4.0 ENVIRONMENTAL CONSEQUENCES OF THE CONTINUATION OF EXISTING MANAGEMENT DIRECTION

As part of the Management Situation Analysis (MSA) process, the potential impacts on resources within the Pinedale Resource Management Plan Planning Area (RMPPA) of continuing the existing management direction have been identified. For the purpose of the MSA process, impacts are defined as—

> The direct or indirect effects on resources that could result from individual or collective management objectives and actions over time. Such impacts may be positive or negative, be individually minor but collectively significant, occur at a single point of time or over a period of time, or be in one location or dispersed over a larger geographic area.

The four steps of the impact analysis process are—

- **Step 1.** Identifying and evaluating current management objectives and actions for each resource, as described in Chapter 2
- **Step 2.** Identifying and describing the resources present in the area that fall within the purview of the management objectives and actions or are affected by them, as described in Chapter 3
- **Step 3.** Identifying and describing the potential impacts that the continuation of current management objectives and actions (described in Chapter 2) would have on the resources described in Chapter 3 in conjunction with assumptions made about the reasonably foreseeable development levels for, or the future availability of, each resource.
- **Step 4.** Articulating how the current management objectives and actions collectively affect each resource and whether the combined impact is negative or positive in nature.

This four-step process shows the interrelationships between Chapters 2, 3, and 4 within this MSA. The impact analysis discussion (Chapter 4) identifies potential impacts of the management actions (as summarized in Chapter 2) on the existing environment (as summarized in Chapter 3). This shows a direct link between the Bureau of Land Management's (BLM) management actions and potential impacts on the existing environment.

The identification, description, and evaluation of the impacts of these management objectives and the actions performed to implement them (Steps 3 and 4) are presented below for each of the resources described in Chapter 3. The assumptions integral to this discussion of impacts are provided in Table 4.0-1.

The impact analysis presented in this MSA relates only to the continuation of existing management direction. Once refined during the Environmental Impact Statement (EIS) process, the continuation of existing management direction will become the basis for the

No Action alternative evaluated within the EIS. The impact analysis within this MSA should be considered preliminary in nature; additional impact analysis will be performed as part of the EIS process. The impact analysis discussions within the EIS will include more quantification of potential impacts.

4.1 AIR RESOURCES

Impacts to air quality are of particular importance because the Bridger Wilderness is down wind from most of the Pinedale RMPPA. Pollutants from activities within the Pinedale RMPPA could affect the air quality within the Bridger Wilderness reducing the visual quality and recreational experience in a nationally important wilderness. Characterization of potential air quality impacts within the RMPPA is based on data sources within the RMPPA when available and on use of nearby representative data outside the RMPPA to fill data gaps or when otherwise appropriate. The Federal Land Policy and Management Act and the Clean Air Act prohibit the BLM or any federal land management agency from conducting, supporting, approving, licensing, or permitting any activity on federal land that does not comply with all applicable local, state, and federal air quality laws, statutes, regulations, and implementation plans. In support of these regulations, a program that provides benefits to air quality and other resources by decreasing air pollutant concentrations, increasing visibility, and decreasing atmospheric deposition has been developed. Adherence to the air quality regulatory program through participation in such projects as the ongoing visibility monitoring by the Inter-Agency Monitoring of Protected Visual Environments (IMPROVE) and coordination with other federal and state agencies is a key to air quality management success. The consideration of potential air quality impacts is qualitative at this stage of the EIS process. After management alternatives are developed, a more quantitative, modeled analysis will be used.

Within the criteria air pollutant data most applicable to the Pinedale RMPPA, the criteria pollutant that is closest to exceeding the National Ambient Air Quality Standards and Wyoming Ambient Air Quality Standards is ozone, which is at 94 percent of the 8-hour standard. The primary sources of impacts on air quality in the Pinedale RMPPA are fire and resource development.

Although fire itself can have devastating short-term air quality impacts through particulates and hazardous air pollutants, management of fire within the RMPPA includes actions that minimize impacts on air quality.

Management actions associated with forest resources have the potential to increase short-term localized impacts on air quality associated with emissions from logging trucks and increased air particulates associated with dust. Although harvesting of timber is a current objective, the impacts on air quality from these activities are minimal due to limited logging within the RMPPA.

Increased mineral exploration and development activity has the potential to affect air quality due to increased vehicle emissions, gas-flaring operations, and airborne particulates related to increased traffic on roads and construction of additional roads.

Surface treatment of roads associated with transportation and access management objectives, as well as mineral production, produce impacts on air quality by limiting dust and airborne particulates. In addition, protection of visual resources through the Visual Resource Management (VRM) system has impacts on air quality.

Other BLM programs that have the potential to increase minor short-term localized adverse impacts on air quality include management of hazardous materials, off-highway vehicle (OHV) use, and recreation.

4.2 CULTURAL RESOURCES

Protection of cultural resources is supported throughout the RMPPA, with a focus on the viewshed and interpretive landscapes for Traditional Cultural Properties and on sites eligible for National Historic Preservation Act listing. The management objectives provide for enhancement of the quality of cultural resources by avoiding or mitigating impacts on these resources and by considering cultural resources in all land management decisions. Preparation of activity plans on any current or future sites listed on, or determined to be eligible for, the National Register of Historic Places will provide greater protection of significant sites by implementing the site-specific management prescriptions included in activity plans.

Cultural resource sites identified as significant and needing special management include 48LN300, 48SU350, and 48SU301; the Overlook Rock Shelter; the Aspen Stone Circle site; the Cora Butte alignment site; the Willow Lake site; the Wardell site; and the Boulder Lake District. Potential impacts upon these sites include vandalism, erosion, cattle trampling and neglect. Overall, planning area wide, potential impacts on National Register eligible sites includes impacts relating to surface disturbing activities, vandalism, increased recreational use of the RMPPA and neglect.

Mineral development has the potential to damage important cultural resources through surface disturbance. Avoidance of inadvertent damage to or destruction of cultural resources located on BLM-administered lands has proved to be difficult because of the complexity of the buried archaeological record encased with San Arcacio soils and the rapid development of the gas field along Sand Draw. The Wardell Buffalo Trap is being severely impacted by erosion, the result of archaeological back filling of screened, unconsolidated fill. The Boulder Lake District is being affected by shoreline action (as well as unauthorized collection and vandalism), and future development of the Jonah/Pinedale Anticline/LaBarge oil and gas fields threatens Site 48SU4000. Mineral development also has an impact on cultural resources by increasing the number of surveys and assessments that are performed throughout the RMPPA.

Fire management can have various impacts on cultural resources. For instance, damage to cultural resources can occur due to wildfires themselves and through surface disturbances caused by activities designed to control such fires (e.g., fire lines). Fire management objectives to minimize the potential for devastating wildfires have the added benefit of protecting cultural resources that can be lost in such events. Fire is recognized to be a naturally occurring event throughout prehistory. Thus, nonflammable archaeological

materials exposed on the surface may have repeatedly been exposed to fire. Any damage to surface cultural materials is thus a matter of archaeological interpretation. Fire represents the greatest threat to the flammable cultural resource. Flammable cultural resources include things like historic cabins, historic wooden oil field related objects (cable spools, for example), fences, historic Aspen carvings and other wooden objects. Native American wickiups, conical pole lodges and wooden drive lines (such as Bridger Antelope Trap) are flammable cultural resources that could be destroyed by fire. Rock Art, either Native American (petroglyphs) or euroamerican (historic inscription sites) can be damaged by fire, with rock exfoliation the result.

Through lands and realty actions, the BLM retains lands with important cultural and historic resources, ensuring their protection. While management actions do not promote the acquisition of private parcels with cultural resources, the presence or absence of cultural resources is an important consideration in any land exchange or sale.

Increased recreational use, including OHV activities, has varying impacts on cultural resources. Increased visitation to sites can lead to overuse, vandalism and illegal artifact collecting. Similar impacts are associated with transportation and access management, and such impacts can be controlled only through effective planning and mitigation strategies.

4.3 FIRE

Wildfires are an unavoidable occurrence within the RMPPA and will continue to occur both naturally and through human interaction with the natural environment. The most likely impacts associated with fire are impacts on fire from BLM management actions and impacts from fire on other resources. Impacts associated with fire would be effects from unplanned fire and suppression actions as well as desirable effects to meet vegetation objectives.

The use of prescribed burns is subject to other management limitations such as vegetative goals, air quality regulations, and the known or potential existence of cultural resources. Fires that are prescribed, or that occur within prescribed fire areas, are typically beneficial because they occur under environmental conditions or in areas where the fires can be contained and do not become excessively hot. Fires that occur outside prescribed fire areas, particularly under environmental conditions that support their rapid expansion, are most often detrimental. These frequently burn with such intensity that they kill the rootstocks of even the most fire-resistant species and often damage soil fertility, leaving it essentially barren for years. Depending on the severity of the burn, such sites may never return to the vegetation mix present at the time of the burn. In addition to their ecological impacts, uncontrolled fires may represent potential safety hazards to people and their infrastructures.

Livestock grazing can affect the fire frequency by reducing the amount of fine fuels that are available to carry a fire. The need to rest areas from grazing following prescribed burns reduces the number and size of prescribed burns implemented. Recreational activities, including OHV use, through transportation and access to remote areas, have

the potential to increase the occurrence of wildfires associated with increased human interaction with the natural environment. Education can reduce this potential but will not completely eliminate the threat of increased wildfires due to increased human presence in remote areas. The presence of oil and gas facilities reduce the opportunities for prescribed burns because these facilities would present a safety hazard.

The potential occurrence of natural wildfires (e.g., from lightning) and their associated magnitude and location of impact cannot be predicted with any degree of accuracy. Even with proper planning and management preparation, the effects of wildfires can be significant, with many years of ecological healing needed in some cases.

Beyond the direct impacts of fires are the indirect impacts associated with aircraft and highway safety when uncontrolled fires are contained through use of aircraft and ground vehicles, and the impacts on human, wildlife, and fish health through degraded air and stream quality. Such impacts may be short term, resulting from pollutants produced during the fire, or long term, resulting from soil erosion and stream degradation following removal of the vegetation.

4.4 FORESTRY

Overall forest health is projected to decline in the next decade due to a rise in insect and disease damage across the planning area that has resulted from the prolonged drought and general overstocked and decadent trees in the forest. Compounding the problem has been a decline in forest management activities in recent years. As a result, forest fuels have increased significantly and are threatening the forest, and adjoining private property and homes with possible catastrophic fire over portions of the landscape. This could result in impacts to natural resources associated with and constituting the forest ecosystem.

- **Deadline–Pinegrove Unit.** Because forested areas in this unit are habitat for wildlife, in particular elk, wildlife management objectives influence the ways in which forestry is practiced in the unit. Specifically, forest cover is maintained at levels sufficient for habitat and forage for elk. Levels of timber harvest are thus influenced by decisions made to protect elk. Endangered species management also has an impact on the management of this unit. The Colorado River cutthroat trout is found in the Rock Creek drainage within the unit, thus placing limits on disturbance from forestry practices in this area.
- **North Piney Unit.** The management of wildlife, in particular elk, also affects this unit. Because portions of the forested area are used as elk feeding grounds, management activities that are focused on maintaining the feeding grounds influence levels of harvest and disturbance of habitat. Like other forested areas, this unit is also affected by the management of threatened and endangered species, in particular the Colorado River cutthroat trout in Beaver Creek. Because of the trout's presence, no clear cutting or road construction is allowed within 1,000 feet of the creek.
- **Miller Mountain Unit.** Again, the main influences on the forest resource in this unit are the objectives of wildlife management to maintain elk habitat, which must

be considered together with forest management objectives. The greatest impact that wildlife management has on this area is associated with the maintenance of forest cover for habitat, which limits the acres harvested and the ways in which timber is cut. This unit contains crucial elk winter range at Fort Hill. Management of the winter range places limits on harvesting in this area, to maintain vegetation for cover and forage.

- **Eastside-Hoback Unit.** This unit also contains elk feeding grounds that influence the way in which the forest resource is managed. Wildlife management objectives require forest management activities to give full protection to the feeding grounds. Recreation management also has an impact on the way in which forestry is practiced in this unit, because of the Scab Creek Campgrounds located within the unit. Management activities for recreation limit the extent to which trees can be harvested. The Scab Creek area is thus managed to maintain the forest for recreational purposes, such as hiking, camping, and sightseeing. Forest cover is maintained to produce firewood and to provide an aesthetic setting for camping, but not for large-scale harvests.

Proper management of forest resources has several benefits for these resources, including the provision of a valuable supply of forest products to the public and the enhancement of ecological resources. Although harvesting and thinning can provide valuable forest products and reduce fuels for wildfires, the impacts of forestry management on wildlife habitat can be negative in the short term for species having large home ranges, but may also be positive because they provide habitat diversity. Limited clear-cutting can be used as a management tool to enhance forest regeneration and control plant intrusions and diseased trees, if performed carefully. Impacts associated with timber harvesting are minimal in the Pinedale RMPPA due to the small acreage that is harvested each year.

Several programs will help to enhance the forest resources within the RMPPA. These include fire management, which helps reduce fuel for wildfires, enhances wildlife habitat, supports increased forest regeneration, and promotes the regeneration of certain species (e.g., lodgepole pine). In addition, management programs focused on soils and watershed will help improve forest health, improve regeneration, and minimize erosion. In addition, transportation planning can lead to increased access to forest resources.

Certain situations may complicate the management of forest resources in the RMPPA. These include the presence of cultural resources that can affect the ability of the BLM to approve a timber sale. Air quality requirements can restrict the timing and use of burning slash as a management tool for timber harvesting. Harvesting may be prohibited or limited in areas with important recreational values. In addition, other methods used for managing forest resources, such as prescribed fires, may be limited due to recreational activities.

4.5 HEALTH/SAFETY AND HAZARDOUS MATERIALS

Health/safety and hazardous materials are managed throughout the RMPPA following applicable local, state, and federal regulations, including BLM Manuals H-2101-4 and H-

1703-1. However, as development continues and as more people use the public lands, health and safety hazards associated with resource development, and the possibility of hazardous waste spills or material mishandling, will increase. Most serious accidents and deaths on public lands within the Pinedale RMPPA have been associated with gas fields. Workers within the gas industry are primarily at risk to these accidents, although anyone using public lands within the gas field could be involved in an accident. With the increase in oil and gas activity, the risk of accidents near oil and gas facilities or within gas fields will increase. Under the current regulatory framework, responsible parties are required to clean up hazardous waste spills to avoid endangering human health or causing environmental damage. Lands are inspected before transfer from public ownership or before acquisition, to protect the public from contact with hazardous materials. The presence of cultural resources within a hazardous waste site can complicate cleanup activities. The most likely health and safety impacts are from increases in accidents resulting from the presence of more people, from new types of personal injuries associated with resource development, and from hazardous materials associated with fire management or oil and gas development.

Accidents and resulting personal injury can occur more frequently when additional people are exploring the rugged back country in vehicles, including OHVs; on horseback; or simply hiking. The seriousness of these accidents may be magnified if individuals become injured in locations that are far from medical help. Safety issues can also arise when individuals are working around heavy equipment at mineral development sites. Adherence to Occupational Safety and Health Administration standards in the workplace, and comparable care taken in private operations and activities can minimize impacts health and safety.

Accidents involving livestock grazing do occur. These accidents usually involve the rancher or ranch employees themselves, but could involve other individuals using the public lands. Most known accidents have involved horses used to move livestock.

Management of wildfires can introduce hazardous materials into localized areas through the use of fire slurries or other fire fighting treatments. In addition, if wildfires occur near oil and gas operations, the hazardous materials associated with the oil and gas operations can be introduced into the environment.

Increased oil and gas development has the potential to increase spills of hazardous materials either at the site or in transport to or from the site. Such spills may be from tanks, tanker trucks, or ruptured pipelines. However, these operations must comply with an extensive regulatory framework that limits the potential for spills and establishes guidelines and responsibilities for management and cleanup of spills. This framework serves to minimize such potential impacts in most cases.

4.6 LANDS AND REALTY

The most likely impacts on lands and realty are from ownership or use changes, corridor designations, the transportation network, and communication site development.

Forest management can affect the ability of the BLM to acquire or dispose of lands by affecting land values and perceived marketability. In addition, the presence of hazardous materials can impact land transactions. However, the requirement that liability issues associated with hazardous materials be addressed in BLM land transactions improves land values, marketability, and public safety.

Limits on the number of pipelines, roads, and utility lines and their consolidation in existing and proposed ROW concentration areas, to the extent practicable, should prevent the proliferation of ROW routes across public lands, reduce the impacts of these developmental activities on BLM-administered lands and resources, and minimize the impacts on wildlife resources and habitat over the next 20 years.

4.7 LIVESTOCK GRAZING

Livestock grazing on public lands is very important to the local ranches, which depend on public land grazing during critical periods of the year. Grazing by domestic livestock occurs on most public land within the Pinedale RMPPA. The most significant impacts on livestock grazing are from changes in grazing preference objectives resulting from fire management; ROW, or transportation development; oil and gas development; recreation expansion; soil and watershed protection; and management for wildlife. A reduction in active preferences may impact individual permittees. However, long-term effects from such actions would include more sustainable range use.

In the long term, fire management benefits livestock grazing by providing improved forage conditions. Improved range conditions also result in areas subjected to other types of vegetation manipulation. During the short-term however, both fire management and other types of vegetation manipulation result in impacts to livestock grazing. Both wildfires and vegetation treatments require rest from grazing to allow plant communities to recover from the disturbance. Although this rest is necessary to allow the herbaceous plant community to recover and increase in productivity following the removal of the shrubs, it does require the grazing permittee to find alternate pasture or reduce livestock numbers during this rest period. Control and management of hazardous materials also can provide localized benefits to livestock grazing by limiting spills and accidents.

Management actions associated with sales, ROWs, disposals, and exchanges can limit the available forage for livestock grazing by reducing the amount of public land available for grazing. In addition, the demand for additional ROWs can disrupt grazing operations and may create conflicts between uses. Increased roads and traffic can cause fragmentation of grazing areas and complicate livestock grazing management.

Livestock grazing can be disrupted by increasing oil and gas development. Large-scale gas field development in the Jonah Field and the Pinedale Anticline, as well as other oil and gas (including coalbed methane [CBM]) activities, has the potential to conflict with and have impacts on livestock grazing and the forage resource. Such activities include construction activities, pipeline construction, disposal of potentially harmful material and increased vehicle traffic. The impacts of these activities can include soil disturbance, removal of vegetation, shifts in grazing distribution and livestock deaths. Often fences

and/or cattle guards are damaged which can result in unauthorized grazing use or the mixing of livestock which increases the costs to the grazing permitee. The oil and gas industry has provided water for livestock which benefits both livestock and wildlife in those areas.

Recreation use and developments can limit livestock grazing in certain areas. Range conditions may be impacted by recreational uses as well as grazing. Increasing OHV use may increase the harassment of livestock and/or change livestock distribution within allotments.

Protection of soils, watershed improvement, and management of wildlife habitat can have impacts on livestock grazing. Changes in grazing management, including reduction in grazing preference and changes in the season of use, may impact individual grazing permittees. These actions would improve overall forage conditions and help maintain a sustainable livestock grazing program. Livestock grazing itself can affect the livestock grazing program. Overuse of vegetation and resultant downward trend in range condition could occur in allotments where active licensed grazing use is above the natural carrying capacity or the current grazing management is unsatisfactory. In some areas, wildlife populations may exceed the population targets and the carrying capacity, which could also result in over use of the native vegetation and affect livestock grazing. Management considerations associated with wildlife can limit the agency's ability to construct fences or water developments designed to improve grazing management.

4.8 MINERALS, GEOLOGY, AND TOPOGRAPHY

No human or resource and land use activities are expected to affect the geology in the Pinedale RMP Planning Area.

The development of roads, well pads, gravel pits, pipelines, compressor sites, and other construction activities involving surface disturbance make alterations to the land surface. None of these activities create a large enough change to alter the overall topographic characteristic of any area in the planning area. There is concern over the volume of discharge and its location. Even the best quality water discharged into an ephemeral drainage that is not used to handling the flows can cause problems with erosion, sediment, and salts.

With the exception of minerals development itself, human or other land and resource uses and protection activities (i.e., vegetation treatment) are not expected to physically affect any RMPPA minerals resources. Mineral development activities, such as oil and gas extraction, will, however, potentially affect the availability of a given resource for future development and consumption. While human or other land and resource uses and protection activities may not affect the actual minerals resource, they do affect the ability to explore and develop minerals resources in the RMPPA.

Other land use allocations and requirements, such as WSAs, surface use limitations, surface disturbance restrictions, seasonal restrictions, etc., affect the availability of

mineral resources for consumptive use. These allocations and requirements also increase the costs of mineral exploration and development.

4.9 OFF-HIGHWAY VEHICLE USE

OHV use is limited to specific designated areas within the Pinedale RMPPA. Anticipated impacts on OHV use are from seasonal closures, the presence of sensitive species, oil and gas development, timber harvesting, shifts in recreational use patterns, and travel management plans.

Instituting seasonal closures for OHV use would adversely affect this activity by displacing users and would in some cases eliminate OHV use entirely. Impacts on OHV use would occur from management actions that close or limit access to areas due to the presence of threatened and endangered (T&E) plant and animal species, cultural sites, and Wilderness Study Areas (WSA) or to conflict with other recreational users and the type of experience they desire. In areas of increased mineral development, there may be increasing pressure to restrict OHV access. However, access provided by fluid mineral development may improve access in some areas for recreation and other interests.

Timber harvesting activities have the tendency to shift recreational OHV activities from semiprimitive motorized areas to roaded natural settings. Increased road development and access will have a tendency to increase, not only OHV use, but also activities associated with OHVs, such as hunting, firewood gathering, and dispersed camping. This may disperse nonmotorized activities to other areas. The result is an increase and change in the patterns of recreational use. Travel management actions can increase OHV access to back-country areas but can also place seasonal restrictions on OHV use.

4.10 PALEONTOLOGY AND NATURAL HISTORY

BLM supports identification and protection of paleontological resources throughout the RMPPA. The impacts of other programs on paleontological resources are very similar to the impacts on cultural resources.

The rapid increase of oil and gas exploration in the Pinedale RMPPA could create direct impacts on paleontological resources through the destruction of sensitive fossils during ground disturbing activities.

Increased recreational and OHV use may increase the knowledge, use, and interpretation of these resources but may also increase overuse and vandalism. Protection of visual resources and air quality will indirectly benefit these resources.

4.11 RECREATION

Recreation activities can occur in designated or undesignated areas throughout the RMPPA, with management emphasis given to Special Recreation Management Areas, other developed recreation sites and national historic trails. Management activities that continue to support the availability of legal outdoor recreational activities, protect health and safety of visitors, and mitigate conflicts between resource uses improve the

recreational experience throughout the RMPPA. The anticipated impacts on recreation resources are from management of cultural resources, timber harvesting, wildlife habitat and riparian areas, oil and gas development, air quality, and visual resources.

Implementing cultural resource management actions in most cases enhances recreational experiences through emphasis on interpretive programs and historical features. This can increase public awareness, knowledge, and use of resources. Managing timber resources to maintain forest health benefits recreational uses by providing opportunities for consumptive and nonconsumptive recreation. Recreational values would benefit from receiving high-priority status in the evaluation of realty actions such as sales, land exchanges, and ROWs. Addressing and improving access to public lands could increase recreational opportunities. Continued protection of recreational areas through avoidance and restrictions will increase recreational opportunities and reduce conflicts with private landowners.

Protecting and improving wildlife habitat and riparian areas would benefit recreation values and potentially increase recreational visitors associated with fishing, hunting, and other nonconsumptive uses. In addition, restricting surface disturbances to reduce impacts to wildlife habitat would positively affect important recreational uses in the RMPPA, such as wildlife viewing, hunting, and fishing. Protection of big game-crucial winter range is essential to protecting wildlife populations, which in most cases results in improved recreational experiences.

There would be an increase in conflicts between oil and gas development and some recreational uses as development continues to increase in the RMPPA. Oil- and gas-related pipelines can also conflict with some recreational uses. Oil and gas field development areas may create adverse impacts to the quality of recreation experience. Direct, short-term adverse effects from OHV-produced noise near recreational opportunity areas where noise would be considered intrusive will occur. OHV-produced noise would tend to degrade and diminish the recreational quality for those users who seek solitude, quiet, and natural settings for camping, hiking, and related recreational activities not involving OHV use.

Livestock grazing can affect recreation opportunities and recreation quality. Livestock grazing in riparian areas can reduce habitat quality for some game fish which could limit fishing opportunities. Livestock grazing and related facilities such as fences can reduce visual qualities and the overall recreation experience in some situations.

Management of air quality and visual resources can improve the recreational experience, especially along historic trails in the RMPPA. Fire suppression can improve recreational safety by reducing the risk of devastating wildfires, and may also reduce negative reactions of recreationists to resources that have suffered from recent wildfire incidents. Proper management of vegetative resources through fire management that improves range and wildlife habitat can benefit recreational activities, especially wildlife viewing and hunting.

4.12 SOCIOECONOMICS

It is likely that BLM management actions will affect individuals and communities in Lincoln and Sublette Counties where the RMPPA is located. However, it is also likely that some actions, especially those that impact oil and gas operations, will have economic repercussions in Sweetwater County, which serves as an economic center for much of the oil and gas activity in southwest Wyoming.

Some areas within or near the RMPPA, particularly the Pinedale area, will continue to experience increased population growth. Any increases in population would tend to be influenced by continued growth of the oil and gas development industry and by increasing demand for the area's high-quality scenic and recreational resources. The current shortage and high cost of housing in the Pinedale area could limit population increases in the near future unless additional housing is made available.

Substantial increases in earned income would accrue from oil and gas operations, which have relatively high wage levels compared with the service and retail economic sectors.

For those RMPPA areas with increasing populations, experience in other areas indicates that there will be indirect effects on housing and public services. An increasing demand for public services is expected to affect service-provider (e.g., cities, counties, and special districts) budgets, unless developers are required to bear the additional cost. Increased oil and gas development would generate additional revenues for all levels of government (including school districts) through the resulting payment of ad valorem taxes, severance taxes, federal royalties, and other taxes on facilities and production.

4.13 SOILS

Impacts on soils are addressed throughout the RMPPA. Of highest management concern are fire and activities, such as transportation, mineral development, and OHV use, that may occur in riparian areas or elsewhere where soils are susceptible to erosion and quality degradation such as compaction.

Efforts to achieve Proper Functioning Condition (PFC) in stream and riparian areas would benefit soil resources. PFC assessments are conducted as part of the management objectives relating to the interrelationships of hydrology, vegetation, and soil/landform.

Fire can cause increased soil erosion in burned areas at rates dependent on the intensity of the fire and suppression efforts. Prescribed burns generally affect soil much less than do wildfires, although soil loss may occur immediately after any burn due to the removal of vegetation. In the long run, however, prescribed burns can reduce soil losses by producing improved vegetative cover and health. Management of vegetation, including forests, can cause short-term localized impacts on physical and chemical characteristics of soils, increasing the potential for erosion through loss of ground cover. However, in the long term, vegetation should increase over pretreatment levels, which would decrease erosion potential.

Management of transportation and access can negatively affect soils through increased road density. Roads tend to increase storm water runoff, causing rill and gully formation on and below roads. This provides more sediment transport and erosion. Roads and other activities also cause soil compaction, which serves to limit the capacity of soils to support vegetation.

Mineral development in conjunction with surface disturbance has the potential to negatively affect soils in localized areas through contamination, compaction, and increased erosion. Drilling fluids and accompanying chemicals can contaminate localized areas. Proper disposal and recycling of drilling fluids, following BLM policies, reduces the adverse effects on soils near drilling locations. Some oil and gas development may result in slumping and accelerated soil loss, which would be locally important but not significant. Proper control of hazardous materials can minimize potential spills and accidents causing soil loss and damage, but will not completely eliminate this risk.

Livestock grazing can affect the soil in various ways. Cattle can remove vegetation which can expose the soil to excessive erosion. Cattle can also cause soil compaction and increase water runoff. Cattle can also physically break off stream banks and cause excessive sedimentation of streams.

OHV use can have localized impacts on soil resources. The largest impact from OHV use is sediment production and erosion from uncontrolled stream crossings, riding in wetlands, and compaction of soils in riparian areas from poorly placed four-wheel-drive roads.

4.14 TRANSPORTATION AND ACCESS

Roads and transportation corridors, as well as other access ways, occur on BLM-managed lands throughout the RMPPA. Management of transportation and access is essential in supporting other resource programs. Transportation planning helps provide efficient access by focusing on existing corridors and ROWs. Where necessary, transportation and access are constrained to existing corridors or limited in extent to minimize impacts on soils, vegetation, visual resources, and air quality and the risk of wildfires.

Activities such as mineral development, timber harvesting, and recreation drive the determination of access to areas within the RMPPA. Transportation and access for these activities are managed in corridors where possible and in part determine which access routes should be closed or expanded. Management of hazardous materials will affect how roads are used throughout the RMPPA, but especially in areas of mineral development. Development of ROWs on BLM lands has impacts by increasing access to otherwise inaccessible areas, improving utility corridors, and providing efficient delivery of natural gas to outside markets.

Some roadways are built by oil and gas companies and then abandoned and reclaimed once exploration is complete. Road reclamation practices are discussed in “Surface Operation Standards Oil and Gas Exploration and Development (Gold Book)”, and are

very similar to those practices used on abandoned well pads. Without a system for proper reclamation and closure, these roads represent a liability and hazard after oil and gas operations cease.

Permitting of new roads and ROWs is affected by the requirements for cultural and paleontological resource surveys and evaluations. These requirements can cause delays and increase costs of transportation and access planning. In addition, the presence of these resources can influence location and use of roads. In some cases, the most linear route of a road, pipeline, or other ROW may not be practicable because of the presence of resources needing protection from surface disturbance.

Protection of soils, watersheds, water quality, and riparian areas requires that roads and ROWs be constructed to reduce erosion and runoff, which can increase the cost of road or ROW development and maintenance. Access will be limited in certain areas to protect sensitive species and important habitats. Protection of visual resources through the VRMs system can influence the location and extent of transportation and ROW routes. This situation is most likely to arise in or near areas that are identified as Class I areas, which are designated for preservation of the existing landscape.

4.15 VEGETATION

Management actions designed to protect visual resources, wildlife areas, special management areas, watershed values, and riparian areas generally benefit and protect native vegetative species. Some short-term disturbance of vegetation can be expected due to construction of wildlife habitat and watershed management improvements. Impacts on vegetation can occur if natural wildlife movements, use of other resources, or their management lead to concentrations of species in certain areas.

Management actions to protect sensitive plant species, wildlife habitat, and riparian areas generally benefit all vegetation. Forest management designed to protect and enhance forest health will increase the diversity of vegetative species and improve habitat within forested areas.

Livestock grazing has a very direct affect on vegetation, and affects the majority of lands within the Pinedale RMPPA. Livestock grazing favors the production of shrubs over grass production. Certain highly preferred grasses would be at a competitive disadvantage. Although those plants would not completely disappear, they would likely be less common, and individual plants would be less productive where they are subject to repeated grazing. Some areas near water sources on some allotments are being over utilized, causing impacts on vegetation, whereas other areas are seldom grazed. Continuation of early livestock turnout on low elevation (desert) allotments may result in a long-term reduction of desirable grass species in sagebrush communities. Any grazing above the natural carrying capacity, or in the absence of proper grazing management, can result in impacts to vegetation communities, such as changes in species composition, and subsequent impacts to other resources including soil, wildlife habitat, and water quality.

Other impacts on vegetation are caused by management actions such as brush control. Vegetation treatments such as burning, chemical control, and mechanical treatments have a direct affect on the vegetation community by killing some species of plants and allowing increased production of other species. Although these treatments are usually designed to control the brush species such as sagebrush, they are not intended to eliminate the brush permanently. Eventually the shrub species will return to the site, but for a period of 10 to 25 years an increase in the grass and forb production on the treated sites is expected. Many constraints limit opportunities for vegetation treatment. By not allowing fire or other vegetation treatment mechanisms to periodically set back ecological succession, much of the sagebrush ecosystem will remain or eventually become decadent with lower productivity.

Mineral activity tends to create a net loss in desirable vegetation and an increase in weeds through the construction of drill pads, roads, facilities, pipelines, and other associated structures. Vegetation may also be impacted or lost through the development of other leasable, salable, and locatable minerals. However, these impacts tend to be very localized and short term if the disturbed area is reclaimed. Even after reclamation the plant community usually contains more weeds, fewer shrubs and lower plant diversity than would be found prior to construction activities.

The development of new roads and ROWs would have similar impacts.

The flora of the Ross Butte ecosystem and its habitat, as identified in Plant Species of Special Concern of the Ross Butte Ecosystem, are threatened by a continuation of minerals exploration and development and uncontrolled OHV use.

Wildfires can lead to a short-term loss in forage for livestock and wildlife and longer-term loss of habitat for some species. However, within 3 years, grasses and forbs may flourish in burn areas, increasing forage beyond original levels, and new habitat is present, albeit for different species. The surface disturbances associated with fire line construction, the use of heavy equipment, and other fire suppression activities can damage or destroy vegetation and accelerate erosion, causing at least short-term impacts.

Generally, management of hazardous materials will not affect vegetation resources, except in the case of a spill or illegal dumping, which could damage or destroy vegetation in a localized area.

OHV use often occurs in areas that are steep and readily eroded. Repeated OHV use can damage and destroy vegetation, leading to increased erosion and sedimentation. Concentrated recreational activities, especially near riparian areas, can damage vegetation through trampling, digging, cutting, and pulling.

4.16 VISUAL RESOURCES

Visual resources are impacted by the rapid increase of disturbances and facilities associated with fluid mineral exploration and development activities. Motorized OHV use contributes to visual impacts on a small scale in some localized areas. The

management of other natural resources and authorized uses such as fire and grazing also affect visual resources.

Visual impacts result from OHV use that cuts new trails and roads and accelerates soil erosion. OHV-produced visual degradation caused by the production of fugitive dust within the area has been categorized as localized, but short term.

Even with strong adherence to guidelines, standards, and APD stipulations, oil and gas development affects the visual quality of large areas within the RMPPA to a degree dependent on the density of well pads and the extent to which roads to pads are properly sited and dust control measures are followed. Direct, local adverse effects result from—

- Fugitive dust from road and well pad construction, and vehicle traffic associated with development
- The large number of proposed drilling sites and their associated drilling towers and support facilities, which alter the form, line, color, and texture of the landscape
- Increased night lighting of these wells and facilities that may introduce new, intrusive, and potentially undesirable elements into the visual landscape, affecting recreational opportunities and the recreational experience.

The wells, roads, and support facilities introduce new visual elements into the landscape and alter the form, line, color, and texture of the existing landscape. For example, Miller Mountain, south of LaBarge, is an undisturbed landscape with primitive 2-track roads. Unstable soils are characteristic within the area. Leasing and subsequent mineral development can cause irreversible impacts to the soils, scenery, culture, and vegetation of this natural landscape.

Even though vegetation rehabilitation occurs on ROWs, well-pads, etc, the area will continue to bear the remnants of the disturbance by construction for decades. Indirect, regional effects of oil and gas development may include degradation of air quality and the formation of regional haze (with associated loss of visual quality) from compressor engine emissions, vehicle emissions, and natural gases escaping from the oil and gas wells, especially when flaring occurs. Since 1988 increased oil and gas activity has had a significant effect on approximately 60,000 acres, and what was a very undisturbed rural setting has been changed to a highly developed industrial complex. With continued increases in oil and gas activity outside of existing fields, this trend would continue.

Range improvement projects in support of livestock grazing such as fences, and wells can also affect visual quality by introducing new visual elements into the landscape.

The Wyoming BLM Mitigation Guidelines for Surface Disturbing and Disruptive Activities, and the specific buffer and mitigation actions required of fluid mineral operators developed in the ROD for the Pinedale Anticline Oil and Gas Exploration and Development Project EIS and the Jonah II ROD constitute a substantial body of decisions aimed at reducing the impact of development on the visual landscape. For the most part,

these requirements are contained in APDs currently governing oil and gas (including CBM) development. Monitoring is key to ensuring that the visual character of the landscape is not affected beyond what is allowed by the guidelines and stipulations.

The long-term impact trends for visual resources under continued management direction are—

- Continued degradation of visual quality throughout the area from uncontrolled use of OHVs.
- Increased visual resource use conflicts between recreational users who seek a high level of visual quality (e.g., campers, hikers, river rafters and floaters, those traveling through the area, fishermen, hunters) and oil and gas development.
- Continued reduction in visual quality in other areas of the Pinedale RMPPA as fluid mineral exploration and development continue to expand under existing leases. Visual quality will likely be impaired from road construction, well pad construction, erection of drilling towers, placement and operation of well pumps, and construction and operation of facilities needed to maintain these activities.

Actions such as maintaining, improving, and restoring riparian values to provide increased forage, habitat, and stream quality, and managing forest lands for watershed, wildlife, and scenic values benefit visual resources. In addition, the active management of air quality throughout the RMPPA benefits visual resources by minimizing air particulates. Protecting National Historic Trails and other cultural and paleontological resources by not allowing visual disturbance enhances visual resources and visitors' experience of these resources throughout the RMPPA. Protection of Areas of Critical Environmental Concern (ACEC) limits access and protects the visual qualities of the areas. Timber harvests, clear cutting, and related road development can also detract from visual resource quality.

Impacts on visual resources associated with fire management, timber harvests, and land and realty actions are generally short term. Although wildfires and prescribed burns can be detrimental to visual resources, efforts to reduce the risks of wildfires will benefit visual resources. In addition, controlling the time and methods used for prescribed burns will minimize short-term impacts on visual resources.

4.17 WATER QUALITY AND WATERSHED

As part of BLM's resource management programs, surface water watersheds, ground water aquifers, and surface and ground water quality are evaluated for potential impacts within the RMPPA, although portions of these resources may extend beyond the area's boundary. It is important that artificial limits, such as the RMPPA boundary, do not limit consideration of potential impacts on the appropriate water resources in a larger geographic context. The anticipated impacts on water quality and watersheds are associated with sediment and salinity, grazing, mineral development, recreation, vegetation, wildfire, and roads and other surface disturbances.

Under the Existing Management Direction, management actions to control sediment and salinity buildup will continue to emphasize the reduction of soil erosion and contributions to the Green River Basin water system. Of particular importance are those areas with highly saline soils, such as the Soap Holes Basin, Alkali Creek, and other critical watersheds where surface disturbance should be minimized. These crucial watersheds are generally found within the boundaries of the ground water recharge zones.

Livestock grazing has the potential to negatively impact watershed resources and water quality if overgrazing occurs in riparian or upland areas. Over utilization can lead to a loss in vegetation, soil compaction, and bank instability, causing increased erosion, sedimentation, and salt and phosphate loads in streams. Proper management of grazing operations can limit these impacts.

Mineral development, with associated surface disturbances, may have the largest impact on water resources. Potential impacts include stream sedimentation, soil contamination, salt and phosphate loading, ground water contamination, changes in aquifers, augmented waterflows, and water disposal problems. APD and NEPA requirements will help minimize, but will not totally eliminate, impacts as development increases in the RMPPA. The possibility exists for ground water contamination from improper casing and cementing operations or undetected or unreported spills. In addition, dewatering of coalbeds or other geologic formations can adversely affect both quantity and quality of ground water, because such large areas are dewatered and the produced water is either re-injected elsewhere or allowed to evaporate.

Outdoor recreation near lakes and streams has the potential to affect water quality. Compaction of soils and loss of vegetation due to overuse of recreational areas can decrease stream stability, thereby causing increased sedimentation, and can add contaminants, such as salts and phosphate, to streams.

Fires can have short-term impacts on water quality and long term impacts if the proper conditions for vegetative growth exist and the resulting vegetation is managed properly. Vegetation removal can cause an augmented flow regime that forces stream channel readjustment to accommodate the larger flow. Water quality can be impacted by increased sedimentation and runoff in the short term after wildfire events because the vegetation has been removed. Conversely, improved vegetative cover in riparian areas and uplands benefits water quality and watershed resources by reducing sedimentation in streams and rivers. Land uses such as ROWs and roads can have impacts on watershed resources by increasing runoff and sedimentation.

4.18 WILD HORSES

Wild horses have been removed from the Pinedale RMPPA in accordance with the current RMP, although a small herd eluded capture in the 1990s and remains in the Desert Herd Management Area. No further impacts on wild horses are expected.

4.19 WILDLIFE AND FISHERIES

Many different wildlife and fish species reside in or travel through the RMPPA. It is important to recognize that some wildlife species are not necessarily year-round residents of the RMPPA and that evaluation of impacts should not be constrained by artificial limits such as the RMPPA boundary. For some wildlife or fish species, geographic units used by Wyoming Game and Fish Department are used to evaluate conditions or impacts within the RMPPA, although these unit boundaries may not be contiguous with RMPPA boundaries. Impacts on wildlife and fisheries are anticipated from oil and gas exploration and development activities, fire management, OHV use, livestock grazing, and management of other natural resources.

Management actions to improve vegetation, soils, and riparian areas improve wildlife habitat. Riparian management actions improve wildlife habitat by restoring preexisting plant communities. Since 70 percent of the wildlife in Wyoming resides in riparian areas or uses them as an important component of their habitat, restoration of these areas are very important to the wildlife and fisheries in the RMPPA. Vegetative treatment of riparian areas and river islands enhances wildlife habitats and improves forage and plant diversity. Spawning areas could be negatively affected in the short term following vegetative treatment, but these effects can be minimized by using buffer strips in treatment areas. The use of rotenone in the Green River Basin in 1962 and the introduction of nonnative fishes as part of former recreation management policies have severely impacted native fish species, including the Colorado River cutthroat trout. The biggest threats to this species are cross-breeding with introduced rainbow trout and restriction of pure strains to very small streams inaccessible to rainbow trout.

Forest management in the RMPPA serves to enhance forest health, thereby improving wildlife habitat for several species. In addition, increasing forest health can reduce erosion and sedimentation, which can improve habitat for native fish species such as the Colorado River cutthroat trout.

Retention of lands at the Cora Y highway crossing north of Pinedale, at the south end of Fremont Lake, and on other important wildlife migration routes has enabled free movement of migrating big game animals, thus benefiting wildlife.

Existing and anticipated oil and gas development impacts the habitats of several wildlife species throughout the RMPPA, including greater sage grouse nesting habitat and cover, raptor nests, and big game crucial winter range and birthing areas. Big game habitat loss and fragmentation result from road construction and road use, facility construction and placement, pipeline construction, field facility maintenance, and disturbance zones around these areas. Mitigation measures, transportation planning, and seasonal restrictions will minimize, but not eliminate, these impacts on wildlife.

Livestock grazing can cause increased dispersal of wildlife as well as competition for forage and water. In addition to competition for forage, livestock can also reduce the height of vegetation which can reduce cover needed by some species of wildlife. The impacts of grazing on wildlife habitats are important because virtually all of the lands

within the Pinedale RMPPA are grazed by livestock. The vegetation component of riparian areas is particularly affected by livestock, and these sites are critical for many species of wildlife.

Fire management can have short-term impacts on wildlife through direct wildlife mortality from fires or fire suppression, and reduction of forage and habitat in burn areas. After 2 to 3 years, these areas will regenerate vegetation that is beneficial to wildlife, although the type of habitat will have changed. Many species of wildlife benefit from fire in the long term. Fire can have short-term impacts on streams and watersheds through runoff affecting habitat and spawning areas for native fish.

Impacts of OHV use result from harassment during any season, but are particularly severe during late winter when energy reserves of many wildlife individuals may be depleted and many females may have the added stress of pregnancy. OHV use to harass and even chase big game in an effort to collect their antlers can also result in population effects through disruption of breeding activities and causing individuals to enter the winter with lower than optimal energy reserves. OHV management and enforcement reduce impacts on riparian areas, reduce stream sedimentation thus improving fish habitat, and decrease stress on wildlife from displacement and harassment.

Expanded public access in fluid mineral development areas may create impacts to wildlife.

4.20 SPECIAL MANAGEMENT AREAS

Under existing management direction, special areas have been identified to recognize particular important resources and enable them to be managed differently from surrounding areas. Currently, four areas are designated as special management areas: Rock Creek and Beaver Creek ACECs and Scab Creek and Lake Mountain WSAs. The management objectives for these areas are different so impacts on the areas will be discussed separately.

The Rock Creek ACEC is managed to protect important wildlife habitat areas for elk and Colorado River cutthroat trout. The management actions benefit these species, as well as other wildlife species. Mineral leasing cannot occur within the Rock Creek ACEC until a mineral and wildlife evaluation is completed. Therefore, impacts from mineral development are limited within the ACEC. Currently, the ACEC is designated a ROW avoidance or exclusion area, so that impacts from ROWs are minimal. However, mining activities outside the ACEC can affect the area through changes in air quality, visual resources, and wildlife. Livestock grazing can occur within the Rock Creek ACEC as long as impacts on the drainage are minimized. OHV and snowmobile use have been restricted within the area, thus minimizing the impacts of these activities. The quality of other dispersed recreational activities is improved by the emphasis on wildlife habitat and nonmotorized use.

The Beaver Creek ACEC is also managed to protect important habitat for elk calving and Colorado River cutthroat trout. However, management prescriptions are not as restrictive

as those in the Rock Creek ACEC. This area can be considered for mineral leasing and related activities, so that impacts can occur to resources within the area. These include surface disturbances, noise impacts, wildlife dispersal, and air quality and visual resource impacts. However, the development of a detailed activity plan, including transportation prescriptions and seasonal use restrictions, will help minimize impacts from development. Timber harvesting is allowed within the ACEC, but specific management actions limit harvests and methods to minimize any impacts on Colorado River cutthroat trout.

The existing Scab Creek and Lake Mountain WSAs will continue to be managed as WSAs until such time as Congress designates one or both of them as wilderness. Until such a determination is made, the wilderness values will be preserved for these two areas. However, there is a potential that activities outside the WSAs can affect the character of these areas. Further, development can impair air quality and visual resources. Dispersal of wildlife or changes in habitat outside the WSAs can affect how wildlife uses these areas.