidelines for Surface-Disturbing Activities.	In part.	Since surface disturbance guidelines have been established and with improvements as a result of Wyoming storm water discharge permitting, riparian/wetland degradation has been lessened. More work needs to be done, particularly in light of the drought and difficulty of reclamation.	Make surface disturbance and reclamation an important priority in all land use activities. Partner with stakeholders to improve education and public understanding.
Rip-3	Surface disturbing activities within 500 feet of surface water and/or riparian areas, aquatic habitats and 100 year floodplains are prohibited.	Mostly	Does not apply to mineral activities under the 1872 Mineral Act.	Consider withdrawing riparian/wetland areas from mineral activities.
Rip-4	Access (including 4-wheel drive, snowmobile, horseback, and pedestrian access) will be limited in areas of crucial habitats, sensitive species habitats and wetland/riparian habitat. The type of limitation will depend on the kind of resource value being protected.	No	Management has proven inadequate. Travel management has not been fully signed and enforcement has been low, spotty, or more recently, non-existent. Demand for “play areas” has been expressed, as well as “solitude” or non-motorized access.	See Travel Management section. The public needs to be educated as to the rules regarding protection of these important habitats and the rules need to be enforced. BLM lacks adequate staffing to fully implement this, so cooperative actions with other agencies are important.
Rip-5	No new permanent facilities are permitted in floodplains, riparian areas, or wetlands, except to benefit watershed health or vegetation. Linear watercourse crossings are considered on a case-by-case basis.	Yes		

Table 4-17. Riparian/Wetland Resources: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Rip-6	Wetlands are managed to maintain and improve habitat through the implementation of changes in livestock grazing systems.	No	Progress towards achieving Standard 2 is slow and, in some cases, riparian/wetland degradation is occurring.	Review S&Gs to determine success. Develop cooperative partnerships to address riparian health. In consideration of drought and climate change, approach livestock grazing management to improve riparian health.
Rip-7	OHV and recreational use is managed to maintain and improve riparian/wetland habitat.	No	See Record 4.	See Travel Management Section.

Table 4-18. Invasive Species: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Weed-1	Noxious weeds and other undesirable vegetation will be controlled in conjunction with local counties; the USDA - APHIS; and other agencies and affected interests, consistent with: 1985 Northwest Area Noxious Weed Control Program EIS and its 1987 Supplement and the ROD (BLM, 1985; BLM, 1986); the ROD for the Final EIS Addressing Vegetation Treatment on BLM Lands in Thirteen Western States (BLM 1991); and the Vegetation Treatments Using Herbicides ON BLM Lands in Seveteen western States Programmatic FEIS and it's ROD (BLM, 2008) .	Yes		
Weed-2	Control of noxious weeds may include manual, mechanical, biological, cultural, or chemical methods. If herbicides are proposed for use, those that are effective on the target weed species and that have minimum toxicity to wildlife and fish, will be selected. As per BLM policy, via BLM Manual direction, buffer zones will be provided along streams, rivers, lakes, and riparian areas, including riparian areas along ephemeral and intermittent streams.	Yes	The buffer strip provisions of the BLM manual are in addition to any other herbicide label precautions.	

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Weed-3	Also, as per current BLM Manual direction, treatments will avoid raptor and upland game bird nesting seasons and other times when loss of cover or disturbance by equipment could be detrimental.	Yes	The buffer strip povisions of the BLM manual are in addtion to any other herbicide label precautions.	
Weed-4	Projects that may affect threatened or endangered plants or animals will be modified to protect the presence of these species. In such cases, the BLM will consult with the USFWS as required by the ESA.	Yes		

Table 4-19. Fish: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Fish-1	Routine fish habitat improvement projects are developed and maintained in the Green Mountain area after appropriate review and where consistent with capabilities and priorities. Selected tree and shrub sites are manipulated to improve beaver, fisheries and other species habitat.	No	Management decision is adequate but not well funded. Livestock grazing has negatively impacted fisheries and fish habitat. Old surface disturbance has degraded fisheries.	Incorporate riparian/wetlands considerations into livestock grazing management and all surface disturbing activities.
Fish-2	The Green Mountain area is a moderate priority area for development of aquatic (fisheries, beaver, riparian) HMPs. The vigor of, expanding the size of, and reestablishing aspen/willow stands to stabilize forage and material base for beavers and dam complexes is prioritized.	No	Historic mineral activities, livestock grazing, and OHV use have contributed to degradation of aquatic habitat. Funding and staff limits have reduced the habitat treatments undertaken.	Incorporate riparian/wetlands considerations into livestock grazing management and all surface disturbing activities.
Fish-3	Special management projects and actions are undertaken in the Beaver Creek area to improve fisheries and associated riparian habitat in Upper Sweetwater River and Beaver Creek drainages.	No	Some watershed improvement has been achieved, but there are many areas where fisheries and riparian/wetlands are not improved.	Incorporate riparian/wetlands considerations into livestock grazing management and all surface disturbing activities. Consider watershed wide implementation of improvement projects.
Fish-4	Routine fish habitat improvement projects are developed and maintained in the Beaver Creek area after appropriate review and where consistent with capabilities and priorities.	No	See Record 3 and 4.	See Record 3 and 4.
Fish-5	Routine fish and wildlife habitat improvement projects are developed and maintained on the Lander Slope after appropriate review and where consistent with capabilities and priorities.	No	See Record 3 and 4.	See Record 3 and 4.
Fish-6	BLM will initiate prescribed burns and other practices to rehabilitate fisheries and riparian habitat on the Lander Slope.	Yes	Management decision is responsive although funding and staff time have not been adequate to fully implement.	Cooperate with partners such as Trout Unlimited, the Popo Agie Conservation District, and angler groups for additional funding and volunteer programs.
Fish-7	Routine fish improvement projects are developed and maintained after appropriate review and where consistent with capabilities and priorities in Red Canyon.	Yes	Management decision is responsive although funding and staff time have not been adequate to fully implement.	Cooperate with partners such as The Nature Conservancy, Trout Unlimited, the Popo Agie Conservation District, and angler groups for additional funding and volunteer programs.

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Table 4-19. Fish: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Fish-8	Prescribed burns and other practices to rehabilitate elk, mule deer, moose, bighorn sheep, fisheries, and riparian habitat are used in Red Canyon in limited ways.	Yes	See record above.	
Fish-9	In-stream structures and fencing in Barret Creek drainage will be used to improve fisheries and riparian habitat.	Yes	The need for fencing has changed due to the implementation of intensive in grazing management in this area.	
Fish-10	Aquatic habitat management for fisheries, beaver, and riparian species use is improved in the South Pass area. Routine fish habitat improvement projects are developed and maintained after appropriate review and where consistent with capabilities and priorities.	Partially	Habitat improvement has been hampered in areas due to permitted land uses. Project implementation has been limited due to funding and staffing limitations.	Cooperate with partners such as Trout Unlimited, the appropriate Conservation District, the WGFD, the Wyoming State Parks and Cultural Resources Department, and angler groups for additional funding and volunteer programs.
Fish-11	Routine fish and wildlife habitat improvement projects are developed and maintained after appropriate review and where consistent with capabilities and priorities in the Gas Hills, Dubois, and Dubois Badlands areas.	Yes		

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Table 4-20. Wildlife: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Wildlife-1	Routine wildlife habitat improvement projects are developed and maintained in the Green Mountain area after appropriate review and where consistent with capabilities and priorities.	Yes	Management decision is responsive to issues but staff funding and time have been limited.	Partner with other stakeholders to increase ability to improve habitat.
Wildlife-2	Major habitat improvement objectives for elk/mule deer are incorporated into comprehensive timber management plan and grazing AMPs in the Green Mountain area.	No	Wildlife is considered in permitted activity but habitat improvement is not the primary focus. Timber is not being managed on Green Mountain, except for small vegetation treatment projects, due to lack of demand. Livestock grazing does not incorporate major habitat improvement.	Partner with other entities to manage the timber on Green Mountain. More vigorously manage livestock grazing on Green Mountain for habitat benefit.
Wildlife-3	Promote aspen and willow regeneration to create diversity in size, age-class, and edge-effect in conifer stands while maintaining elk cover requirements in the Green Mountain area.	No	Wildlife is considered in permitted activity but habitat improvement is not the primary focus. Timber is not being managed on Green Mountain, except for small vegetation treatment projects, due to lack of demand. Livestock grazing does not incorporate major habitat improvement.	Partner with other entities to manage the timber on Green Mountain. More vigorously manage livestock grazing on Green Mountain for habitat benefit.
Wildlife-4	Green Mountain MU is a moderate priority area for development of aquatic (fisheries, beaver, riparian) HMP. The vigor of, expanding the size of, and reestablishing aspen/willow stands to stabilize forage and material base for beavers and dam complexes is prioritized.	No	Management decision does not address the loss of beaver and fisheries habitat. Treatment to improve aspen/willow stands is not undertaken on an adequate basis.	Partner with other stakeholders to increase ability to improve habitat.
Wildlife-5	Routine wildlife habitat improvement projects are developed and maintained in the Beaver Creek area after appropriate review and where consistent with capabilities and priorities.	Yes	Management decision is responsive to issues but staff funding and time have been limited.	Partner with other stakeholders to increase ability to improve habitat.
Wildlife-6	Routine wildlife habitat improvement projects are developed and maintained after appropriate review and where consistent with capabilities and priorities on the Lander Slope.	Yes	Management decision is responsive to issues but staff funding and time have been limited.	Partner with other stakeholders to increase ability to improve habitat.

Table 4-20. Wildlife: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Wildlife-7	The Lander Slope area is a high-priority area for development of a terrestrial HMP, with elk as the primary species. BLM will initiate prescribed burns and other cultural practices to rehabilitate elk, mule deer, moose, bighorn sheep, and riparian habitat.	Yes	Management decision is responsive to issues but staff funding and time have been limited.	Partner with other stakeholders to increase ability to improve habitat.
Wildlife-8	Routine wildlife habitat improvement projects are developed and maintained in Red Canyon after appropriate review and where consistent with capabilities and priorities.	Yes	Management decision is responsive to issues but staff funding and time have been limited.	Partner with other stakeholders to increase ability to improve habitat.
Wildlife-9	Red Canyon is a high-priority area for development of a terrestrial HMP with elk as the primary species. The MU is managed to continue to make available 500 AUMs of forage for elk.	No	Red Canyon has more than 500 wintering elk.	Consider whether there is adequate forage and larger number of AUMs should be allocated for elk.
Wildlife-10	Prescribed burns and other practices to rehabilitate elk, mule deer, moose, bighorn sheep, and riparian habitat are used in limited ways in Red Canyon.	Yes		
Wildlife-11	Aquatic habitat management for beaver and riparian use is improved in the South Pass area. Routine wildlife habitat improvement projects are developed and maintained after appropriate review and where consistent with capabilities and priorities.	No	Wildlife is considered in permitted activity but habitat improvement is not the primary focus. Only small vegetation treatments are undertaken due to lack of funding. Livestock grazing does not incorporate major habitat improvement.	Continue to expand opportunities for habitat management through vegetation treatment.
Wildlife-12	In conjunction with interested publics and partners, develop a workable bighorn sheep reintroduction program for Sweetwater Rocks.	No	Many private landowners objected to reintroduction.	Manage habitat so that reintroduction could be possible in the future with public support and funding.
Wildlife-13	Routine fish and wildlife habitat improvement projects are developed and maintained after appropriate review and where consistent with capabilities and priorities in the Gas Hills, Dubois, and Dubois Badlands areas.	No	Wildlife is considered in permitted activity but habitat improvement is not the primary focus. Only small vegetation treatments are undertaken due to lack of funding. Livestock grazing does not incorporate major habitat improvement.	Continue to expand opportunities for habitat management through vegetation treatment. Address increasing risk to habitat from drought or beetle killed trees.
Wildlife-14	Continue with cooperative habitat improvement projects to improve elk habitat in the East Fork area. Prescribed burning, seeding, pitting, herbicide treatment, and water development are utilized for the benefit of the elk.	Yes		

Table 4-20. Wildlife: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Wildlife-15	Projects initiated in the East Fork area will be designed to improve habitat for wintering elk.	Yes		
Wildlife-16	Use all habitat and animal management techniques and improvement projects for direct/indirect benefit of Whiskey Mountain bighorn sheep population and habitat.	Yes		
Wildlife-17	Any projects used to improve habitat for other species (besides bighorn sheep) in the Whiskey Mountain area will reduce the competition of these animals with bighorns or to not cuase significant negative effects on bighorn sheep.	Yes		
Wildlife-18	Activities and surface use will be prohibited within 0.25 mile of Greater sage-grouse strutting grounds (leks) or as appropriate unless an exception is authorized.	No	Science now shows that the .25 mile distance is inadequate and that entire lifecycle habitat must be protected.	Work cooperatively to protect sage-grouse and their habitat in intact and functioning condition to prevent listing as a T&E species. BLM is determining prescriptions that will be adopted to protect sage-grouse and their habitats..
Wildlife-19	A seasonal restriction will be applied to surface-disturbing and disruptive activities and land uses during nesting/brooding periods within a two-mile radius of active Greater sage-grouse leks or as appropriate on a case-by-case basis.	No	Science now shows that the 2 mile radius is inadequate. Seasonal restrictions may be inadequate and generally do not apply to production activities, just exploration and drilling activities.	Work cooperatively to protect sage-grouse and their habitat in intact and functioning condition to prevent listing as a T&E species. . BLM is determining prescriptions that will be adopted to protect sage-grouse and their habitats..
Wildlife-20	BLM will consult with the WGFD before waiving, allowing exceptions to, or modifying wildlife-related land use restrictions and mitigations.	Yes		
Wildlife-21	Seasonal restrictions will be applied as appropriate to surface-disturbing and disruptive activities and land uses on big game crucial winter range, elk winter range, big game parturition areas, sage-grouse breeding and nesting habitat, and raptor nesting areas.	No	Current restrictions protect habitat only during the seasonal period and do not ensure habitat is available the following year. Research has shown that current protection distances for sage-grouse habitats are inadequate and need to be increased	Develop habitat loss thresholds in important and limited habitats. Adopt recommendations for increasing sage-grouse protection distances.
Wildlife-22	Wildlife escape ramps would be installed in all water troughs to prevent birds and small mammals from drowning.	Yes		Existing projects needed to be checked more frequently and escape ramps repaired or replaced as needed.

Table 4-20. Wildlife: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Wildlife-23	No planning decisions address protecting wildlife migration routes.	No	Current plan did not address wildlife migration routes.	Work with WGFD to identify migration routes and develop protection measures. Include seasonal migration as well as "historic migration corridors."

Table 4-21. Special Status Species – Plants: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
SSP-1	A management plan is implemented to identify, protect, and maintain the habitat and population of rare plants, the Beaver Rim cushion plant (*Phlox pungens)* and limber pine/bluebunch wheatgrass (*Pinus flexilis/Agropyron spicatum*) communities in the Beaver Creek area.	Yes	Consider making more of the habitat protected from surface or mineral entry.	
SSP-2	A management plan is implemented to identify, protect, and maintain the habitat of Barneby's clover (*Trifolium barnebyi*) in Red Canyon.	Yes	A management plan was not required because the lands in Red Canyon on which Barneby's clover habitat has been identified are owned by The Nature Conservancy and managed to protect the sensitive species.	
SSP-3	A management plan is implemented to identify, protect, and maintain the habitat and population of Meadow pussytoes (*Antennaria arcuata*), Williams rock cress (*Arabis Williamsii*), and Small rock cress (*Arabis pusilla*) in the South Pass area.	No	Inventory determined that the species are not found in the South Pass area.	
SSP-4	Conservation Measures and BMPs as described in USFWS Amended Consultation Memorandum ES-61411/W.02/WY9485 for the management of the Desert Yellowhead *(Yermo xanthocephalus)* and its critical habitat are incorporated by reference, per BLM Instruction Memorandum WY-2005-052.	Yes		Close critical habitat to mineral leasing, ROWs, and vehicle traffic. Maintain current locatable mineral withdrawal.
SSP-5	Conservation Measures and BMPs described in USFWS Biological Opinion Memorandum ES-61411/W.02/WY06F0205b for the management of the Ute Ladies'-tresses orchid are incorporated by reference, per BLM Instruction Memorandum WY-2007-020.	Yes		

Table 4-22. Special Status Species – Fish: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
N/A	No current objectives or decisions for special status fish species are included in the RMP; however, all management decisions relating to fish species, and many management actions relating to water quality, riparian and wetland resources, livestock grazing, fire and fuels management, locatable mineral resources, and management of invasive/non-native species, would also apply to or have an impact on special status fish species.	No	Special status fish species need to be addressed.	Develop protection measure for special staus fish species.
SSF-1	Consultation is required as described in the USFWS Memorandum concerning Federal Agency Actions Resulting in Minor Water Depletions to the Platte River System dated June 13, 1996.	Yes		

Table 4-23. Special Status Species – Wildlife: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
SSW-1	No current objectives or decisions for special status wildlife species as they were not discussed as a group in the RMP. Several current special status species were discussed under general wildlife in current RMP. Threatened and Endangered wildlife is managed in accordance with the requirements of the Endangered Species Act. **There was no discussion of the Wyoming Game and Fish Department's list of Species of Greatest Concern.**	No	Management focuses on the more high profile wildlife such as Canadian lynx and sage-grouse and little attention is paid to other special status species that are not covered by specific laws such as the Migratory Bird Treaty Act.	Identify indicator species for habitats, such as the sage-grouse, so that habitat management that protects the sage-grouse will likely protect the less well known or more difficult to track species. Partner with the educational institutions and organizations to increase the knowledge of and awareness for other special status species.
SSW-2	The BLM will participate with the FWS in the evaluation and designation of critical habitat for T&E species on BLM-administered lands. If proposed surface-disturbing or disruptive activities could affect these species, the BLM will consult with the FWS as required by the Endangered Species Act.	Yes		

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Table 4-23. Special Status Species – Wildlife: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
SSW-3	Conservation Measures and BMPs described in attachment 2 of USFWS Informal Conference Memorandum ES-61411/W.02/WY8797 for the management of potential gray wolf habitat are incorporated by reference, per BLM Instruction Memorandum WY-2005-046.	Ongoing	Gray wolf has been proposed for de-listing. The status in Wyoming is dependent on USFWS's acceptance of the Wyoming management plan.	
SSW-4	Conservation Measures and BMPs described in attachment 2 of USFWS Informal Conference Memorandum ES-61411/W.02/WY9669c for the management of potential Canada lynx habitat are incorporated by reference, per BLM Instruction Memorandum WY-2005-058.	Yes		
SSW-5	Conservation Measures and BMPs described in attachment 2 of USFWS Informal Conference Memorandum ES-61411/W.02/WY9741d for the management of potential Black-footed ferret habitat are incorporated by reference, per BLM Instruction Memorandum WY-2006-037.			
SSW-6	Conservation Measures and BMPs as described in attachment 2 of USFWS Informal Conference Memorandum ES-61411/W.02/WY07FA0408 for the management of white-tailed prairie dog habitat are incorporated by reference, per BLM Instruction Memorandum WY-2008-025.	Yes		
SSW-7	Conservation Measures and BMPs described in attachment 2 of USFWS Conference Memorandum ES-61411/W.02/WY9751d for the management of grizzly bear are incorporated by reference, per BLM Instruction Memorandum WY-2006-049.	Yes		Identify priority habitat areas and potential conflicts with other land uses.
SSW-8	Conservation recommendations as described in the USFWS Biological Opinion for the Wyoming BLM RMPs and Their Effects to the Bald Eagle transmitted by USFWS Memorandum ES-61411/W.02/WY7682b are incorporated by reference, per BLM Instruction Memorandum WY-2004-051.	Yes		

Table 4-23. Special Status Species – Wildlife: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
SSW-9	Habitat preservation measures as identified in the Wyoming BLM Statewide Programmatic Biological Assessment for Whooping Cranes *(Grus Americana)* and USFWS concurrence as transmitted by Memorandum ES-61411/W.02/(BIO-OPIN.WPD) are incorporated by reference, per BLM Instruction Memorandum WY-2004-032.	Yes	Species is extirpated in planning area.	
SSW-10	Conservation Measures and BMPs described in attachment 2 of USFWS Informal Conference Memorandum ES-61411/W.02/WY07FA0290 for the management of mountain plover habitat are incorporated by reference, per BLM Instruction Memorandum WY-2007-018.	Yes	Seasonal protections are breeding and nesting mountain plovers are currently in required for surface-disturbing activities.	
SSW-11	For the protection of prey bases essential to the peregrine falcon or other T&E birds, spraying of insecticides will not be allowed until after the completion of site-specific environmental analyses.	Yes		

Table 4-24. Wild Horses: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
WH-1	Wild horse are managed under interim decisions until the Decision Record from the Evaluation of Wild Horse Herd Areas and Capture Environmental Assessments, which implemented the recommendations from the 1992 Evaluation of Wild Horse HMAs and the USDI-BLM 1992 Strategic Plan for Management of Wild Horses and Burros on Public Lands.	No	Population expansion has exceeded the numbers approved in the Consent Decree. Population control is provided as possible within funding constraints.	Continue adoption programs. Work with partners to find additional support for population control.
WH-2	Wild horse gathers are implemented to control population size, diversity, and habitat values.	No	See Record 1.	See Record 1.
WH-3	Public education about wild horses is implemented as part of management and used to generate support for the wild horse program.	No	Some progress on education is being made. Additional public outreach and viewing opportunities should be expanded.	Partner with wild horse enthusiasts and tourism promoters to improve wild horse viewing opportunities and adoption programs.

4.1.5 Heritage and Visual Resources

Table 4-25. Cultural Resources: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
	Site-specific inventories for cultural resources are required before the start of surface-disturbing activities. Adverse effects on significant resources will be mitigated, or the resources themselves will be avoided by surface-disturbing activities.	Yes		
	Sites listed on the NRHP are appropriately protected. Any violations of the Archaeological Resources Protection Act are investigated.	Yes		
Cult-0.1	The BLM's consultation with the Advisory Council for Historic Preservation and the Wyoming State Historic Preservation office is consistent with the cultural resources programmatic agreement signed in 1995.	Yes		
Cult-0.2	Rock art, as well as other prehistoric and historic archaeological sites and districts associated with specific time periods or cultures, are managed for scientific, public, and socio-cultural use. General areas will be managed for research, with emphasis on interpreting former ecosystems. Specific sites or areas will be preserved for future study and use. Near rock art, the use of heavy equipment to construct fire lines and the use of chemical and dye retardants will be restricted or prohibited.	Yes		
Cult-0.3	As appropriate, specific sites on public lands will be managed for their traditional Native American cultural values.	Yes	Additional consultation may be required as more sites and TCP become known or recognized.	
Cult-0.4	Adverse effects are avoided on public lands and resource values listed in National Park Service inventories of possible NNL. These lands and resources include paleontological and scenic values at Beaver Rim and Red Canyon.	No	The potential status of Beaver Rim as a NNL is not considered in management decisions.	Incorporate into current management.

Table 4-25. Cultural Resources: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Cult-0.5	Protective measures will be implemented for all important cultural sites, either known or identified in the future.	Yes		
Cult-1	All management actions in the Beaver Creek area are consistent with the Oregon/Mormon Pioneer NHT Management Plan. Pursue designation and enrollment of the Beaver Rim NNL.	No	The Trails are managed in accordance with the Plan. Experience has shown that the ¼ mile protection zone does not comply with the National Historic Preservation Act and does not adequately protect the Trails. Designation of the Beaver Rim NNL was not implemented.	Look for partners to assist in designating the Beaver Rim NNL, including tourism and education groups. Expand protections for the NHTs to comply with National Historic Preservation Act and adequately protect the Trails.
Cult-2	The Red Canyon NNL's natural character and qualities are protected. Protect future appreciation of classic natural history resource.	Yes		
Cult-3	The South Pass area is managed to protect fragile and important historic sites. Prevent deterioration of 19th and 20th century historical resources.	Partially	Additional lands are needed to be included in the protected area.	Expand ACECs. Work with the Wyoming Parks Department to protect the historic resources. Work with other BLM field offices to fully protect the area.
Cult-4	The South Pass area is managed to deter destruction of historical sites.	Partially	The area has been patrolled annually.	Work to acquire additional protections for historic resources.
Cult-5	The South Pass area is managed to preserve all significant sites within the historic district.	Partially	There are additional sites, such as the original Miner's Delight, that are not part of the public lands being adequately managed.	Work cooperatively to protect additional historic resources.
Cult-6	The South Pass area's historical setting is maintained around South Pass City.	Partially	The area has been significantly stabilized. Some new intrusions have occurred but they have not significantly diminished from the historical setting.	Identify unnecessary modern intrusions that, if removed, would contribute to the historical setting. Other management decisions, above, would also contribute to maintaining the setting.
Cult-7	Miner's Delight is managed to improve understanding of its history. Test excavations will be made to facilitate interpretation.	Partially	Excavations have been conducted at Miner's Delight and useful information has been collected; however, good interpretation at the site is lacking	Secure funding to implement the recommendations of an interpretation plan that was written by the University of Wyoming for the BLM.

Table 4-25. Cultural Resources: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Cult-8	A management plan will be developed for Castle Gardens including walkways and other fencing to halt deterioration of the site.	No	Resources have only recently been available to implement this program.	A plan is now being developed which will look at better protecting Castle Gardens and interpreting the site in the context of a larger geographic area. To protect Native American cultural values, surface disturbing and mining activities will need to be limited, prohibited or avoided.
Cult-9	The NHT Management Plan is incorporated into the RMP and used for management decisions in the Gas Hills area.	No	See Record Cult-1.	See Record Cult-1.
Cult-10	Pursue a protective withdrawal for the Martin's Cove site.	Yes	..The original withdrawal proposal for Martin's was never done, but subsequent action by Congress for the Martin's Cove lease included withdrawal of 1240 acres.	Because of Congressional actions, there is no need for further withdrawals
Cult-11	Conduct a study of stabilization needs of the Warm Spring Canyon Flume in the Dubois area.	Partially	A stabilization study has been made but not implemented, due to budget constraints.	Work with the Shoshone National Forest, the Dubois community and other stakeholders to implement the conservation plan.
Cult-12	Develop a management plan for the Warm Springs Canyon Flume.	No	Not implemented due to budget constraints.	See Record Cult-11.
Cult-13	Manage regional trails on a case-by-case basis.	Partially	Only a limited implementation has been possible because of lack of knowledge and little RMP protection.	Provide more intensive management of the regional trails including their historic setting, particularly those with intact segments. Work cooperatively with groups to raise educational awareness, contribute to tourism by developing interpretive sites, making use of scenic overlooks, signs, and walking trails. Coordinate regional trails management with adjoining public land managers.
	Review the ACEC nominations and the cultural resource alternatives.			

Table 4-25. Cultural Resources: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
????	Manage American Indian religious sites on a case-by-case basis	No	Subsequent Executive Orders and laws have increased our responsibilities for protecting and managing tribal sacred, religious, spiritual, and traditional sites	Add language to reflect our increased responsibilities.Since the approval of the Lander RMP in 1987, several laws, Executive Orders and regulations have been established to guide BLM in managing Native American religious sites. These include the Native American Graves Protection and Repatriation Act, Executive Order 13007, and Presidential Memorandum on Government to Government Relations with Native American Tribal Governments, BLM Manual 8120 now guides BLM offices on how to consult with tribal authorities.

Table 4-26. Paleontological Resources: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Paleo-1	No objectives or management decisions on paleontological resources are included in the RMP. The resources included under cultural resources. BLM Guidance on paleontological resources has been issued.	No	New guidance has been approved to ensure better management of paleontological resources,	Implement protections of paleontological resources.
Paleo-2	Important paleontological resources are managed for scientific and public use.	Yes		
Paleo-3	Potential effects on paleontological resources are considered in site-specific environmental analyses before the authorization of surface-disturbing activities. As appropriate, site-specific inventories are required where significant fossil resources are known or anticipated to occur.	Yes		
Paleo-4	Closing lands or restricting uses to protect paleontological resources will be evaluated on a case-by-case basis.	Partially	Insufficient information is known about paleontological resources and additional information is needed to identify areas that might be appropriate for closure.	Work cooperatively with scientific investigators, mineral development companies and others to obtain better knowledge about the resources.
Paleo-5	Important paleontological sites are protected through the use of surface and subsurface protection stipulations and discretionary management authority.	Yes	New guidance has been approved to ensure better management of paleontological resources; it needs to be referred to in here.	
CO-005	Areas in the immediate vicinity of significant cultural and paleontological resource sites, and within 0.25 mile or the visual horizon (whichever is closer) of significant segments of historic trails and early highways are avoidance areas for surface-disturbing activities. Included under these provisions are the Bridger Trail, the Rawlin – Fort Washakie Trail, the Casper to Lander Road, the Green River to South Pass Trail, the Birdseye Pass Trail, the Point of Rock to South Pass Stage Road, the Yellowstone Highway, and the National Park to Park Highway. No objectives or management decisions on regional historic trails are included in the RMP.	No	..New RMP decisions are needed to ensure more consistent management of regional historic trails, and to reduce workloads on staff when conflicts arise.	Revise management prescriptions in accordance with those developed for the Bridger Trail through Memorandum of Agreements.

Table 4-27. Visual Resources: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
VRM-2	Visual resources are managed in accordance with objectives for VRM classes that have been assigned to the planning area (See Map 21)	No	See Record 1.This decision was done with limited inventory information, and does not recognize the increase in visual sensitivity .	A new inventory will be developed to support management decisions in this RMP. Through the land use allocation process, important visual resources will be supported with allowable use stipulations. Additionally Visual Resource Management classes will be complimentary to other planning decisions, so as to avoid conflicting planning decisions (e.g. a VRM class 2 overlaid across a high potential area targeted for intensive resource extraction).
VRM-3	Visual resource values are considered and impacts mitigated on a project by project bases. Wyoming Standard Surface Disturbing Guidelines prohibit surface disturbing activities in VRM Classes 1 and 2.	No	Often project proponents and lease holders are unaware of Visual Resource Management requirements . Standard Surface Disturbing Guidelines have not been applied consistently.	Allowable use stipulations need to be developed to support VRM classifications.

4.1.6 Land Resources

Table 4-28. Lands and Realty: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Realty-1	The preferred method of disposal or acquisition of lands by BLM is through exchange.	Yes		
Realty-2	Acquired lands and/or interests in acquired lands will be managed in a manner consistent with adjacent or nearby public lands if applicable. Acquired lands within an ACEC or other special management area will be managed in accordance with the special management area's activity plan.	Yes		
Realty-3	Proposals for disposal of any BLM-administered lands in the planning area not identified for disposal in the RMP will be considered on a case-by-case basis. Before a disposal action could be implemented, the RMP would have to be amended.	Yes		
Realty-4	Tracts 134 and 135 in the Green Mountain area (see map) are identified for disposal and will be considered on a case-by-case basis.	No	Needs to be re-evaluated in light of current management and community needs.	Analysis of existing land ownership, resource and resource use needs, and adequacy of management need to be evaluated. Both tracts have been disposed of.
Realty-5	Twenty-five isolated tracts in the Beaver Creek area are identified for disposal and will be considered on a case-by-case basis.	No	Needs to be re-evaluated in light of current management and community needs.	Analysis of existing land ownership, resource and resource use needs, and adequacy of management need to be evaluated. All still available.
Realty-6	Ten full tracts and four partial tracts in the Lander Slope area are identified for disposal and will be considered on a case-by-case basis.	No	Needs to be re-evaluated in light of current management and community needs.	Analysis of existing land ownership, resource and resource use needs, and adequacy of management need to be evaluated.3 full tracts and 1 partial tract have been disposed of.
Realty-7	No public lands are identified for disposal in the Red Canyon area.	No	Needs to be re-evaluated in light of current management and community needs.	Analysis of existing land ownership, resource and resource use needs, and adequacy of management need to be evaluated.

Table 4-28. Lands and Realty: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Realty-8	No public lands are identified for disposal in the South Pass area.	No	Needs to be re-evaluated in light of current management and community needs.	Analysis of existing land ownership, resource and resource use needs, and adequacy of management need to be evaluated.
Realty-9	Forty tracts are identified for disposal in the Gas Hills area and will be considered on a case-by-case basis.	No	Needs to be re-evaluated in light of current management and community needs.	Analysis of existing land ownership, resource and resource use needs, and adequacy of management need to be evaluated.4 tracts have been disposed of.
Realty-10	In the East Fork area, tracts 24, 25, 26, and 27 (totaling 961 acres) are identified for disposal but only to private or public agencies which will use the lands in consistency with management objectives for elk winter range. Future exchanges will be considered on a case-by-case basis.	No	Needs to be re-evaluated in light of current management and community needs.	Analysis of existing land ownership, resource and resource use needs, and adequacy of management need to be evaluated. All 4 tracts are still available.
Realty-11	In the Dubois Badlands area, parcels 33, 34, and 35 are identified for disposal with exchange as the preferred method, and will be considered on a case-by-case basis.	No	Needs to be re-evaluated in light of current management and community needs.	Analysis of existing land ownership, resource and resource use needs, and adequacy of management need to be evaluated. 2 tracts have been disposed of.
Realty-12	In the Whiskey Mountain area, landownership adjustments will be allowed only when the Bighorn Sheep Interagency Technical Committee has analyzed and recommended such adjustments.	No	Needs to be re-evaluated in light of current management and community needs.	Analysis of existing land ownership, resource and resource use needs, and adequacy of management need to be evaluated.
Realty-13	Tracts 1, 4, 5, 7, 8, 11, 14, 16, 17, 20, 21, 22, 23, 28, 30, 32, 37, and 168 in the Dubois area are identified for disposal and will be considered on a case-by-case basis.	No	Needs to be re-evaluated in light of current management and community needs.	Analysis of existing land ownership, resource and resource use needs, and adequacy of management need to be evaluated. 8 tracts have been disposed of.
Realty-14	Agricultural trespass on public land generally will be resolved by prohibiting the unauthorized use; however, land sales, exchanges, or leases could resolve agricultural trespass in some cases. Leases might be used to develop the lands as wildlife food and cover areas.	No	Because of limited staff and budget, trespass can be rewarded by acquiring property interests that are not in the best interest of other resources and uses. Trespass is not limited to agricultural trespass.	Identify all trespass, including agricultural trespass, and begin process of resolving. Avoid creating a moral hazard encouraging trespass.
Realty-15	R&PP leases and patents are considered on a case-by-case basis.	Yes		

Table 4-28. Lands and Realty: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Realty-16	The acquisition of non-BLM-administered lands to achieve management objectives will be considered on a case-by-case basis.	Yes		
Realty-17	Existing stock driveway withdrawals will be retained, although the BLM reserves the right to modify historic trailing routes and use, to mitigate any impacts associated with trailing, or to deny trailing use if the impacts cannot be adequately mitigated.	Yes		
Realty-18	The BLM access policy in Wyoming is to acquire permanent exclusive easements (BLM controls and includes rights for the public) over mainline roads in the BLM transportation plan. A BLM mainline road is considered the principal access into larger blocks of BLM-administered public lands or into tracts of BLM administered lands with high resource values.	Yes		
Realty-19	The BLM will seek to acquire administrative access to areas identified as important for resource and resources uses.	Yes		See Travel Management section.
Realty-20	The BLM will pursue public access on important roads and trails identified in the BLM transportation plan. The transportation plan will be updated as necessary and implemented to provide access to large blocks of public land or to smaller parcels of land having high public values.	Yes		See Travel Management section.
Realty-21	Access to specific areas may be closed or restricted to protect public health and safety. Before access is upgraded in the vicinity of important cultural, paleontological, natural history, wildlife habitat, or other sensitive resources, the security and protection of these resources will be carefully considered.	Yes		See Travel Management section.
Realty-22	As of 1985, easements in the Green Mountain area will be negotiated for Willow Creek Road (via Cooper Creek Road), Crooks Mountain Road, and Taggart Meadows Road.	Partially	Funding and staff time have not been adequate to complete this work.	Improve access as funding permits.
Realty 23	In the Beaver Creek area, negotiate with landowners for easements or initiate appropriate route alternatives to secure public access on East Beaver Creek, Twin Creek, Government Draw, Signor Ridge, Hudson-Atlantic City, Beaver Rim, and Dilabaugh Butte roads.	Partially	Funding and staff time have not been adequate to complete this work.	Improve access as funding permits.

Table 4-28. Lands and Realty: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Realty-24	In the Green Mountain area, public access is provided for forest, wildlife, recreation, and livestock management. Existing necessary roads will be maintained. Additional easements or appropriate route alternatives will be negotiated to secure public access.	Partially	Funding and staff time have not been adequate to complete this work.	Improve access as funding permits.
Realty-25	In the Lander Slope area, negotiate for easements or initiate appropriate route alternatives to secure public access on the Shoshone Lake Road to Mormon Basin.	Partially	Funding and staff time have not been adequate to complete this work.	Improve access as funding permits.
Realty-26	In the Gas Hills area, negotiate with landowners for administrative access and easements for Copper Mountain Road, Wolf Gap, Beef Gap, and Beaver Rim Road. Consider other alternatives for easements.	Partially	Funding and staff time have not been adequate to complete this work.	Improve access as funding permits.
Realty-27	Negotiations with landowners for easements across Tappan Creek Road will be pursued.	No	Not pursued because of staff time limitations.	Re-evaluate.

Table 4-29. Renewable Energy: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Renew-1	No current objectives and decisions for renewable energy are included in the RMP. Any non-wind renewable energy proposal will require a plan amendment to implement.	Yes		
Renew-2	The Wind Energy Programmatic ROD (2005) is incorporated into the RMP. Any wind energy proposals will require a plan amendment to implement except for those activities authorized by the ROD, such as meteorological towers. The provisions of IM-2009-043 are followed in processing applications for wind energy development.	Yes	Some of the analysis issues in connection with wind energy development were not addressed by the Programmatic ROD.	Address analysis issues at the time of a “full blown” wind energy development proposal.

Table 4-30. Rights-of-Way and Corridors: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
ROW-1	Most of the planning area is open for the location of utility and transportation systems. Proposals will be addressed on an individual basis with emphasis on avoiding identified potential conflict areas.	No	Current guidance and sensible planning require designating appropriate ROW systems. This will save time and expense for the public and BLM.	Use the RMP revision process to designate ROW corridors that respond to modern needs for transportation, access, and transmissions while protecting other resources and uses.
ROW-2	Utility, pipelines, and ROWs will be co-located whenever possible.	Yes		
ROW-3	To protect scenic quality, placement of aboveground facilities, such as power lines, will be avoided along major transportation routes.	No	See Record 1.	See Record 1.
ROW-4	If restricted types of ROWs are required in avoidance areas or when such areas cannot reasonably be avoided, the adverse effects of construction will be intensively mitigated.	No	See Record 1 plus intensive mitigation is not in compliance with existing guidance (see Visual Resources.)	Develop VRM and other resource specific land use allocation. Avoidance and reduced impacts are part of the design of the project.
ROW-5	No utility and pipeline corridors or communication site windows are designated in the RMP. The Whiskey Peak area is identified as a location where a communication tower exists.	No	See Record 4.	See Record 4.
ROW-6	Public lands in the Green Mountain area will be open for the location of utility and transportation systems and concentrated in existing corridors whenever possible.	No	See Record 4.	See Record 4.
ROW-7	Construction of major utility systems in the Beaver Creek will be allowed and concentrated in existing corridors whenever possible, except for the Oregon/Mormon Pioneer Trails corridor, Sweetwater Canyon, and Sweetwater Rocks. ROWs might be granted in the exception areas if no feasible alternative route or designated corridor is available.	No	See Record 1; see also issues identified under NHTs and the Continental Divide National Scenic Trail.	See Record 1.

Table 4-30. Rights-of-Way and Corridors: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
ROW-8	The Lander Slope is avoided when locating major utility systems; locating these systems in the Lander Slope is only allowed when no feasible alternative route or designated ROW corridor is available. The BLM will consider lowlands near Hwy 28-287 for utility systems before allowing them on slopes of the mountain.	No	See Record 4.	See Record 4.
ROW-9	Red Canyon is avoided for placement of major utility systems. Major utility system ROWs may be granted only when no feasible alternative route or designated corridor is available.	No	See Record 4.	See Record 4.
ROW-10	South Pass, East Fork, Dubois Badlands, and Whiskey Mountain are avoided for placement of major utility systems. Major utility system ROWs may be granted only when no feasible alternative route or designated corridor is available.	No	See Record 4.	See Record 4.
ROW-11	Major utilities are allowed in the Gas Hills area. No utilities will be allowed along the Oregon/Mormon Pioneer Trails corridor and the Sweetwater Rocks. Utility systems will be concentrated in existing corridors whenever possible. ROW might be granted if no feasible alternative route or designated ROW corridor is available.	No	See Record 7.	See Record 7.
ROW-12	Major utility systems will be allowed in the Dubois area, but utility systems will be concentrated in existing corridors whenever possible.	No	See Record 4.	See Record 4.
ROW-13	Power line construction will be required to incorporate standard or special design features to reduce bird collisions and reduce impacts to habitat. Additional power line construction limitations will be applied on a case-by-case basis in special situations to reduce bird collisions.	Yes		..
ROW-14	Existing transportation and utility routes for roads, pipelines, and power lines will be designated as preferred ROW corridors, which would be the preferred location for existing and future ROW grants (map 6).	Yes		

Table 4-31. Trails and Travel Management: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Travel-1	Unless otherwise specified, vehicular use on BLM-administered public lands in the general planning area is designated as limited to existing roads and trails (Map will be supplied with Alternatives). "Existing" roads and trails apply only to roads and trails in existence when these designations were identified for the Lander planning area in the Federal Register on June 9, 1987 .	No	Proliferation of roads and trails continues increase.	All areas in the field office within the "limited to existing designation" need a published map detailing exactly what constitutes an existing road. In doing so, law enforcement officials can realistically enforce the limited to existing travel designation. The RMP should also provide a mechanism to adaptively respond (changing a limited to existing area to a limited to designated) if resource conditions or planning objectives are compromised.
Travel-2	Existing OHV designations completed in 1981 on about one-half of the resource area will be continued. Designations will be completed on the remaining areas of public lands. OHV management will focus more intensive management on those units having crucial wildlife values, significant visual resources, high watershed sensitivity, and outstanding natural character.	No	See travel 1	See travel 1
Travel-3	Except for areas where motorized travel is closed or limited to designated roads or, performance of necessary tasks requiring off-road use of a vehicle is authorized. Examples of necessary tasks include picking up big game kills and constructing or repairing authorized range improvements.	No	Current Travel Management guidance from the Wyoming State Office and the BLM Washington Office has further refined what actions can be exempted from travel management decisions in	All exceptions to travel management decisions will need further detail and definition.
Travel-4	The Red Canyon Management Unit is closed to over the snow vehicle travel and winter activities. Until activity planning specifically addresses the use of over-the-snow vehicles in the rest of the field office, they are subject to the same requirements and limitations as all other vehicles.	No	Critical Ungulate Winter and parturition areas are open to over the snow travel; even though they are closed to motorized vehicles. Groomed Non-motorized over the snow trails are also susceptible to damage by snow machine use.	This RMP needs to review all travel decisions associated with over the snow travel.
Travel-5	No open area for OHV "play" or other cross-country vehicular use is designated.	No	Customer demand has demonstrated a need for such an area.	This RMP needs to explore options for managing for a more intensive OHV use area.
Travel-7	Unnecessary roads in the Green Mountain area, such as the Cooper Creek fire access road, will be removed and rehabilitated.	No	Road closures and rehab needs to be conducted in a manner that is enforceable by BLM law enforcement.	Utilize this process to identify existing and new road closures in the Green Mountain Area. Develop partnerships to implement and enforce these closures, and armor /improve areas where

Table 4-31. Trails and Travel Management: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
				motorized use will be allowed. Limiting mechanized use may be necessary to protect identified resource values.
Travel-8	OHV use in the Green Mountain area is limited to designated roads and trails with seasonal (Closed December 1-June 15) travel limitations above 7,000 feet to protect roadbed and surrounding watershed values.	No	Area above 7,000 feet does not provide a strong boundary to anchor travel restrictions.	See travel 7

Table 4-31. Trails and Travel Management: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Travel-10	The Castle Gardens withdrawal area is closed to OHV use, but the BLM road to Castle Gardens picnic area is open.	No	Easy public access to the petroglyph sites have resulted in vandalism.	The closure may need to be expanded to encompass a larger area to ensure resource protection.
Travel-11	Motorized use in the Lander Slope is limited to designated roads and trails with seasonal travel limitations (Closed December 1-June 15) except for snowmobiles.	No	Management of over the snow travel needs to be consistent with the management of overland vehicles.	Travel limitations on all forms of motorized and mechanized conveyances needs to be explored to consistently protect identified resource values.
Travel-13	Motorized use in Red Canyon is limited to designated roads and trails with seasonal travel limitations (Closed December 1-June 15).	No		Travel limitations on all forms of motorized and mechanized conveyances needs to be explored to consistently protect identified resource values.
Travel-13.1	Motorized use in the Whiskey Mountain Area is limited to designated roads and trails with seasonal travel limitations (Closed December 1-June 15).	No.	See Travel 1	See Travel 1

Table 4-31. Trails and Travel Management: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Travel-14	Existing transportation system is adequate for recreational use and will be maintained.	Yes	In the future the LFO transportation system will be revised through activity level planning. Revisions will be consistent with the revised Lander RMP.	
Travel-18	OHV use in the East Fork area is limited to existing roads and trails.	No	Management of travel needs to consider critical wildlife ranges contained in this area.	Travel limitations on all forms of motorized and mechanized conveyances needs to be explored to consistently protect identified resource values.
Travel-19	The Dubois Badlands area is closed to OHV to protect outstanding scenery and natural values.	Yes	Implementation needs to be stronger; offsite OHV use site may be necessary to provide users an alternative.	Explore methods to reduce illegal use in the Badlands.

Table 4-32. Recreation: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Recreation-1	The Following areas are Special Recreation Areas: The 1987 RMP stated that SRMAs were areas that required explicit on-the0ground management. • Continental Divide National Scenic Trail • Oregon-Mormon Pioneer National Historic Trail • South Pass Historic Mining District	No	These SRMAs were established under old guidance. Existing SRMAs were established broadly and in some cases encompass more area then was necessary, and in others encompass less area then necessary. These SRMAs do not contain adequate management guidance and/or may encompass areas where SRMA	This RMP needs t review customer demand and available supply to determine the locations of all SRMAs. Adequate detail including setting prescriptions' and allowable use decisions need to be developed for all SRMAs to ensure the protection of important recreational outcomes and settings.

Table 4-32. Recreation: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Recreation-2	The following areas are Extensive Recreation Management Areas: The 1987 RMP stated that minimal management is frequently sufficient in extensive recreation management areas. • Beaver Rim • Castle Gardens • Copper Mountain • Dubois Badlands • Government Draw • Green Mountain • Lander Slope/Red Canyon • Lysite Badlands • Sweetwater Canyon • Sweetwater Rocks • Warm Springs Canyon • Whiskey Mountain/East Fork • The Rest of the Field Office not in a SRMA or individual ERMA	No	Management of ERMAs needs to be focused on the field office wide visitor service objectives of resource protection, ensuring human health/safety, and preventing resource use/user conflict. Separate ERMAs and supporting objectives may be established to address local planning issues. Actions in ERMAS need to be the minimum necessary to address and make progress towards the identified objective.	Ensure ERMAs are managed under the standard field office wide custodial objectives for resource protection, ensuring human health/safety, and preventing resource use/user conflict. Considerate separate ERMAs and supporting objectives to address local planning issues. Ensure actions in these areas are the minimum necessary to address and make progress towards the identified objective.
Recreation-3	Prohibit surface occupancy within the following developed recreation sites (Map XXX): • Cottonwood Campground (XXX acres) • Lands adjacent to the Fremont County Campground (XXX acres) • Wildhorse Point (XXX acres) • Atlantic City Campground (XXX acres) • Big Atlantic Gulch (XXX acres) • Miners Delight (XXX acres)	No	New developed sites have been added since the 1987 RMP.	Protections need to be established for all developed recreation sites. Additionally adaptive language needs to be added to protect future developed recreation sites.

Table 4-33. Wilderness Characteristics: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Wilderness-1	No current objectives or decisions for wilderness characteristics are included in the RMP.	No	Guidance and court cases make clear that BLM must inventory the lands it manages and identify areas with wilderness characteristics and determine appropriate management.	Review citizens' proposals for areas with wilderness characteristics and BLM inventories and identify those areas that should be managed as non-WSA lands containing wilderness character.

Table 4-34. Livestock Grazing: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Grazing-1	Livestock grazing use in the planning area will be continued. Livestock grazing will also be managed to provide for protection or enhancement of other resource values. Actions will be consistent with the Guidelines for Livestock Grazing Management for public lands administered by the BLM in the State of Wyoming.	No	Insufficient progress has been made to avoiding damage to other resources or towards achieving rangeland health in some areas.	Re-examine livestock grazing decisions and AMPs to refocus direction on achieving rangeland health.
Grazing-2	This plan incorporates the "Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management for Public Lands Administered by the BLM in the State of Wyoming" approved August 12, 1997. Please see Appendix ____.	Yes	See Record 1	
Grazing-3	High-intensity monitoring will be conducted on top-priority Category I allotments, on allotments with AMPs. Low intensity monitoring will be conducted on the other Category I allotments and on Category M and C allotments.	No	Based on dated information and analyzed prior to the SHR being incorporated into the RMP.	The RMP is re-analyzing livestock grazing.

Table 4-34. Livestock Grazing: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Grazing-4	The current amounts, kinds, and seasons of livestock grazing use will continue to be authorized until monitoring indicates a grazing use adjustment is necessary or that a class of livestock or season of use modification can be accommodated.	No	Stocking rates were addressed on only a portion of the high priority allotments and there has been little staff time or budget to monitor results.	S&Gs need to be completed on all category I allotments and monitoring success must be implemented in cooperation with interested stakeholder.
Grazing-5	The decisions for the Gas Hills Study Area and the Green Mountain Rangeland Programs Summary were developed from the Lander RMP/EIS.	Yes		
Grazing-6	Decisions will be made when monitoring data are sufficient to support decisions. Decisions may include changing livestock numbers, changing periods of use, or both. Monitoring will be a continuous process to assure management objectives are being met. If further modification of periods of use, livestock numbers, classes of livestock or grazing systems, adjustments will be made only after consultation with livestock operators and other affected parties.	No	See Record 4. Grazing systems have not been implemented on all of the high priority I allotments.	See Record 4. Hot season grazing and season long grazing needs to be eliminated on category I allotments.
Grazing-7	Grazing allotments are grouped into three categories. Category I allotments are managed to improve existing resource conditions and to reduce or eliminate resource use conflicts. Category M allotments are managed to maintain or improve present satisfactory resource condition and allotment management. Category C allotments are managed to prevent deterioration of current resource conditions by managing the lands in a custodial manner.	Yes		
Grazing-8	High intensity monitoring will be conducted on top priority "I" allotments, on allotments with AMPs. Low intensity monitoring will be conducted on the other "I" allotments and on "M" and "C" category allotments.	In part.	Condition and trend monitoring projects in a large number of priority allotments have been implemented. A total of 150+ transects have been installed. These were read every five years from 1982 until 1997. Staff and budget have not been available to monitor since that time.	Partner with interested publics to improve monitoring. Make more staff time available for field work through efficiencies in office work and other strategies. Employ conditions that will reduce the need for on-the-ground monitoring as an approach to ensuring improvements in rangeland health.

Table 4-34. Livestock Grazing: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Grazing-9	Based on available monitoring data, management actions will be implemented, beginning with Category I allotments needing the most improvement. AMPs will be developed for allotments in the planning area on a priority basis. The intensity of the AMPs will depend on allotment condition and resource conflicts.	No	See Records 6 and 8.	See Records 6 and 8.
Grazing-10	The remaining grazing allotments in the planning area are the "M" and "C" category allotments. They will be monitored at a lower intensity level to ensure no significant adverse changes are taking place as a result of ongoing management.	No	There is insufficient staff and time to meet this requirement.	Adjust grazing systems, seasons of use, and stocking rates to improve rangeland health in the face of reduced staff time and budget.
Grazing-11	Stock driveway withdrawals will be retained, although the BLM reserves the right to modify historic trailing routes and use, to mitigate any impacts associated with trailing, or to deny trailing use if the impacts cannot be adequately mitigated. Portions of grazing allotments that are outside withdrawn stock driveways and that are affected by trailing will be monitored to determine whether the allotment can accommodate trailing without unacceptable effects on resources.	Yes		
Grazing-12	The level of livestock grazing on public lands, when combined with all other public land uses, will not be allowed to exceed the carrying capacity of the land. Meeting the SHR is the most important requirement of livestock grazing management.		See Record 4.	See Record 4.
Grazing-13	Management actions will address known resource problems. The following rangeland improvements will be made: • 45 to 55 miles of fence will be constructed. • Ten reservoirs will be constructed. • 57 other water improvement projects will be built. • Reduce livestock grazing 13-19 percent in Category I allotments (cumulative target: 114,298-144,101 AUMs; overall change between 4 percent decrease to 21 percent increase).	No	Some of the improvements have been made. Livestock grazing has, for the most part, not been implemented. The identification of improvements needs to be re-assessed in light of the SHR.	Re-assessment of all grazing decisions through S&Gs and AMPs needs to be accomplished. See Records 6 and 8.

Table 4-34. Livestock Grazing: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Grazing-14	Present resource management will be retained and, if possible, improved. The following management will be utilized: • Authorize current livestock use under a 10-year permit. • Authorize increases in livestock use, when appropriate, that will be consistent with multiple-use objectives and will not be detrimental to other resources; increases range from 10-55 percent. • Consult with permittees to develop flexibility in livestock operations. • Authorize and construct range improvements to meet multiple-use management objectives. • Monitor trends in range condition and productivity to ensure conditions of the basic renewable resources will remain satisfactory.	No	These allotments may have higher resource values such as riparian/wetlands that were not considered. Livestock use has been authorized on a 10 year permit without determining progress on SHR.	See Records 6 and 8. Re-assess all grazing decisions using S&Gs and AMPs.
Grazing-15	Use all management actions as necessary to reverse downward trends in range conditions, increase productivity of vegetation resources, improve wildlife habitat and improve soil and watershed conditions. Funding is allocated to Category I allotments first.		See Records 6 and 8.	See Records 6 and 8. Re-assess all grazing decisions using S&Gs and AMPs.
Grazing-16	Develop monitoring program to evaluate effectiveness of present management situation. Develop AMPs and incorporate any/all specific management actions if objective(s) are not being met. The following actions may be taken for Category I allotments not meeting Standard of Rangeland Health 1-3: • Adjust stocking levels of grazing animals; include increases/ decreases in livestock grazing and/or wildlife. • Implement grazing systems. • Conduct vegetation manipulation projects. • Adjust turn-out dates/seasons of use.	No	See Records 6 and 8. Re-assess all grazing decisions using S&Gs and AMPs. Stocking rates have not been re-assessed. Many grazing systems have not been implemented or evaluated.	See Records 6 and 8. Re-assess all grazing decisions using S&Gs and AMPs.

Table 4-34. Livestock Grazing: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Grazing-17	The following actions may be taken for Category I allotments. • Develop water projects where livestock distribution problems have been caused by lack of water. • Use grazing systems and/or range improvements to solve problems where large grazing animals are concentrating on riparian areas. • Adjust turn-out dates and/or season of use based on plant phenology and range readiness. • Implement grazing systems to provide for the physiological needs of the key forage plants. • Where land-use conflicts have been causing a loss of forage production because of surface disturbance, rehabilitation efforts will be conducted and monitored for effectiveness. • Where land-use conflicts have been damaging structural improvements or causing a livestock trespass situation, identify the agent causing the problem and correct it. • For land-use conflicts involving damage to public and private lands by off-road vehicle use during wet weather, BLM will develop sign program and/or seasonal site-specific road closures.		See Records 6 and 8. Re-assess all grazing decisions using S&Gs and AMPs. Stocking rates have not been re-assessed. Many grazing systems have not been implemented or evaluated.	See Records 6 and 8. Re-assess all grazing decisions using S&Gs and AMPs.
Grazing-18	Deterioration of current resource conditions will be prevented by managing lands in a custodial manner. Livestock use will be permitted as authorized under a 10-year permit/lease. BLM will conduct low-intensity use supervision and monitoring. Adjustments will be made in numbers and season of use where necessary to prevent deterioration of present resource conditions.	No	See Records 6 and 8.	See Records 6 and 8. Re-assess all grazing decisions using S&Gs and AMPs.
Grazing-19	Livestock grazing is managed to provide enough forage on a sustained-yield basis to satisfy at least the present demands of livestock, wild horses, and wildlife and to maintain range condition at a level that would provide for sustained yield of forage production. Terrestrial, aquatic and riparian ecosystems are maintained or improved to provide wildlife with adequate amounts of forage and habitat for planned population levels.	No	See Records 6 and 8.	See Records 6 and 8. Re-assess all grazing decisions using S&Gs and AMPs.

Table 4-34. Livestock Grazing: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Grazing-20	Final Rangeland Improvement Policy requires an economic analysis for proposed range improvements. As improvement projects are proposed from allotment monitoring and consultation process, benefit/cost evaluations are done. For allotments that may have potential for economic return on public investment, BLM will conduct benefit/cost analyses on AMPs or grazing system plans and related range improvements before they are implemented.	No	Benefit cost analysis was done on a project by project basis. BLM Management removed the requirement to do cost/benefit analysis.	Reconsider whether cost/benefit analysis of rangeland improvements would be a useful tool that is allowed under current guidance.
Grazing-21	Maintain or improve the allotment condition. Consult with all affected interests to establish a mutual understanding of the management flexibility for livestock operations given to individual livestock operators; a change in category may be necessary if a significant change in management occurs.	No	These allotments may have higher resource values such as riparian/wetlands that were not considered. Livestock use has been authorized on a 10 year permit without determining progress on SHR.	See Records 6 and 8. Re-assess all grazing decisions using S&Gs and AMPs.
Grazing-22	Current livestock active preferences are authorized under a 10-year permit/lease with the following management: • Conduct low-level monitoring of actual use, climate and trend. • Allow increases in grazing use by any or all types of grazing animals if monitoring indicates this will be consistent with multiple-use objectives. • Conduct low-intensity use supervision consisting of periodic consultation with livestock operator(s); occasional counts of livestock numbers may be conducted. • Authorize any range improvements that meet multiple-use objectives for the allotment. Encourage livestock operator(s) to fund installation of range improvements; some range betterment funds may be made available as budges permit.	No	See Record 14.	See Record 14.
Grazing-23	The following are the monitoring priorities: • Conduct low-level monitoring of actual use, climate and trend with priority given to those allotments that have marginally met the categorization criteria. • Conduct low-intensity use supervision consisting of periodic consultation with livestock operators and occasional counts of livestock numbers.	No	See Record 9.	See Record 9.

Table 4-34. Livestock Grazing: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Grazing-24	Manage livestock grazing to improve existing resource conditions and to reduce or eliminate resource conflicts. Take corrective measures in response to the existing problems. Help to better define the problems, provide for input from all interested parties to find solutions to the problems, and implement measures determined to be beneficial in achieving multiple use objectives.	No	See Record 9.	See Record 9.
Grazing-25	Conduct monitoring of allotments which are not satisfactory for the range trend, utilization, actual use, and climate.	No	See Record 9.	See Record 9.
Grazing-26	The following factors are considered in managing Category I allotments: • Actions may include development of grazing systems, changes in turnout dates and season of use, development of additional water to improve distribution and adjustments in stocking levels. • Implement adjustments in stocking levels of all grazing animals if range condition/vegetation production is deteriorating. • Horse HMAs will be a priority for development of management plans. • Development of water sources will be priority in allotments where lack of water is the primary problem. • Implement grazing systems and/or fencing if cattle concentrate in riparian areas, even though there's sufficient water in allotment. • Use flexibility for turnout dates and season of use in allotments that may be unsatisfactory. • Rehabilitate areas where land-use conflict(s) has caused loss of forage production; this may include adjustments in stocking levels of grazing animals. • Where livestock grazing is causing adverse conditions for another land use, alternative management actions will be considered on a case-by-case basis. • Management actions will be dependent on manpower capability and improvement funding; concentrate limited resources in the allotments with most problems and the ones that offer the prospect for maximum return on public	No	See Record 9.	See Record 9.

Table 4-34. Livestock Grazing: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
	investment. • Monitoring on Category I allotments will be conducted in accordance with a list of procedures (p. 85 of ROD).			
Grazing-27	Prevent deterioration of current resource conditions by managing lands in a custodial manner. Category C allotments will be redesignated or eliminated by the following methods: • Changing fence locations. • Exchanging land to block up public land. • Selling public land.	No	See Record 6 and 8.	See Record 6 and 8.
Grazing-28	Manage the allotments are follows: • Authorize current livestock active preference under a 10-year permit/lease. • Consult with all affected interests to establish a mutual understanding of the management flexibility given to the individual livestock operations. • Conduct low-level monitoring of actual use, climate and trend, with priority given to those allotments designated for fence location changes. • Conduct low-intensity use supervision consisting of periodic consultation with livestock operators; occasional counts of livestock numbers may be conducted. • Authorize any range improvements that meet multiple-use objectives of the allotment. • Encourage livestock operator(s) to fund installation of range improvements (some range betterment funds may be made available). Decisions on Category C allotments will be issued as land is sold or exchanged or fence locations are changed.	No	See Record 6 and 8.	See Record 6 and 8.

Table 4-34. Livestock Grazing: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Grazing- 29	Appendix E identifies the various types of management actions including grazing systems, land treatments, range improvements, and development of AMPs that will be implemented throughout the planning area. These actions will be directed toward resolving or reducing such concerns as continuous spring grazing and conflicts between livestock grazing and wildlife uses, and toward improvement of wetland/riparian areas and overall vegetative ground cover and production. If these measures fail to accommodate the livestock grazing preference, while concurrently providing for protection of other resource values, reductions in livestock grazing use may become necessary.	Yes		
Grazing-30	Any adjustments in livestock grazing use, either short-term or long-term, will be made as a result of monitoring and consultation with grazing permittees or through negotiation with grazing permittees and other affected interests. Adjustments may also result from land use planning decisions to change the allocation of land uses or from transfers of BLM-administered public lands to other agency jurisdictions or into nonfederal ownerships.	Partially	See Record 6 and 8	See Record 6 and 8
Grazing-31	The level of livestock grazing on public lands, when combined with all other public land uses, will not be allowed to exceed the carrying capacity of the land. (See Glossary.)	Partially	See Record 6 and 8.	See Record 6 and 8.
Grazing-32	The placement of salt and mineral supplements on public lands is allowed outside riparian areas and reclaimed or reforested areas, in locations designed to improve livestock distribution.	Yes		
Grazing-33	If grazing management techniques described or referenced above are not adequate to meet the objectives of resource management, livestock grazing will be reduced or eliminated on some allotments or portions of allotments, especially around sources of springs, reservoirs, other riparian wetland, aspen stand regeneration areas, and crucial big game winter ranges.	No	Never implemented.	Implement.

4.1.7 Special Designations and Other Management Areas

Table 4-35. ACECs and Other Management Areas: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
ACEC-1	The plan designates approximately 117,000 acres as ACECs. This represents about 4.7 percent of the planning area.	No	There are other areas in the planning area that meet the requirements for ACEC designations and need special management.	Consider the input from internal and external scoping for other areas meeting the ACEC requirements including regional trails, Cedar Ridge, Castle Gardens, and others. Identify surface prescriptions, VRM and OHV allocations and other management needs.
ACEC-2	Designate 18,000 acres for the Green Mountain ACEC, which includes crucial elk winter range and the area within a 350-foot radius of Sparhawk Cabin.	Yes	Although Sparhawk Cabin may not be as historically important as originally thought, it is still a contributing part of the ACEC and BLM has invested in conserving it.	Continue the ACEC management. Determine if the parturition areas on Green Mountain need to be included in the ACEC to meet ACEC objectives. Identify surface prescriptions, VRM and OHV allocations and other management needs and adequacy of current management.
ACEC-3	Designate about 20,000 acres in the Beaver Creek area as an ACEC along the Oregon/Mormon Pioneer Trail (expanded to include the California and Pony Express Trails).	No	Experience has shown that the ¼ mile protection zone does not comply with the National Historic Preservation Act and does not adequately protect the Trails.	Re-evaluate the protections along the Trails. Appropriately consider VRM of the Trails' setting. Identify surface prescriptions, VRM and OHV allocations and other management needs and adequacy of current management.
ACEC-4	Designate about 3,900 acres in the Gas Hills area as an ACEC along the Oregon/Mormon Pioneer Trail (expanded to include the California and Pony Express Trails.)	No	Experience has shown that the ¼ mile protection zone does not comply with the National Historic Preservation Act and does not adequately protect the Trails.	Re-evaluate the protections along the Trails. Appropriately consider VRM of the Trails' setting. Identify surface prescriptions, VRM and OHV allocations and other management needs and adequacy of current management.
ACEC-5	Beaver Rim ACEC: Designate about 7,000 acres in the Beaver Creek area along Beaver Rim as an ACEC.	Partially	Other parts of Beaver Rim have been nominated for ACEC nomination because of important natural values.	Study Beaver Rim area and consider adding to the existing ACEC.

Table 4-35. ACECs and Other Management Areas: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
ACEC-6	Designate about 25,000 acres as ACEC to protect the important wildlife habitat and scenic quality of the Lander Slope	No	Does not adequately protect against phosphate or surface mining.	Consider a withdrawal and determine if other surface controls should be implemented. Work with WGFD regarding dates of seasonal closures. Consider land acquisition and blocking up parcels. Identify surface prescriptions, VRM and OHV allocations and other management needs and adequacy of current management.
ACEC-7	Designate 15,000 acres within the Red Canyon area as an ACEC for protection of highly visible steep slopes and areas of important wildlife habitat.	No	Does not adequately protect against phosphate or surface mining.	Consider a withdrawal and determine if other surface controls should be implemented. Work with WGFD regarding dates of seasonal closures. Consider land acquisition and blocking up parcels. Identify surface prescriptions, VRM and OHV allocations and other management needs and adequacy of current management.
ACEC-8	Designate 12,000 acres in the South Pass area as ACEC to protect significant cultural values, which will include the Historic Mining District. Improve habitat for the Lander moose herd winter range and other species. Develop special management actions for aspen and beaver management, in-stream structure developments and fencing projects, and protecting willow regeneration. Emphasize improvement of conifer, aspen, willow-riparian, and other shrub stands.	No	Does not include enough area to adequately protect historic resources. Redirect ACEC emphasis towards importance as a historic resource and less as a wildlife ACEC.	Determine appropriate boundaries to adequately protect historic resources in their historic setting. Identify surface prescriptions, VRM and OHV allocations and other management needs and adequacy of current management.
ACEC-9	Designate 1,000 acres in the East Fork area surface as an ACEC to protect crucial elk winter range.	Yes	Mineral withdrawal needs to be extended.	Identify surface prescriptions, VRM and OHV allocations and other management needs and adequacy of current management.
ACEC-10	Designate approximately 5,000 acres in the Dubois Badlands as ACEC to protect bighorn sheep habitat, scenic quality and protect against the erosive nature of the badlands.	Yes		Identify surface prescriptions, VRM and OHV allocations and other management needs and adequacy of current management.
ACEC-11	Designate approximately 4,000 acres as an ACEC to protect the Whiskey Mountain Bighorn Sheep Winter Range.	Yes	Mineral withdrawal needs to be extended.	Identify surface prescriptions, VRM and OHV allocations and other management needs and adequacy of current management.
ACEC-12	See appendix for other restrictions that may be applied to surface-disturbing activities, as appropriate.	No	Surface Disturbing Activities are not adequately described.	Identify surface disturbance prescriptions.

Table 4-35. ACECs and Other Management Areas: Management Opportunities (Continued)

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
ACEC-13	Identify wildfire prescriptions for each ACEC that advances the values for which the ACEC is designated. Prescribed fire will be used as appropriate to accomplish multiple use management objectives as they are identified.	Yes		

Table 4-36. Scenic or Backcountry Byways: Management Opportunities

Planning Decision Number	Planning Decision	Duplication with Other Resource Areas	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Byways	No current objectives and decisions for scenic or backcountry byways are included in the RMP.	N/A			

Table 4-37. National Historic Trails and National Scenic Trails: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
Cong Des-1	Management activities for the NHTs were addressed in the ACEC designation and in other management actions, such as ROW avoidance zones.	No.	Current management does not comply with the National Historic Preservation Act or BLM guidance for management of Congressionally designated trails. Current management is not adequate, including the corridor management , visual resource surface disturbance, recreation, and other managements prescriptions.	Completely revise the management prescriptions to bring it into compliance with current requirements and properly manage the Trails and their historic and recreational setting.
Cong Des-2	The Continental Divide National Scenic Trail is managed as a Congressionally-designated trail.	No	Current management does not comply with the Trail planning or BLM guidance for management of Congressionally designated trails. Current management is not adequate, including corridor management, visual resource management, recreation, and allowable use decisions.	Completely revise the management prescriptions to bring it into compliance with current requirements and properly manage the Trail .

Table 4-38. Wild and Scenic Rivers: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
N/A	No current objectives and decisions for WSRs are included in the RMP.	No	BLM must inventory to tentative classify all eligible and suitable waterways.	This RMP will develop plans for all waterways found to be eligible and suitable for inclusion in the Wild and Scenic Rivers system.

Table 4-39. Wilderness Study Areas: Management Opportunities

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
N/A	All WSAs are managed under the Interim Management Policy For Lands Under Wilderness Review.	Yes	Additional management actions and allowable uses will be complimentary of the IMP.	The RMP needs to address livestock grazing levels in the Sweetwater Canyon WSA. Additionally all travel management allocations need to be revised and updated within WSAs.
	Motorized travel in all WSAs except the Dubois Badlands (which is closed) is limited to designated roads and trails that existed at the time the area became a WSA.	No	Travel management in other WSAs needs to be fully implemented.	Develop travel management allocations for all WSAs; develop implementation level travel management decisions in all WSAs.

4.1.8 Socioeconomic Resources Table 40

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
N/A	No current objectives and decisions for social conditions are included in the RMP.	No	Management actions on public lands can have a profound impact on social conditions.	Consider impacts on social conditions.

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
N/A	No current objectives and decisions for economic conditions are included in the RMP.	No	Management actions on public lands can have a profound impact on economic conditions.	Consider impacts on economic conditions.

Planning Decision Number	Planning Decision	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
N/A	No current objectives and decisions for health and safety are included in the RMP. Other management actions for other resources, such as fire or recreation, addressed public safety as a part of those programs.	Yes		

Table 4-43. Environmental Justice: Management Opportunities

Planning Decision Number	Planning Decision	Duplication with Other Resource Areas	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
N/A	No current objectives and decisions for environmental justice are included in the RMP.	N/A			

Table 4-44. Tribal Treaty Rights: Management Opportunities

Planning Decision Number	Planning Decision	Duplication with Other Resource Areas	Is decision responsive to current issues?	Remarks (rationale)	Options for Change
N/A	No current objectives and decisions for tribal treaty rights are included in the RMP.	N/A			

4.2 Areas of Relative Ecological Importance

Areas of relative ecological importance are places recognized as important to managing the health, diversity, and productivity of the public lands in either the planning area or the broader, eco-region. Identifying areas of relative ecological importance is an important step in the RMP revision process. It enables planners to understand tradeoffs when establishing land use allocations and management requirements and is fundamental to developing a range of alternatives in the RMP and EIS. Focusing on these areas will help to guide the planning process through the identification of management opportunities for the maintenance or rehabilitation of areas important to the overall health of public lands.

Areas of relative ecological importance in the planning area have been identified for each resource area or land use by interdisciplinary team members with expertise in that resource (Map 66). The following section includes a description of why each area is important for a given resource, as well as the current management and condition of the area.

Dubois Area

The northwest corner of the planning area is a high priority management area because of its important wildlife values, scenic resources, WUI issues, pine beetle infestation problems, recreational use, and historic relics. The Dubois area has three ACECs, two WSAs, two wildlife management units, habitat for sensitive species and sometimes list T&E species, and adjoins the Fitzpatrick Wilderness and potential Wild and Scenic River segments.

Sweetwater Watershed and Sage-Grouse Concentration Area

The southern section of the planning area is a high priority management area because of its important wildlife values, scenic resources, recreational use, and extraordinary historic values. The area contains some of the most intact sage-grouse habitat in the nation, five WSAs, two ACECs, five Congressionally designated trails with the best trail segments in the nation, priority wildlife habitat, blue ribbon fishing, a proposed Wild and Scenic River, national landmarks, and high recreational use.

Lander Slope including Red Canyon

The Lander Slope flank of the Wind River Mountains is a high priority management area because of its important wildlife values, scenic resources, recreational usage and WUI issues. It has extraordinary geologic formations and is the iconic image for the Lander area. It contains two ACECs, a National Natural Landmark, a proposed Wild and Scenic River, and high recreational usage.

5.0 CONSISTENCY/COORDINATION WITH OTHER PLANS

5.1.1 Local, Tribal, State, and Federal Management Plans

According to guidance found in FLPMA (43 CFR 1610), BLM RMPs must be consistent, to the extent practical, with officially approved or adopted resource-related plans of other Tribal, Federal, State, and local governments so long as the plans are compatible. BLM RMPs must also be consistent with the purposes, policies, and programs of FLPMA and other Federal laws and regulations related to public lands. If these other entities do not have officially approved or adopted resource-related plans, them BLM RMPs must, to the extent practical, be consistent with those entities' officially approved and adopted resource-related policies and programs. This consistency will be accomplished so long as BLM RMPs incorporate the policies, programs, and provisions of public land laws and regulations. Table 5-1 outlines the applicable Tribal, local, state, and federal management plans that pertain to the Lander Planning Area and the resource areas that will require coordination with those plans.

Table 5-1. Local, State, and Federal Management Plans That Pertain to the Bighorn Basin Planning Area

Resource Plans	**Physical Resources**	Air Quality	Geology	Soil Resources	Water Resources	Cave and Karst Resources	**Mineral and Energy Resources**	**Fires and Fuel Management**	**Biological Resources**	**Heritage and Visual Resources**	Cultural Resources	Historic Trails	Paleontological Resources	Visual Resources	**Land Resources**	Lands and Realty	Renewable Energy	Rights of Way and Corridors	Trails and Travel Management	Recreation	Wilderness Characteristics	Livestock Grazing	**Special Designations**	ACECs and Other Management Areas	Scenic or Backcountry Byways	National Historic Trails	Wild and Scenic Rivers	Wilderness Study Areas	**Socioeconomic Resources**	Social Conditions	Economic Conditions	Health and Safety	Environmental Justice	Tribal Treaty Rights
COUNTY PLANS																																		
Fremont County Land Use Plan			x	X	X		X		X	x	X	X		X		X		X		X	X	X	x			X				X	X	X		
Hot Springs County Land Use Plan		X			X		X		X		X	X	X	X						X		X		X			X	X				X		
Sweetwater County Land Use Plan			X	X	X		X		X	X	X			X		X				X		X	X	X		X	X	X		X	X	x		
Natrona County Land Use Plan		X			X		x																											
CONSERVATION DISTRICTS																																		
Popo Agie CD Plan				x	X				X											x		X									x			
Sweetwater CCD Plan																																		
Lower Wind River CD				X	X		X		X					x			X			X		X									X			
Dubois Crowheart CCD Plan			X	X	X						X			X								X									x			
Powell Clarks Fork Conservation District Plan			X	X					X											X		X												
WEED MANAGEMENT PLANS																																		
Fremont C W&P				x	X			X	X										X	X		X										X		
Natrona C W&P					X		X		X											X		X										X		
Dubois-Crowheart WMA				X	X				X										X	X		X								X	X	X		
Popo Agie WMA					X				X													X										X		

Table 5-1. Local, State, and Federal Management Plans That Pertain to the Bighorn Basin Planning Area

Resource Plans	**Physical Resources**	Air Quality	Geology	Soil Resources	Water Resources	Cave and Karst Resources	**Mineral and Energy Resources**	**Fires and Fuel Management**	**Biological Resources**	**Heritage and Visual Resources**	Cultural Resources	Historic Trails	Paleontological Resources	Visual Resources	**Land Resources**	Lands and Realty	Renewable Energy	Rights of Way and Corridors	Trails and Travel Management	Recreation	Wilderness Characteristics	Livestock Grazing	**Special Designations**	ACECs and Other Management Areas	Scenic or Backcountry Byways	National Historic Trails	Wild and Scenic Rivers	Wilderness Study Areas	**Socioeconomic Resources**	Social Conditions	Economic Conditions	Health and Safety	Environmental Justice	Tribal Treaty Rights
Lower Wind River WMA				X	X		X	X	X										X	X		X									X	X		
STATE AGENCY PLANS																																		
Wyoming Dept of Agriculture Strategic Plan 2005																						X												
Wyoming Game and Fish Strategic Habitat Plan									X											X		X												
Wyoming Game and Fish Greater Sage-Grouse Conservation Plan				X	X		X		X											X		X												
Wyoming Game and Fish Final Wyoming Gray Wolf Management Plan 2007									X																									
Wyoming State Water Plan Wind/Bighorn River Basin 2003					X						X						X			X		X												X
Wyoming Statewide Comprehensive Outdoor Recreation Plan (2003)																			X	X														
Wyoming Statewide Trails Plan 2004												X							X	X						X		X						
Wyoming SHPO Comprehensive Statewide Historic Preservation Plan											X	X	X	X																				

Table 5-1. Local, State, and Federal Management Plans That Pertain to the Bighorn Basin Planning Area

Resource Plans	**Physical Resources**	Air Quality	Geology	Soil Resources	Water Resources	Cave and Karst Resources	**Mineral and Energy Resources**	**Fires and Fuel Management**	**Biological Resources**	**Heritage and Visual Resources**	Cultural Resources	Historic Trails	Paleontological Resources	Visual Resources	**Land Resources**	Lands and Realty	Renewable Energy	Rights of Way and Corridors	Trails and Travel Management	Recreation	Wilderness Characteristics	Livestock Grazing	**Special Designations**	ACECs and Other Management Areas	Scenic or Backcountry Byways	National Historic Trails	Wild and Scenic Rivers	Wilderness Study Areas	**Socioeconomic Resources**	Social Conditions	Economic Conditions	Health and Safety	Environmental Justice	Tribal Treaty Rights
2007-2013																																		
FEDERAL AGENCY PLANS																																		
Shoshone National Forest Plan		X		X	X		X	X	X											X	X	X					X	X		X	X			
US Fish and Wildlife Service Wyoming Plan					X				X																									
US EPA Region 8 Wyoming State Implementation Plans		X												X																				
FIRE MANAGEMENT PLANS																																		
Fremont County Fire Plan		x			X			X	X					X								X								X	X			
US Forest Service National Fire Plan		X		X	X			X	X																									

5.1.2 Cooperating Agencies

The BLM plans to collaborate with other federal, state, and local agencies and governmental entities throughout the RMP process. Coordination was initiated at the inception of the project through the identification of cooperating agencies, including:

- Fremont County Board of Commissioners
- Hot Springs County Commissioners
- Popo Agie Conservation District
- Lower Wind River Conservation District
- Dubois Crowheart Conservation District
- Sweetwater Conservation District
- State of Wyoming: Governor's Office
- State of Wyoming: Department of Agriculture
- State of Wyoming: Game & Fish Department
- State of Wyoming: Department of Environmental Quality
- State of Wyoming: Business Council
- State of Wyoming: State Historic Preservation Officer
- State of Wyoming: Trail Program
- US National Parks Department
- US Bureau of Indian Affairs

Additional opportunities for cooperation with other agencies will be sought throughout the RMP and EIS development process. Project phases where state and local governments, other federal agencies, and tribal government are involved will assist in providing consistency.

Regular interaction between the BLM and the cooperators will provide expertise and consistency.

6.0 SPECIFIC MANDATES AND AUTHORITY

6.1 Mandates and Authorities Pertaining to All Resources

6.1.1 Federal Laws and Statutes

Federal Law or Statute	Year
Act of October 30, 1978 (92 Stat. 2073-2075)	1978
Act of September 1, 1949, Section 3 (30 U.S.C. 192c)	1949
Act of June 30, 1950 (16 U.S.C. 508(C) and (e))	1950
Act of August 13, 1954 (68 Stat. 708, 30 U.S.C. 521 subpart)	1954
Act of July 23, 1955 (P.L. 16743 CFR 3710)	1955
Act of September 28, 1962 (P.L. 87-713, 76 Stat. 652)	1962
Air Pollution Control Act (P.L. 84-159) as amended	1955
American Indian Religious Freedom Act (42 U.S.C. 1996)	1978
Antiquities Act (16 U.S.C. 431-433, P.L. 59-209, 34 Stat. 225)	1906
Acquired Lands Act - Act of August 7, 1947 (61 Stat. 913)	1947
Archaeological Resources Protection Act (16 U.S.C. 47Oaa et seq., P.L. 96-95, 93 Stat. 721) as amended (P.L. 100-555, P.L. 100-588)	1979
Archeological and Historic Preservation Act (16 U.S.C. 469-469c-1, P.L. 86-523, 74 Stat. 220, 88 Stat. 174)	1974
Archeological and Paleontological Salvage for Federal Highway Projects (23 U.S.C. 305, 72 Stat. 913 (1958), 74 Stat. 525 (1960))	1960
Bald Eagle Protection Act (16 U.S.C. 668-668d, 54 Stat. 250)	1940
Carey Act of August 18, 1894 as amended (43 U.S.C. 641 et seq.)	1894
Carlson-Foley Act of 1968 (42 U.S.C. 1241-1243)	1968
Classification and Multiple Use Act of September 19, 1964 (43 U.S.C. 1411–18, 78 Stat. 986)	1964
Clean Air Act of 1970 (42 U.S.C. 7401-7671q) as amended	1970
Coastal Zone Management Act (16 U.S.C. 1451-1456, P.L. 92-583)	1972
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C. 9601)	1980
Department of Energy Organization Act (42 U.S.C. 7101 et seq.)	1977
Department of the Interior Secretarial Order 3226	2001
Desert Land Act (43 U.S.C. 321-323, 19 Stat. 377), as amended	1877
Economy Act 1932, as amended (31 U.S.C. 686, P.L. 72-211, 47 Stat. 417)	1932
Emergency Planning and Community Right-to-Know Act (42 U.S.C. 11001-11050)	1986
Emergency Wetland Resources Act of 1986 (16 U.S.C. 3901-3932)	1986
Endanger Species Act (16 U.S.C. 1531-1544, 87 Stat. 884), as amended	1973
Energy Policy Act (P. L. 109–58)	2005
Engle Act (43 U.S.C. 155 et seq.)	1958
Executive Order 11514 – Protection and Enhancement of Environmental Quality	1970
Executive Order 11593 – Protection and Enhancement of the Cultural Environment	1971
Executive Order 11644–Use of Off-Road Vehicles on the Public Lands	1972
Executive Order 11738 – Providing for Administration of the Clean Air Act and the Federal Water Pollution Control Act With Respect to Federal Contracts, Grants, or Loans	1973

Federal Law or Statute	Year
Executive Order 11987 – Exotic organisms	1977
Executive Order 11988 – Floodplain Management	1977
Executive Order 11989 – Off-road Vehicles on Public Lands	1977
Executive Order 11990 – Protection of Wetlands	1977
Executive Order 11991 – Relating to protection and Enhancement of Environmental Quality	1977
Executive Order 12088 – Federal Compliance with Applicable Pollution Control	1978
Executive Order 12580 –Superfund Implementation and 13016 – Amendment to Executive Orders 12580	1987 and 1996
Executive Order 13007 – Indian Sacred Sites	1996
Executive Order 13084 – Consultation and Coordination with Indian Tribal Governments	1998
Executive Order 13112 – Invasive Species	1999
Executive Order 13148 – Greening of the Government through Leadership in Environmental Management	2000
Executive Order 13195 – Trails for America in the 21st Century	2001
Executive Order 13212 – Actions to Expedite Energy-Related Projects	2003
Executive Order 13287 – Preserve America	2003
Executive Order Public Water Reserve 107	1926
Executive Order 10355 – Delegating to the Secretary of the Interior the authority of the President to withdraw or reserve lands of the United States for public purposes	1952
Executive Order 13175 – Consultation and Coordination with Indian Tribal Governments	2000
Executive Order 6910 and Executive Order 6964, and amendments	1934
Executive Order 13443 – Facilitation of Hunting Heritage and Wildlife Conservation	
Federal Aid Highway Act (23 U.S.C. 107(d) and 317)	1958
Federal Cave Resources Preservation Act (16 U.S.C. 4301 – 4309)	1988
Federal Coal Leasing Amendments Act (90 Stat. 1083-1092), as amended	1976
Federal Coal Management Program Coal Screening Process (43 CFR 3420.1-4)	1997
Federal Facilities Compliance Act of 1992 (42 U.S.C 6901-6992, P.L. 102-368)	1992
Federal Land Policy and Management Act (43 U.S.C. 1701, P.L. 94-579)	1976
Federal Land Recreation Enhancement Act (P.L. 108-477)	2004
Federal Land Transaction Facilitation Act (43 U.S.C. 2301, et seq.)	2000
Federal Noxious Weed Act of 1974, as amended (7 U.S.C. 2801 et seq.)	1974
Federal Oil and Gas Royalty Management Act	1982
Federal Plant Pest Act (7 U.S.C. 150aa et seq.)	1957
Federal Property and Administrative Services Act of 1949	1949
Federal Water Pollution Control Act (33 U.S.C. 1251 - 1376), as amended	1948
Federal Water Projects Recreation Act [16 U.S.C 460(L)(12)- 460(L)(21)], as amended	1965
Federal Wildland Fire Management Policy	2001
Fish and Wildlife Coordination Act of 1934 (16 U.S.C. 661-667e), as amended	1934
Fish and Wildlife Conservation Act (16 U.S.C. 2901-2911)	1980
Food Security Act of 1985 (16 U.S.C. 3801-3862)	1985
General Allotment Act, Section 4 (25 U.S.C 334), as amended	1887
General Mining Law of 1872, as amended	1872
Geothermal Steam Act of 1970 (30 U.S.C. 1001 et seq.), as amended	1970
Guidance for Implementation of Federal Wildland Fire Management Policy	2009

Federal Law or Statute	Year
Healthy Forests Restoration Act (P.L. 108-148)	2003
Historic Sites Act of 1935 (16 U.S.C. 461 et seq.)	1935
Independent Offices Appropriation Act of 1952 (31 U.S.C. 9701)	1952
Lacey Act (18 U.S.C. 42), as amended	1988
Land & Water Conservation Act, as amended (16 U.S.C. 4601-4)	1965
Lode Law Act of 1866 (14 Stat. 251)	1866
Materials Act of July 31, 1947 (30 U.S.C. 601-604), as amended	1947
Migratory Bird Conservation Act of 1929 (16 U.S.C. 715-715r)	1929
Migratory Bird Treaty Act of 1918 (16 U.S.C. 703 et seq.)	1918
Mineral Leasing Act of 1920, as amended (30 U.S.C. 181 et seq.)	1920
Mineral Leasing Act for Acquired Lands of 1947, as amended (30 U.S.C. 351 et seq.)	1947
Mining and Mineral Policy Act of 1970 (30 USC 181 et seq.)	1970
Mining Claim Rights Restoration Act (30 U.S.C. 621-625)	1955
Multiple Mineral Development Act (30 U.S.C. 521-531 et seq.)	1954
Naval Petroleum Reserves Production Act (43 CFR 2361.1(f))	1976
National Environmental Policy Act (42 U.S.C. 4321 et seq.)	1969
National Fire Plan	2000
National Historic Trails System Act (16 U.S.C. 1241-1249), as amended	1968
National Historic Preservation Act of 1966 (16 U.S.C. 470)	1966
National Materials and Minerals Policy, Research and Development Act of 1980 (P.L. 96-479, 94 Stat. 2305)	1980
National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR 300).	1998
National Parks and Recreation Act of 1978 (16 U.S.C. 1242 and 1243)	1978
National Trails System Act of 1968 (16 U.S.C. 1241 et seq.), as amended	1968
National Wild & Scenic Rivers Act (16 U.S.C. 1271 et seq.)	1968
Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001 et seq.)	1990
Neotropical Migratory Bird Conservation Act (P.L. 106-247)	2000
Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990, as amended (16 U.S.C. 4701 et seq.)	1990
Noxious Weed Control Act of 2004 (P.L. 108-412)	2004
O&C Lands Act of 1937 (62 Stat. 162)	1948
Occupational Safety and Health Act (29 U.S.C. 651 et seq.)	1970
Oil Pollution Act (33 U.S.C. 2701 et seq.)	1990
Placer Law - Act of July 9, 1870 (16 Stat. 217)	1870
Plant Protection Act (7 U.S.C. 7701-7772)	2000
Pollution Prevention Act (42 U.S.C. 13101)	1990
Public Range Improvement Act (43 U.S.C. 1901 et seq.)	1978
Public Rangelands Improvement Act of 1978 (43 U.S.C. 1901 et seq.)	1978
Record of Decision and Resource Management Plan Amendments for Geothermal Leasing in the Western United States	2008
Record of Decision for Designation of Energy Corridors on BLM-Administered Lands in the 11 Western States	2009
Recreation and Public Purposes Act (43 U.S.C. 869), as amended in 1988	1926
Reorganization Plan No. 3 of 1946 (5 U.S.C. Section 402)	1946

Federal Law or Statute	Year
Reservoir Salvage Act of 1960 (16 U.S.C. 469), as amended by Archeological and Historic Preservation Act of 1974	1960
Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6901 et seq.) and the Bevill Amendment (Section 3001(b) (3) (A) (ii) and 40 CFR 261.4(b)(7))	1976
Riparian-Wetlands Initiative for the 1990's, The U.S. Department of the Interior, Bureau of Land Management, January 22, 1992	1992
Rivers and Harbors Act of 1899 (10 U.S.C. 1899, Section 10)	1899
Safe Drinking Water Act, as amended 1977 (42 U.S.C. 201, 300 et. seq., P.L. 95-190)	1977
San Juan Basin Wilderness Protection Act of 1984 (16 U.S.C. 1132)	1984
Sikes Act of 1974, as amended (16 U.S.C. 670 et seq.)	1974
Soil and Water Resources Conservation Act of 1977 (16 U.S.C. 2001 et seq.)	1977
Soil Conservation and Domestic Allotment Act of 1935, as amended (16 U.S.C. 590)	1935
Soil Information Assistance for Community Planning and Resource Development Act of 1966 (42 U.S.C. 3271)	1966
Stock Raising Homestead Act of 1916 as amended (43 U.S.C. 299)	1916
Surface Mining Control and Reclamation Act (30 U.S.C. 1201 et seq.)	1977
Surface Resources Act of 1955 (30 U.S.C. 611-614)	1955
Taylor Grazing Act of 1934 (43 U.S.C 315)	1934
Toxic Substance and Control Act of 1976 (P.L. 104-66), as amended in 1995	1976
Unified Federal Policy for a Watershed Approach to Federal Land and Resource Management	2000
US Onshore Orders Onshore Order No. 1 – Approval of operations on onshore Federal and Indian oil & gas leases Onshore Order No. 2 – Onshore oil and gas drilling operations on Federal and Indian oil and gas leases Onshore Order No. 3 – Site security on Federal oil and gas leases Onshore Order No. 4 – Measurement of oil on Federal oil and gas leases Onshore Order No. 5 – Measurement of gas on Federal oil and gas leases Onshore Order No. 6 – Hydrogen sulfide operations on Federal oil and gas leases Onshore Order No. 7 – Disposal of produced water from Federal oil and gas leases	 1983 1988 1989 1989 1989 1991 1993
U.S. V. Peck, No. 97-8122, 1999 WL 33022	1999
Water Quality Act of 1987, as amended from the Federal Water Pollution Control Act of 1977 (Clean Water Act) as amended (33 U.S.C. 1251 et seq.)	1987
Water Resources Development Act	1974
Water Resources Planning Act (42 U.S.C. 1962a - 1962(a)(4)(e)), as amended	1965
Watershed Protection and Flood Protection Act, as amended (16 U.S.C. 1001 et seq.)	1954
Watershed Restoration and Enhancement Agreements ("Wyden Amendment") (P.L.104-208, Sec. 124, P.L. 10-5-277, Sec. 136 of the 1999 Interior Appropriations Act of 1998)	1998
Wild and Free Roaming Horse and Burro Act (P.L. 92-195)	1971
Wild and Scenic Rivers Act (16 U.S.C. 1271 et seq.)	1968
Wilderness Act of 1964 (16 U.S.C. 1131), as amended	1964

6.1.2 Regulations and Policies

BLM Directive	Year
Abandoned Mine Lands National Strategic Plan	2006
Applications for Permits to Drill Fees	2007
Applications for Permits to Drill (APDs)	2007
Best Management Practices – "The Gold Book"	2007
BLM 3809 Manual (1985, revised 2001)	2001
BLM Handbook (Draft) H-2101-5 – Environmental Site Assessments for Disposal of Real Property	2004
BLM Handbook 2200-1, Land Exchange Handbook	2005
BLM Handbook 3809 (Draft 2006)	2006
BLM Handbook H-1112-2, Safety and Health for Field Operations Manual	1998
BLM Handbook H-1703-1, Response Actions NCP/CERCLA	2001
BLM Handbook H-1742-1, Burned Area Emergency Stabilization and Rehabilitation Handbook	2007
BLM Handbook H-1790-1, National Environmental Policy Act	2008
BLM Handbook H-2101-4, Pre-Acquisition Environmental Site Assessments	2000
BLM Handbook H-3042-1, Solid Minerals Reclamation Handbook	1992
BLM Handbook H-3720-1, Abandoned Mine Land Program Policy	2007
BLM Handbook H-3809-1, for Mineral Examiners, v. 3-332, Sept., 11, 2007	2007
BLM Handbook H-3809-3, Validity Mineral Reports, June 1969	1969
BLM Handbook H-4180-1 Rangeland Health Standards	2001
BLM Handbook H-8160-1, General Procedural Guidance for Native American Consultation	1994
BLM Handbook H-9214-1, Prescribed Fire Management Handbook	1998
BLM Information Bulletin No. WO-2002-101, Cultural Resource Considerations in Resource Management Plans	2002
BLM Instruction Memorandum No. 2008-009, Potential Fossil Yield Classification System for Paleontological Resources on Public Lands	2007
BLM Instruction Memorandum No. WO-2003-147, Application for Permit to Drill - Process Improvement #3 - Cultural Resources	2003
BLM Instruction Memorandum No. WO-2005-003, Cultural Resources and Tribal Consultation for Fluid Minerals Leasing	2005
BLM Instruction Memorandum No. WO-2005-227, NHPA Section 106 and Oil and Gas Permitting	2005
BLM Instruction Memorandum No. WO-99-039, Issuance of Grazing Permits in Compliance with Applicable Laws, Regulations and Policy	1999
BLM Instruction Memorandum No. WY-97-111, Report of Conformance of BLM Land Use Plans with the S&Gs on the Public Lands; Follow-up Maintenance of Land Use Plans	1997
BLM Instruction Memorandum No. WY-99-20, Complying with Section 106 in Conformance with WO IM No. 99-039	1999
BLM Instructional Memorandum No. WO-2003-147, Application for Permit to Drill - Process Improvement #3 - Cultural Resources	2003

BLM Directive	Year
BLM Instructional Memorandum No. WO-2005-003, Cultural Resources and Tribal Consultation for Fluid Minerals Leasing	2005
BLM Instructional Memorandum No. WO-2005-227, NHPA Section 106 and Oil and Gas Permitting	2005
BLM Instructional Memorandum No. WO-99-039, Issuance of Grazing Permits in Compliance with Applicable Laws, Regulations and Policy	1999
BLM Instructional Memorandum No. WY-97-111, Report of Conformance of BLM Land Use Plans with the S&Gs on the Public Lands; Follow-up Maintenance of Land Use Plans	1997
BLM Instructional Memorandum No. WY-99-20, Complying with Section 106 in Conformance with WO IM No. 99-039	1999
BLM Instructional Memorandum WY-2005-046, Conservation measures and best management practices for the management of potential gray wolf habitat	2005
BLM Instructional Memorandum WY-2005-058, Conservation measures and best management practices for the management of potential Canada lynx habitat	2005
BLM Instructional Memorandum WY-2006-037, Conservation measures and best management practices for the management of potential Black-footed ferret habitat	2006
BLM Instructional Memorandum WY-2006-049, Conservation measures and best management practices for the management of grizzly bear habitat	2006
BLM Instructional Memorandum WY-2007-018, Conservation measures and best management practices for the management of mountain plover habitat	2007
BLM Land Use Planning Handbook H-1601-1	2005
BLM Manual 1737, Riparian Habitat	1992
BLM Manual 2800, Cadastral Surveys-General	1985
BLM Manual 3060, Mineral Reports - Preparation and Review, April 7, 1994	1994
BLM Manual 4180 , Land Health	2001
BLM Manual 6500, Manual of Wildlife, Fish and Plant Resources	2002
BLM Manual 6840, Special Status Species Management	1988
BLM Manual 6840, Special Status Species Policy	2008
BLM Manual 8100, Cultural Resource Management	2004
BLM Manual 8160, Native American Consultation and Coordination	1990
BLM Manual 8340, Off-Road Vehicles	1982
BLM Manual 8341, Conditions of Use (Off- Road Vehicles)	1979
BLM Manual 8342, Designation of Roads and Trails	1988
BLM Manual 8343, Vehicle Operations	1979
BLM Manual 8344, Permits	1979
BLM Manual 8400, Visual Resource Management	1980
BLM Manual Section 1703, Hazardous Materials Management	2007
BLM Manual Section 7240, Water Quality	1978
BLM Manual Section 7250, Water Rights	1984
BLM Manual Section 8270-1, General Procedural Guidance for Paleontological Resource Management	1998
BLM Policy Statement on Riparian Area Management	1987

BLM Directive	Year
BLM TR 1734-6 Version 4: Interpreting Indicators of Rangeland Health	2005
BLM TR 1737 series: Riparian Area Management Assessing Proper Functioning Condition (PFC) for Lotic and Lentic areas	various
BLM Wyoming Riparian Management Activity Guide	1991
BLM Wyoming Sensitive Species Policy and List	2002
Board of Regents of the University of Oklahoma, 165 IBLA 231	2005
BLM grazing administration range improvements and water rights (43 CFR 4100 et seq.)	2002 (revised)
Cave Management (43 CFR 37.4(c) and 37.11(c)(3)(iii))	1988
Competitive Leasing (43 CFR 3120)	2002
Delegation of Authority, Cooperative Agreements, & Contracts for Oil & Gas Inspection (43 CFR 3190)	1987
Federal Coal Management Program Regulations (43 CFR Group 3400)	1979
Federal Manual for Identifying and Delineating Jurisdictional Wetlands	1991
Fish and Wildlife 2000 BLM National, State and District policies	2000
Geothermal Resource Leasing (43 CFR 3200)	1998
Geothermal Resources Unit Agreements (43 CFR 3280)	1973
Instructional Memorandum 2002-196	2002
Instructional Memorandum 2003-020, Interim Wind Energy Development Policy	2003
Instructional Memorandum 2005-069, Offsite Compensatory Mitigation Guidelines	2005
Instructional Memorandum 2005-176, Filing of Protests on lands Included in Oil and Gas Lease Sales	2005
Instructional Memorandum 2005-210, Energy Policy and Conservation Act (EPCA) Inventory – Data Compilation for Phases III and IV	2005
Instructional Memorandum 2005-247, National Environmental Policy Act (NEPA) Compliance for Oil, Gas, and Geothermal Development	2005
Instructional Memorandum 2006-071, Process Improvement for Oil, Gas, Geothermal, Geophysical, and Related Rights-of-Way Approvals	2006
Instructional Memorandum 2006-206, Oil and Gas Bond Adequacy Reviews	2006
Instructional Memorandum No. 2006-145, Cooperative Conservation Based Strategic Plan for the Abandoned Mine Lands Program	2006
Instructional Memorandum No. 2007-096, Refinement of the Methodology to Identify Abandoned Mine Land Sites Near Populated Places and High Use Areas	2007
Instructional Memorandum No. WY-2003-011	2002
Instructional Memorandum No. WY-2006-009	2006
Mineral Leasing Act of 1920 (43 CFR From 3100-11 (July 2006), 43 CFR Part 3160)	1920
Mineral Leasing Act of 1920 (43 CFR 2006 3425.1–7(a)(2)(iv, v))	1920
Mineral Leasing Act of 1920 (43 CFR 2006 3461.5(h)(2)(i))	1920
Mineral Leasing Act of 1920 and others (43 CFR 2006 3591.1(b)(10))	1920
Mineral Leasing Act of 1920 and others (43 CFR 2006 3430.4-4(a)(10); 43 CFR 2006 3430.4-4(b)(8))	1920

BLM Directive	Year
Minerals Management, Generally (43 CFR 3000)	1983
National Contingency Plan Regulations (40 CFR 300)	1994
National Management Strategy for Motorized Off-highway Vehicle Use on BLM Public Lands	2001
National Register Bulletin 38: Guidelines for Evaluating and Documenting Traditional Cultural Properties	1990
Natural Resource Damage Assessment Regulations (43 CFR Part 11)	1986
Noncompetitive Leasing (43 CFR 3110)	1988
Off-Road Vehicle Implementation Strategy Washakie Resource Area	1994
Oil and Gas Leasing (43 CFR 3100)	1983
Onshore Oil and Gas Geophysical Exploration (43 CFR 3150)	1988
Onshore Oil and Gas Operations (43 CFR 3160)	1982
Onshore Oil and Gas Unit Agreements; Unproven Areas (43 CFR 3180)	1983
Permits for Recreation on Public Lands (43 CFR 2930)	2004
Riparian-Wetlands Initiative for the 1990's, The U.S. Department of the Interior, BLM	1992
Solicitor's Opinion of Jan. 17, 1986	1986
Solicitor's Opinion of July 10, 1963	1963
Solicitor's Opinion of Oct. 12, 1956	1956
Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management for the Public Lands Administered by the BLM in the State of Wyoming	2004
Standards for Healthy Rangelands, Standard #2	1997
The Standards for Healthy Rangelands and Guidance for Livestock Grazing Management (43 CFR 4180)	1997
WO- Instructional Memorandum -2002-034, Recent Changes in Management Direction: Federal Wildland Fire Management Policy, National Fire Plan	2002
WY Instructional Memorandum No. 2005-034, Travel Management Guidelines for the Public Lands in Wyoming	2005
WY Instructional Memorandum No. 89-402, April 3, 1989, Inspection and Enforcement Program for Locatable Minerals Activities	1989
WY-2001-040, Issuance of BLM (Wyoming) Sensitive Species Policy and List (Expires 9/30/02)	2001
Wyoming BLM Coal/Coal Bed Methane Policy	2000
Wyoming BLM Soil Program Ten Year Strategy	2003
Wyoming Instructional Memorandum 87-672, August 26, 1987	1987

6.1.3 Applicable Wyoming State Laws and Regulations

Wyoming State Laws and Regulations
Wyoming State Engineer's Office Statutes, Rules & Regulations
State of Wyoming Occupational Health and Safety Rules & Regulations
State of Wyoming Oil & Gas Conservation Commission Rules & Regulations
Wyoming Department of Environmental Quality Rules & Regulations
State of Wyoming Occupational Health and Safety Rules & Regulations
State of Wyoming Oil & Gas Conservation Commission Rules & Regulations
Wyoming Department of Environmental Quality Rules & Regulations

6.1.4 Memoranda and Agreements

Memoranda and Agreements	Year	Description
Memorandum of Understanding No. WY 19	2003	Between the United States DOI BLM and the Wyoming DEQ-Land Quality Division (LQD) and addresses Management Of Surface Mining and Exploration for Locatable Minerals On Public Lands. It was signed November 11, 2003. This is a Supplemental Memorandum to the General Statewide MOU dated October, 1975, between the Governor of Wyoming and the United States, by and through the State Director, Bureau Of Land Management, United States, Department of the Interior.
Wyoming DEQ	N/A	There are currently no agreements between BLM and the State of Wyoming DEQ-LQD regarding exploration for or development of non-energy leasable minerals. Wyoming DEQ-LQD processes applications for these minerals under their "Non-Coal" rules and regulations. It is possible that the same Memorandum of Understanding between BLM and Wyoming DEQ-LQD for locatable minerals would have some valuable application should these two agencies need to work together to process applications related to non-energy leasable minerals.
Clean and Diversified Energy Initiative	2005	Recommends initiatives to facilitate the timely leasing and permitting of geothermal resources.
BLM Memorandum of Understanding WO300-2006-08, April 2006	2006	Facilitate interagency coordination and establish policies and procedures to implement Section 225 of the Energy Policy Act of 2005.
National Memorandum of Understanding between the BLM and the Department of Defense		This Memorandum of Understanding outlines procedures for processing Notices of Intent (NOIs) to conduct geophysical operations when Air Force, Army, and Navy lands are involved. The Department of Defense will be the lead agency when their lands are involved in an NOI.
Interagency between BLM and Bureau of Reclamation cy Agreement		The BLM has jurisdiction over NOIs to conduct geophysical exploration which involve Bureau of Reclamation (BOR) lands. The BOR will be contacted for their conditions of approval.

Memoranda and Agreements	Year	Description
Memorandum of Understanding between BLM and State of Wyoming Oil and Gas Conservation Commission		Outlines the handling of NOIs to conduct geophysical exploration and sharing of information and compliance inspections. The State of Wyoming Oil and Gas Conservation Commission (WOGCC) has jurisdiction over injection wells and spacing.
Memorandum of Agreement, between the Wyoming Department of Environmental Quality and the State of Wyoming Oil and Gas Conservation Commission	1999	Wyoming DEQ delegated permitting of road applications for oilfield wastes when the wastes are to be applied on the lease, unit, or communitized area. Wyoming DEQ still has the jurisdiction for permitting road application of oil field wastes outside of the lease, unit, or communitized area.
Interagency Agreement between the U. S. Forest Service and the BLM	2006	Establishes procedures for the administration of oil and gas operations on federal leases within the National Forest System.
Memorandum of Understanding BLM/APHIS-Wildlife Services (ADC)	2003	Detailing cooperative efforts between the two groups on suppression of grasshoppers and Mormon crickets on BLM lands (Document #03-8100-0870-MU, February 27, 2003), and local National Resource Conservation Service (NRCS).
Western Association of Fish and Wildlife Agencies WAFWA/USFS/BLM/USFWS Memorandum of Understanding (08-31-2000)	2000	Involving the management of sage grouse and their habitat.
Memorandum of Understanding between the BLM and the Department of Agriculture (60F26045-48)	1995	Predator control protocols were formalized in this Interagency Memorandum of Understanding.
Cooperative Agreements with Weed and Pest Districts	2003-2009	Popo Agie Conservation District, Lower Wind River Conservation District, Dubois Crowheart Conservation District, weed and pest management
Programmatic Agreement Among BLM, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Offices (SHPOs)	1997	Regarding the Manner in which BLM will meet its responsibilities under the NHPA.
State Protocol Agreement Between the Wyoming BLM State Director and the Wyoming SHPO	2006	Regarding the Manner in which BLM will meet its responsibilities under the NHPA.
Memorandum of Agreement WY-7		Memorandum of Agreement between the BLM and the Wyoming Recreation Commission; addresses land classifications and withdrawals to protect public lands generally, and specifically to protect historic trails.
Memorandum of Agreement WY-19		Memorandum of Agreement between the BLM and the Wyoming Governor, addresses overall cooperation in public and state land management efforts.

Memoranda and Agreements	Year	Description
Memorandum of Agreement WY-20		Memorandum of Agreement between the BLM and the Wyoming Game and Fish Commission, addresses a myriad of land and resource management issues, including classifications, land acquisition and disposal, and access.
Memorandum of Agreement WY-21		Memorandum of Agreement between the BLM and Region II and Region IV of the U.S. Forest Service, addresses overall coordination on a myriad of land and resource management issues.
Memorandum of Agreement WY-63		Memorandum of Agreement among the BLM, the U.S. Forest Service, Wyoming Department of Public Lands and the Wyoming Game and Fish Commission, addresses public land access and management of access problems.
Memorandum of Agreement WY-65		Memorandum of Agreement between the BLM and the ASCS, addresses overall coordination on a myriad of land and resource management issues.
Memorandum of Agreement WY-77		Memorandum of Agreement among the BLM, the ASCS, U.S. Forest Service, AES, and Wyoming State Conservation Commission, addresses overall coordination on conservation planning projects.
Memorandum of Agreement WY-117		Memorandum of Agreement among the BLM and the Wyoming Board of Land Commissioners, the Wyoming State Historic Preservation Office and the Advisory Council on Historic Preservation, addresses cultural resource protection in state exchanges.
Memorandum of Agreement WY-118		Memorandum of Agreement between the BLM and the Wyoming Board of Land Commissioners, addresses processing state exchanges.
Memorandum of Agreement WY-119		Memorandum of Agreement between the BLM and the ASCS, addresses management of agricultural trespass.
Memorandum of Agreement WY-121		Memorandum of Agreement between the BLM and the National Park Service, addresses management of the Oregon National Historic Trails.
Memorandum of Agreement WY-122		Memorandum of Agreement among the BLM and the U.S. Forest Service, Wyoming Department of Public Lands, Wyoming Game and Fish Commission, Wyoming Recreation Commission, Wyoming Department of Agriculture, and the Wyoming State Planning Coordinator's Office, addresses access to public land.
Memorandum of Agreement WY-131		Memorandum of Agreement between the BLM and the WGFD, addresses overall coordination on land and resource management.
Memorandum of Agreement WY930-91-06-38		Memorandum of Agreement between the BLM and the Wyoming Board of Land Commissioners, addresses exchange pooling.
Memorandum of Agreement WY930-91-06-39		Memorandum of Agreement between the BLM and the Wyoming Board of Land Commissioners, addresses exchange of state land in holdings in wilderness areas.

Memoranda and Agreements	Year	Description
Memorandum of Understanding WY920-08-07-192	2007	Memorandum of Understanding (Memorandum of Understanding) WY920-08-07-192 between BLM, the Federal Aid Highway Administration, and the Wyoming Department of Transportation, addresses each agency's responsibilities in regard to processing Federal-aid highway appropriations. To implement Sections 107(d) and 317 of the Federal Aid Highway Act (23 U.S.C. 107(d) and 317), as amended, the agencies operate under this Memorandum of Understanding (updated in August 2007). All appropriations under the Federal Aid Highway Act are required to be consistent with the referenced Memorandum of Understanding.
Memorandum of Understanding WY920-02-09-108	2002	Between the BLM, the FHWA, and the Wyoming Department of Transportation that defines each agency's responsibilities in regard to processing federal-aid highway appropriations.
Programmatic Agreement Among BLM, the Advisory Council on Historic Preservation, and the National Conference of SHPOs	1997	Regarding the Manner in which BLM will meet its Responsibilities Under the NHPA.
State Protocol Agreement between the Wyoming BLM State Director and the Wyoming SHPO	2006	Regarding the Manner in which BLM will meet its Responsibilities Under the NHPA.
Assistance agreement KAA990028-Abandoned Mine Land Reclamation Agreement		The AML program in Wyoming currently operates pursuant to this assistance agreement between the Wyoming State Office of the BLM and the Wyoming DEQ. It provides for the cooperative effort between the two agencies for a long term relationship to efficiently and economically plans for, and share responsibilities to ensure, effective abandoned mine land reclamation on public lands in Wyoming.

7.0 SUMMARY OF SCOPING REPORT

7.1 Purpose of the Scoping Process

Public involvement, which includes the scoping process, is a vital component of the FLPMA and NEPA. Through the public involvement process, the public is able to participate in the planning process. NEPA requirements for public involvement are set forth in the Council on Environmental Quality regulations 40 CFR 1500–1508.

The purpose of the public scoping process is to identify issues and planning criteria that should be considered in the Lander RMP revision and associated EIS and to initiate public participation in the planning process. Issues identified during the scoping process are then used to formulate management alternatives later on in the revision process. As part of the scoping process, the BLM solicited comments and issues from the public, organizations, tribal governments, and federal, state, and local agencies, as well as from BLM specialists.

7.2 Scoping Period

The scoping period for the Lander RMP revision project began with the publication of the Notice of Intent in the Federal Register on February 13, 2007. The Notice of Intent served to notify the public of the BLM's intent to revise the RMP for the Lander planning area, provide the location of the public scoping meetings, and identify the preliminary issues and preliminary planning criteria to be utilized in the RMP revision process. The scoping period lasted 60 days ending on April 16, 2007.

During the scoping process, the BLM hosted 5 public scoping meetings in locations across the planning area to provide the public with an opportunity to learn and ask questions about the project and the planning process and to submit their issues and concerns to the BLM. Approximately 70 individuals attended the public meetings which were held in Riverton, Shoshoni, Jeffrey City, Dubois, and Lander in March 2007. The times and locations of public scoping meetings were advertised to the public using a variety of outreach methods. The number of comments obtained during those meetings and the resource areas addressed during scoping are summarized in the Table 7-1.

The BLM received approximately 30 comment documents during the scoping process. Comment documents were submitted to the BLM in person, mailed to the Lander Field Office, or submitted via e-mail. Commenters included individuals, private organizations, businesses, county governments, conservation districts, and state and federal agencies. Most comment documents received contained multiple comments. The BLM identified approximately 725 unique comments from the comment documents that related to RMP planning issues. In addition, the BLM received a number of comments that fall outside the scope and will not be addressed in the RMP including comments related to policy, regulatory, or administrative actions.

Table 7-1. Number of Public Comments for Each Resource Area Received During the Public Scoping Period for the Lander Resource Management Plan Revision

Resource and Resource Uses	Number of Comments	Resource and Resource Uses	Number of Comments
Air Quality	8	Recreation	31
Coal	7	Scenic Byways	2
Cultural Resources	15	Scenic Trails	2
Cumulative Impacts	2	Soils	3
Drought	9	Special Recreation Management	18
Fire Management	9	Threatened and Endangered Species	11
Forest Management	16	Vegetation	0
Grazing	84	Water	25
Historical and Cultural Resources	1	Wild and Scenic Rivers	11
Historic Trails	7	Wild Horses	3
Mineral Leasing	156	Wilderness	24
Noise	1	Wildlife	75
Oil and Gas	40	Wind Energy	3

Planning Issues

As part of the scoping process the BLM identified key issues that are considered in the RMP revision process. Planning issues are controversies or concerns about existing and potential land and resource allocations, levels of resource use, production, and related management practices. Issue identification is a key component of the scoping process, and the BLM used a multi-step process to categorize and distill the issues presented in the scoping comments. All issues identified during scoping will be considered in alternative formulation and the effects analysis.

The issues identified by the BLM during the scoping process are presented below in the form of questions. These issue statements summarize the key questions and concerns identified in the scoping comments. Adjustments to the planning issues will continue to be made as needed during the planning process as the BLM receives additional input from the public and cooperators.

Climate Change:

- How can the BLM incorporate climate change into its land management practices?

Watershed and Air Management:

- How can the BLM manage use of public lands while protecting watershed and air quality?

Energy and Minerals Management:

- Which areas should be open to mineral and energy development, and how should BLM manage such development while protecting human health as well as natural and cultural resources?

Fire and Fuels Management:

- How can the BLM manage fire and fuels to protect public safety as well as natural and cultural resources?

Invasive and/or Noxious Species:

- How can the BLM manage the spread of and mitigate impacts associated with invasive species and/or noxious weeds?

Fish, Wildlife, and Special Status Species:

- How can the BLM manage public land use while maintaining and improving terrestrial and aquatic habitats?

Wild Horses:

- How can the BLM manage wild horses on public lands while also protecting natural and cultural resources?

Cultural and Paleontological Resources:

- How can the BLM manage paleontological, cultural, and traditional resources to provide both resource protection and opportunities for public education and study?

Visual Resources:

- How can the BLM manage public lands for visual qualities?

Lands and Realty:

- What land tenure and management adjustments are needed to meet access and development needs, while also protecting natural and cultural resources?

Comprehensive Trails and Travel Management, and OHV:

- How can the BLM manage travel on public lands?

Recreation and Visitor Use:

- How can the BLM provide recreational opportunities on public lands while protecting public safety, and natural and cultural resources?

Livestock Grazing:

- How can the BLM manage livestock use on public lands while also protecting natural and cultural resources?

Special Designation Management:

- How can the BLM manage areas that contain unique or sensitive resources?

Socioeconomic Resources:

- How can the BLM manage public land use with the preservation of local tradition and local economies that rely upon BLM-administered land?

For a detailed description of all issues identified during scoping, please refer to the Lander Field Office Final Scoping Report (BLM 2007). The scoping report is available on the Lander RMP website, http://www.blm.gov/wy/st/en/info/NEPA/lfodocs/lander_rmp.html.

8.0 LIST OF PREPARERS

Name	Education	Title	Role	Years of Experience
BLM Team				
Kristin Yannone	B.A. History J.D. Law	Environmental Planner and Coordinator	Project Manager/Inspector and Team Leader	21
Jim Cagney	B.S. Range/Forest Management	Field Office Manager (acting)	Lander Field Office Manager	32
Connie Breckenridge	B.S., Fish and Wildlife Biology, Iowa State University	GIS Specialist	GIS Data Management	27
Sydney Schoepke	B.S. Land Resource Management, MS Applied Geographic Information Sciences	GIS Specialist	GIS Data Management	1
Beth Ransel	M.S. Environmental Policy and Management, B.S. Environmental Studies	Assistant Field Manager for Minerals and Lands (Acting)	Realty Specialist	6
Greg Bautz	B.S. Resource Management	Soil Scientist	Soil, Surface Water, Invasive	29
Jared Oakleaf	B.A. Geography and Recreation, B.A. Environmental and Natural Resources	Outdoor Recreation Planner	Cave and Karst, Recreation, Travel Management, Wild and Scenic Rivers, Wilderness Study Areas, Areas with Wilderness Characteristics, Visual Resources, ACECs, National Scenic Trails	9
Scott Fluer	B.S. Range Science	Rangeland Management Specialist	Vegetation, Riparian/Wetland Areas, Livestock Grazing, ACECs	23
Tim Kramer	B.S. Rangeland Resources and History, M.S. Rangeland Resources, Crops and Soil Sciences	Natural Resource Specialist,Fire and Fuels	Forestry, Fire and Fuels	13
Sue Oberlie	B.S. Wildlife Management; B.S. Secondary Education	Wildlife Biologist	Fish & Wildlife, Special Status Species, ACECs	25
Craig Bromley	B.A. Anthropology	Archeologist	Cultural, Paleontology, National Historic Trails, ACECs	31
Jon Kaminsky	B.A. Geology, M. Sci. Hydrogeology	Geologist	Geology, Solid Minerals, Mineral Occurrence Report	22
Roy Packer	B.S. Forestry and Range and Watershed Management	Rangeland Management Specialist	Wild Horses	35

Name	Education	Title	Role	Years of Experience
Leta Rinker	B.S. Business Administration, B.A. Business Managemenet	Realty Sepcialist	Lands & Realty, including Transportation/Access and ROWs, Renewable Energy Utility/Communication Corridors, Land Tenure	24
Stuart Cerovski	B.S. Petroleum Engineering	Petroleum Engineer	Fluid Minerals	26
Roy Allen	B.S. Chemistry M.S. and PhD Economics	Social Conditions/ Economic Conditions/ Environmental Justice	Socioeconomics	32
Dean Stillwell	B.S. Geology and M.S. Geology	Geologist	Oil and Gas, RFD	31
Stan William Davis-Lawrence	B.S. Math/Physics/ Geophysical Engineering, M.S. Geophysical Engineering	Petroleum Engineer	Oil and Gas, RFD	36
Alfred M. Elser	B.S. Geology, M.S. Geology, and Ph.D. Chemistry with a concentration in geochemistry	Petroleum Geologist	Oil and Gas, RFD	5
John Zachariassen	B.S. Biology, 1981, Carleton University M.S. Soils, 1985, University of Nebraska-Lincoln Ph.D., Biogeochemistry/ Atmosphere-Bios Interactions, 1992 Colorado State University	Air Quality Specialist	Air Quality	11
Contractor				
SAIC and ICF International				

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9.0 GLOSSARY

The definitions provided below are the broadest meaning and context of a particular term or phrase. For any specific application the statutes, executive orders, regulations, or other State Director policies relative to the subject activity should be consulted first for a more specific meaning of a particular term or phrase. Additional glossary terms are contained in the Land Use Planning Handbook and other guidance, laws, regulations and directives.

Areas Administratively Unavailable to Leasing: BLM H-1601-1 - Land Use Planning, Appendix C.4 uses the term areas closed to oil and gas leasing. Areas administratively unavailable or closed to oil and gas leasing are areas where it has been determined that other land uses or resource values cannot be adequately protected with even the most restrictive oil and gas leasing stipulations; appropriate protection can be ensured only by making the areas administratively unavailable to oil and gas leasing for the life of the plan. Lands currently under lease would remain leased for the life of the leases. After expiration of these leases, no lands would be available for lease.

Allotment: An area of land where one or more livestock operators graze their livestock. Allotments are 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. Allotments are classified by the following:

Category I – Improve Existing Resource Conditions

Category M – Maintain Existing Resource Conditions

Category C – Custodial Management.

Analysis Area: Any lands, regardless of jurisdiction, for which the BLM synthesizes, analyzes, and interprets data for information that relates to planning for BLM-administered lands.

Animal Unit Month (AUM): A standardized measurement of the amount of forage necessary for the sustenance of one cow unit or its equivalent for 1 month (approximately 800 pounds of forage).

Appropriate Management Response (AMR): Term formerly used for Fire Management Response planning. Current term is Response to Wildland Fire (RWF).

Authorized /Authorized Use – This is an activity (i.e., resource use) occurring on the Public Lands that is either explicitly or implicitly recognized and legalized by law or regulation. This term may refer to those activities occurring on the Public Lands for which the BLM, or other appropriate authority (e.g., Congress for RS 2477 rights-of-way [ROWs], FERC for major, interstate ROWs, etc.), has issued a formal authorization document (e.g., livestock grazing lease/permit; right-of-way grant; coal lease; oil and gas permit to drill; etc.). Formally authorized uses typically involve some type of commercial activity, facility placement, or event. These formally authorized uses are often spatially or temporally limited. Unless constrained or bounded by statute, regulation, or an approved land use plan decision, legal activities involving public enjoyment and use of the Public Lands (e.g., hiking, camping, hunting, etc.) require no formal BLM authorization.

Authorized Surface-Disturbing Activities: See Surface-Disturbing Activities

Big Game Crucial Winter Range: Winter habitat on which a wildlife species depends for survival. Because of severe weather conditions or other limiting factors, no alternative habitat would be available.

Borrow Material: A term used in conjunction with construction. The term refers to unprocessed material excavated from a borrow pit for use as fill at another location.

Carbon Dioxide Flood: A carbon dioxide flood is an enhanced oil recovery technique that injects fluid into the reservoir. When carbon dioxide is injected, it mixes with the oil and the two compounds dissolve into one another. The injected CO_2 acts as a solvent to overcome forces that trap oil in tiny rock pores and helps sweep the immobile oil left behind after the effectiveness of water injection decreases, resulting in increased oil production (EnCana 2005).

Casual Use: The term varies in meaning depending upon the use or resource involved. Reference to the guidance for the particular application must be made.

Cheatgrass: Cheatgrass is an annual grass that forms tufts up to 2 feet tall. The leaves and sheaths are covered in short, soft hairs. The flowers occur as drooping, open, terminal clusters that can have a greenish, red, or purple hue. Flowering occurs in the early summer. These annual plants will germinate in fall or spring (fall is more common), and senescence usually occurs in summer. Cheatgrass invades rangelands, pastures, prairies, and other open areas. Cheatgrass has the potential to completely alter the ecosystems it invades. It can completely replace native vegetation and change fire regimes and is most problematic in areas of the western United States with lower precipitation levels.

Class I Wells: Injection wells that are

(1) Wells used by generators of hazardous waste or owners or operators of hazardous waste management facilities to inject hazardous waste beneath the lowermost formation containing, within ¼ mile of the well bore, an underground source of drinking water.

(2) Other industrial and municipal disposal wells that inject fluid beneath the lowermost formation containing, within ¼ mile of the well bore, an underground source of drinking water.

(3) Radioactive waste disposal wells that inject fluid below the lowermost formation containing an underground source of drinking water within ¼ mile of the well bore.

Class II Wells: Injection wells

(1) That are brought to the surface in connection with natural gas storage operations, or conventional oil or natural gas production, and may be commingled with wastewaters from gas plants, which are an integral part of production operations, unless those waters are classified as a hazardous waste at the time of injection.

(2) For enhanced recovery of oil or natural gas.

(3) For storage of hydrocarbons that are liquid at standard temperature and pressure.

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.

Commodity: An economic good, such as a product of agriculture or mining.

Commodity Production: Production aim at maximizing commercial benefit of resource use.

Communication Site Management Plan: A plan that provides for effective administration of a communications site. The site plan defines the principles and technical standards adopted in the site designation. The site plan provides direction for the day-to-day operations of the site in connection with the lease. The site plan shall delineate the types of uses that are appropriate at this site and the technical and administrative requirements for management of the site. The site plan should reflect the complexity of the current situation and the anticipated demand for the site.

Comprehensive Weed Management Plan: A plan for controlling invasive plant species that incorporates integrated weed management techniques and accounts for pertinent considerations, such as management actions and allocations affecting weeds.

Condition of Approval: A site-specific and enforceable requirement included in an approved Application for Permit to Drill or sundry Notice that may 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.

Controlled Surface Use (CSU): Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts. Identified resource values require special operational constraints that may modify the lease rights. CSU is used for operating guidance, not as a substitute for the no surface occupancy or timing limitation stipulations.

Cooperative Monitoring: Joint Cooperative Monitoring – Process where partners voluntarily help us collect monitoring information. This involves data collected by outside parties in a cooperative manner and assumes some level of agreement in advance as to the data to be collected as well as the specific methods, timing and locations for data collection. Although data may be provided by permittees or other groups or individuals outside of the agency without prior discussion or agreement, that would not be considered joint cooperative monitoring regardless of whether or not the agency considers the data provided to be useful or accurate.

Data collected by state or federal agencies that are responsible for resources or monitoring on public land, or contractors that we have hired to collect monitoring information is not necessarily considered to be joint cooperative monitoring.

Cultural Resource Inventory Levels: A three-tiered process for discovering, recording, and evaluating cultural resources.

(a) Class I - A review of existing literature and oral informant data combined with an analysis of a specific geographic region (e.g., an area of potential effect, drainage basin, resource area, etc.).

(b) Class II - A sampling survey usually aimed at developing and testing a predictive model of cultural resource distribution.

(c) Class III - An on-the-ground survey to discover, record, and evaluate cultural resources within a specific geographic area (e.g., usually an area of potential effect for a proposed undertaking).

(d) dB (decibel): A unit of measurement of the loudness or strength of a signal. One decibel is considered the smallest difference in sound level that the human ear can discern. Decibels are a relative measurement derived from two signal levels: a reference input level and an observed output level. A decibel is the logarithm of the ratio of the two levels. One Bel is when the output signal is 10x that of the input and one decibel is $1/10^{th}$ of a Bel.

Desired Plant Community (DPC): Of the several plant communities that may occupy a site, the DPC is the community that has been identified through a management plan to best meet the plan's objectives for the site. At a minimum, it must protect the site.

Disruptive Activities: Those Public Land resource uses/activities that are likely to alter the behavior, displace, or cause excessive stress to existing animal or human populations occurring at a specific location and/or time. In this context, disruptive activity(ies) refers to those actions that alter behavior or cause the displacement of individuals such that reproductive success is negatively affected, or an individual's physiological ability to cope with environmental stress is compromised. This term does not apply to the physical disturbance of the land surface, vegetation, or features. Examples of disruptive activities may include noise, human foot or vehicle traffic, domestic livestock roundups, or other human presence regardless of the activity. When administered as a land use restriction (e.g., *No Disruptive Activities*), this term may prohibit or limit the physical presence of sound above ambient levels, light beyond background levels, and/or the nearness of people and their activities. The term is commonly used in conjunction with protecting wildlife during crucial life stages (e.g., breeding, nesting, birthing, etc.), although it could apply to any resource value on the Public Lands. The use of this land use restriction is not intended to prohibit all activity or authorized uses.

Distance Zones: Landscapes are divided into three distance zones based on relative visibility from travel routes or observation points. The Foreground Middle Ground Zone is an area between 0 and 5 miles, the Background Zone is an area between 6-15 miles, and the Seldom Seen zone is the area beyond the Background and areas within the Foreground/Middle ground that cannot be seen.

Ecological Site: A kind of land with a specific potential natural community and specific physical site characteristics, differing from other kinds of land in that the site has the ability to produce distinctive kinds and amounts of vegetation and to respond to management. Ecological sites are defined and described with information about soil, species composition, and annual production.

Ecological Integrity: An approach used to evaluate the health of an ecological site, in terms of functioning as a system to meet site potential.

Ephemeral Stream: A stream that flows only in direct response to precipitation, and whose channel is at all times above the water table. Confusion over the distinction between intermittent and ephemeral streams may be minimized by applying Meinzer's suggestion that the term "ephemeral" be arbitrarily restricted to streams that do not flow continuously for at least 30 days (Prichard et al. 1998). Ephemeral streams support riparian areas when streamside vegetation reflects the presence of permanent subsurface water.

Exceedance: An event in which measurements of ambient air quality are above the national ambient air quality standard (NAAQS) or Wyoming Department of Environmental Quality (DEQ) standard set for a particular pollutant. For example, an annual average nitrogen dioxide value of 110 µg/m3 is an exceedance of both the NAAQS and Wyoming DEQ annual average standard for nitrogen dioxide of 100 µg/m3.

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

Exclusion Areas: Areas with sensitive resource values where rights-of-way and 302 permits, leases, and easements would not be authorized.

Please use definition from land use planning handbook.**Fire Management Plan:** Identifies appropriate strategies to achieve resource objectives. Identifies fire policy, objectives, and prescribed actions; may include maps, charts, tables, and statistical data.

Fire Regime Condition Class: A classification of the amount of departure from the natural fire regime. The departure results in changes to one or more of the following ecological components: vegetation characteristics (e.g., species composition, structural stages, stand age, canopy closure, and mosaic pattern), fuel composition, fire frequency, severity, and pattern, and other associated disturbance (e.g., insect and disease mortality, grazing, and drought). The three condition classes are listed below:

(e) **Condition Class 1**

- The historic disturbance regime is largely intact and functioning (e.g., has not missed a fire return interval)
- Potential intensity and severity of fire within historic range
- Effects of disease and insects within historic range
- Hydrologic functions within normal historic range
- Vegetation composition and structure resilient to disturbances
- Nonnative species currently not present or to a limited extent
- Low risk of loss for key ecosystem components.

(f) **Condition Class 2**

- Moderate alterations to historic disturbance regime evident (e.g., missed one or more fire return intervals)
- Effects of disease and insects pose an increased risk of loss of key community components

- Riparian areas and associated hydrologic function show measurable signs of adverse departure from historic conditions
- Vegetation composition and structure shifted toward conditions less resilient to disturbances
- Populations of nonnative species may have increased, increasing the risk of further increases following disturbance.

(g) **Condition Class 3**

- Historic disturbance regime significantly altered; historic disturbance processes and impacts may be precluded (e.g., missed several fire return intervals)
- Effects of disturbance (fire, insects, and disease) may cause significant or complete loss of key community components
- Hydrologic functions may be adversely altered; high potential for increased sedimentation and reduced streamflows
- Invasive, nonnative species may be common and in some cases the dominant species on the landscape; disturbance will likely increase both the dominance and geographic extent of these invasive species
- Highly altered vegetation composition and structure predisposes community to disturbance events outside the range of historic availability; disturbance may have effects not observed or measured before.

Fire Return Interval: The number of years between two successive fire events at a specific site or area.

Flaring/Venting: The controlled burning (flare) or release (vent) of natural gas that cannot be processed for sale or use because of technical or economic reasons.

Floodplain Connectivity: Maintenance of lateral, longitudinal, and vertical pathways for biological and hydrological processes in the floodplain. Examples of failures to maintain connectivity could include culverts or levees that restrict flow in the floodplain and that focus overbank flow into the channel.

Flushing Livestock: Flushing livestock is the holding of livestock in an invasive, nonnative plant species (INPS) seed-free area where they are fed an INPS seed-free ration for 72 hours, thus flushing INPS seed from the animals' digestive systems.

Fossil: The remains or traces of an organism preserved by natural processes in the earth's crust. This would include plants and animals, their tracks, burrows, and other imprints, and are considered a non-renewable resource. It does not include minerals such as coal, oil and gas, and tar sands.

Geologic Resources: Resources associated with the scientific study of the Earth, including its composition, structure, physical properties, and history. Geologic resources commonly include the study of minerals (**mineralogy**) and rocks (**petrology**); the structure of the Earth (**structural geology**) and volcanic phenomena (**volcanology**); and landforms and the processes that produce them (**geomorphology** and **glaciology**).

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

Guzzler: A water development for wildlife.

HABS/HAER: The Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) is an integral component of the federal government's commitment to historic preservation. The program documents important architectural, engineering and industrial sites throughout the United States and its territories. A complete set of HABS/HAER documentation, consisting of measured drawings, large-format photographs, and written history plays a key role in accomplishing the mission of creating an archive of American architecture and engineering and in better understanding what historic resources tell us about America's diverse ethnic and cultural heritage. To insure that such evidence is not lost to future generations, the HABS/HAER Collections are archived at the Library of Congress, where they are made available to the public.

Heavy Equipment Use: This phrase is used in fire management and is relative to limiting fire suppression tactics. In this context it refers to not using dozers, skidders, or graders in areas where important resource values are in need of protection. Fire engines and water tenders used during suppression activities would be allowed.

Held by Production: Leases that become productive and do not terminate until all wells on the lease have ceased production.

Hot Season Grazing: Hot-season grazing is the use of pastures during nthe critical growing season for riparian plants. In the planning area, this is **g**enerally, mid-June to mid-September (TR 1737-20 2006).

Integrated Pest Management: The use of all appropriate weed control measures, including fire, as well as mechanical, chemical, biological, and cultural techniques, in an organized and coordinated manner on a site-specific basis.

Intermittent Stream: A stream that flows only at certain times of the year when it receives water from springs or from some surface source such as melting snow in mountainous areas. Confusion over the distinction between intermittent and ephemeral streams may be minimized by applying Meinzer's suggestion that the term "intermittent" be arbitrarily restricted to streams that flow continuously for periods of at least 30 days (Prichard et al. 1998).

Impact Analysis for Planning (IMPLAN 2000) Model: IMPLAN is a regional economic model that provides a mathematical accounting of the flow of money, goods, and services through a region's economy. The model provides estimates of how a specific economic activity translates into jobs and income for the region. It includes the "ripple effect" (also called the "multiplier effect") of changes in economic sectors that may not be directly impacted by management actions, but are linked to industries that are directly impacted. In IMPLAN, these ripple effects are termed indirect impacts (for changes in industries that sell inputs to the industries that are directly affected) and induced impacts (for changes in household spending as household income increases or decreases due to the changes in production).

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

Laramide orogeny: The Laramide orogeny (orogeny is the Greek word for mountain building) was a period of mountain building in western North America which began during the Late Cretaceous period, 70 to 80 million years ago, and ended 35 to 55 million years ago. The major feature that was created by this orogeny was the Rocky Mountains, but evidence of this period is found from Alaska to Mexico and as far east as the Black Hills. The phenomenon is named for the Laramie Mountains of eastern Wyoming.

Leasable Minerals: Those minerals or materials subject to lease by the federal government under the Mineral Leasing Act of 1920. They include coal, phosphate, asphalt, sulphur, potassium, and sodium minerals; oil and gas, as well as geothermal resources.

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 metallic minerals such as gold, silver, and other uncommon materials not subject to lease or sale.

Maintenance Action: A minor adjustment to the land use plan that does not require an amendment.

Major Utility System: A major right-of-way is a Category 6 processing project. It includes large power lines (115kV or above), large diameter pipelines, ROW with significant surface disturbance either linear or site, Long distance ROWs, ROWs involving multiple federal jurisdictions, ROW that would require a LUP amendment, proposals with a high lever of public controversy, ROW that may impact critical or sensitive resources, ROW that require extensive coordination or consultation, cross border projects (US to Mexico or Canada), any ROW requiring an EIS.

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

Mineral Withdrawal: A formal order that withholds federal lands and minerals from entry under the Mining Law of 1872, as amended, and closes the area to mineral location (i.e., staking mining claims) and development.

Mitigation:

(a) Avoiding the impact altogether by not taking a certain action or parts of an action.

(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.

(c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.

(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

(e) Compensating for the impact by replacing or providing substitute resources or environments.

Modern Intrusions: includes not only the intrusion but also related impacts, such as a water well; related impacts could include livestock trails to the well and un-reclaimed roads leading to it (update and add to this definition)

Modification: A change to the provisions of a 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 site within the leasehold to which the restrictive criteria are applied.

Multiple Use Reservoir: A human-created lake or pond with a combination of balanced uses, including, but not limited to, recreation, livestock watering, watershed health, and wildlife and fish.

- Populations are declining or restricted in numbers and (or) distribution, extirpation is not imminent; habitat is not restricted, vulnerable, but no loss; species is not sensitive to human disturbance
  OR
- Species is widely distributed, population status or trends are unknown, but are suspected to be stable; habitat is restricted or vulnerable, but no recent or ongoing significant loss; species may be sensitive to human disturbance
  OR
- Populations that are stable or increasing and not restricted in numbers and (or) distribution; ongoing significant loss of habitat.

Natural Fire Regime: The general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning (Agee 1993, Brown 1995). The ultimate regulating factor for any natual fire regime is climate, with aspects such as the historic intensity of fire, time between fires (frequency), season of burning , the extent (or patchiness) of a fire, and the type of fire (i.e. solely above ground versus also consuming the organic layer of soil) collectively combining to define the natural fire regime for a given landscape (Whelan, 1995).

No Surface Occupancy (NSO): The term “no surface occupancy” (NSO) is used in two ways. It is used in one way to define a NSO area where no surface-disturbing activities of any nature or for any purpose would be allowed. For example, construction or the permanent or long-term placement of structures or other facilities for any purpose would be prohibited in an NSO area.

The other way the “no surface occupancy” term is used is as a stipulation or mitigation requirement for controlling or prohibiting selected land uses or activities that would conflict with other activities, uses, or values in a given area. When used in this way, the NSO stipulation or mitigation requirement is applied to prohibit one or more specific types of land and resource development activities or surface uses in an area, while other—perhaps even similar—types of activities or uses (for other purposes) would be allowed. For example, protecting important rock art relics from destruction may require closing the area to the staking of mining claims and surface mining, off-road vehicle travel, construction or long-term placement of structures or pipelines, powerlines, general purpose roads, and livestock grazing.

Conversely, the construction of fences to protect the rock art from vandalism or from trampling or breakage by livestock, an access road or trail, and other visitor facilities to provide interpretation and opportunity for public enjoyment of the rock art would be allowed. Further, if there were interest in development of leasable minerals in the area, leases for oil and gas, coal, and so forth, could be issued with a “no surface occupancy” stipulation or mitigation

requirement for the rock art site, which would still allow access to the leasable minerals from adjacent lands and underground. The term “no surface occupancy” has no relationship or relevance to the presence of people in an area.

Occupied Lek: A lek that has been active during at least one strutting season within the last 10 years.

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

Open: Generally denotes that an area is available for a particular use or uses. Refer to specific program definitions found in law, regulations, or policy guidance for application to individual programs.

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 being used for emergency purposes; (3) any vehicle whose use is expressly authorized by the authorized officer, or otherwise officially approved; (4) vehicles in official use; and (5) any combat or combat support vehicle when used in times of national defense emergencies.

Off-Highway Vehicle (OHV) Management Designations: The authorized officer shall designate all public lands as either open, limited, or closed to off-road vehicles. All designations shall be based on the protection of the resources of the public lands, the promotion of safety of all users of the public lands, and the minimization of conflicts among the various uses of the public lands; and in accordance with the following criteria:

(a) Areas and trails shall be located to minimize damage to soil, watershed, vegetation, air, or other resources of the public lands, and to prevent impairment of wilderness suitability.

(b) Areas and trails shall be located to minimize harassment of wildlife or significant disruption of wildlife habitats. Special attention will be given to protect endangered or threatened species and their habitats.

(c) Areas and trails shall be located to minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands, and to ensure the compatibility of such uses with existing conditions in populated areas, taking into account noise and other factors.

(d) Areas and trails shall not be located in officially designated wilderness areas or primitive areas. Areas and trails shall be located in natural areas only if the authorized officer determines that off-road vehicle use in such locations will not adversely affect their natural, esthetic, scenic, or other values for which such areas are established.

Closed Area: an area where off-road vehicle use is prohibited. Use of off-road vehicles in closed areas may be allowed for certain reasons; how-ever, such use shall be made only with the approval of the authorized officer.

Open Area: An area where all types of vehicle use is permitted at all times, anywhere in the area subject to the operating regulations and vehicle standards set forth in the code of federal regulations.

Limited Area: An area restricted at certain times, in certain areas, and/or to certain vehicular use. These restrictions may be of any type, but can generally be accommodated within the following type of categories: Numbers of vehicles, types of vehicles, time or season of vehicle use; permitted or licensed use only; use on existing roads and trails; use on designated road and trails; and other restrictions.

Off-site Mitigation: Mitigation that is performed away from the immediate project area.

Over-Snow Vehicle: An over-snow vehicle is a motor vehicle that is designed for use over snow that runs on a track or tracks and/or a ski or skis. An over-snow vehicle does not include machinery used strictly for the grooming of non-motorized trails.

Overgrazing: Continued heavy grazing that exceeds the recovery capacity of the forage plants and creates deterioration of the grazing lands (Valentine 1990).

Paleontological Locality: A geographic point or area where a fossil or associated fossils are found in a related geological context. A paleontological locality is confined to a discrete stratigraphic layer, structural feature, or physiographic area.

Perennial Stream: A stream that flows continuously. Perennial streams generally are associated with a water table in the localities through which they flow (Prichard et al. 1998).

Pest: With the exception of vascular plants classified as invasive nonnative plant species, a pest can be any biological life form that poses a threat to human or ecological health and welfare. For the purposes of this planning effort, an “animal pest” is any vertebrate or invertebrate animal subject to control by Animal and Plant Health Inspection Service (APHIS). APHIS is currently BLM’s authorized agent for controlling “animal pests.” For this reason, “animal pests” will be considered a subset of Pest.

Planning Area: A geographic area for which land use and resource management plans are developed and maintained. For the Lander Land Use Plan revision, planning area is the Lander Field Office.

Potential Natural Community (PNC): The biotic community that would become established if all successional sequences were completed without interference by humans under the present environmental conditions. Natural disturbances are inherent in development. PNCs can include naturalized nonnative species.

Prairie Dog "Complex": Defined as a cluster of two or more prairie dog towns within 3 kilometers of each other (Clark and Stromberg 1987; Luce 2003), and bounded by either natural or artificial barriers (Whicker and Detling 1998) which effectively isolate one cluster of colonies from interacting/interchanging with another. Prairie dogs may commonly move among colonies of a cluster, and thereby foster reproductive/genetic viability, but exhibit little emigration/immigration between clusters. A cluster may include some currently unoccupied, through physically suitable (i.e., vegetation, soils, topography, etc), land immediately adjacent to occupied colonies that support other prairie dog-associated (ecosystem function), obligate or facultative species (e.g., swift fox, mountain plover, burrowing owl, etc.).

Prescribed Burning: Controlled application of fire to wildland fuels in either their natural or modified state under specified environmental conditions that allow the fire to be confined to a predetermined area and at the same time to produce the fire intensity and rate of spread required to attain planned resource management objectives.

Prescribed Fire: The introduction of fire to an area under regulated conditions for specific management purposes.

Priority Fish Species: Priority fish species are species considered to be sport fish and native species.

Probable Fossil Yield Classification: Geologic units in the planning area are classified according to the Probable Fossil Yield Classification, usually at the formation or member level, according to the probability of yielding resources of concern to land managers, primarily vertebrate fossils. The classification uses a ranking of 1 through 5, with Class 5 assigned to units with a high potential for fossils. Within the planning area, Class 4 and Class 5 geologic formations account for approximately 50 percent of the total acreage, including all ownerships. About 35 percent of public land in the planning area is underlain by Class 4 and Class 5 formations. The classifications are described as below.

> **Class 1.** Igneous and metamorphic geologic units, or units with highly disturbed preservational environments that are not likely to contain recognizable fossil remains. Management concern is negligible for Class 1 resources and mitigation requirements are rare.

> **Class 2.** Sedimentary geologic units that are not likely to contain vertebrate fossils or significant nonvertebrate fossils. Management concern is low for Class 2 resources and mitigation requirements are not likely.

Class 3. Fossiliferous sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence, or units of unknown fossil potential. Management concern may extend across the entire range of management. Ground-disturbing activities require sufficient assessment to determine whether significant resources occur in the area of the proposed action.

Class 4. Class 4 units are Class 5 units with a lowered risk of human-caused adverse impacts or lowered risk of natural degradation. Ground-disturbing activities require assessment to determine whether significant resources occur in the area of the proposed action and whether those actions will impact the resource. Mitigation may include full monitoring of significant localities.

Class 5. Highly fossiliferous geologic units that regularly produce vertebrate fossils or significant nonvertebrate fossils and that are at risk of natural degradation or human-caused adverse impacts. Class 5 areas receive the highest level of management focus. Mitigation of ground-disturbing actions is required and may be intense. Areas of special interest may be designated and intensely managed.

Produced Water: Groundwater removed to facilitate the extraction of minerals, such as coal, oil, or gas.

Proper Functioning Condition: Riparian-wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high waterflows, thereby reducing erosion and improving water quality; filter sediment, capture bedload, and aid floodplain development; improve flood-water retention and ground-water recharge; develop root masses that stabilize steambanks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; and support greater biodiversity. The functioning condition of riparian-wetland areas is a result of interaction among geology, soil, water, and vegetation. (BLM, 1993).

Proper Grazing: Proper grazing is the practice of managing forage use by grazing animals at a sustainable level that maintains rangeland health. Proper grazing will maintain or increase plant cover, including residue, which acts to slow down or reduce runoff, increase water infiltration, and keep erosion and sedimentation at or above acceptable levels within the potential of ecological sites within a given geographic area (e.g., watershed, grazing allotment, etc.).

Rangeland: Land on which the native vegetation is predominantly grasses, grass-like plants, forbs, or shrubs suitable for grazing or browsing. This includes lands revegetated naturally or artificially when routine management of that vegetation is accomplished mainly through manipulation of grazing. Rangelands include natural grasslands, savannas, shrublands, most deserts, tundra, alpine communities, coastal marshes, and wet meadows.

Rangeland Health: The degree to which the integrity of the soil and ecological processes of rangeland ecosystems are sustained.

Range Improvement Project: A structural improvement requiring placement or construction to facilitate management or control distribution and movement of grazing or browsing animals. Such improvements may include, but are not limited to, fences, wells, troughs, reservoirs, water catchments, pipelines, and cattleguards. The project also may include a practice or treatment which improves rangeland condition and or resource production for multiple use. Nonstructural types of projects may include, but are not limited to, seeding and plant control through chemical, mechanical, and biological means or prescribed burning.

Raptor: Bird of prey with sharp talons and a strongly curved beak, such as hawks, falcons, owls, vultures, and eagles.

Recreation experiences : Sychological outcomes realized either by recreation-tourism participants as a direct result of their onsite leisure engagements and recreation-tourism activityparticipation or by non-participating community residents as a result of their interaction withvisitors and guests within their community and/or interaction with the BLM and other public andprivate recreation-tourism providers and their actions.

Recreation management zones (RMZ): Subunits within a SRMA managed for distinctly different recreation products. Recreation products are comprised of recreation opportunities, the natural resource and community settings within which they occur, and the administrative and service environment created by all affecting recreation-tourism providers, within which recreation participation occurs.

Recreation niche : The place or position within the strategically targeted recreation-tourism market for each SRMA that is most suitable (i.e., capable of producing certain specific kinds of recreation opportunities) and appropriate (i.e., most responsive to identified visitor or resident customers), given available supply and current demand, for the production of specific recreation opportunities and the sustainable maintenance of accompanying natural resource and/orcommunity setting character.

Recreation opportunities : Favorable circumstances enabling visitors' engagement in a leisure activity to realize immediate psychological experiences and attain more lasting, value-added beneficial outcomes.

Recreation opportunity spectrum (ROS): One of the existing tools for classifying recreation environments (existing and desired) along a continuum ranging from primitive, low-use, and inconspicuous administration to urban, high-use, and a highly visible administrative presence. This continuum recognizes variation among various components of any landscape's physical, social and administrative attributes; and resulting descriptions (of existing conditions) and prescriptions (of desired future conditions) define recreation setting character.

Recreation setting character conditions ~ the distinguishing recreational qualities of any landscape, objectively defined along a continuum ranging from primitive to urban landscapes, expressed in terms of the nature of the component parts of its physical, social and administrativeattributes. These recreational qualities can be both classified and mapped. This classification and mapping process should be based on variation that either exists (i.e., setting descriptions) or is desired (i.e., setting prescriptions) among component parts of the various physical, social, and administrative attributes of any landscape. The recreation opportunity spectrum is one of the existing tools for doing this.

Recreation settings ~ the collective, distinguishing attributes of landscapes that influence, and sometimes actually determine, what kinds of recreation opportunities are produced.

Recreation-tourism market ~ recreation-tourism visitors, affected community residents, affecting local governments and private sector businesses, or other constituents and the communities or other places where these customers originate (local, regional, national, or international). Based on analysis of supply and demand, land use plans strategically identify primary recreation-tourism markets for each SRMA-destination, community, or undeveloped.

Response to Wildland Fire (RWF): The policy area defining the actions for managing a wildland fire.

Restricted Disposal: Parcels identified for restricted disposal may be disposed of under the Recreation and Public Purposes Act, by exchange, may limit the disposal to a particular type of entity capable of preserving the resource values, or may include the use of covenants in the deed or land sale patent to ensure the resource values are protected.

Riparian Areas: Riparian areas are a form of wetland transition between permanently saturated wetlands and upland areas. These areas exhibit vegetation or physical characteristics reflective of permanent surface or subsurface water influence. 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 are typical riparian areas. Excluded are such sites as ephemeral streams or washes that do not exhibit the presence of vegetation dependent upon free water in the soil.

Riparian/Wetland Functionality Classification:

Functional-At-Risk (FAR): Riparian/wetland areas that are in functional condition, but an existing soil, water, or vegetation attribute makes them susceptible to degradation.

Proper Functioning Condition (PFC): A riparian or wetland area is considered to be in proper functioning condition when adequate vegetation, landform, or large woody debris is present to do the following:

- Dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality
- Filter sediment, capture bedload, and aid floodplain development
- Improve floodwater retention and groundwater recharge
- Develop root masses that stabilize streambanks against cutting action
- Develop diverse ponding and channel characteristics to provide the habitats and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses
- Support greater biodiversity.

Nonfunctional: Riparian or wetland areas that clearly are not providing adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows and thus are not reducing erosion, improving water quality, and so on, as listed above. The absence of certain physical attributes, such as a floodplain where one should be, are indicators of nonfunctioning conditions.

Unknown: Riparian or wetland areas that the Bureau of Land Management lacks sufficient information on to make any form of determination.

Rights-of-Way (ROW): A ROW grant is an authorization to use a specific piece of public land for a specific project, such as roads, pipelines, transmission lines, and communication sites. The grant authorizes rights and privileges for a specific use of the land for a specific period of time.

ROW Avoidance Areas: Areas where negative routing factors exist. ROWs either will not be granted in these areas, or—if granted—will be subject to stringent terms and conditions. In other words, ROWs would be *restricted* (but not necessarily prohibited) in these avoidance areas.

Saleable Minerals: Common variety of minerals on public lands, such as sand and gravel, used mainly for construction. Saleable minerals are disposed of by sales to the public or free-use permits to government agencies or nonprofit organizations.

Seasonal Ranges: The Wyoming Game and Fish Department has identified various ranges for big game species. These ranges are defined as follows:

> **Summer or Spring-Summer-Fall:** A population or portion of a population of animals uses the documented habitats within this range annually from the end of previous winter to the onset of persistent winter conditions.
>
> **Severe Winter Relief:** A documented survival range, which may or may not be considered a crucial range area as defined above. It is used to a great extent, but only in extremely severe winters. It may lack habitat characteristics that would make it attractive or capable of supporting major portions of the population during normal years, but is used by and allows at least a significant portion of the population to survive the occasional extremely severe winter.
>
> **Winter:** A population or portion of a population of animals annually uses the documented suitable habitat sites within this range in substantial numbers during the winter period only.
>
> **Winter/Year-long:** A population or a portion of a population of animals makes general use of the documented suitable habitat sites within this range on a year-round basis. During the winter months there is a significant influx of additional animals into the area from other seasonal ranges.
>
> **Year-long:** A population or substantial portion of a population of animals makes general use of the suitable documented habitat sites within the range on a year-round basis. On occasion, animals may leave the area under severe conditions.
>
> **Parturition Areas:** Documented birthing areas commonly used by females. They include calving areas, fawning areas, and lambing grounds. These areas may be used as nurseries by some big game species.

Section 106 of National Historic Preservation Act: "The head of any Federal agency having direct or indirect jurisdiction over a proposed federal or federally assisted undertaking in any state and the head of any federal department or independent agency having authority to license any undertaking shall, prior to the approval of the expenditure of any federal funds on

the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register. The head of any such federal agency shall afford the Advisory Council on Historic Preservation established under Title II of this Act a reasonable opportunity to comment with regard to such undertaking" (16 U.S.C. 47 df).

Sensitive Sites or Resources: Sensitive sites or resources refer to significant cultural resources that are or may be eligible for nomination to the National Register of Historic Places.

Sensitive Species: Species designated as sensitive by the Bureau of Land Management (BLM) State Director include species that are under status review, have small or declining populations, live in unique habitats, or require special management. BLM Manual 6840 provides policy and guidance for special status species management. The BLM Wyoming Sensitive Species Policy and List are provided in a memorandum updated annually. Primary goals of the BLM Wyoming policy include maintaining vulnerable species and habitat components in functional BLM ecosystems and preventing a need for species listing under the Endangered Species Act.

Seral Stage: One of a series of plant communities that follows another in time on a specific ecological site.

Setting (Recreational): The condition of any recreation system, objectively defined along a continuum ranging from primitive to urban in terms of variation of its component physical, social, and administrative attributes.

Setting (Cultural): Setting is the physical environment of a historic property and how the property evokes a sense of feeling and association with past events. Accordingly, setting referees to the **character** of the place in which the property played its historic role. It involves **how**, not just where, the property is situated and its relationship to surrounding features and open space. These features and their relationships should be considered not only within the exact boundaries of the property, but also between the property and its surroundings.

Significant Paleontological Resource (also Significant Fossil Resource): Any paleontological resource that is considered to be of scientific interest, including most vertebrate fossil remains and traces, and certain rare or unusual invertebrate and plant fossils. A significant paleontological resource is considered to be scientifically important because it is a rare or previously unknown species, it is of high quality and well-preserved, it preserves a previously unknown anatomical or other characteristic, provides new information about the history of life on earth, or has identified educational or recreational value.

Special Status Species: Includes proposed species, listed species, and candidate species under the Endangered Species Act; state-listed species; and BLM State Director-designated sensitive species (see BLM Manual 6840, Special Status Species Policy).

Split-Estate: Surface land and mineral estate of a given area under different ownerships. Frequently, the surface will be privately owned and the minerals federally owned.

Standards for Healthy Rangelands (SHR): Range health standards adopted by Wyoming BLM August 12, 1997 which apply to all activities on the BLM-administered lands.

State-Listed Species: Species proposed for listing or listed by a state in a category implying, but not limited to, potential endangerment or extinction. Listing is either by legislation or regulation.

Surface-disturbing Activities (or Surface Disturbance): The physical disturbance and movement or removal of land surface and vegetation. These activities range from the very minimal to the maximum types of surface disturbance associated with such things as off-road vehicle travel or use of mechanized, rubber-tired, or tracked equipment and vehicles; some timber cutting and forest silvicultural practices; excavation and development activities associated with use of heavy equipment for road, pipeline, power line and other types of construction; blasting; strip, pit, and underground mining and related activities, including ancillary facility construction; oil and gas well drilling and field construction or development and related activities; range improvement project construction; and recreation site construction.

Surface Water Classes and Uses: The following water classes are a hierarchical categorization of waters according to existing and designated uses. Except for Class 1 waters, each classification is protected for its specified uses plus all the uses contained in each lower classification. Class 1 designations are based on value determinations rather than use support and are protected for all uses in existence at the time of or after designation. There are four major classes of surface water in Wyoming with various subcategories within each class (see "Wyoming Surface Water Classification List" for current listing).

(a) Class 1, Outstanding Waters. Class 1 waters are those surface waters in which no further water quality degradation by point source discharges other than from dams will be allowed. Nonpoint sources of pollution shall be controlled through implementation of appropriate best management practices. Pursuant to Section 7 of these regulations, the water quality and physical and biological integrity that existed on the water at the time of designation will be maintained and protected. In designating Class 1 waters, the Environmental Quality Council shall consider water quality, aesthetic, scenic, recreational, ecological, agricultural, botanical, zoological, municipal, industrial, historical, geological, cultural, archeological, fish and wildlife, the presence of substantial quantities of developable water, and other values of present and future benefit to the people.

(b) Class 2, Fisheries and Drinking Water. Class 2 waters are waters, other than those designated as Class 1 that are known to support fish or drinking water supplies or where those uses are attainable. Class 2 waters may be perennial, intermittent, or ephemeral and are protected for the uses indicated in each subcategory listed below. Five subcategories of Class 2 waters exist.

(c) Class 3, Aquatic Life Other than Fish. Class 3 waters are waters other than those designated as Class 1 that are intermittent, ephemeral, or isolated waters, and because of natural habitat conditions, do not support nor have the potential to support fish populations or spawning or certain perennial waters that lack the natural water quality to support fish (e.g., geothermal areas). Class 3 waters provide support for invertebrates, amphibians, or other flora and fauna that inhabit waters of the state at some stage of their life-cycles. Uses designated on Class 3 waters include aquatic life other than fish, recreation, wildlife, industry, agriculture, and scenic value. Generally, waters suitable for this classification have wetland characteristics; and such characteristics will be a primary indicator used in identifying Class 3 waters. There are four subcategories of Class 3 waters.

(d) Class 4, Agriculture, Industry, Recreation, and Wildlife. Class 4 waters are waters other than those designated as Class 1 where it has been determined that aquatic life uses are not attainable pursuant to the provisions of Section 33 of these regulations. Uses designated on Class 4 waters include recreation, wildlife, industry, agriculture and scenic value. (Source: WDEQ, Wyoming Surface Water Quality Standards)

Vegetative Diversity: The variety of vegetative types in an area, including species, the genetic differences among species and populations, the communities and ecosystems in which vegetation types occur, and the structure and seral stage of these communities. Vegetative diversity includes rare as well as common vegetative types, and typically supports a diverse array of animal species and communities.

Visual Resource Management (VRM) Classes: Categories assigned to public lands based on scenic quality, sensitivity level, and distance zones. There are four classes. Each class has an objective which prescribes to amount of change allowed in the characteristic landscape.

- **Class 1:** The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
- **Class 2:** The objective to this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any

changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

- **Class 3:** The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
- **Class 4:** The objective of this class is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

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

Wetlands: Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and which, under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. BLM Manual 1737, Riparian-Wetland Area Management, includes marshes, shallow swamps, lakeshores, bogs, muskegs, wet meadows, estuaries, and riparian areas as wetlands.

Wildfire: Any natural fire ignition occurring on wildland that neither meets management objectives nor occurs within a prescribed fire area, thus requiring a suppression response.

Wildland Industrial Interface: The area where industrial development meets or intermingles with undeveloped wildland.

Wildland Urban Interface (WUI): Healthy Forest Recreation Act 2003: defines wildland urban interface (WUI) (section 101) as an area within or adjacent to an at risk community that has been identified by a community in it's wildfire protection plan or, for areas that do not have such a plan, an area extending; 1) ½ mile from the boundary of an at risk community, or 2) 1 ½ miles when other criteria are met. (e.g., a sustained steep slope or a geographic feature aiding in creating an effective fire break or is condition class III land, or 3) is adjacent to an evacuation route.

Wildland Fire Use: Using non-prescribed fire (accidental, naturally occurring, human caused, etc.) to achieve predetermined fire objectives.

Wildlife-Disturbing Activity: BLM-authorized activities other than routine maintenance that may cause displacement of or excessive stress to wildlife during critical life stages. Wildlife-disturbing activities include human presence, noise, and activities using motorized vehicles or equipment.

Wind River Indian Reservation (WRIR): The Tribal Reservation of the Eastern Shoshone and Northern Arapahoe Tribes located in central Fremont County.

Winter Activities: Activities occurring in the winter season within dates set by individual resources such as wildlife stipulations.

Withdrawal: Removal or withholding of public lands, by statute or Secretarial order, from operation of some or all of the public land laws. A mineral withdrawal includes public lands potentially valuable for leasable minerals, precluding the disposal of the lands except with a mineral reservation clause, unless the lands are found not to contain a valuable deposit of minerals. A mineral withdrawal is the closing of an area to mineral location and development activities.

Yellowcake: Yellowcake is the product of the uranium extraction (milling) process. Early production methods resulted in a bright yellow compound, hence the name yellowcake. The material is a mixture of uranium oxides that can vary in proportion and color from yellow to orange to dark green (blackish), depending at which temperature the material was dried (level of hydration and impurities). Higher drying temperatures produce a darker, less soluble material. Yellowcake is commonly referred to as U3O8 and is assayed as pounds U3O8 equivalent. This fine powder is packaged in drums and sent to a conversion plant that produces uranium hexafluoride as the next step in the manufacture of nuclear fuel.

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Lander Summary of the
Analysis of the Management Situation

Appendix A

Maps

MAPS

Maps are included in electronic format. CD versions are available from the Lander Field Office.

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Lander Summary of the
Analysis of the Management Situation

Appendix B

Lander Field Office Species List

Table B-1. Common and Scientific Names of Plant and Wildlife Species Identified in the Analysis of the Management Situation

Common Name	*Scientific Name*
Plants	
Aspen	*Populus spp.*
Barneby's clover	*Trifolium barnebyi*
Beaver rim phlox	*Phlox pungens*
Black henbane	*Hyoscyamus niger*
Blowout penstemon	*Penstemon haydenii*
Buffalobur	*Solanum rostratum*
Canada thistle	*Cirsium arvense*
Cedar rim thistle	*Cirsium aridum*
Cheatgrass/downy brome	*Bromus tectorum*
Chokecherry	*Prunus virginiana*
Common burdock	*Arctium minus (Hill) Bernh.*
Common cocklebur	*Xanthium sp.*
Common St. Johnswort	*Hypericum perforatum*
Common tansy	*Tanacetum vulgare*
Cottonwood	*Populus spp.*
Dalmation toadflax	*Linaria genistifolia ssp. dalmatica*
Desert yellowhead	*Yermo xanthocephalus*
Diffuse knapweed	*Centaurea diffusa*
Douglas -fir	*Pseudotsuga menziesii*
Dubois milkvetch	*Astragalus gilviflorus var. purpureus*
Dwarf Mistletoe	
Dyer's woad	*Isatis tinctoria*
Field bindweed	*Convolvulus arvensis*
Fremont bladderpod	*Lesquerella fremontii*
Greasewood	*Sarcobatus vermiculatus*
Halogeton	*Halogeton glomeratus*
Hoary cress (whitetop)	*(Cardaria draba and Cardaria pubescens Desv.)*
Houndstongue	*Cynoglossum offinale*
Indian paintbrush	*Castilleja spp.*
Larkspur	*Delphinium occidentale*
Leafy spurge	*Euphorbia esula*
Limber pine	*Pinus flexilis*
Locoweed	*Astragalus spp.*
Locoweed	*Oxytropis sp.*
Lodgepole pine	*Pinus contorta*
Lupine	*Lupinis spp.*
Meadow pussytoes	*Antennaria arcuata*
Mistletoe	*Arceuthobium spp.*
Musk thistle	*Carduus nutans*
Nelson's milkvetch	*Astragalus nelsonianus*

Table B-1. Common and Scientific Names of Plant and Wildlife Species Identified in the Analysis of the Management Situation (Continued)

Common Name	*Scientific Name*
Owl creek miner's candle	*Cryptantha subcapitata*
Ox-eye daisy	*Leucanthemum vulgare or Chrysanthemum leucanthemum*
Perennial pepperweed (giant whitetop)	*Lepidium latifolium*
Perennial sowthistle	*Sonchus arvensis*
Persistent sepal yellowcress	*Rorippa calycina*
Phlox	*Phlox spp.*
Plains prickley pear	*Opuntia polyacantha*
Plumeless thistle	*Carduus acanthoides*
Ponderosa pine	*Pinus ponderosa*
Porter's sagebrush	*Artemisia porteri*
Puncturevine	*Tribulus terrestris*
Purple loosestrife	*Lythrum salicaria*
Quackgrass	*Agropyron repens*
Rocky Mountain juniper	*Juniperus scopulorum*
Rocky Mountain twinpod	*Physaria saximontana var. saximontana*
Russian knapweed	*Acroptilon repens (synonym = Centaurea repens)]*
Russian olive	*Elaeagnus angustifolia*
Sagebrush	*Artemisia spp.*
Saltcedar	*Tamarix spp.*
Scotch thistle	*Onopordum acanthium*
Shoshonea	*Shoshonea pulvinata*
Showy milkweed	*Asclepias speciosa*
Skeletonleaf bursage	*Franseria discolor*
Spotted knapweed	*Centaurea maculosa*
Utah juniper	*Juniperus osteosperma*
Ute ladies'-tresses	*Spiranthes diluvialis*
Water birch	*Betula occidentalis*
Wild licorice	*Glycyrrhiaz lepidota*
Willow	*Salix spp.*
Yellow toadflax	*Linaria vulgaris*
Big sagebrush	
Sedge	*Carex spp.*
Rush	*Juncus spp.*
Russian thistle	*Salsola tragus*
Mustard	*Brassicaceae spp.*
Plains larkspur / Geyer larkspur	*Delphinium geyeri*
Wyeth lupine	*Lupinus wyethii*
Swainsonpea	*Sphaerophysa salsula*
Curlycup gumweed	*Grindelia squarrosa*
Foxtail barley	*Hordeum jubatum*
Lady's bedstraw	*Galium verum*

Table B-1. Common and Scientific Names of Plant and Wildlife Species Identified in the Analysis of the Management Situation (Continued)

Common Name	*Scientific Name*
Mountain thermopsis	*Thermopis montana*
Poplar Bud-Gall Mite	*Eriophes parapopuli*
Bull Thistle	*Cirsium vulgare*
Sulfur Cinquefoil	*Potentilla recta*
Tumble Mustard	*Thelypodiopsis spp.*
Fungi	
Blister rust or white pine blister rust	*Cronartium ribicola*
Fish	
Bear River cutthroat	*Oncorhynchus clarki utah)*
Black bullhead	*Ameirus melas*
Black crappie	*Pomoxis nigromaculatus*
Bluegill	*Lepomis macrochirus*
Brook trout	*Salvelinus fontinalis*
Brown trout	*Salmo trutta*
Burbot	*Lota lota*
Channel catfish	*Ictalurus punctatus*
Common carp [Carp in text]	*Cyprinus carpio*
Creek chub	*Semotilus atromaculatus*
Cutthroat trout	*Oncorhynchus clarki*
Emerald shiner	*Notropis atherinoides*
Fathead minnow	*Pimephales promelas*
Flathead chub	*Platygobio gracilis*
Golden shiner	*Notemigonus crysoleucas*
Grass Carp	*Ctenopharyngodon idella*
Green sunfish- [Green Sunfish - Bluegill Hybrid]	*Lepomus cyanellus*
Iowa Darter	*Etheostoma exile*
Johnny Darter	*Etheostoma nigrum*
Lake chub	*Couesius plumbeus*
Lake trout	*Salvelinus namaycush*
Largemouth bass	*Micropterus salmoides*
Longnose dace	*Rhinichthys cataractae*
Longnose sucker	*Catostomus catostomus*
Mottled Sculpin	*Cottus bairdi*
Mountain sucker	*Catostomus platyrhynchus*
Mountain whitefish	*Prosopium williamsoni*
Plains killifish	*Fundulus zebrinus*
Rainbow trout	*Oncorhynchus mykiss*
River carpsucker	*Carpiodes carpio*
Sand shiner	*Notropis stramineus*
Sauger	*Sander canadensis*
Shorthead redhorse	*Moxostoma macrolepidotum*

Table B-1. Common and Scientific Names of Plant and Wildlife Species Identified in the Analysis of the Management Situation (Continued)

Common Name	*Scientific Name*
Snake River cutthroat	*Oncorhynchus clarki spp.*
Splake (brook and lake trout hybrid)	*Salvelinus namaycush X Salvelinus fontinalis*
Spottail Shiner	*Notropis hudsonius*
Stonecat	*Noturus flavus*
Tiger Muskie (Muskellunge and Northern Pike hybrid)	*Esox lucius X Esox masquinongy*
Walleye	*Sander vitreus*
White Crappie	*Pomoxis annularis*
White sucker	*Catostomus commersoni*
Yellow perch	*Perca flavescens*
Yellowstone cutthroat trout	*Oncorhynchus clarki bouvieri*
Wildlife	
Badger	*Taxidea taxus*
Baird's sparrow	*Ammodramus bairdii*
Bald eagle	*Haliaeetus leucocephalus*
Beaver	*Castor canadensisis*
Beet leafhopper	*Circulifer tenellus*
Bighorn sheep	*Ovis canadensis)*
Bison	*Bison bison*
Black bear	*Ursus americanus*
Black-footed ferret	*Mustela nigripes*
Blue grouse	*Dendragapus obscurus*
Bobcat	*Lynx rufus*
Boreal chorus frog	*Pseudacris triseriata*
Boreal toad (Rocky Mtn. population)	*Bufo boreas boreas*
Brewer's sparrow	*Spizella breweri*
Bull snake	*Pituophis catenifer*
Burro	*Equus asinus*
Burrowing owl	*Speotyto cunicularia*
Canada lynx	*Lynx canadensis*
Chukar partridge	*Alectoris chukar*
Cooper's Hawk	*Accipiter cooperii*
Coot	*Fulica spp.*
Cottontail rabbit	*Sylvilagus spp.*
Coyote	*Canis latrans*
Dwarf shrew	*Sorex nanus*
Eastern yellow-bellied racer	*Coluber constrictor flaviventris*
Elk	*Cervus elaphus*
Ferruginous hawk	*Buteo regalis*
Golden eagle	*Aquila chrysaetos*
Goshawk	*Accipiter gentilis*
Gray wolf	*Canis lupus*

Table B-1. Common and Scientific Names of Plant and Wildlife Species Identified in the Analysis of the Management Situation (Continued)

Common Name	*Scientific Name*
Great Basin Spadefoot Toad	*Spea intermontana*
Great gray owl	*Strix nebulosa)*
Great horned owl	*Bubo virginianus,*
Greater sage-grouse [Sage-grouse in Ch. 2]	*Centrocercus urophasianus*
Greater short-horned lizard	*Phrynosoma hernandesi*
Grizzly bear	*Ursus arctos horribilis*
Ground squirrel	*Spermophilus sp.*
Horse	*Equus ferus caballus*
Hungarian partridge	*Perdix perdix*
Intermountain wandering gartersnake	*Thamnophis elegans vagrans*
Kestrel	*Falco spp.*
Loggerheaded shrike	*Lanius ludovicianus*
Long-billed curlew	*Numenius americanus*
Long-eared myotis	*Myotis evotis*
Long-eared owl	*Asio otus*
Marten	*Martes sp.*
Merlin	*Falco columbarius*
Mink	*Mustela vison*
Moose	*Alces alces*
Mormon cricket	*Anabrus simplex*
Mountain lion	*Puma concolor*
Mountain plover	*Charadrius montanus*
Mourning dove	*Zenaida macroura*
Mouse	*Peromyscus spp.*
Mule deer	*Odocoileus hermionus*
Muskrat	*Ondata zibethicus*
Northern goshawk	*Accipiter gentilis*
Northern harrier	*Circus cyaneus*
Northern leopard frog	*Rana pipiens*
Northern sagebrush lizard	*Sceloporus graciosus*
Peregrine falcon	*Falco peregrinus*
Pheasant	*Phasianus colchicus*
Plains rattlesnake	*Crotalus viridis*
Plains spadefoot toad	*Scaphiopus bombifrons*
Prairie falcon	*Falco mexicanus*
Pronghorn [antelope in text]	*Antilocapra americana*
Pygmy rabbit	*Brachylagus idahoensis*
Raccoon	*Procyon lotor*
Rail	*family Rallidae*
Rat	*Rattus spp.*
Red fox	*Vulpes vulpes*
Red squirrel	*Tamiasciurus hudsonicus*

Table B-1. Common and Scientific Names of Plant and Wildlife Species Identified in the Analysis of the Management Situation (Continued)

Common Name	*Scientific Name*
Red-tailed hawk	*Buteo jamaicensis*
Ruffed grouse	*Bonasa umbellus*
Sage sparrow	*Amphispiza belli*
Sage thrasher	*Oreoscoptes montanus*
Sandhill crane	*Grus canadensis*
Sharp-shinned hawk	*Accipiter striatus)*
Shrew	*family Soricidae*
Short-eared owl	*Asio flammeus)*
Skunk	*family Mephitidae*
Snipe	*Gallinago sp.*
Snowshoe hare	*Lepus americanus*
Spotted bat	*Euderma maculatum*
Spotted frog	*Rana luteiventris*
Swainson's hawk	*Buteo swainsoni*
Swift fox	*Vulpes velox*
Tiger salamander	*Ambystoma tigrinum mavortium*
Townsend's big-eared bat	*Corynorhinus townsendii*
Trumpeter swan	*Cygnus buccinator*
Vole	*Microtus sp.*
Weasel	*Mustela spp.*
White-faced ibis	*Plegadis chihi*
White-tailed deer	*Odocoileus virginianus*
White-tailed jackrabbit	*Lepus townsendii*
White-tailed prairie dog	*Cynomys leucurus*
Yellow-billed cuckoo	*Coccyzum americanus*
Prairie dogs	*Cynomys spp.*
Ducks and Geese	*family Anatidae*
Invertebrates	
Grasshopper	*suborder Caelifera; order Orthoptera*
Mountain pine beetle	*Dendroctonus ponderosae*
Mosquito	*Culicidae spp.*
Mosquito	*Culex tarsalis*
Army cutworm	*Euxos auxilliarius*
Fecal coliform bacteria	*Escherichia coli*

Lander Summary of the
Analysis of the Management Situation

Appendix C

Lands Currently Identified for Disposal in the Lander RMP

LANDS IDENTIFIED FOR DISPOSAL IN RMP

Parcel No.	Legal Description	Mining Claims	Withdrawals	Resource Values	Management Category	Priority
1	T. 43 N., R. 108 W., Sec. 27: SW¼NW¼, NW¼SW¼ 80 ac.	None (December 10, 2008)	None	WL-MG-3 CR-C-0-0 R-HV		
5	T. 42 N., R. 108 W., Sec. 21: S½NE¼ 80 ac.	None (December 10, 2008)	None	WL-E-3 WL-D-3 WL-MG-3 CR-A-0-0 F-C		
7	T. 43 N., R. 108 W., Sec. 35: NE¼SW¼ 40 ac.	None (December 10, 2008)	Coal withdrawal (No effect)	WL-M-3 WL-R-4 WL-MG-3 CR-B-0-0		
8	T. 42 N., R. 108 W., Sec. 2: E2SE¼ 80 ac.	None (December 10, 2008)	None	WL-D-3 WL-M-3 WL-RP-4 CR-B/C-0-0		
11	T. 42 N., R. 107 W., Sec. 18: S½NW¼, SW¼ 240 ac.	None (December 10, 2008)	None	WL-D-3 WL-SG-3 CR-B-0-0		
12	T. 42 N., R. 108 W., Sec. 25: N½NE¼ 80 ac.	None (December 10, 2008)	Yes, power site withdrawal Res. 6 EO 07-02-1910	WL-D-3 WL-M-3 WL-WF-3 WL-F-3 WL-T&E-3&4 WL-RP-3 CR-B-12.5-O R-HV		

LANDS IDENTIFIED FOR DISPOSAL IN RMP (Continued)

Parcel No.	Legal Description	Mining Claims	Withdrawals	Resource Values	Management Category	Priority
14	T. 42 N., R. 107 W., Sec. 17: S½SW¼ 20: NW¼, NE¼SW¼ 280 ac.	None (December 10, 2008)	None	WL-D-3 WL-SG-3 A-A/B-0-0		
24	T. 43 N., R. 105 W., Sec. 32: W½NW¼ 80 ac.	None (May 8, 1984)	None	WL-E-1 WL-D-3 WL-MG-3 CR-A/B-0-0 R-HV East Fork Elk Winter Range		
25	T. 43 N., R. 105 W., Sec. 33: E½E½, W½NE¼ 34: W½W½ 400 ac.	None (December 10, 2008)	None	WL-E-3 WL-D-3 WL-MG-3 CR-A/B-0-0 R-HV East Fork Elk Winter Range		
26	T. 42 N., R. 105 W., Sec. 4: Lots 3, 4 (N½NW¼) S½NW¼ Sec. 5: SE¼NE¼ 200.7 ac.	None (December 10, 2008)	None	WL-E-1 WL-D-3 CR-A/B-0-0 R-HV East Fork Elk Winter Range		
27	T. 42 N., R. 105 W., Sec. 3: S½SE¼ 10: NE¼, SE¼NW¼ 280 ac.	None (December 10, 2008)	None	WL-D-1 WL-E1 CR-B-0-0 R-HV East Fork Elk Winter Range		

LANDS IDENTIFIED FOR DISPOSAL IN RMP (Continued)

Parcel No.	Legal Description	Mining Claims	Withdrawals	Resource Values	Management Category	Priority
28	T. 42 N., R. 105 W., Sec. 9: SW¼SE¼ 40 ac.	None (December 15, 2008)	None	WL-D-1 WL-E-1 WL-M-3 CR-B-0-0 R-HV		GREEN ON MAP
34	T. 41 N., R. 105 W., Sec. 8: NW¼NW¼, NW¼SE¼ 80 ac.	None (December 10, 2008)	None	WL-D-1 WL-A-3 WL-BS-1 CR-BC-0-0		GREEN ON MAP
38	T. 40 N., R. 106 W., Sec. 22: SE¼NE¼, S½ 360 ac.	None (December 10, 2008)	None	WL-E-3 WL-D-3 WL-BS-1 WL-M-3 CR-B/C-0-0 R-HV		GREEN ON MAP
48	T. 33 N., R. 100 W., Sec. 28: E½SE¼ 80 ac.	None (December 10, 2008)	None	WL-D-1 WL-M-3 WL-UP-3 CR-C-0-0 (MLs-P-M)		
56	T. 32 N., R. 99 W., Sec. 17: SE¼NW¼ 40 ac.	None (December 15, 2008)	None	WL-D-3 CR-C-0-0		
62	T. 32 N., R. 99 W., Sec. 30: SE¼NE¼ 40 ac.	None (December 10, 2008)	None	WL-D-1 WL-M-3 CR-C-0-0		
66	T. 31 N., R. 98 W., Sec. 5: Lot 4, SE¼NW¼ 80.86 ac.	None (December 10, 2008)	None	WL-SG-2 WL-D-1 CR-C-0-0 (MLs-P-M)		

LANDS IDENTIFIED FOR DISPOSAL IN RMP (Continued)

Parcel No.	Legal Description	Mining Claims	Withdrawals	Resource Values	Management Category	Priority
67	T. 31 N., R. 98 W., Sec. 21: SE¼NE¼ 40 ac.	None (December 10, 2008)	None	WL-D-1 CR-C-0-0		
68	T. 30 N., R. 98 W., Sec. 7: NE¼SE¼ 18: SE¼NE¼, NE¼NW¼ 120 ac.	None (December 10, 2008)	EO 9/4/1912 Wdl Pho Res 15	WL-M-1 WL-F-3 CR-B/C-0-0 (MLs-P-M)		
69	T. 30 N., R. 98 W., Sec. 12: S½NE¼, SE¼NW¼ N½N½ 280 ac.	None (December 15, 2008)	None	WL-SG02 WL-D-3 WL-M-1 WL-UG-3 CR-B/C-0-0		
70	T. 30 N., R. 97 W., Sec. 18: SE¼SE¼ 19: NE¼NE¼ 20: NW¼NW¼ 120 ac.	None (December 15, 2008)	None	WL-SG-2 CR-B/C-0-0		
71	T. 29 N., R. 100 W., Sec. 25: NE¼ 160 ac.	None (December 15, 2008)	None	WL-M-1 CR-B/C-0-0		
72	T. 29 N., R. 98 W., Sec. 7: Lot 5 37.57 ac.	None (December 10, 2008)	None	WL-M-1 CR-B/C-0-0 MLc-Au-H		
73	T. 29 N., R. 98 W., Sec. 10: SE¼SW¼, SW¼SE¼ 15: NE¼NE¼ 120 ac.	None (December 10, 2008)	None	WL-M-3 CR-B/C-0-0		

LANDS IDENTIFIED FOR DISPOSAL IN RMP (Continued)

Parcel No.	Legal Description	Mining Claims	Withdrawals	Resource Values	Management Category	Priority
74	T. 29 N., R. 98 W., Sec. 11: SW¼NE¼, S½NW¼ 120 ac.	None (December 10, 2008)	None	WL-M-3 CR-C-0-0 (MLs-P-M)		
75	T. 29 N., R. 98 W., Sec. 1: SW¼SW¼ 12: W½NW¼, NW¼SW¼ 160 Ac.	None (December 10, 2008)	None	WL-M-3 CR-B/C-0-0 (MLs-P-M)		
78	T. 31 N., R. 97 W., Sec. 10: SW¼SE¼ 11: N½SW¼ 120 ac.	None (December 10, 2008)	None	WL-D-3 WL-A-1 CR-B/C-0-0		
79	T. 31 N., R. 97 W., Sec. 12: SE¼SE¼ 40 ac.	None (December 10, 2008)	None	WL-D-1 WL-A-1 CR-B/C-0-0		
80	T. 31 N., R. 96 W., Sec. 18: SW¼SE¼ 19: N½NE¼, SW¼NE¼ 160 ac.	None (December 10, 2008)	None	WL-D-1 WL-A-1 CR-B/C-0-0 MS-SG-H		
81	T. 31 N., R. 96 W., Sec. 20: SE¼SW¼, S½SE¼ 29: NE¼NW¼, N½NE¼ 28: W½NW¼ 320 ac.	None (December 10, 2008)	None	WL-R-2 WL-D-1 WL-A-1* CR-B/C-0-0 *Also restricted area no. 2		

LANDS IDENTIFIED FOR DISPOSAL IN RMP (Continued)

Parcel No.	Legal Description	Mining Claims	Withdrawals	Resource Values	Management Category	Priority
82	T. 31 N., R. 96 W., Sec. 21: SE¼SE¼ 22: SW¼SW¼ 80 ac.	None (December 10, 2008)	None	WL-D-3 WL-A-1 CR-C-0-0		
83	T. 31 N., R. 96 W., Sec. 27: SW¼SW¼ 34: NW¼NE¼, NE¼NW¼ 120 ac.	None (December 15, 2008)	None	WL-D-1 WL-A-1 CR-C-0-0		
84	T. 31 N., R. 96 W., Sec. 33: E½SE¼ 80 ac.	None (December 15, 2008)	None	WL-D-1 WL-A-3 CR-C-0-0		
85	T. 31 N., R. 96 W., Sec. 35: N½SW¼ 80 ac.	None (December 10, 2008)	None	WL-D-1 WL-E-3 WL-RP-3 CR-B-C-0-0		
86	T. 40 N., R. 94 W., Sec. 11: NE¼NW¼ 40 ac.	None (December 15, 2008)	None	WL-D-1 WL-UG-3		
87	T. 40 N., R. 94 W., Sec. 12: SE¼NE¼, NE¼SE¼ T. 39 N., R. 93 W., Sec. 7: SW¼NW¼ 120 ac.	None (December 16, 2008)	None	WL-D-1 WL-UG-3 CR-C-0-0 MLs-Au-H		

LANDS IDENTIFIED FOR DISPOSAL IN RMP (Continued)

Parcel No.	Legal Description	Mining Claims	Withdrawals	Resource Values	Management Category	Priority
88	T. 40 N., R. 93 W., Sec. 5: SE¼NE¼ 40 ac.	None (December 10, 2008)	None	WL-UG-3 CR-B/C-0-0		
89	T. 40 N., R. 93 W., Sec. 3: SW¼SW¼ 40 ac.	None (December 10, 2008)	None	WL-UG-3 CR-C-0-0		
90	T. 40 N., R. 92 W., Sec. 6: Lot 5 T. 40 N., R. 93 W., Sec. 1: NW¼SE¼, NE¼SW¼ 128.15 ac.	None (December 10, 2008)	None	WL-E-2 CR-C-0-0		
91	T. 40 N., R. 93 W., Sec. 14: SW¼NW¼ 15: NE¼SE¼ 80 ac.	None (December 10, 2008)	None	WL-D-3 CR-C-0-0		
92	T. 40 N., R. 91 W., Sec. 19: NW¼SE¼ 20: NW¼SW¼ 80 ac.	None (December 10, 2008)	None	WL-D-1 WL-UG-3 CR-B/C-0-0		
93	T. 40 N., R. 92 W., Sec. 11: S½SE¼ 80 ac.	None (December 16, 2008)	None	WL-D-1 WL-E-3 WL-UG-3 CR-B-0-0 MLc-U-H		

LANDS IDENTIFIED FOR DISPOSAL IN RMP (Continued)

Parcel No.	Legal Description	Mining Claims	Withdrawals	Resource Values	Management Category	Priority
96	T. 40 N., R. 91 W., Sec. 5: NE¼NW¼ (Lot 3) 45.83 ac.	None (December 10, 2008)	None	WL-RP-4 CR-A/B-0-0		
97	T. 40 N., R. 91 W., Sec. 8: N½NE¼, SW¼NE¼ 120 ac.	None (December 10, 2008)	None	CR-B-0-0		
98	T. 40 N., R. 91 W., Sec. 9: NE¼NW¼ 40 ac.	None (December 10, 2008)	None	CR-B-0-0		
99	T. 40 N., R. 91 W., Sec. 10: SW¼NW¼ 40 ac.	None (December 10, 2008)	None	WL-D-1 WL-RP-3 CR-A/B-0-0		
101	T. 40 N., R. 91 W., Sec. 3: Lots 1, 2 91.88 ac.	None (December 10, 2008)	None	WL-D-1 WL-UG-3 WL-RP-4 CR-B/C-0-0		
105	T. 40 N., R. 89 W., Sec. 9; N½NE¼ 80 ac.	None (December 10, 2008)	None	WL-SG-2 WL-E03 CR-C-0-0		
106	T. 39 N., R. 91 W., Sec. 24: NW¼SE¼ 40 ac.	None (December 10, 2008)	None	WL-D-1 WL-A-1 CR-B/C-0-0 MLs-OG-H		

LANDS IDENTIFIED FOR DISPOSAL IN RMP (Continued)

Parcel No.	Legal Description	Mining Claims	Withdrawals	Resource Values	Management Category	Priority
108	T. 39 N., R. 89 W., Sec. 8: E½NW¼ 80 ac.	None (December 10, 2008)	None	WL-D-3 WL-A-1 CR-B/C-0-0 MLs-OG-H		
109	T. 39 N., R. 89 W., Sec. 8: NE¼SE¼ 40 ac.	None (December 10, 2008)	None	WL-D-1 WL-A-1 WL-RP-4 CR-B/C-100-4 MLs-OG-H MS-SG-H (FUP)		
110	T. 39 N., R. 89 W., Sec. 8: SW¼SW¼ 17: NW¼NW¼ 18: NE¼NE¼ 120 ac.	None (December 10, 2008)	None	WL-D-3 WL-A-1 WL-RP-4 CR-B/C-0-0 MLs-OG-H MS-SG-H (FUP)		
112	T. 38 N., R. 94 W., Sec. 11: SW¼SW¼ 14: W½NW¼ 120 ac.	None (December 10, 2008)	Yes, Cl. SO 08/25/1945 CL Pwr S 375 NW¼NW¼ of Sec. 14 only	WL-R-2 WL-D-3 WL-A-1 CR-B/C-0-0		
118	T. 37 N., R. 89 W., Sec. 28: NW¼NW¼ 29: N½N½, SW¼NE¼, S½NW¼ 320 ac.	None (December 10, 2008)	None	WL-D-3 WL-A-1 WL-RP-3 CR-B-0-0		

LANDS IDENTIFIED FOR DISPOSAL IN RMP (Continued)

Parcel No.	Legal Description	Mining Claims	Withdrawals	Resource Values	Management Category	Priority
119	T. 35 N., R. 92 W., Sec. 4: Lot 1 41.31 ac.	None (March 13, 1984	None	WL-D-3 WL-A-1 WL-RP-3 CR-B-0-0		
121	T. 35 N., R. 90 W., Sec. 10: SE¼SW¼ 40 ac.	None (December 10, 2008)	None	WL-SG-2 WL-D-3 CR-C-100-0		
122	T. 34 N., R. 94 W., Sec. 31: NE¼NE¼ 32: NW¼NW¼ 80 ac.	None (December 10, 2008)	None	CR-C-0-0		
124	T. 31 N., R. 92 W., Sec. 33: S½NW¼ 80 ac.	None (December 10, 2008)	None	CR-B-0-0		
127	T. 30 N., R. 93 W., Sec. 26: SW¼SW¼ 34: NE¼NE¼ 35: NW¼NW¼ 120 ac.	None (December 10, 2008)	None	WL-D-3 WL-A-1 CR-A/B-0-3		
133	T. 29 N., R. 92 W., Sec. 23: NE¼SE¼ 24: NW¼SW¼ 80 ac.	None (December 10, 2008)	None	WL-SG-2 WL-A-1 CR-B-0-0		

LANDS IDENTIFIED FOR DISPOSAL IN RMP (Continued)

Parcel No.	Legal Description	Mining Claims	Withdrawals	Resource Values	Management Category	Priority
136	T. 30 N., R. 89 W., Sec. 29: SW¼SW¼ 32: NW¼NW¼ 80 ac.	None (December 10, 2008)	None	WL-D-3 WL-RS03 WL-R04 CR-B/C-0-0		
137	T. 30 N., R. 89 W., Sec. 15: S½NW¼, SW¼ 240 ac.	None (December 10, 2008)	None	WL-D-1 WL-D03 WL-R-4 CR-B/C-0-0		
138	T. 30 N., R. 89 W., Sec. 9: SE¼ 10: NW¼SW¼ 200 ac.	None (December 10, 2008)	None	WL-D-1 WL-D-3 WL-R-4 WL-A+4-4 CR-B-0-4		
139	T. 32 N., R. 88 W., Sec. 3: NW¼SW¼ 40 ac.	None (December 10,2008)	None	CR-B/C-0-0		
140	T. 32 N., R. 88 W., Sec. 15: W½SE¼ 22: NW¼NE¼ 120 Ac.	None (December 10, 2008)	None	CR-B/C-0-0		
141	T. 32 N., R. 87 W., Sec. 3: Lot 4 41.58 ac.	None (December 10, 2008)	None	WL-D-3 WL-E CR-B/C-0-0		

LANDS IDENTIFIED FOR DISPOSAL IN RMP (Continued)

Parcel No.	Legal Description	Mining Claims	Withdrawals	Resource Values	Management Category	Priority
143	T. 32 N., R. 87 W., Sec. 15: NW¼NE¼ 40 ac.	None (December 10, 2008)	None	WL-E CR-C-0-0		
144	T. 32 N., R. 87 W., Sec. 31: NW¼SE¼ 40 ac.	None (December 10, 2008)	None	CR-B/C-0-0		
145	T. 31 N., R. 87 W., Sec. 5: SE¼NE¼, NE¼SE¼ 80 ac.	None (December 10, 2008)	None	CR-B/O-0-0		
146	T. 31 N., R. 87 W., Sec. 28: W½NE¼ 80 ac.	None (December 10, 2008)	None	CR-B/C-0-0		
147	T. 32 N., R. 85 W., Sec. 13: NE¼NE¼ 40 ac.	None (December 10, 2008)	None	WL-D-3 WL-A-3 CR-B/C-0-0		
149	T. 30 N., R. 85 W., Sec. 7: SE¼SW¼ 18: E½NW¼ 120 ac.	None (December 10, 2008)	None	CR-B/C-0-0		
150	T. 30 N., R. 85 W., Sec. 29: NW¼NE¼, NE¼NW¼ 80 ac.	None (December 10, 2008)	None	WL-A-1 WL-WF-3 CR-B-0-0		

LANDS IDENTIFIED FOR DISPOSAL IN RMP (Continued)

Parcel No.	Legal Description	Mining Claims	Withdrawals	Resource Values	Management Category	Priority
158	T. 29 N., R. 88 W., Sec. 20: NE¼NW¼, E2NW¼NW¼, NW¼NW¼NW¼ 19: N½NE¼NE¼, SW¼SE¼NE¼ 100 ac.	None (December 10, 2008)	None	WL-A-1 WL-WF-4 CR-A-0-3,4		
160	T. 28 N., R. 89 W., Sec. 24: SW¼NW¼ 40 ac.	None (December 10, 2008)	None	WL-A-1 CR-B/C-0-0 MS-SG-H		
167	T. 33 N., R. 93 W., Sec. 33: E½E½ 34: W½NW¼ 240 ac.	None (December 10, 2008)	None	CR-C/B-0-0		

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Lander Summary of the
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Appendix D

Fire Regime Groups, Descriptions, and Condition Classifications

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Table 1. Fire Regime Groups and Descriptions

Group	Frequency	Severity	Severity description
I	0–35 years	Low / mixed	Generally low-severity fires replacing less than 75% of the dominant over story vegetation; can include mixed-severity fires that replace up to 75% of the over story
II	0–35 years	Replacement	High-severity fires replacing greater than 75% of the dominant over story vegetation
III	35–200 years	Mixed/low	Generally mixed-severity; can also include low-severity fires
IV	35–200 years	Replacement	High severity fires
V	200+ years	Replacement/any severity	Generally replacement-severity; can include any severity type in this frequency range.

Table 2. Fire Regime Condition Classifications

Condition Class	Severity description
I	For the most part, fire regimes in this fire condition class are within historical ranges. Vegetation composition and structure are intact. Therefore, the risk of losing key ecosystem components from the occurrence of fire remains relatively low.
2	Fire regimes on these lands have been moderately altered from their historical range by either increased or decreased fire frequency. A moderate risk of losing key ecosystem components has been identified on these lands.
3	Fire regimes on these lands have been substantially altered from their historical return interval. The risk of losing key ecosystem components from fire is high. Fire frequencies have departed from historical ranges by multiple return intervals. Vegetation composition, structure, and diversity have been substantially altered.

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Lander Summary of the
Analysis of the Management Situation

Appendix E

Livestock Grazing Allotments and Range Improvements

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This appendix provides an overview of livestock grazing allotments including acreage and season of use; allotment categorization; and allotments assessed for standards and guidelines. In addition it provides details of range improvement projects. The data are presented in five tables:

Table 1. Grazing Allotments, Acres, AUMs, and Season of Use E-2

Table 2. Allotment Categorization – Current and Proposed E-27

Table 3. Lander Field Office Grazing Allotments Assessed for Meeting Standards E-40

Table 4. Allotment Management Plans and Rangeland Management Agreements Developed E-45

Table 5. Summary of Range Improvements Lander Field Office 1986-2009……E-48

Table 6. Animal Unit Months (AUMs) Authorized from 1989-2008…….E-52

Table 1. Grazing Allotments, Acres, AUMs, and Season of Use

Allotment Number	Allotment Name	Public Acres GIS	Permit/Lease	Livestock Kind	Season of Use	Public AUMs	Common Allotment
180	LOST CREEK	238.00	PERMIT- SEC 3	CATTLE	6/15-9/25	21	
655	COPPER MTN.*	248.00	PERMIT - SEC 3	CATTLE	6/1-11/15	121	
1301	CANTRIL JACK ALLOT.	6,875.00	PERMIT- SEC 3	CATTLE	8/16-11/30	573	
1302	NORTH OF CB&Q R.R.	961.00	PERMIT- SEC 3	CATTLE	3/5-5/4	160	
1303	SOUTH OF CB&Q R.R.	7,256.00	PERMIT- SEC 3	CATTLE	3/5-5/4	660	
				CATTLE	10/20-12/16		
				CATTLE	11/15-12/16		
1304	CRAWFORD CREEK	1,209.00	PERMIT- SEC 3	CATTLE	6/15-10/14	460	
1305	LYBYER NORTH	3,175.00	PERMIT- SEC 3	CATTLE	4/26-5/31	262	
1306	CANNING ALLOTMENT	347.00	PERMIT- SEC 3	CATTLE	8/10-2/28	28	
				CATTLE	3/1-5/1		
				HORSE	3/1-2/28		
1307	MALLET-SMITH PASTURE	137.00	PERMIT- SEC 3	CATTLE	7/1-9/30	24	
1308	167A SCOTT-ROBSON	283.00	PERMIT- SEC 3	CATTLE	5/1-6/15	33	
				CATTLE	10/15-12/17		
				SHEEP	5/1-6/15		
				SHEEP	10/15-12/17		
1309	LOGAN PASTURE	3,427.00	PERMIT- SEC 3	CATTLE	6/1-9/15	610	

Table 1. Grazing Allotments, Acres, AUMs, and Season of Use (Continued)

Allotment Number	Allotment Name	Public Acres GIS	Permit/Lease	Livestock Kind	Season of Use	Public AUMs	Common Allotment
1310	COTTONWOOD PASS	2,321.00	PERMIT- SEC 3	CATTLE	10/18-11/1	249	
				CATTLE	6/1-6/15		
1311	KEENAN	191.00	PERMIT- SEC 3	CATTLE	4/30-5/30	16	
1312	NORTH OF TRACKS	15,556.00	PERMIT- SEC 3	CATTLE	2/14-6/15	2820	
				CATTLE	10/1-12/31		
				HORSE	3/1-2/28		
1313	SOUTH OF TRACKS	8,923.00	PERMIT- SEC 3	CATTLE	4/1-12/31	1110	
1314	MONETA HILLS PASTURE	7,752.00	PERMIT- SEC 3	CATTLE	4/1-12/31	587	
1315	DITCH PASTURE	782.00	PERMIT- SEC 3	CATTLE	4/20-5/5	108	
1316	MADDEN RANCH PASTURE	1,442.00	PERMIT- SEC 3	CATTLE	5/5-12/30	170	
1317	BRANDAU RANCH ALLOT	309.00	PERMIT- SEC 3	CATTLE	8/15-12/31	167	
1318	BELOW THE HILL PAST.	2,793.00	PERMIT- SEC 3	CATTLE	6/1-9/29	78	
1319	TWIDALE	200.00	PERMIT- SEC 3	CATTLE	5/1-5/31	39	
				CATTLE	10/1-10/31		
				HORSE	11/1-2/28		
1320	ST CLAIR WEST	350.00	PERMIT- SEC 3	CATTLE	4/10-5/10	65	
1321	ST CLAIR RANCH	141.00	PERMIT- SEC 3	CATTLE	11/15-2/28	89	
				CATTLE	3/1-3/31		

Table 1. Grazing Allotments, Acres, AUMs, and Season of Use (Continued)

Allotment Number	Allotment Name	Public Acres GIS	Permit/Lease	Livestock Kind	Season of Use	Public AUMs	Common Allotment
1322	ST.CLAIR SOUTH PAST.	4,435.00	PERMIT- SEC 3	HORSE	5/1-1/15	726	
				CATTLE	10/15-12/31		
1323	FULLER ALLOTMENT	3,050.00	PERMIT- SEC 3	CATTLE	8/7-10/28	413	
				CATTLE	5/24-6/25		
1324	HOODOO CREEK ALLOT	23,168.00	PERMIT- SEC 3	CATTLE	9/1-10/10	1491	
				CATTLE	1/6-6/26		
1325	EAST OF RANCH	3,033.00	PERMIT- SEC 3	CATTLE	12/1-5/31	236	
				SHEEP	12/1-6/15		
1326	LICHTENSTEIN	5,998.00	PERMIT- SEC 3	CATTLE	1/1-2/28	501	
				SHEEP	12/1-4/15		
1327	MYRTLE REED ALLOT	1,213.00	PERMIT- SEC 3	CATTLE	5/1-10/31	72	
1328	BATTLE AXE SOUTH	6,994.00	PERMIT- SEC 3	CATTLE	5/1-9/12	552	
1329	LYSITE MOUNTAIN	8,192.00	PERMIT- SEC 3	CATTLE	5/10-11/1	2569	X
				HORSE	6/1-5/31		
1330	BATTLE AXE LYSITE	3,717.00	PERMIT- SEC 3	SHEEP	3/19-4/20	420	X
				CATTLE	8/15-10/1		
				CATTLE	4/15-6/1		
1331	BATTLE AXE BERGER	8,537.00	PERMIT- SEC 3	CATTLE	5/16-4/30	911	X
				HORSE	3/1-2/28		

Table 1. Grazing Allotments, Acres, AUMs, and Season of Use (Continued)

Allotment Number	Allotment Name	Public Acres GIS	Permit/Lease	Livestock Kind	Season of Use	Public AUMs	Common Allotment
1332	BOW & ARROW	1,094.00	PERMIT- SEC 3	CATTLE	4/10-6/15	159	
				CATTLE	10/1-12/1		
				HORSE	6/1-9/30		
1333	GATES DRAW ALLOTMENT	12,793.00	PERMIT- SEC 3	CATTLE	11/1-5/31	1490	
1334	COTTONWOOD PASS	3,890.00	PERMIT- SEC 3	CATTLE	6/11-10/20	825	
1335	OCLA SOUTH OF R.R.	6,848.00	PERMIT- SEC 3	CATTLE	12/1-3/31	912	
1336	OCLA NORTH OF R.R.	5,600.00	PERMIT- SEC 3	CATTLE	4/20-5/30	425	
1337	DE PASS RANCH	528.00	PERMIT- SEC 3	CATTLE	3/1-2/28	125	
1338	FULLER RANCH PASTURE	1,450.00	PERMIT- SEC 3	CATTLE	3/1-4/30	165	
1339	PICARD PRIVATE ALLOT	3,146.00	PERMIT- SEC 3	CATTLE	12/1-5/15	490	
1340	168A NORTH OF SEEPS	796.00	PERMIT- SEC 3	CATTLE	9/20-12/1	200	
				CATTLE	5/1-6/1		
				HORSE	6/1-9/30		
1341	168A STOCK DRIVEWAY	2,016.00	PERMIT- SEC 3	CATTLE	12/1-12/31	40	X
				HORSE	12/1-12/31		
1342	KNAPP INDIVIDUAL	997.00	PERMIT- SEC 3	CATTLE	10/10-11/15	40	
1343	TUFF CREEK PASTURE	15,728.00	PERMIT- SEC 3	CATTLE	11/16-2/28	860	
				CATTLE	4/1-7/31		

Table 1. Grazing Allotments, Acres, AUMs, and Season of Use (Continued)

Allotment Number	Allotment Name	Public Acres GIS	Permit/Lease	Livestock Kind	Season of Use	Public AUMs	Common Allotment
1344	WESTFALL	3,620.00	PERMIT- SEC 3	HORSE	3/1-12/20	698	
				CATTLE	6/1-2/28		
1345	MOUNTAIN PASTURE	1,135.00	PERMIT- SEC 3	CATTLE	5/20-1/15	277	
1346	BONNEVILLE RESERVOIR	10,968.00	PERMIT- SEC 3	CATTLE	4/15-6/10	984	
				HORSE	4/15-6/10		
				CATTLE	10/1-12/31		
1347	JONES CREEK BASIN	1,292.00	PERMIT- SEC 3	CATTLE	7/1-10/10	488	
1348	J.HERBST SUMMER	2,198.00	PERMIT- SEC 3	CATTLE	6/1-9/30	308	
				HORSE	10/1-4/30		
1349	J.HERBST TUFF CREEK	1,226.00	PERMIT- SEC 3	CATTLE	10/1-11/15	228	
				CATTLE	5/1-5/30		
1350	WM.HERBST SUMMER	885.00	PERMIT- SEC 3	CATTLE	10/15-12/15	60	
1351	SCOTT DRAW	3,386.00	PERMIT- SEC 3	CATTLE	10/1-11/7	303	
1352	JOE JOHNS PASTURE	1,109.00	PERMIT- SEC 3	CATTLE	8/15-11/30	298	
				SHEEP	6/1-10/1		
1353	CAMPBELL	2,843.00	PERMIT- SEC 3	CATTLE	5/13-11/30	299	
				HORSE	4/15-1/1		
				SHEEP	5/15-7/15		
				SHEEP	9/1-12/10		
1354	STINKING WELL	10,009.00	PERMIT- SEC 3	SHEEP	3/1-4/15	789	

Table 1. Grazing Allotments, Acres, AUMs, and Season of Use (Continued)

Allotment Number	Allotment Name	Public Acres GIS	Permit/Lease	Livestock Kind	Season of Use	Public AUMs	Common Allotment
				SHEEP	5/15-6/15		
				CATTLE	3/1-5/31		
				CATTLE	12/1-2/28		
				SHEEP	12/1-2/28		
1355	LOOKOUT HILL	7,942.00	PERMIT- SEC 3	SHEEP	4/1-6/28	682	
				SHEEP	10/20-12/10		
				CATTLE	4/1-5/15		
1356	HOWARD PASTURE	2,717.00	PERMIT- SEC 3	CATTLE	1/1-2/28	224	
				SHEEP	4/1-7/31		
				SHEEP	12/15-2/28		
1357	SUMMER ALLOTMENT	182.00	PERMIT- SEC 3	CATTLE	6/15-7/14	32	
1358	TOP OF MOUNTAIN PAST	910.00	PERMIT- SEC 3	CATTLE	6/15-10/15	23	
1359	RAMAGE RANCH	11,990.00	PERMIT- SEC 3	HORSE	3/1-2/28	1549	
				CATTLE	11/1-6/20		
1360	RUTH FULLER PRIVATE	86.00	PERMIT- SEC 3	CATTLE	5/15-5/23	9	
				CATTLE	6/26-8/6		
1361	COPPER MT. (LANDER)	288.00	PERMIT- SEC 3	CATTLE	7/1-9/30	40	
1362	LYBYER SOUTH	2,500.00	PERMIT- SEC 3	CATTLE	3/1-4/30	319	
				CATTLE	10/15-11/30		
1363	HOODOO HQ PASTURES	86.00	PERMIT- SEC 3	CATTLE	3/1-2/28	4	

Table 1. Grazing Allotments, Acres, AUMs, and Season of Use (Continued)

Allotment Number	Allotment Name	Public Acres GIS	Permit/Lease	Livestock Kind	Season of Use	Public AUMs	Common Allotment
				HORSE	3/1-2/28		
1364	RED RANCH PASTURE	24.00	PERMIT- SEC 3	CATTLE	3/1-2/28	1	
1365	QUIEN SABE RANCH PASTURE	5,973.00	PERMIT- SEC 3	CATTLE	4/1-6/30	944	
				CATTLE	10/1-11/15		
1366	CABIN PASTURE	265.00	PERMIT- SEC 3	CATTLE	3/1-2/28	65	
				HORSE	5/1-11/30		
				SHEEP	3/1-2/28		
1367	HENRICH PASTURE	81.00	PERMIT- SEC 3	CATTLE	5/15-11/1	11	
1368	BRIDGER CREEK	114.00	PERMIT- SEC 3	CATTLE	3/1-2/28	18	
				HORSE	3/1-2/28		
1369	PICARD RANCH HQ	191.00	PERMIT- SEC 3	CATTLE	3/1-2/28	17	
1373	COPPER MOUNTAIN	277.00	PERMIT- SEC 3	CATTLE	6/1-10/15	16	
1401	RIM PASTURE	19,100.00	PERMIT- SEC 3	CATTLE	6/1-10/31	3982	X
				SHEEP	6/1-10/8		
1402	DELFELDER ALLOTMENT	8,938.00	PERMIT- SEC 3	CATTLE	3/1-1/17	1203	
1403	CONANT CREEK COMMON	49,541.00	PERMIT- SEC 3	SHEEP	12/16-4/15	7987	X
				CATTLE	5/1-11/30		
				SHEEP	5/1-6/15		
				SHEEP	10/14-11/30		

Table 1. Grazing Allotments, Acres, AUMs, and Season of Use (Continued)

Allotment Number	Allotment Name	Public Acres GIS	Permit/Lease	Livestock Kind	Season of Use	Public AUMs	Common Allotment
1404	WM HERBST WINTER	2,932.00	PERMIT- SEC 3	CATTLE	4/6-6/20	398	
				CATTLE	11/1-12/31		
1405	POSEY NORTH ALLOTMNT	4,410.00	PERMIT- SEC 3	CATTLE	4/15-6/20	429	
				CATTLE	11/1-12/15		
1406	POISON CREEK	16,759.00	PERMIT- SEC 3	CATTLE	3/15-6/15	817	
				CATTLE	10/15-12/30		
1407	MUSKRAT AMP	39,494.00	PERMIT- SEC 3	CATTLE	10/15-4/30	3962	
1408	TOWNSHIP PASTURE	18,904.00	PERMIT- SEC 3	CATTLE	10/1-1/15	2478	
				HORSE	11/1-2/28		
				HORSE	3/1-4/30		
				CATTLE	4/1-4/30		
1409	MUSKRAT OPEN	99,243.00	PERMIT- SEC 3	CATTLE	5/1-11/30	10519	X
1410	POSEY PASTURE	1,061.00	PERMIT- SEC 3	CATTLE	4/22-5/20	165	
1411	SHOSHONI ROAD	21,158.00	PERMIT- SEC 3	CATTLE	3/1-1/17	2706	
				HORSE	3/1-2/28		
1412	POSTON WINTER	3,552.00	PERMIT- SEC 3	CATTLE	3/1-2/28	437	
1413	PIPELINE PASTURE	4,228.00	PERMIT- SEC 3	HORSE	12/1-4/30	452	
				CATTLE	12/1-5/4		
1414	ANDERSON WINTER	5,864.00	PERMIT- SEC 3	CATTLE	11/1-1/2	770	
				CATTLE	5/15-5/31		

Table 1. Grazing Allotments, Acres, AUMs, and Season of Use (Continued)

Allotment Number	Allotment Name	Public Acres GIS	Permit/Lease	Livestock Kind	Season of Use	Public AUMs	Common Allotment
1415	MYERS PASTURE	903.00	PERMIT- SEC 3	CATTLE	5/1-9/15	116	
1416	LAME JACK DRAW	6,373.00	PERMIT- SEC 3	CATTLE	5/1-9/30	720	
1417	HAYBARN HILL	9,947.00	PERMIT- SEC 3	CATTLE	11/1-4/30	1195	
1512	SOUTH DOBIE FLAT	6,847.00	PERMIT- SEC 3	CATTLE	5/23-6/9	1207	
				CATTLE	10/25-12/6		
1518	LITTLE BUG PASTURE	3,837.00	PERMIT- SEC 3	CATTLE	1/1-4/1	564	
1601	DODDS ALLOTMENT	1,744.00	PERMIT- SEC 3	SHEEP	5/1-10/30	446	
1604	#17 HORSE HEAVEN PST	16,329.00	PERMIT- SEC 3	HORSE	6/1-9/30	3077	
				CATTLE	6/15-10/19		
				SHEEP	7/1-10/18		
1605	#18 HORSE CREEK PAST	3,685.00	PERMIT- SEC 3	SHEEP	5/1-6/15	459	
				SHEEP	10/19-11/30		
				CATTLE	10/20-11/16		
1606	#19 VINEGAR HILL PST	6,662.00	PERMIT- SEC 3	SHEEP	10/19-12/12	981	
				HORSE	1/1-3/31		
				CATTLE	11/18-12/24		
				SHEEP	12/30-1/15		
1607	#16 PHILLIPS PAST.	1,872.00	PERMIT- SEC 3	SHEEP	1/16-4/15	259	
				CATTLE	12/25-2/8		
1608	#20 CALF	828.00	PERMIT- SEC 3	CATTLE	5/1-6/15	130	

Table 1. Grazing Allotments, Acres, AUMs, and Season of Use (Continued)

Allotment Number	Allotment Name	Public Acres GIS	Permit/Lease	Livestock Kind	Season of Use	Public AUMs	Common Allotment
	PASTURE						
				SHEEP	5/1-6/15		
1609	#21 HORSE PASTURE	1,143.00	PERMIT- SEC 3	HORSE	4/1-5/31	168	
				CATTLE	6/1-6/6		
			PERMIT- SEC 3	SHEEP	6/16-6/30		
1610	#22 BULL PASTURE	908.00	PERMIT- SEC 3	CATTLE	4/1-6/30	156	
				SHEEP	5/1-6/15		
1612	HAMILTON ROCK PAST.	3,998.00	PERMIT- SEC 3	CATTLE	12/25-1/27	454	
				SHEEP	1/16-4/15		
1614	CIRCLE BAR ALLOTMENT	38,299.00	PERMIT- SEC 3	HORSE	5/1-2/28	5897	
				CATTLE	5/1-2/28		
1615	NORTH OF DRIFT FENCE	20,318.00	PERMIT- SEC 3	CATTLE	6/10-9/26	4391	
1616	KEESTER	29,779.00		HORSE	11/15-12/5	4582	
			PERMIT- SEC 3	CATTLE	5/16-11/28		
1619	WINTER PASTURES (incl.Clayto 1618)	17,569.00	PERMIT- SEC 3	CATTLE	9/26-5/15	2635	
				HORSE	12/6-6/30		
1620	CABIN CREEK PASTURE	1,153.00	PERMIT- SEC 3	CATTLE	7/10-10/26	241	
1622	HAT RANCH	5,022.00	PERMIT- SEC 3	CATTLE	3/1-5/15	855	
				HORSE	3/1-5/15		
				CATTLE	12/1-2/28		

Table 1. Grazing Allotments, Acres, AUMs, and Season of Use (Continued)

Allotment Number	Allotment Name	Public Acres GIS	Permit/Lease	Livestock Kind	Season of Use	Public AUMs	Common Allotment
				HORSE	11/1-2/28		
1623	MURPHREE PASTURES	9,219.00	PERMIT- SEC 3	HORSE	6/25-11/16	1061	
				CATTLE	3/1-11/30		
1625	JAMERMAN PASTURES	6,603.00	PERMIT- SEC 3	CATTLE	3/1-5/19	478	
				CATTLE	11/1-2/28		
1626	MUD LAKE	1,324.00	PERMIT- SEC 3	CATTLE	12/1-12/31	113	
1628	SAGE HEN	1,312.00	PERMIT- SEC 3	CATTLE	12/1-2/28	189	
1629	JJ WINTER PASTURES	721.00	PERMIT- SEC 3	CATTLE	3/1-4/30	276	
				HORSE	3/1-2/28		
				CATTLE	11/1-2/28		
1630	TRAM ROAD PASTURE	1,136.00	PERMIT- SEC 3	CATTLE	4/1-5/15	135	
1631	CLAYTOR HOMESTEAD	59.00	PERMIT- SEC 3	CATTLE	3/1-3/31	6	
1632	NORTH HAT PASTURE	1,144.00	PERMIT- SEC 3	CATTLE	3/15-4/30	180	
				HORSE	6/1-8/31		
1633	STAMPEDE BOG	552.00	PERMIT- SEC 3	CATTLE	3/1-4/30	89	
				CATTLE	10/15-11/30		
1635	BIG ROCK PASTURE	13,386.00	PERMIT- SEC 3	CATTLE	4/1-5/31	1995	
				CATTLE	10/15-11/26		
1636	GRAINTE MT OPEN	77,746.00	PERMIT- SEC 3	CATTLE	5/10-10/31	12584	X
1638	WINTER	160.00	PERMIT- SEC 3	CATTLE	3/1-3/31	16	

Table 1. Grazing Allotments, Acres, AUMs, and Season of Use (Continued)

Allotment Number	Allotment Name	Public Acres GIS	Permit/Lease	Livestock Kind	Season of Use	Public AUMs	Common Allotment
	ALLOTMENT						
1640	GARSON RANCH	2,531.00	LEASE- SEC 15	CATTLE	6/1-10/31	403	
1642	DEVILS GATE*	24,227.00	PERMIT- SEC 3	CATTLE	3/1 - 2/28	3700	
				HORSE			
1644	TURKEY TRACK RANCH*	9,057.00	PERMIT- SEC 3	CATTLE	3/1-2/28	1832	
				HORSE			
1660	HOME,NORTH OF HIGHWY	1,231.00	PERMIT- SEC 3	CATTLE	12/1-5/25	205	
				HORSE	3/1-5/25		
1701	FLAGG AMP	11,463.00	PERMIT- SEC 3	CATTLE	5/1-11/30	2086	X
1702	FLAGG INDIVIDUAL	298.00	PERMIT- SEC 3	CATTLE	12/1-2/28	51	
1703	BIG PASTURE	76,090.00	PERMIT- SEC 3	CATTLE	5/1-11/7	11909	X
1704	BREEDING PASTURE	16,916.00	PERMIT- SEC 3	CATTLE	4/3-6/8	1956	X
				CATTLE	9/1-11/16		
				HORSE	4/1-12/15		
1705	MYERS FENCED PASTURE	1,640.00	PERMIT- SEC 3	CATTLE	4/6-4/30	175	
1706	TRENT&HOME PLACE	427.00	PERMIT- SEC 3	CATTLE	11/16-2/28	40	
1707	ICE SLOUGH	953.00	PERMIT- SEC 3	CATTLE	5/1-7/31	183	
1709	LONG CREEK PASTURE	2,567.00	PERMIT- SEC 3	CATTLE	4/1-9/30	227	
				CATTLE	11/16-12/15		
1710	GRAHAM RANCH	1,129.00	PERMIT- SEC 3	CATTLE	11/15-2/28	175	

Table 1. Grazing Allotments, Acres, AUMs, and Season of Use (Continued)

Allotment Number	Allotment Name	Public Acres GIS	Permit/Lease	Livestock Kind	Season of Use	Public AUMs	Common Allotment
	PASTURE						
				CATTLE	3/1-4/30		
1711	HAY MEADOW PASTURE	316.00	PERMIT- SEC 3	CATTLE	3/1-5/14	50	
				CATTLE	9/1-2/28		
1712	LONG CRK SWEETWATER	426.00	PERMIT- SEC 3	CATTLE	11/1-4/30	66	
1713	WHITLOCK FENCED	1,057.00	PERMIT- SEC 3	CATTLE	4/1-4/30	126	
1714	SCARLETT PASTURE	41.00	PERMIT- SEC 3	CATTLE	10/1-2/28	79	
1715	HORSE PASTURE	130.00	PERMIT- SEC 3	HORSE	3/1-3/31	14	
				HORSE	12/16-2/28		
1716	DISHPAN BUTTE	16,069.00	PERMIT- SEC 3	CATTLE	5/15-11/1	1983	X
1717	FENCED INDIVIDUAL	1,310.00	PERMIT- SEC 3	CATTLE	5/1-6/14	171	
1801	EAST BEAVER COMMON	61,911.00	PERMIT- SEC 3	CATTLE	5/1-11/15	7331	X
1802	SAND DRAW AMP	13,635.00	PERMIT- SEC 3	CATTLE	6/1-10/15	1418	
1803	GOVERNMENT DRAW	75,775.00	PERMIT- SEC 3	CATTLE	5/7-10/31	8940	X
1804	GOVT DRW-LWR BEAVER	20,468.00	PERMIT- SEC 3	CATTLE	3/1-6/10	4040	X
				CATTLE	11/1-2/28		
1805	KIRBY-RESERVATN BDRY	5,265.00	PERMIT- SEC 3	CATTLE	5/16-6/14	734	
				CATTLE	11/1-11/30		

Table 1. Grazing Allotments, Acres, AUMs, and Season of Use (Continued)

Allotment Number	Allotment Name	Public Acres GIS	Permit/Lease	Livestock Kind	Season of Use	Public AUMs	Common Allotment
1806	GRIFFIN BVR CRK	6,087.00	PERMIT- SEC 3	CATTLE	5/1-10/15	714	
1807	BALDWIN PASTURE	465.00	PERMIT- SEC 3	CATTLE	4/20-5/15	105	
1808	HUDSON DRAW PVT ALLT	481.00	PERMIT- SEC 3	CATTLE	5/7-6/14	38	
1809	BRINGOLF RANCH	668.00	PERMIT- SEC 3	CATTLE	4/15-5/14	141	
				CATTLE	10/1-10/31		
1810	YELLOWSTONE RANCH	338.00	PERMIT- SEC 3	CATTLE	11/1-12/31	92	
1813	BLUE RIDGE	260.00	PERMIT- SEC 3	CATTLE	11/1-12/16	8	
1814	HIGHWAY PASTURE	152.00	PERMIT- SEC 3	CATTLE	5/1-5/29	21	
1901	ATLANTIC CITY COMMON	38,698.00	PERMIT- SEC 3	CATTLE	5/20-9/30	4765	X
				CATTLE	5/8-10/4		
				GOAT	5/20-9/30		
1902	COTTONWOOD BASIN	7,625.00	PERMIT- SEC 3	HORSE	5/1-9/30	705	
				CATTLE	4/20-10/31		
1903	SILVER CREEK COMMON	32,941.00	PERMIT- SEC 3	CATTLE	5/15-10/31	3524	X
1904	DEVILS CANYON AMP	3,585.00	PERMIT- SEC 3	CATTLE	5/16-9/30	652	X
1905	ELLIS UPPER BEAVER	2,105.00	PERMIT- SEC 3	CATTLE	5/16-9/30	530	X
1906	TWIN CK. INDIVIDUAL	7,516.00	PERMIT- SEC 3	CATTLE	5/1-12/1	1644	
				HORSE	5/2-7/1		

Table 1. Grazing Allotments, Acres, AUMs, and Season of Use (Continued)

Allotment Number	Allotment Name	Public Acres GIS	Permit/Lease	Livestock Kind	Season of Use	Public AUMs	Common Allotment
1907	COMMISSARY HILL	953.00	PERMIT- SEC 3	CATTLE	6/1-6/15	74	
				CATTLE	10/1-10/15		
1908	LITTLE POPO AGIE AMP	8,541.00	PERMIT- SEC 3	CATTLE	5/10-10/1	1814	
1909	ONION FLAT	1,193.00	PERMIT- SEC 3	CATTLE	5/1-5/31	188	
				CATTLE	10/16-11/15		
1910	SAWMILL BASIN	2,401.00	PERMIT- SEC 3	CATTLE	6/1-10/15	197	
1911	RED CANYON AMP	3,605.00	PERMIT- SEC 3	CATTLE	5/15-8/28	580	X
1912	TWIN CREEK PRIVATE	385.00	PERMIT- SEC 3	CATTLE	5/16-10/15	44	
1913	MCGRAW FLAT INDIVIDUAL	1,034.00	PERMIT- SEC 3	CATTLE	6/1 - 9/30	206	
1914	MCGRAW FLAT COMMON	10,401.00	PERMIT- SEC 3	CATTLE	5/1-10/31	1824	X
1915	BEAVER AMP	8,958.00	PERMIT- SEC 3	CATTLE	5/1-10/31	1964	
1916	HALL CK. INDIVIDUAL	12,464.00	PERMIT- SEC 3	CATTLE	5/1-1/31	2328	
				HORSE	5/15-2/28		
1917	COTTONWOOD DIVIDE	5,685.00	PERMIT- SEC 3	CATTLE	6/1-7/10	1570	
				CATTLE	10/1-11/14		
1918	MC GRAW FLT-U.BEAVER	8,388.00	PERMIT- SEC 3	CATTLE	7/1-10/10	1146	
1919	GRAVEL SPRINGS	2,840.00	PERMIT- SEC 3	CATTLE	5/16-10/10	488	X
1920	SALISBURY AMP	5,389.00	PERMIT- SEC 3	CATTLE	5/16-9/30	996	

Table 1. Grazing Allotments, Acres, AUMs, and Season of Use (Continued)

Allotment Number	Allotment Name	Public Acres GIS	Permit/Lease	Livestock Kind	Season of Use	Public AUMs	Common Allotment
				HORSE	5/16-9/30		
1921	LEVEL MEADOWS	3,249.00	PERMIT- SEC 3	CATTLE	6/1-10/30	701	
1922	FRENCH GEORGE CROSSING	626.00	PERMIT- SEC 3	CATTLE	5/16-9/30	146	
1923	ATL.CTY.UPPER FENCED	248.00	PERMIT- SEC 3	CATTLE	5/1-11/30	81	
1924	ATL. CTY. LOWER FENCED	127.00	PERMIT- SEC 3	CATTLE	5/1-11/30	58	
1925	HALL CRK WINTER PAST	1,299.00	PERMIT- SEC 3	CATTLE	11/23-2/28	98	X
1926	MCKINNEY INDIVIDUAL	818.00	PERMIT- SEC 3	CATTLE	5/1-9/30	235	
1927	UPPER ELLIS RANCH	236.00	PERMIT- SEC 3	CATTLE	9/15-12/31	157	
1928	LOWER ELLIS RANCH	321.00	PERMIT- SEC 3	CATTLE	9/15-12/31	48	
1929	BARRAS SPRING	51.00	NOT LICENSED				
1930	LONG WILLOW	709.00	NOT LICENSED				
1931	WOOLERY INDIVIDUAL	1,231.00	NOT LICENSED				
1932	SHEEP MOUNTAIN	558.00	PERMIT- SEC 3	CATTLE	6/1-9/30	99	
1933	LAZY Y	173.00	NOT LICENSED				
1934	RED CANYON RIM	846.00	PERMIT- SEC 3	CATTLE	6/5-10/31	29	
1935	BOWMAN RANCH		NOT LICENSED				
1936	DERBY		NOT LICENSED				

Table 1. Grazing Allotments, Acres, AUMs, and Season of Use (Continued)

Allotment Number	Allotment Name	Public Acres GIS	Permit/Lease	Livestock Kind	Season of Use	Public AUMs	Common Allotment
1937	LITTLE KNOLL		NOT LICENSED				
1938	BERGSTEDT RANCH	52.00	NOT LICENSED				
1939	AUER RANCH	649.00	PERMIT- SEC 3	CATTLE	11/1-2/28	93	
1940	HENTON RANCH	24.00	NOT LICENSED				
1941	FLAT ONION		NOT LICENSED				
1943	RED BLUFF CREEK	89.00	PERMIT- SEC 3	CATTLE	3/1-2/28	1	
				CATTLE	6/1-9/30		
2009	ALKALI PASTURE	444.00	PERMIT- SEC 3	CATTLE	5/1-6/30	28	
				CATTLE	8/1-10/31		
2011	HIGHWAY ALLOTMENT	509.00	PERMIT- SEC 3	CATTLE	4/1-5/15	90	
2021	WILLOW CREEK ALLOTME	85.00	PERMIT- SEC 3	CATTLE	5/1-6/30	15	
2023	CROOKS GAP	952.00	PERMIT- SEC 3	CATTLE	10/1-11/30	83	
2025	LECKINBY PASTURE	3,436.00	PERMIT- SEC 3	CATTLE	5/1-11/30	607	
2026	LITTLE CAMP CREEK*	2,281.00	PERMIT- SEC 3	CATTLE	5/1-10/31	294	
2028	MITCHELL PASTURE	544.00	PERMIT- SEC 3	CATTLE	6/15-9/15	106	
2029	DIAMOND HOOK	141.00	PERMIT- SEC 3	CATTLE	3/1-2/28	27	
2103	LIME KILN GULCH	1,159.00	LEASE-SEC 15	CATTLE	5/15-6/30	154	

Table 1. Grazing Allotments, Acres, AUMs, and Season of Use (Continued)

Allotment Number	Allotment Name	Public Acres GIS	Permit/Lease	Livestock Kind	Season of Use	Public AUMs	Common Allotment
2104	LITTLE WARM SP. CNYN	315.00	NOT LICENSED	CATTLE	9/25-9/28	27	
2106	FIRE RIDGE	148.00	LEASE-SEC 15	HORSE	6/15-9/30	8	
2107	WELLS 11	305.00	LEASE-SEC 15	HORSE	5/1-6/30	31	
				HORSE	8/1-10/31		
2108	GEYSER CREEK	829.00	LEASE-SEC 15	HORSE	6/1-9/30	50	
2109	CROSS 14	643.00	LEASE-SEC 15	CATTLE	6/1-9/30	134	
2110	LITTLE HORSE CREEK	720.00	LEASE-SEC 15	HORSE	5/15-10/31	51	
2111	E A MOUNTAIN 16	1,761.00	LEASE-SEC 15	CATTLE	6/1-6/30	264	
				CATTLE	8/1-10/30		
2112	BEAR CREEK NO.2112	3,499.00	LEASE-SEC 15	CATTLE	5/1-6/30	542	
				CATTLE	10/15-11/30		
2113	CROOKED CREEK	1,247.00	LEASE-SEC 15	CATTLE	6/25-9/30	133	
				HORSE	6/25-10/28		
2114	SPENCE 23	1,470.00	LEASE-SEC 15	CATTLE	5/1-12/1	290	
2115	HAT BUTTE	893.00	LEASE-SEC 15	CATTLE	6/1-6/30	154	
				CATTLE	9/1-10/30		
2116	ELK RIDGE SOUTHEAST	316.00	LEASE-SEC 15	HORSE	6/1-8/31	21	
2117	BLUE HOLES	682.00	LEASE-SEC 15	HORSE	3/1-4/30	90	
				HORSE	11/1-2/28		
2119	WHITE PASS 31	650.00	LEASE-SEC 15	CATTLE	5/1-6/30	116	
				CATTLE	10/1-11/30		
2120	WINDY RIDGE	332.00	LEASE-SEC 15	CATTLE	4/1-6/30	54	

Table 1. Grazing Allotments, Acres, AUMs, and Season of Use (Continued)

Allotment Number	Allotment Name	Public Acres GIS	Permit/Lease	Livestock Kind	Season of Use	Public AUMs	Common Allotment
				CATTLE	10/1-10/31		
2121	MASON DRAW	6,813.00	LEASE-SEC 15	CATTLE	5/1-6/30	845	
				CATTLE	10/1-10/30		
2122	TAPPAN CREEK 34	1,065.00	LEASE-SEC 15	CATTLE	6/1-11/15	180	
2123	BATTRUM MOUNTAIN	5,936.00	LEASE-SEC 15	CATTLE	6/1-10/15	531	
2125	ALBRIGHT 47	286.00	LEASE-SEC 15	HORSE	4/1-6/30	28	
				HORSE	10/1-10/31		
2126	CM 49	940.00	LEASE-SEC 15	HORSE	11/10-12/9	67	
				HORSE	6/1-6/30		
2127	WAGON GULCH	80.00	LEASE-SEC 15	CATTLE	6/15-12/15	95	
				HORSE	6/15-12/15		
2128	BITTERROOT 60	691.00	LEASE-SEC 15	HORSE	5/20-6/17	68	
2130	CROSS 67		LEASE-SEC 15	CATTLE	5/1-9/30	91	
2132	STONEY POINT 73	591.00	LEASE-SEC 15	HORSE	3/1-6/1	12	
		121.00		HORSE	10/15-2/28		
2201	NORTH FORK RIM		LEASE-SEC 15	CATTLE	6/1-10/31	60	
2202	BALDWIN CREEK SCHOOL	1,959.00	LEASE-SEC 15	HORSE	5/1-7/1	16	
2203	MADISON CREEK	1,656.00	LEASE-SEC 15	HORSE	5/1-11/30	20	
		282.00		CATTLE	5/1-11/30		
2204	TABLE MOUNTAIN 9	1,216.00	LEASE-SEC 15	CATTLE	6/1-10/1	128	

Table 1. Grazing Allotments, Acres, AUMs, and Season of Use (Continued)

Allotment Number	Allotment Name	Public Acres GIS	Permit/Lease	Livestock Kind	Season of Use	Public AUMs	Common Allotment
2205	HOPKINS 13	200.00	LEASE-SEC 15	CATTLE	6/1-9/30	40	
				HORSE	6/1-9/30		
2206	WICKSTROM 17	179.00	LEASE-SEC 15	CATTLE	6/16-/7/16	11	
2207	STEERS 19	2,522.00	LEASE-SEC 15	CATTLE	6/15-9/30	146	
2208	PINE BAR 21	418.00	LEASE-SEC 15	CATTLE	6/1-8/31	6	
2210	WILLOW CREEK 24	1,108.00	LEASE-SEC 15	CATTLE	5/15-10/15	274	
2211	SQUAW CREEK	1,174.00	LEASE-SEC 15	CATTLE	6/1-8/31	209	
2212	FRANK RANCH 28	582.00	LEASE-SEC 15	CATTLE	5/1-11/1	110	
2213	SPRIGGS 36	2,196.00	LEASE-SEC 15	CATTLE	6/15-9/29	70	
2214	MEYER BASIN	1,273.00	LEASE-SEC 15	CATTLE	6/1-9/30	233	
2215	WUNDER 38	1,284.00	LEASE-SEC 15	CATTLE	7/1-9/15	63	
2216	DAY 39	106.00	LEASE-SEC 15	HORSE	6/1-7/13	4	
2217	NICHOLAS 40	428.00	LEASE-SEC 15	CATTLE	6/1-9/29	48	
2218	DOUBLE A 41	280.00	LEASE-SEC 15	CATTLE	6/1-6/30	38	
2219	ORCHARD DRAW	964.00	LEASE-SEC 15	CATTLE	5/10-10/1	124	
2220	RED BUTTE	40.00	LEASE-SEC 15	CATTLE	6/1-10/31	5	
2221	JUNIPER HILL	200.00	LEASE-SEC 15	CATTLE	10/1-11/15	15	
2222	SCHOOL ALLOTMENT	160.00	LEASE-SEC 15	CATTLE	5/1-7/2	25	
2223	BALDWIN CREEK 51	200.00	LEASE-SEC 15	CATTLE	6/1-8/31	18	
2224	NATURAL LAKE	235.00	LEASE-SEC 15	CATTLE	6/1-7/27	22	
2225	CRUMP 53	163.00	LEASE-SEC 15	HORSE	6/1-11/14	27	
2226	HUNTER	79.00	LEASE-SEC 15	CATTLE	6/1-8/31	6	

Table 1. Grazing Allotments, Acres, AUMs, and Season of Use (Continued)

Allotment Number	Allotment Name	Public Acres GIS	Permit/Lease	Livestock Kind	Season of Use	Public AUMs	Common Allotment
2227	SMITH CREEK	78.00	LEASE-SEC 15	CATTLE	10/1-10/7	6	
2228	SPRIGGS 57	120.00	LEASE-SEC 15	HORSE	8/1-9/30	6	
2229	KAPER 59	277.00	LEASE-SEC 15	CATTLE	6/1-9/30	56	
2230	TABLE MTN 61	40.00	LEASE-SEC 15	CATTLE	6/1-9/22	7	
2231	BOOTH 62	121.00	LEASE-SEC 15	CATTLE	6/1-6/21	8	
2232	BEASON CREEK 63	476.00	LEASE-SEC 15	CATTLE	6/1-9/30	20	
2233	BATRUM GAP	474.00	LEASE-SEC 15	CATTLE	6/1-10/30	96	
				HORSE	12/1-12/15		
2234	SJOSTROM 66	168.00	LEASE-SEC 15	HORSE	6/1-8/31	18	
2235	HORNY TOAD ASSOCIATE	522.00	LEASE-SEC 15	CATTLE	6/1-10/30	35	
2236	FREEMAN 70	121.00	LEASE-SEC 15	HORSE	5/1-9/25	24	
2237	NORTH FORK	473.00	LEASE-SEC 15	CATTLE	5/10-10/31	38	
2238	HILLTOP	40.00	LEASE-SEC 15	CATTLE	3/1-6/1	7	
				CATTLE	11/15-2/28		
2239	CYCLONE PASS		NOT LICENSED				
2240	HARVEY BASIN	1,475.00	LEASE-SEC 15	CATTLE	5/15-10/30	183	
2520	WOODS BASIN	173.00	LEASE-SEC 15	CATTLE	6/20-9/30	25	
10160	CEDAR RIDGE LRA*	520.00	PERMIT- SEC 3	CATTLE	3/1-2/28	67	
10203	CHERRY CREEK*	28,793.00	PERMIT- SEC 3	CATTLE/HORSE	3/1-2/28	4841	
10205	BAR ELEVEN*	51,065.00	PERMIT- SEC 3	CATTLE	3/1-2/28	11419	
				HORSE			
				SHEEP			
10224	STEWART	61,284.00	PERMIT- SEC 3	CATTLE	5/28-8/30	149	X

Table 1. Grazing Allotments, Acres, AUMs, and Season of Use (Continued)

Allotment Number	Allotment Name	Public Acres GIS	Permit/Lease	Livestock Kind	Season of Use	Public AUMs	Common Allotment
	CREEK*						
10533	STEAMBOAT LAKE*	1,633.00	PERMIT- SEC 3	CATTLE	3/1-2/28	261	
				HORSE			
11501	MUSKRAT-LINN	54,118.00	PERMIT- SEC 3	CATTLE	1/1-12/31	6799	
11502	FRASER DRAW	73,110.00	PERMIT- SEC 3	CATTLE	5/16-12/16	5941	X
11504	CANYON CREEK	11,109.00	PERMIT- SEC 3	CATTLE	5/20-10/31	1400	
11505	SOUTH DEER CREEK	11,319.00	PERMIT- SEC 3	CATTLE	5/10-10/31	1292	
11506	DEER CREEK AMP	7,052.00	PERMIT- SEC 3	CATTLE	5/15-11/15	1297	
11507	SOUTH CROSS L	2,360.00	PERMIT- SEC 3	CATTLE	3/1-5/21	386	
				HORSE	6/1-10/12		
11508	GAS HILLS	48,496.00	PERMIT- SEC 3	CATTLE	5/16-12/10	3547	
				SHEEP	5/16-12/10		
11509	DIAMOND SPRINGS	40,573.00	PERMIT- SEC 3	CATTLE	6/10-11/20	4956	
				HORSE	10/23-11/20		
11510	NORTH WILLOW CREEK*	3,475.00	PERMIT- SEC 3	CATTLE	4/20-6/10	616	
11511	NORTH DOBIE FLAT	11,469.00	PERMIT- SEC 3	CATTLE	5/5-6/5	1516	
				CATTLE	10/15-11/30		
11513	BLACKJACK RANCH	31,197.00	PERMIT- SEC 3	CATTLE	6/6-9/6	1721	
11514	GAP PASTURE	3,433.00	PERMIT- SEC 3	CATTLE	5/1-6/2	581	

Table 1. Grazing Allotments, Acres, AUMs, and Season of Use (Continued)

Allotment Number	Allotment Name	Public Acres GIS	Permit/Lease	Livestock Kind	Season of Use	Public AUMs	Common Allotment
11515	CROSS L PASTURES	1,327.00	PERMIT- SEC 3	CATTLE	12/16-4/30	316	
				HORSE	5/26-6/24		
11516	BASIN PASTURE	18,286.00	PERMIT- SEC 3	CATTLE	7/1-11/30	2471	
11517	BUG MEADOWS PASTURES	568.00	PERMIT- SEC 3	CATTLE	3/1-5/31	91	
12002	HARRIS SLOUGH PAST	110.00	PERMIT- SEC 3	CATTLE	4/20-5/19	5	
12003	WHISKEY PEAK INCOMM*	63,446.00	PERMIT- SEC 3	CATTLE	6/1-12/30	5254	X
				SHEEP			
12004	GREEN MT.FENCED	4,310.00	PERMIT- SEC 3	CATTLE	4/10-5/10	652	
				CATTLE	10/1-11/1		
				HORSE	8/1-9/30		
12005	HOME,SOUTH OF HIGHWY	2,715.00	PERMIT- SEC 3	CATTLE	12/16-3/5	383	
12006	46 PASTURE	2,683.00	PERMIT- SEC 3	CATTLE	3/1-6/15	488	
				CATTLE	10/1-2/28		
12007	RIGBY PASTURE	1,091.00	PERMIT- SEC 3	CATTLE	6/1-10/31	176	
12012	EAST ALLOTMENT	2,002.00	PERMIT- SEC 3	CATTLE	10/16-11/7	377	
				CATTLE	4/16-5/15		
12013	FENCED ALLOTMENT	10,329.00	PERMIT- SEC 3	CATTLE	5/16-10/31	1703	
12014	SOUTH HAT PASTURE	1,789.00	PERMIT- SEC 3	CATTLE	4/15-6/13	287	

Table 1. Grazing Allotments, Acres, AUMs, and Season of Use (Continued)

Allotment Number	Allotment Name	Public Acres GIS	Permit/Lease	Livestock Kind	Season of Use	Public AUMs	Common Allotment
12015	HADSELL PASTURE	3,806.00	PERMIT- SEC 3	CATTLE	5/10-10/16	547	
12016	STATE-71 MEADOWS	274.00	PERMIT- SEC 3	CATTLE	5/1-5/31	51	
12018	ALMA GRIEVE PASTURE	3,271.00	PERMIT- SEC 3	CATTLE	10/1-2/28	453	
12019	COOPER CREEK*	1,247.00	PERMIT- SEC 3	CATTLE	6/1-7/15	200	
				CATTLE	10/1-12/30		
12020	COTTONWOOD PASTURE*	2,019.00	PERMIT- SEC 3	CATTLE	11/1-2/28	265	
12242	SQUAW CREEK	80.00	LEASE-SEC 15	CATTLE	10/1-11/14	13	
14289	UPPER POISON SPIDER CREEK*	9,065.00	PERMIT- SEC 3	CATTLE		1693	
				SHEEP			
14808	THREE CROSSINGS ALLOTMENT	1,514.00	PERMIT- SEC 3	CATTLE	5/1-10/11	602	
				CATTLE	11/10-11/30		
20213	ELKHORN LRA (incl.oil city allot 1602)*	305.00	PERMIT- SEC 3	CATTLE	5/20-6/8	791	
				HORSES	5/15-6/14		
				CATTLE	7/15-10/15		
21519	MILLER SPRINGS PAST.	1,884.00	PERMIT- SEC 3	CATTLE	6/1-9/30	313	
21520	SCHOOL PASTURE	874.00	PERMIT- SEC 3	CATTLE	9/1-11/30	251	
21521	RIDDLE PASTURE	1,350.00	PERMIT- SEC 3	CATTLE	4/1-5/31	306	
				CATTLE	11/1-12/31		

Table 1. Grazing Allotments, Acres, AUMs, and Season of Use (Continued)

Allotment Number	Allotment Name	Public Acres GIS	Permit/Lease	Livestock Kind	Season of Use	Public AUMs	Common Allotment
21522	DECKER PASTURE	331.00	PERMIT- SEC 3	CATTLE	4/1-5/31	49	
				CATTLE	11/1-12/31		
21523	HAY MEADOW PASTURES	69.00	PERMIT- SEC 3	CATTLE	12/1-4/30	168	
31519	BEEF GAP PASTURE	352.00	PERMIT- SEC 3	CATTLE	5/1-6/2	72	
32001	GREEN MOUNTAIN CMN	466,474.00	PERMIT- SEC 3	SHEEP	3/1-2/28	47361	X
				CATTLE	5/1-12/31		
	TOTAL ACRES:	2,481,517			TOTAL AUMS:	308,376	

Table 2. Allotment Categorization – *Current and Proposed*

Allotment	Allotment Name	Existing RMP	Proposed New Category
180	LOST CREEK	M	M
00655	COPPER MTN	I	I
01301	CANTRIL JACK ALLOT.	M	M
01302	NORTH OF CB&Q R.R.	C	I
01303	SOUTH OF CB&Q R.R.	M	I
01304	CRAWFORD CREEK	I	I
01305	LYBYER NORTH	I	I
01306	CANNING ALLOTMENT	M	M
01307	MALLET-SMITH PASTURE	C	C
01308	167A SCOTT-ROBSON	M	M
01309	LOGAN PASTURE	M	M
01310	COTTONWOOD PASS	C	I
01311	KEENAN	C	C
01312	NORTH OF TRACKS	M	I
01313	SOUTH OF TRACKS	I	I
01314	MONETA HILLS PASTURE	M	M
01315	DITCH PASTURE	C	C
01316	MADDEN RANCH PASTURE	C	C
01317	BRANDAU RANCH ALLOT	C	I
01318	BELOW THE HILL PAST.	M	M
01319	TWIDALE	C	C
01320	ST CLAIR WEST	C	I
01321	ST CLAIR RANCH	C	C
01322	ST.CLAIR SOUTH PAST.	I	I

Table 2. Allotment Categorization – *Current and Proposed (Continued)*

Allotment	Allotment Name	Existing RMP	Proposed New Category
01323	FULLER ALLOTMENT	I	I
01324	HOODOO CREEK ALLOT	I	I
01325	EAST OF RANCH	I	I
01326	LICHTENSTEIN	I	I
01327	MYRTLE REED ALLOT	I	I
01328	BATTLE AXE SOUTH	M	M
01329	LYSITE MOUNTAIN	I	I
01330	BATTLE AXE LYSITE	M	M
01331	BATTLE AXE BERGER	M	I
01332	BOW & ARROW	M	M
01333	GATES DRAW ALLOTMENT	I	I
01334	COTTONWOOD PASS	I	I
01335	OCLA SOUTH OF R.R.	I	I
01336	OCLA NORTH OF R.R.	I	I
01337	DE PASS RANCH	C	C
01338	FULLER RANCH PASTURE	I	I
01339	PICARD PRIVATE ALLOT	I	I
01340	168A NORTH OF SEEPS	C	I
01341	168A STOCK DRIVEWAY	M	M
01342	KNAPP INDIVIDUAL	C	C
01343	TUFF CREEK PASTURE	C	I
01344	WESTFALL	I	I
01345	MOUNTAIN PASTURE	C	I
01346	BONNEVILLE RESERVOIR	I	I

Table 2. Allotment Categorization – *Current and Proposed (Continued)*

Allotment	Allotment Name	Existing RMP	Proposed New Category
01347	JONES CREEK BASIN	I	M
01348	J.HERBST SUMMER	M	I
01349	J.HERBST TUFF CREEK	C	I
01350	WM.HERBST SUMMER	C	C
01351	SCOTT DRAW	I	M
01352	JOE JOHNS PASTURE	C	C
01353	CAMPBELL	M	M
01354	STINKING WELL	I	I
01355	LOOKOUT HILL	M	M
01356	HOWARD PASTURE	I	I
01357	SUMMER ALLOTMENT	M	M
01358	TOP OF MOUNTAIN PAST	C	C
01359	RAMAGE RANCH	I	I
01360	RUTH FULLER PRIVATE	C	C
01361	COPPER MT. (LANDER)	C	C
01362	LYBYER SOUTH	I	M
01363	HOODOO HQ PASTURES	C	C
01364	RED RANCH PASTURE	C	C
01365	QUIEN SABE RANCH PASTURE	I	M
01366	CABIN PASTURE	C	C
01367	HENRICH PASTURE	I	I
01368	BRIDGER CREEK	C	C
01369	PICARD RANCH HQ	C	C
01373	COPPER MOUNTAIN	C	C
01401	RIM PASTURE	I	I

Table 2. Allotment Categorization – *Current and Proposed (Continued)*

Allotment	Allotment Name	Existing RMP	Proposed New Category
01402	DELFELDER ALLOTMENT	I	I
01403	CONANT CREEK COMMON	I	I
01404	WM HERBST WINTER	I	I
01405	POSEY NORTH ALLOTMNT	I	I
01406	POISON CREEK	M	M
01407	MUSKRAT AMP	I	I
01408	TOWNSHIP PASTURE	I	I
01409	MUSKRAT OPEN	I	I
01410	POSEY PASTURE	I	I
01411	SHOSHONI ROAD	I	I
01412	POSTON WINTER	I	M
01413	PIPELINE PASTURE	I	M
01414	ANDERSON WINTER	M	M
01415	MYERS PASTURE	I	M
01416	LAME JACK DRAW	I	I
01417	HAYBARN HILL	C	I
01512	SOUTH DOBIE FLAT	M	I
01518	LITTLE BUG PASTURE	M	M
01519	MILLER SPRINGS PAST.	M	I
01520	SCHOOL PASTURE	M	M
01521	RIDDLE PASTURE	M	M
01523	BUG LAKE	M	M
01601	DODDS ALLOTMENT	M	M
01604	#17 HORSE HEAVEN PST	M	I
01605	#18 HORSE CREEK PAST	M	M

Table 2. Allotment Categorization – *Current and Proposed (Continued)*

Allotment	Allotment Name	Existing RMP	Proposed New Category
01606	#19 VINEGAR HILL PST	M	M
01607	#16 PHILLIPS PAST.	M	M
01608	#20 CALF PASTURE	M	M
01609	#21 HORSE PASTURE	M	M
01610	#22 BULL PASTURE	C	C
01612	HAMILTON ROCK PAST.	M	M
01614	CIRCLE BAR ALLOTMENT	M	I
01615	NORTH OF DRIFT FENCE	M	I
01616	KEESTER	M	M
01619	WINTER PASTURES	M	M
01620	CABIN CREEK PASTURE	C	C
01622	HAT RANCH	I	M
01623	MURPHREE PASTURES	I	I
01625	JAMERMAN PASTURES	M	M
01626	MUD LAKE	C	C
01628	SAGE HEN	M	M
01629	JJ WINTER PASTURES	C	C
01630	TRAM ROAD PASTURE	M	I
01631	CLAYTOR HOMESTEAD	C	C
01632	NORTH HAT PASTURE	M	M
01633	STAMPEDE BOG	C	M
01635	BIG ROCK PASTURE	I	I
01636	GRANITE MT OPEN	I	I
01638	WINTER ALLOTMENT	M	M
01640	GARSON RANCH	C	C

Table 2. Allotment Categorization – *Current and Proposed (Continued)*

Allotment	Allotment Name	Existing RMP	Proposed New Category
01642	DEVILS GATE	M	M
01644	TURKEY TRACK	I	I
01660	HOME,NORTH OF HIGHWY	M	M
01701	FLAGG AMP	I	I
01702	FLAGG INDIVIDUAL	C	C
01703	BIG PASTURE	I	I
01704	BREEDING PASTURE	M	M
01705	MYERS FENCED PASTURE	I	I
01706	TRENT&HOME PLACE	M	M
01707	ICE SLOUGH	I	I
01709	LONG CREEK PASTURE	I	M
01710	GRAHAM RANCH PASTURE	M	M
01711	HAY MEADOW PASTURE	C	C
01712	LONG CRK SWEETWATER	C	C
01713	WHITLOCK FENCED	I	I
01714	SCARLETT PASTURE	C	C
01715	HORSE PASTURE	M	M
01716	DISHPAN BUTTE	I	I
01717	FENCED INDIVIDUAL	I	M
01801	EAST BEAVER COMMON	I	I
01802	SAND DRAW AMP	I	I
01803	GOVERNMENT DRAW	I	I
01804	GOVT DRW-LWR BEAVER	I	I
01805	KIRBY-RESERVATN BDRY	I	I
01806	GRIFFIN BVR CRK	M	M

Table 2. Allotment Categorization – *Current and Proposed (Continued)*

Allotment	Allotment Name	Existing RMP	Proposed New Category
01807	BALDWIN PASTURE	I	I
01808	HUDSON DRAW PVT ALLT	M	M
01809	BRINGOLF RANCH	C	C
01810	YELLOWSTONE RANCH	C	C
01813	BLUE RIDGE	C	C
01814	HIGHWAY PASTURE	C	C
01901	ATLANTIC CITY COMMON	I	I
01902	COTTONWOOD BASIN	I	I
01903	SILVER CREEK COMMON	I	I
01904	DEVILS CANYON AMP	I	I
01905	ELLIS UPPER BEAVER	I	I
01906	TWIN CK. INDIVIDUAL	I	I
01907	COMMISSARY HILL	I	M
01908	LITTLE POPO AGIE AMP	I	M
01909	ONION FLAT	I	I
01910	SAWMILL BASIN	I	I
01911	RED CANYON AMP	I	I
01912	TWIN CREEK PRIVATE	C	C
01913	MC GRAW FLAT INDIVID	I	I
01914	MCGRAW FLAT COMMON	I	I
01915	BEAVER AMP	I	I
01916	HALL CK. INDIVIDUAL	I	I
01917	COTTONWOOD DIVIDE	I	I
01918	MC GRAW FLT-U.BEAVER	I	I
01919	GRAVEL SPRINGS ALLT	I	I

Table 2. Allotment Categorization – *Current and Proposed (Continued)*

Allotment	Allotment Name	Existing RMP	Proposed New Category
01920	SALISBURY AMP	I	I
01921	LEVEL MEADOWS	I	I
01922	P HEART INDIVIDUAL	I	I
01923	ATL.CTY.UPPER FENCED	C	C
01924	ATL.CTY.LOWER FENCED	C	C
01925	HALL CRK WINTER PAST	M	M
01926	MCKINNEY INDIVIDUAL	I	I
01927	UPPER ELLIS RANCH	C	C
01928	LOWER ELLIS RANCH	C	C
01929	BARRAS SPRING	C	C
01930	LONG WILLOW	C	C
1931	WOOLERY INDIVIDUAL	M	M
01932	SHEEP MOUNTAIN	M	M
01933	LAZY Y	C	C
01934	RED CANYON RIM	I	M
01935	BOWMAN RANCH	C	C
01936	DERBY ALLOTMENT	M	M
01937	LITTLE KNOLL	C	C
01938	BERGSTEDT RANCH	C	C
01939	AUER RANCH	C	C
01940	HENTON RANCH	C	C
01941	FLAT ONION	I	I
01943	RED BLUFF CREEK	M	M
02009	ALKALI PASTURE	M	M
02011	HIGHWAY ALLOTMENT	I	I

Table 2. Allotment Categorization – *Current and Proposed (Continued)*

Allotment	Allotment Name	Existing RMP	Proposed New Category
02019	COOPER CREEK	M	M
02021	WILLOW CREEK ALLOTME	C	C
02023	CROOKS GAP	M	M
02025	LECKINBY PASTURE	M	M
02026	LITTLE CAMP CREEK	I	I
02028	MITCHELL PASTURE	C	C
02029	DIAMOND HOOK	C	C
02103	LIME KILN GULCH	C	C
02104	LITTLE WARM SP. CNYN	M	M
02106	FIRE RIDGE	M	M
02107	WELLS 11	M	M
02108	GEYSER CREEK	M	M
02109	CROSS 14	C	C
02110	LITTLE HORSE CREEK	I	I
02111	E A MOUNTAIN 16	M	M
02112	BEAR CREEK NO.2112	C	C
02113	CROOKED CREEK	C	C
02114	SPENCE 23	C	C
02115	HAT BUTTE RANCH	C	C
02116	ELK RIDGE SOUTHEAST	C	C
02117	BLUE HOLES	C	C
02119	WHITE PASS 31	C	C
02120	WINDY RIDGE	C	C
02121	MASON DRAW	I	I
02122	TAPPAN CREEK 34	I	I

Table 2. Allotment Categorization – *Current and Proposed (Continued)*

Allotment	Allotment Name	Existing RMP	Proposed New Category
02123	BATTRUM MOUNTAIN	C	I
02125	ALBRIGHT 47	C	C
02126	CM 49	M	M
02127	WAGON GULCH	C	C
02128	BITTERROOT 60	C	C
02130	CROSS 67	C	C
02132	STONEY POINT 73	C	C
02201	NORTH FORK RIM	M	M
02202	BALDWIN CREEK SCHOOL	C	C
02203	MADISON CREEK	C	C
02204	TABLE MOUNTAIN 9	C	C
02205	HOPKINS 13	I	I
02206	WICKSTROM 17	I	C
02207	STEERS 19	I	I
02208	PINE BAR 21	M	M
02210	WILLOW CREEK 24	I	I
02211	SQUAW CREEK	I	I
02212	FRANK RANCH 28	C	C
02213	SPRIGGS 36	I	C
02214	MEYER BASIN	I	I
02215	WUNDER 38	I	C
02216	DAY 39	C	C
02217	NICHOLAS 40	I	I
02218	DOUBLE A 41	I	I
02219	ORCHARD DRAW	I	I

Table 2. Allotment Categorization – *Current and Proposed (Continued)*

Allotment	Allotment Name	Existing RMP	Proposed New Category
02220	RED BUTTE	I	I
02221	JUNIPER HILL	C	C
02222	SCHOOL ALLOTMENT	I	I
02223	BALDWIN CREEK 51	I	I
02224	NATURAL LAKE	C	C
02225	CRUMP 53	I	I
02226	HUNTER	C	C
02227	SMITH CREEK	C	C
02228	SPRIGGS 57	I	I
02229	KAPER 59	C	C
02230	TABLE MTN 61	C	C
02231	BOOTH 62	C	C
02232	BEASON CREEK 63	I	I
02233	BATRUM GAP	C	C
02234	SJOSTROM 66	C	C
02235	HORNY TOAD ASSOCIATE	I	I
02236	FREEMAN 70	I	I
02237	NORTH FORK	C	C
02238	HILLTOP	C	C
02239	CYCLONE PASS	I	I
02240	HARVEY BASIN	I	I
02520	WOODS BASIN	C	C
10160	CEDAR RIDGE LRA	C	C
10203	CHERRY CREEK	I	I
10205	BAR ELEVEN	I	I

Table 2. Allotment Categorization – *Current and Proposed (Continued)*

Allotment	Allotment Name	Existing RMP	Proposed New Category
10224	STEWART CREEK	I	I
10533	STEAMBOAT LAKE	C	C
11501	MUSKRAT-LINN	I	I
11502	FRASER DRAW	M	M
11504	CANYON CREEK	I	M
11505	SOUTH DEER CREEK	I	M
11506	DEER CREEK AMP	I	I
11507	SOUTH CROSS L	M	M
11508	GAS HILLS	M	I
11509	DIAMOND SPRINGS	I	I
11510	NORTH WILLOW CREEK	M	M
11511	NORTH DOBIE FLAT	M	I
11513	BLACKJACK RANCH	I	I
11514	GAP PASTURE	M	M
11515	CROSS L PASTURES	M	M
11516	BASIN PASTURE	M	I
11517	BUG MEADOWS PASTURES	M	M
12002	HARRIS SLOUGH PAST	C	C
12003	WHISKEY PEAK INCOMM	I	I
12004	GREEN MT.FENCED	I	I
12005	HOME,SOUTH OF HIGHWY	I	I
12006	46 PASTURE	I	I
12007	RIGBY PASTURE	I	I
12012	EAST ALLOTMENT	M	M
12013	FENCED ALLOTMENT	I	I

Table 2. Allotment Categorization – *Current and Proposed (Continued)*

Allotment	Allotment Name	Existing RMP	Proposed New Category
12014	SOUTH HAT PASTURE	M	M
12015	HADSELL PASTURE	I	I
12016	STATE-71 MEADOWS	C	C
12018	ALMA GRIEVE PASTURE	M	M
12020	COTTONWOOD PASTURE	M	M
12242	SQUAW CREEK	C	C
14289	UPPER POISON SPIDER CREEK	I	I
14808	THREE CROSSINGS ALLOTMENT	M	M
20213	ELKHORN - LRA	I	I
21522	DECKER PASTURE	M	C
31519	BEEF GAP PASTURE	M	I
32001	GREEN MOUNTAIN CMN	I	I

Table 3. Lander Field Office Grazing Allotments Assessed for Meeting Standards

Allotment Number	Allotment Name	Year Assessed	Acres Assessed	Meeting Standards	Not Meeting Standards - Management Implemented	Not Meeting Standards - Causal Factors Not Determined	Not Meeting Standards - Other Than Livestock Grazing
1307	Mallet-Smith Pasture	2003	181	X			
1324	Hoodoo Creek	2001	23,209		X		
1327	Myrtle Reed	2003	1,209	X			
1329	Lysite Mountain	1998	8,192	X			
1330	Battle Axe Lysite	2000	4,298	X			
1334	Cottonwood Pass	1998	3,900	X			
1335	Ocla South of RR	2000	6,413	X			
1336	Ocla North of RR	2000	4,861		X		
1337	De Pass Ranch	2000	472	X			
1338	Fuller Ranch Pasture	2000	1,477		X		
1341	Stock Driveway	2000	2,185		X		
1358	Top Of Mountain Pasture	2001	1,449	X			
1359	Ramage Ranch	1998	12,060				X
1363	Hoodoo HQ Pasture	2001	149			X	

Table 3. Lander Field Office Grazing Allotments Assessed for Meeting Standards (Continued)

Allotment Number	Allotment Name	Year Assessed	Acres Assessed	Meeting Standards	Not Meeting Standards - Management Implemented	Not Meeting Standards - Causal Factors Not Determined	Not Meeting Standards - Other Than Livestock Grazing
1369	Picard Ranch HQ	2000	169		X		
1373	Copper Mountain	2001	128	X			
1401	Rim Pasture	2000	19,095	X			
1403	Conant Creek	2000	50,376	X			
1404	WM Herbst Winter	2000	2,989		X		
1405	Posey North	2000	4,431		X		
1412	Poston Winter	2000	3,239	X			
1414	Anderson Winter	2000	5,924	X			
1416	Lame Jack Draw	2000	6,060	X			
1417	Haybarn Hill	2000	10,288	X			
1506	Deer Creek AMP	1998	7,000				X
1508	Gas Hills	1998	42,201	X			
1509	Diamond Springs	2008	40,890			X	
1511	North Dobie Flat	2008	11,435			X	
1512	South Dobie Flat	2008	6,752			X	
1513	BlackJack Ranch	2008	31,708			X	

Table 3. Lander Field Office Grazing Allotments Assessed for Meeting Standards (Continued)

Allotment Number	Allotment Name	Year Assessed	Acres Assessed	Meeting Standards	Not Meeting Standards - Management Implemented	Not Meeting Standards - Causal Factors Not Determined	Not Meeting Standards - Other Than Livestock Grazing
1633	Stampede Bog	2000	301	X			
1704	Breeding Pasture	2001	17,107	X			
1705	Myers Fenced Pasture	2001	1,288	X			
1706	Trent & Home Place	2001	500	X			
1707	Ice Slough	2002	947	X			
1709	Long Creek Pasture	2001	2,406	X			
1710	Graham Ranch Pasture	2001	1,118	X			
1712	Long Creek Sweetwater	2001	388	X			
1713	Whitlock Fenced	2001	1,086	X			
1714	Scarlett Pasture	2001	173	X			
1715	Horse Pasture	2004	133	X			
1802	Sand Draw AMP	1999	11,092	X			
1805	Kirby Reservation Boundary	2000	5,333	X			
1806	Griffin Beaver Creek	2000	6,068	X			

Table 3. Lander Field Office Grazing Allotments Assessed for Meeting Standards (Continued)

Allotment Number	Allotment Name	Year Assessed	Acres Assessed	Meeting Standards	Not Meeting Standards - Management Implemented	Not Meeting Standards - Causal Factors Not Determined	Not Meeting Standards - Other Than Livestock Grazing
1901	Atlantic City Common	2001	39,094		X		
1903	Silver Creek Common	2000	33,702		X		
1904	Devils Canyon AMP	2004	3,717			X	
1905	Ellis Upper Beaver	2000	3,326	X			
1906	Twin Creek Individual	1998	7,602	X			
1908	Little Popo Agie AMP	1998	8,651	X			
1911	Red Canyon AMP	1999	3,699		X		
1914	McGraw Flat Common	2000	10,149	X			
1915	Beaver AMP	2004	10,640			X	
1916	Hall Creek Individuial	1998	12,711				X
1921	Level Meadows	2000	3,271	X			
1923	Atlantic City Upper Fenced	2000	60	X			
1924	Atlantic City Lower Fenced	2000	78	X			
1925	Hall Creek Winter Pasture	1998	1,305	X			

Table 3. Lander Field Office Grazing Allotments Assessed for Meeting Standards (Continued)

Allotment Number	Allotment Name	Year Assessed	Acres Assessed	Meeting Standards	Not Meeting Standards - Management Implemented	Not Meeting Standards - Causal Factors Not Determined	Not Meeting Standards - Other Than Livestock Grazing
1927	Upper Ellis Ranch	2002	598	X			
1928	Lower Ellis Ranch	2002	339	X			
1934	Red Canyon Rim	1998	853	X			
1939	Auer Ranch	2004	427	X			
2001	Green Mt. Common	1999	468,379		X		
2002	Harris Slough Pasture	2001	94	X			
2210	Willow Creek	2009	982				
2219	Orchard Draw	1998	1361	X			
			971,718				

Table 4. Allotment Management Plans and Rangeland Management Agreements Developed

Allotment Number	Allotment Name	AMP Implement Date	Public Acres
01330	Battle Axe Lysite	08/23/89	4,298
01361	Copper Mt. (Lander)	03/29/96	270
01401	Rim Pasture	05/01/92	19,037
01403	Conant Creek Common	07/15/92	47,078
01406	Poison Creek*	08/06/97	16,815
01407	Muskrat Amp	11/01/68	39,876
01408	Township Pasture *	05/16/94	19,162
01414	Anderson Winter	05/01/92	5,914
01415	Myers Pasture*	06/10/95	923
01512	South Dobie Flat	06/11/92	6752
01636	Granite Mt Open *	03/24/93	77,896
01643	Rawlins Draw	05/21/08	6,367
01660	Home,North Of Highwy	06/11/92	1,353
01701	Flagg Amp	06/01/69	11,361
01703	Big Pasture	07/05/91	74,351
01802	Sand Draw Amp	05/01/66	11,905
01803	Government Draw	11/26/90	77,299
01901	Atlantic City Common	07/31/97	38,765
01903	Silver Creek Common	05/08/97	31,953
01904	Devils Canyon Amp	05/01/69	3,717

Allotment Number	Allotment Name	AMP Implement Date	Public Acres
01905	Ellis Upper Beaver	05/01/70	2,370
01906	Twin Ck. Individual	03/28/93	7,532
01907	Commissary Hill	06/14/94	994
01908	Little Popo Agie Amp	06/01/70	10,760
01911	Red Canyon Amp	06/01/69	4009
01914	Mcgraw Flat Common	05/08/97	11,295
01915	Beaver Amp	06/01/69	10,640
01916	Hall Ck. Individual	12/20/89	14,386
01920	Salisbury Amp	11/01/69	5,384
01925	Hall Crk Winter Past	12/20/89	492
01926	Mckinney INDIVIDUAL*	04/03/97	800
01934	Red Canyon Rim	06/14/94	853
01939	Auer Ranch	06/01/69	427
102019	Cooper Creek	10/01/87	1,402
02021	Willow Creek Allotment	10/01/87	71
02029	Diamond Hook	10/01/87	207
02219	Orchard Draw	06/09/69	804
11504	Canyon Creek	02/25/99	11,065
11505	South Deer Creek	09/23/88	11,225
11506	Deer Creek Amp	05/01/69	6,447
11507	South Cross L	06/11/92	2,347
11509	Diamond Springs	06/11/92	40,890

Allotment Number	Allotment Name	AMP Implement Date	Public Acres
11510	North Willow Creek*	05/21/08	3469
11511	North Dobie Flat	06/11/92	11,435
11513	Blackjack Ranch	06/11/92	31,708
11514	Gap Pasture	06/11/92	3,604
11515	Cross L Pastures	06/11/92	1,535
11516	Basin Pasture	02/16/01	16,830
12003	Whiskey Peak	10/01/87	76,083
12005	Home, South Of Highway	06/11/92	2,560
12018	Alma Grieve Pasture	10/01/87	3,249
31519	Beef Gap Pasture	06/11/92	381
TOTAL ALLOTMENTS: 52		TOTAL ACRES:	779,108
*Denotes Rangeland Management Agreement			

Table 5. Summary of Range Improvements Lander Field Office 1986-2009

Fiscal Year	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Grand Total
Improvement Fences																									
Antelope drop panels								18.5												0.1					18.6
Electric								5	3		3	9		5	9	34	10	4.75		20.9	9.7				113.38
Exclosures, enclosures			1	2	1	5.5	3.3		1.4	1.4	1	0.5					5.7	2.7	1	1					27.5
Four strand plus	23.1	9.7	2.7		1			1	1	1	0.52	3.13		0.35	2.7	6.8	6.2	2.05		1.4	1	1.25			64.9
Three strand		4	1		17	4.2	9.05	11.2	5.84	6.3		29.2	11.2		4.8	3	5	2.6		9.4	2.5				126.19
Wood Rail													0.1	0.25					0.25	0.1		0.5			1.2
Other			0.1			1.3	0.2	1							1										3.6
Fence Total (Miles)	23.1	13.7	4.8	2	19	11	12.6	36.7	11.2	8.7	4.52	41.8	11.3	5.6	17.5	43.8	26.9	12.1	1.25	32.9	13.2	1.75	0	0	355.4
Land Treatments																									
Lake and Wetland Improvement					1															3			1		5
Lake and Wetland Improvement Total																				3			1		4
Land Treatment						5		6.5	50	9	35						100		100						305.5
Land Treatment Total					1	5		6.5	50	9	35						100		100	6			2		314.5
Management Facility																									
Cattleguard for vehicle use	2	2	1			1	2		1	7			1		11				1						29
Corrals and loading chutes						1																			1
Line Cabins																	1								1
Other																				1					1
Management Facility Total (Each)	2	2	1			2	2		1	7			1		11		1		1	1					32

Table 5. Summary of Range Improvements Lander Field Office 1986-2009 (Continued)

Fiscal Year	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Grand Total
Vegetation Manipulation																									
Stream Improvement											1														1
Chemical																				313			2300		2613
Cutting or Beating																					4000	1220			5220
Prescribed Fire	910	160	250	100			1228		12			56													2716
Vegetation Manipulation Total (Acres)	910	160	250	100			1228		12		1	56								313	4000	1220	2300		10550
Water Control/ Development																									
Pipelines (miles)	1	5		4	9		9.2	3	5		1	7.26	10	5	38	1		2		7.5		0	1	1	109.96
Check Dams, earthen (each)				2																					2
Reservoirs (each)	6	5	2	2	6	1	4	2	6	5	3		3	1		2	5								53
Retention Dams: retains water/silt; primary object (each)							1		1		1														3
Sheet piling drop structure (each)													1				1								2
Springs (each)		2	3		1		1	1	4	7	5	2	1	1	3	2	2	2					1		38
Supplemental Water Storage (each)												1	1												2
Wells (each)	6		4	4	8	3	3		1	3	2	7	2	5	12	2	5	3	3	1	1		1		76
Water Control/ Development Total	12	7	9	8	15	4	9	3	12	15	11	10	8	7	15	6	13	5	3	1	1		2	0	176
Weed Control (acres)	0	246	240	297	60	207	183	156	69	18	56	216	408	561	882	735	620	800	770	948	700	996	0	1,650	10818

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Table E-6. Animal Unit Months (AUMs) Authorized from 1989-2008

Year	AUMs Billed	Percent Actual Use
1989	230351	82
1990	217122	78
1991	211366	76
1992	217322	78
1993	227202	81
1994	218276	78
1995	223874	80
1996	247568	89
1997	221688	79
1998	228616	82
1999	245140	88
2000	246760	88

2001	**220107**	**77**
2002	**152198**	**54**
2003	**143590**	**51**
2004	**177260**	**63**
2005	**191272**	**68**
2006	**160237**	**57**
2007	**143026**	**51**
2008	**167170**	**60**
Average Total:	**204,507**	**73**

Lander Summary of the
Analysis of the Management Situation

Appendix F

Designated Invasive Noxious Weeds and Pests and Secondary Weeds by County

Wyoming Invasive and Noxious Weeds		
Field bindweed	Perennial pepperweed	Scotch thistle
Canada thistle	Ox-eye daisy	Musk thistle
Leafy spurge	Skeletonleaf bursage	Common burdock
Perennial sowthistle	Russian knapweed	Plumeless thistle
Quackgrass	Yellow toadflax	Dyers woad
Hoary cress (whitetop)	Dalmatian toadflax	Houndstongue
Diffuse knapweed	Purple loosestrife	Common St. Johnswort
Common Tansy	Russian olive	Spotted knapweed
Designated Pests		
Grasshoppers	Mormon crickets	Prairie dogs
Ground squirrels	Mountain pine beetle	Beet Leafhopper

Secondary Weeds by County

	Fremont County	Carbon County	Natrona County	Sweetwater County
Mosquito	Yes	Yes	Yes	Yes
Russian olive	Yes	No	No	No
Swainsonpea	Yes	No	No	No
Plains prickly pear	No	Yes	No	No
Plains larkspur, Geyer larkspur	No	Yes	No	No
Wyeth lupine	No	Yes	No	No
Halogeton	No	No	Yes	No
Cheatgrass, downy brome	No	No	Yes	No
Wild licorice	No	No	Yes	No
Black henbane	No	No	Yes	Yes
Buffalobur	No	No	Yes	No
Curlycup gumweed	No	No	Yes	No
Puncturevine	No	No	Yes	No
Showy milkweed	No	No	Yes	No
Army cutworm	No	No	No	Yes

Foxtail barley	No	No	No	Yes
Lady's bedstraw	No	No	No	Yes
Poplar bud-gall mite	No	No	No	Yes

Source: County Pest Departments.