

management by BLM to oversee maintenance, maintain closures, and monitor use.

The amount of traffic due to oil and gas development would depend on the rate and distribution of development in any one year. However, the estimated 79 wells drilled per year under this alternative would result in approximately 3,093 vehicle trips per day as shown for 80 wells in Table 4-34. Most of this traffic would be vehicles larger than pickups. If the number of wells drilled annually in areas above and below the rim were in the same proportion as assumed in the RFD (Appendix H), about 12 wells would be drilled at the higher elevations. If all of this traffic were to travel via Cow Creek Road via SH 13 to CR 5 in Rio Blanco County, the impact in 2023 of an additional 464 vehicle trips per day would represent an 11-percent increase on SH 13 north of Rifle and a 145-percent increase on CR 5. If all of the pickup truck traffic were to travel via the JQS Road, the impact on that road would be 162 trips per day, a 143-percent increase in 2023. BLM currently intends to preclude use of JQS Road for any oil and gas activities involving heavy or oversize vehicles, and the County may elect to establish restrictions for oil and gas travel involving pickup trucks or other smaller vehicles. The latter restrictions would be based on safety concerns and interference with other uses (e.g., recreational travel).

### **Indirect, Offsite, and Cumulative Impacts**

It is unlikely that the County road system within the Planning Area would grow because the dispersed private lands within the Planning Area are already served by County roads. The road network on private lands created to serve oil and gas development would continue to grow, adding as much as 884 miles of new roads to the area, assuming that the per-well average of 0.6 mile of access road per pad used in the RFD for BLM lands would also apply to private lands. The 350 miles of new or widened access roads on BLM lands would be in addition to this total.

County road maintenance costs would reflect the level of increased activity on County roads.

## **4.5 MANAGEMENT ENVIRONMENT**

### **4.5.1 Lands and Realty**

#### **4.5.1.1 Alternative I**

This alternative calls for the continuation of existing management. The principal element of this alternative for the lands and realty program is continued maintenance of the two withdrawals used to establish NOSRs 1 and 3 in 1916 and 1924, respectively. Continuation of the withdrawals means that the 54,485 acres of the former NOSRs would not be available for actions that could result in the land going to patent — i.e., being transferred to a private entity under the Mining Law of 1872 or being included in a land exchange between BLM and another public or private entity.

BLM would be able to authorize land uses that do not call for patenting public land, such as rights-of-way, on the former NOSRs. Those lands and the remaining 12,452 acres of public land in the Planning Area would be available for location of utilities, roads, and communication and other facilities (such as wind power generation facilities) and would be dealt with on a case-by-case basis. No utility corridor for electric transmission lines and pipelines would be designated along SH 13.

All lands listed as Category I (Disposal) in the 1988 revised GSRA RMP would remain as such, and all lands except the former NOSRs would remain as Category II (Exchange). The former NOSRs would remain as Category III (Retention) lands. A 40-acre parcel adjacent to the Rifle Sportsmen's Club would not be designated as potentially suitable for R&PP lease and patent.

All direct impacts upon the lands and realty program would be administrative in nature; there would be no direct environmental impacts. Other programs and resources would be affected by failure to revoke the NOSR withdrawals, by the maintenance of current land tenure categories, by failure to clarify the availability of

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land near the Rifle Sportsmen's Club for R&PP lease, and by failure to designate formal utility corridors.

This alternative would not have indirect, offsite, or cumulative environmental impacts on the lands and realty program.

### 4.5.1.2 Alternative II

Under this alternative, BLM would recommend the revocation of the withdrawals for NOSRs 1 and 3. If approved, this would allow entry and patenting under the Mining Law of 1872.

All public lands within the Planning Area, with the exceptions noted below, would be designated Category II and thus subject to multiple-use management and available for exchange. This would include several parcels (12 to 15, 21, and 22) that were identified for Disposal (Category I) under the 1988 GSRA RMP. The parcels are now contiguous with a more substantial parcel of public land (NOSR 3) and are no longer considered small or isolated.

Parcel 11 (approximately 40 acres in the NE¼, SW¼, Section 21, Township 6 South [T6S], Range 96 West [R96W]) and Parcel 20 (39.98 acres in Lot 10, Section 29, T6S, R94W) would remain Category I because they are small and isolated from other public land. Four other parcels formerly within the NOSR surface or mineral estate would be placed in Category I. They are located in the extreme northeastern portion of the Planning Area near SH 13 (35.28 in Lot 11, Section 6, T5S, R93W); on top of the plateau in the middle of a large tract of private property (39.7 acres in Lot 10, Section 10, and Lot 10, Section 11, T6S, R95W); just north of I-70 in the Cottonwood Gulch drainage (40 acres in the SE¼, NE¼, Section 33, T6S, R95W); and in the northwestern portion of the Planning Area (73.38 acres in Lots 5 and 7, Section 4, T5S, R95W).

Some 35,000 acres of the former NOSRs and another 5,000 acres would be classified as Category III lands. Their status as lands within one of four ACECs, within areas having wilderness character, or within the Hubbard

Mesa SRMA would preclude their consideration for exchange or sale.

The utility corridor along the west side of SH 13 and across Hubbard Mesa and Hubbard Gulch to I-70 would be identified as a formal BLM utility corridor for new pipelines and utilities. The 40-acre parcel adjacent to the Rifle Sportsmen's Club would be designated as suitable for expansion of the club under terms of the R&PP.

All direct impacts upon the lands and realty program would be administrative in nature, with no direct environmental impacts. Other programs and resources would be affected by the revocation of the NOSR withdrawals, by the change in land tenure categories, by the availability of land near the Rifle Sportsmen's Club for R&PP lease, and by the designation of formal utility corridors.

This alternative would not result in indirect, offsite, or cumulative environmental impacts upon the lands and realty program.

### 4.5.1.3 Alternative III – Preferred Alternative

The recommendations of the lands and realty program under this alternative would be the same as under Alternative II except that the acreage classified as Category III would be reduced because this alternative includes only two of the four ACECs proposed under Alternative II and no special protection for areas having wilderness character. However, 9,006 acres would be managed in ways that would protect roadlessness and naturalness (Map 36). The Hubbard Mesa SRMA would be classified as Category III under this alternative.

All direct impacts upon the lands and realty program would be administrative in nature, with no direct environmental impacts. The deferment of oil and gas leasing for a period of time could have reduce the demand for off-lease rights-of-way for pipelines and access roads until lands atop the plateau are leased. Other programs and resources would be affected by the revocation of the NOSR withdrawals, by the change in land tenure categories, by the availability of land near

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the Rifle Sportsmen's Club for R&PP lease, and by the designation of formal utility corridors.

This alternative would not cause indirect, offsite, or cumulative environmental impacts to the lands and realty program.

### 4.5.1.4 Alternative IV

The recommendations of the lands and realty program under this alternative would be the same as under Alternative II except that the acreage classified as Category III would be reduced because this alternative includes only two of the four ACECs proposed under Alternative II and no special protection for areas having wilderness character. The Hubbard Mesa SRMA would be retained under this alternative.

All direct impacts upon the lands and realty program would be administrative in nature, with no direct environmental impacts. Other programs and resources would be affected by the revocation of the NOSR withdrawals, the change in land tenure categories, the availability of land near the Rifle Sportsmen's Club for R&PP lease, and the designation of formal utility corridors.

This alternative would not cause indirect, offsite, or cumulative environmental impacts to the lands and realty program.

### 4.5.1.5 Alternative V

The recommendations of the lands and realty program under this alternative would be the same as under Alternative II except that no lands would be placed in Category III (Retention). The Hubbard Mesa OHV area would not be designated an SRMA, no lands would be designated as ACECs, and no special protection would be made for areas having wilderness character or specific wilderness values. Thus, all of those lands could be made available for exchange. With the exception of 268 acres classified as Category I (Disposal), the entire Planning Area would be classified as Category II (Exchange).

All direct impacts upon the lands and realty program would be administrative in nature, with

no direct environmental impacts. Other programs and resources would be affected by the revocation of the NOSR withdrawals, by the change in land tenure categories, by the availability of land near the Rifle Sportsmen's Club for R&PP lease, and by the designation of formal utility corridors.

This alternative would not have indirect, offsite, or cumulative environmental impacts on the lands and realty program.

## 4.5.2 Onsite Travel Management

### Introduction

Travel management in the Planning Area would vary among the five alternatives, depending on the area included in each of the three travel management designations; that is, according to the acreage that would be open to motorized or mechanized cross-country travel, or limited to designated routes, or closed to motorized and mechanized travel. Additionally, the alternatives vary in the degree to which available routes are open to public use, versus administrative use only or closed to all use.

Table 4-35 in Section 4.4.4 summarizes the OHV designations and route management by alternative. Over-snow travel by snowmobile would be allowed throughout the Planning Area under all alternatives, except that Alternative II would limit snowmobiles to designated routes.

Under all five alternatives, access to the area atop the plateau for oil and gas development would be via the existing Cow Creek Road, which enters the area from Rio Blanco CR 5 to the north, or from an approved route on private land. The closer access route from Rifle, the JQS Road (Garfield CR 242) would not be available for oil and gas use involving heavy or oversize vehicles. This decision by BLM is based on the steep, narrow, and winding nature of the JQS road, the highly erodible soil through which it passes, the unacceptable visual impacts that would accompany any attempts to improve the road for use by large vehicles, and the unacceptable level of interference with travel by other users when it is passable.

Also under all five alternatives, future closure of any existing routes would include reclamation, typically consisting of decompaction, recontouring, seeding with an appropriate native seed mix, and (where needed) installing an erosion-control fabric or similar material. Upon abandonment, any new roads constructed for oil and gas development would also be reclaimed, unless BLM determines that a road should be retained for another use. During the period of oil and gas drilling and production, roads constructed for that purpose are to be closed to public use; in most cases, locked gates will be placed across the roads to prevent public access.

### 4.5.2.1 Alternative I

Under Alternative I, existing management and current uses would continue. No oil and gas leasing would occur on NOSR 1 and on portions of NOSR 3 that have not already been leased. BLM would continue to provide opportunities for non-motorized, mechanized, and motorized travel within the framework of existing management. Because the interim travel management designations on the transferred lands are temporary, contingent on land use planning, those designations would be vacated and travel management would return to the system in place when BLM receives jurisdiction. The entire 66,934 acres of public surface land in the Planning Area would be open to motorized or mechanized cross-country travel, and all 259 miles of existing routes would be open to public use (Table 4-35 and Map 31).

Impacts on travel management are summarized below by resource management program. If a program is not listed, it means that program is not expected to affect the system of roads and trails.

#### Impacts of Recreation Management

Continuation of existing management is likely to result in a continued, gradual increase in the amount of motorized and mechanized use as the local population increases and as the popularity of the Hubbard Mesa area as a year-round OHV area grows. Travel above the rim would continue to be greatest during hunting season.

Hunters using ATVs and high-clearance vehicles to hunt, set up camps, and retrieve game would continue to rely on existing trails and to pioneer new trails. Hunting and other recreation uses would result in creation of additional routes over the long term. Problems created by driving on wet roads or cross-country travel, such as tearing up road surfaces or creating ruts across open meadows, would continue to require road maintenance, reclamation, and rehabilitation. The unregulated nature of travel in the Planning Area would result in a minor impact in the short term, as changes in the number, type, and use of roads would be imperceptible at first. In the long term, impacts would be moderate to major as the accumulation of routes and the increase in motorized and mechanized use begins to limit the opportunities for non-motorized activities.

#### Impacts of Oil and Gas Development

Where public mineral estate is currently leased or available for lease, oil and gas drilling and production would eventually result in as much as 152 miles of new or improved/widened road, all but 4 miles of which would be below the rim. Although new oil and gas roads would be limited to administrative use, the industrial traffic would cause associated generation of noise and dust, diminution of visual quality, and changes in wildlife use.

Section 4.4.4 discusses impacts to traffic volumes associated with oil and gas development, including an estimated 1,160 total vehicle trips and 39 average daily vehicle trips to complete a single well — and not including trips during operation and maintenance. Road segments shared by oil and gas lessees and recreational travel, whether vehicular or non-motorized and non-mechanized, would represent a conflict for the latter group in terms of traffic, noise, safety, and quality of the experience.

#### Impacts of Livestock Management

Over the long term, livestock management could periodically require construction of fences, ponds, springs, and other range improvement projects. Each of these could require a new road or trail which would continue to be available for

maintenance of range improvements and would also be available for motorized or mechanized use by the public.

### **Impacts of Wildlife and Special Status Species Management**

Seasonal restrictions to protect wildlife, special status species, or their habitat can limit use and, temporarily, the construction of roads and trails. Other applicable stipulations could limit the construction of new roads or trails. Exceptions could be granted based on approval by the authorized officer.

### **Impacts of Weeds**

Roads and trails serve as conduits for introduction and spread of invasive plants, including State-listed noxious weeds (see Section 4.3.3). Noxious weeds and other undesirable invasive plants generally share the ability to become established and proliferate quickly once introduced into suitable environments such as disturbed ground along roads and other travel routes. The spread of weeds is usually at the expense of more desirable native plant (and, indirectly, wildlife) species. Roads and trails are ideal corridors for weed dispersal because they damage or destroy the native vegetation, create patches of bare soil ideal for colonization, result in soil compaction that native species cannot tolerate, change the hydrologic regime by increasing or disrupting runoff, create a zone of warmer temperatures, create zones of dust accumulation, or (if magnesium chloride is used as a dust suppressant) create a zone of saline conditions. Vehicle tires, boot laces, and livestock hoofs can serve as vectors for weeds once they become established.

### **Impacts on Riparian Zones and Wetlands**

To maintain or improve the functioning of riparian zones, existing roads and trails may be rerouted, repaired (e.g., a culvert installed), or removed. New routes would be constructed to avoid impacts to riparian zones and wetlands. Exceptions could be granted by the authorized officer.

### **Indirect, Offsite, and Cumulative Impacts**

The estimated 152 miles of new roads for oil and gas development would be in addition to any new roads or trails constructed for grazing and range management and any new routes created by cross-country travel. The road network on private lands created to serve oil and gas development would also continue to grow, adding as much as 884 miles of new or widened access roads to the Planning Area, assuming that the per-pad average of 0.6 mile used in the RFD for BLM lands would also apply to private lands.

In addition to multiple secondary impacts on natural resources and ecosystem values, the increased road network would generate additional routes and trails pioneered by motorized recreationists using the open access roads. This would be a natural consequence of the cross-country travel that would be permitted on BLM land under this alternative.

Indirect impacts on resources and management programs would be created by the expanded road system as previously isolated areas of public land would be opened up to motorized and mechanized use. New oil and gas roads would be closed to public use. However, the visual and ecological impacts of new and widened/improved roads and the increased generation of dust and noise from oil and gas vehicles could reduce the quality of the recreational experience on designated routes.

Oil and gas traffic in previously isolated areas would change their character from predominantly recreational use to motorized industrial use. Many of the recreationists who make use of these areas because of the isolation and quiet would be displaced.

#### **4.5.2.2 Alternative II**

This alternative would emphasize landscape management, natural values, and wilderness character, featuring the area's ecological richness and unique ecosystem values. The 21,382 acres in the three areas having wilderness character would be closed to motorized and

mechanized travel. The remaining 45,552 acres would be limited to designated routes, including over-snow conveyance. A total of 43 miles of existing roads would be closed and rehabilitated, including 34 miles above the rim and 9 miles below (Table 4-35 and Map 32). Another 43 miles above the rim would be limited to administrative uses. A total of 173 miles would be open, 75 miles above the rim and 98 below the rim. Of the latter, 35 miles would be in the Hubbard Mesa SRMA. Unlike Alternative I, new routes associated with oil and gas development would be limited to administrative access only.

Impacts are summarized below by resource management program. If a program is not listed, it means that program is not expected to affect the system of roads and trails.

### **Impacts of Recreation Management**

Implementation of this alternative would result in a reduction of 21,382 acres in the area available for OHV use and would prohibit cross-country travel. A total of 43 miles of existing roads and trails would be closed and rehabilitated, reducing the supply for motorized recreation. Closure of the entire Planning Area to cross-country motorized or mechanized travel would prevent or limit the gradual, incremental growth of the road and trail network due to pioneering of new routes. The overall result of these changes would be a more balanced offering of motorized and non-motorized opportunities on public lands.

### **Impacts of Oil and Gas Development**

The 21,021 acres within the Planning Area that would be available for oil and gas development under this alternative could result in up to 186 miles of new or improved/widened access roads, including 40 miles above the rim. New roads would be designated for administrative access only, but existing roads would remain open to the public unless otherwise identified for closure. This growth in the road system would allow vehicular traffic into previously isolated areas of public land. Although new roads would be limited to administrative use, the industrial

traffic would cause associated generation of noise and dust, diminution of visual quality, and changes in wildlife use.

Section 4.4.4 discusses impacts to traffic volumes associated with oil and gas development, including an estimated 1,160 total vehicle trips and 39 average daily vehicle trips to complete a single well — and not including trips during operation and maintenance. Road segments shared by oil and gas lessees and recreational travel, whether vehicular or non-motorized and non-mechanized, would represent a conflict for the latter group in terms of traffic, noise, safety, and quality of the experience.

### **Impacts of Areas having Wilderness Character**

Identifying and providing special (protective) management prescriptions for areas having wilderness character under this alternative would impact travel management by closing 43 miles of routes to motorized and mechanized use. Conversely, several large reservoirs of non-motorized recreational opportunities would become available.

### **Impacts of ACEC Designation**

Designation of four ACECs would require limitation of motorized and mechanized traffic to designated roads and trails.

### **Impacts of Visual Resource Management**

The principal VRM proposal in this alternative that would affect travel routes is the use of NGD/NSO stipulations to maintain VRM Class I standards and protect visually sensitive areas in the I-70, SH 13, and East Fork Parachute Creek viewsheds. These NGD/NSO areas represent about 50,000 acres in which new roads or trails could be developed if in line with the management prescription of the special designation or a proposed mitigation activity. If outside a special designation area, such as a VRM Class I area, roads and trails could be developed only if they maintain the natural character and scenic quality of the landscape. Limited activities may be allowed if the basic

landscape elements are repeated and natural appearing.

### **Impacts of Livestock Management**

Over the long term, livestock management would require periodic construction of fences, ponds, springs, and other range improvement projects. Each of these may well require a new road or trail that would continue to be available for maintenance of range improvements. Those roads would not be built in the areas having wilderness character or areas protected by NGD/NSO stipulations. New roads for this use would be open only for administrative uses.

### **Impacts of Wildlife and Special Status Species Management**

Seasonal restrictions to protect wildlife, special status species, or their habitat could limit use and, temporarily, the construction of roads and trails. Other applicable stipulations could limit construction of new roads or trails. Exceptions could be granted based on approval by the authorized officer.

### **Impacts of Weeds**

Roads and trails serve as conduits for the introduction and spread of invasive plants, including State-listed noxious weeds (see Section 3.3.1). Noxious weeds and other undesirable invasive plants generally share the ability to become established and proliferate quickly once introduced into suitable environments such as disturbed ground along roads and other travel routes. The spread of weeds is usually at the expense of more desirable native plants (and, indirectly, wildlife). Roads and trails are ideal corridors for weed dispersal because they damage or destroy the native vegetation, create patches of bare soil ideal for colonization, result in soil compaction that native species cannot tolerate, change the hydrologic regime by increasing or disrupting runoff, create a zone of warmer temperatures and dust accumulation, or (if magnesium chloride is used as a dust suppressant) create a zone of saline conditions. Vehicle tires,

bootlaces, and livestock hoofs can serve as vectors for weeds once they become established.

### **Impacts on Riparian Zones and Wetlands**

To maintain or improve the functioning of riparian zones, existing roads and trails may be rerouted, repaired (e.g., a culvert installed), or removed. New routes would be constructed to avoid impacts to riparian zones and wetlands. Exceptions may be granted by the authorized officer.

### **Indirect, Offsite, and Cumulative Impacts**

Adding up to 186 miles of new roads to the existing 259 miles due to oil and gas drilling would be offset to some extent by closing and rehabilitating 43 miles of existing roads. The road network on private lands would also continue to grow, adding as much as 884 miles of new or improved/widened roads to the area assuming that the RFD estimate of 0.6 mile per pad applies to these lands.

Oil and gas access roads would have multiple secondary impacts on natural resources and ecosystem values because of physical disturbance from construction and increased vehicular use in areas of public and private land that had previously been isolated. Limiting new roads on public lands to administrative access, while beneficial, would not eliminate secondary impacts.

#### **4.5.2.3 Alternative III – Preferred Alternative**

Under Alternative III, motorized and mechanized travel in portions of the Planning Area with BLM surface — a total of 66,934 acres — would be limited to designated routes, including snowmobiles. A total of 26 miles of existing road would be closed and rehabilitated; another 24 miles would be limited to administrative uses, and 209 miles would be open, of which 35 miles are in the Hubbard Mesa SRMA (Table 4-35 and Map 33). New roads associated with oil and gas development would be designated for administrative use only.

Impacts are summarized below by resource management program. If a program is not listed, it means the program is not expected to affect the system of roads and trails.

### **Impacts of Recreation Management**

Implementation of this Alternative would not reduce the area available for OHV use but would halt cross-country motorized or mechanized travel. The gradual, incremental growth of the road and trail network due to pioneering of new routes cross-country should be greatly reduced. It is expected that enforcement needs may grow and that maintenance needs may also grow as BLM attempts to maintain a system of designated routes.

### **Impacts of Oil and Gas Development**

With the entire Planning Area available for lease (although deferred atop the plateau), oil and gas drilling would eventually occur over the entire area and would result in up to 241 miles of new or widened access roads, including 23 miles above the rim. All new roads would be designated for administrative access only. Despite this limitation, the growth in the road system would open previously isolated areas of public land to motorized use. The limitation to administrative use of new roads would be beneficial but would not eliminate the increased generation of noise and dust, diminution of visual quality, and changes in wildlife use along new roads or existing roads improved for oil and gas access.

Section 4.4.4 discusses impacts to traffic volumes associated with oil and gas development, including an estimated 1,160 total vehicle trips and 39 average daily vehicle trips to complete a single well — and not including trips during operation and maintenance. Road segments shared by oil and gas lessees and recreational travel, whether vehicular or non-motorized and non-mechanized, would represent a conflict for the latter group in terms of traffic, noise, safety, and quality of the experience.

### **Impacts of ACEC Designation**

Special management stipulations associated with designation of two ACECs would require limitation of motorized and mechanized traffic to designated roads and trails.

### **Impacts of Visual Resource Management**

The principal VRM proposal in this alternative that would affect the system of roads and trails and route management is the NGD/NSO stipulation to protect visually sensitive areas in the I-70, SH 13, and East Fork Parachute Creek viewsheds. This NGD/NSO represents about 15,000 acres in which new roads or trails could be developed in line with the management prescription of the special designation or a proposed mitigation activity. If outside a special designation area, such as a VRM Class I area, roads and trails could be developed only if they maintain the natural character and scenic quality of the landscape. Limited activities could be allowed if the basic landscape elements are repeated and natural appearing.

### **Impacts of Livestock Management**

Over the long term, livestock management would require periodic construction of fences, ponds, springs, and other range improvement projects. Each of these may well require a new road or trail which would continue to be available for maintenance of range improvements. Those roads would not be built in areas protected by NGD/NSO stipulations. Any new roads for this use would be open only for administrative uses.

### **Impacts of Wildlife and Special Status Species Management**

Seasonal restrictions to protect wildlife, special status species, or their habitat could limit use and, temporarily, construction of roads and trails. Other applicable stipulations could limit construction of new roads or trails. Exceptions could be granted based on approval by the authorized officer.

### Impacts of Weeds

Roads and trails serve as conduits for introduction and spread of invasive plants, including State-listed noxious weeds (see Section 3.3.1). Noxious weeds and other undesirable invasive plants generally share the ability to become established and proliferate quickly once introduced into suitable environments such as disturbed ground along roads and other travel routes. The spread of weeds is usually at the expense of more desirable native plants (and, indirectly, wildlife). Roads and trails are ideal corridors for weed dispersal because they damage or destroy the native vegetation, create patches of bare soil ideal for colonization, result in soil compaction that native species cannot tolerate, change the hydrologic regime by increasing or disrupting runoff, create a zone of warmer temperatures, create zones of dust accumulation, or (if magnesium chloride is used as a dust suppressant) create a zone of saline conditions. Vehicle tires, bootlaces, and livestock hoofs can serve as vectors for weeds once they become established.

### Impacts on Riparian Zones and Wetlands

To maintain or improve the functioning of riparian zones, existing roads and trails could be rerouted, repaired (e.g., a culvert installed), or removed. New routes would be constructed to avoid impacts to riparian zones and wetlands. Exceptions could be granted by the authorized officer.

### Indirect, Offsite, and Cumulative Impacts

Adding up to 241 miles of new roads to the existing 259 miles due to oil and gas drilling would be offset only slightly by closure and rehabilitation of 26 miles of existing roads. New roads or trails built for range improvements would add to the oil and gas total. The road network on private lands would continue to grow, adding as much as 884 miles based on the per-well average of 0.6 mile used in RFD for BLM lands.

Oil and gas access roads would have multiple secondary impacts on natural resources and ecosystem values, not only due to physical disturbance but also because the expanded route network would increase vehicular traffic in areas of public and private land that had previously been isolated. Limiting new roads on public lands to administrative access would not eliminate secondary impacts.

#### 4.5.2.4 Alternative IV

The analyses and resulting impacts of Alternative IV are the same as Alternative III.

#### 4.5.2.5 Alternative V

Under Alternative V, motorized and mechanized travel would be limited to designated routes in all portions of the Planning Area having BLM surface — a total of 66,934 acres — except that this restriction would not apply to over-snow travel by snowmobile. None of the existing roads or trails would be closed and rehabilitated, and the entire 259-mile network would be open to motorized and mechanized uses (Table 4-35 and Map 34). New routes associated with oil and gas development would be designated for administrative use only.

Impacts are summarized below by resource management program. If a program is not listed, it is not expected to affect the system of roads and trails.

### Impacts of Recreation Management

Implementation of this alternative would prohibit cross-country travel but would continue to permit motorized access to all parts of the Planning Area. This would greatly reduce or prevent the gradual, incremental growth of the road and trail network due to pioneering of new routes by cross-country travel. It is expected that enforcement and maintenance needs may grow as BLM attempts to maintain a system of designated routes.

### **Impacts of Oil and Gas Development**

All Federal mineral estate within the Planning Area would be available for lease and development. Oil and gas drilling would eventually occur on most of that land and would result in up to 350 miles of new or improved/widened roads, including 105 miles above the rim. New roads would be designated for administrative access only. However, the growth in the road system would cause previously isolated areas of public land to be opened to motorized use. The limitation to administrative use of new roads would be beneficial but would not eliminate the generation of noise and dust, diminution of visual quality, or changes in wildlife use.

Section 4.4.4 discusses impacts to traffic volumes associated with oil and gas development, including an estimated 1,160 total vehicle trips and 39 average daily vehicle trips to complete a single well — and not including trips during operation and maintenance. Road segments shared by oil and gas lessees and recreational travel, whether vehicular or non-motorized and non-mechanized, would represent a conflict for the latter group in terms of traffic, noise, safety, and quality of the experience.

### **Impacts of Livestock Management**

Over the long term, livestock management would from time to time require construction of fences, ponds, springs, and other range-improvement projects. Each could require a new road or trail which would continue to be available for maintenance of range improvements and for public use. Any new roads for this use would be open only for administrative uses.

### **Impacts of Wildlife and Special Status Species Management**

Seasonal restrictions to protect wildlife, special status species, or their habitat could limit use and, temporarily, construction of roads and trails. Other applicable stipulations could limit construction of new roads or trails. Exceptions

could be granted based on approval by the authorized officer.

### **Impacts of Weeds**

Roads and trails serve as conduits for the introduction and spread of invasive plants, including State-listed noxious weeds (see Section 3.3.1). Noxious weeds and other undesirable invasive plants generally share the ability to become established and proliferate quickly once introduced into suitable environments such as disturbed ground along roads and other travel routes. The spread of weeds is usually at the expense of more desirable native plants (and, indirectly, wildlife). Roads and trails are ideal corridors for weed dispersal because they damage or destroy the native vegetation, create patches of bare soil ideal for colonization, result in soil compaction that native species cannot tolerate, change the hydrologic regime by increasing or disrupting runoff, create a zone of warmer temperatures or dust accumulation, or (if magnesium chloride is used as a dust suppressant) create a zone of saline conditions. Vehicle tires, bootlaces, and livestock hoofs can serve as vectors for weeds once they become established.

### **Impacts on Riparian Zones and Wetlands**

To maintain or improve the functioning of riparian zones, existing roads and trails could be rerouted, repaired (e.g., a culvert installed), or removed. New routes would be constructed to avoid impacts to riparian zones and wetlands. Exceptions could be granted by the authorized officer.

### **Indirect, Offsite, and Cumulative Impacts**

Adding as many as 350 miles of roads to the existing 259 miles due to oil and gas drilling could more than double the road network on BLM land in the Planning Area. New roads for range improvements would add to that total. The road network on private lands created to serve oil and gas development would continue to grow, adding as much as 884 miles of new or improved/widened roads based on the RFD assumption of 0.6 mile of new roads per pad.

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Oil and gas access roads would have multiple secondary impacts on natural resources and ecosystem values, not only because of physical disturbance during construction but also because the expanded road network would increase vehicular traffic in areas that had previously been isolated. Limiting new roads on public lands to administrative access would not eliminate secondary impacts.

**4.5.3 Recreation**

**Introduction**

**Assumptions** — Public lands are increasingly crucial for neighboring communities as “close-to-home” open spaces and recreation opportunities are disappearing. The recreation management challenge is formidable, whether preserving existing recreational opportunities, intermingling the desired recreational opportunities of new/different users, or commingling recreation with other land uses.

All five alternatives offer dispersed recreation opportunities consistent with the management of other priority land uses. The activity, settings, and experience/outcome opportunities vary among the five alternatives in terms of quantity, quality, and distribution. If recreation settings

change too much, some recreational opportunities will be lost and some visitors will likely be displaced.

**Recreation Opportunity Spectrum (ROS)** — Planners must consider the short-term and long-term effects of a resource activity to determine the impacts on the recreational opportunity (Clark and Stankey 1979). Changing the physical, social, and administrative characteristics of the recreational setting provides different opportunities for recreation.

The ROS (shown in Maps 39 through 42) is an analytical tool for portraying the existing character of recreational settings and prescribing desired future conditions. The areas of various ROS classes located on public lands within the Planning Area are summarized in Table 4-36. The relationship between on-the-ground actions, consequent changes to setting structure, and the activity and experience opportunities produced enables recreation managers to shift from managing only for activities to managing for explicitly stated recreation outcomes (Driver et al. 1991).

**Table 4-36. Acres of ROS Classes for Public Lands (Surface Ownership) <sup>1</sup>**

Class	Existing	Alternative				
		I <sup>2</sup>	II	III	IV	V
Urban	0	0	0	0	0	0
Rural	2,826	8,372	8,372	8,372	8,372	8,372
Front Country	19,076	14,319	36,635	57,295	57,295	58,053
Middle Country	24,539	24,133	21,345	684	684	9
Back Country	20,493	20,110	583	583	583	500
Primitive	0	0	0	0	0	0

<sup>1</sup> ROS mapping and acreage estimates were based on foreseeable development and use according to management scenarios for each alternative.

<sup>2</sup> Eventually, cross-country travel would create unestimated reductions in backcountry and increase middle-country settings under Alternative I due to no restrictions on cross-country motorized or mechanized travel.

**Impacts Common to All Alternatives** — Recreation managers are interested in the benefits of recreation (Driver et al. 1991, Driver 1995, Driver and Bruns 1999), specifically how

management actions and setting conditions facilitate the creation of recreation opportunity outputs and realization of outcomes in the form of improved conditions (i.e., satisfying

experiences and benefits) (Lee and Stein 1995). The combination of management, marketing, and monitoring actions are the means by which collaborating partners effect necessary setting conditions and produce desired recreation opportunities (i.e., for activities, experiences, and improved/worsened conditions for individuals, communities, their economies and the environment. Visitor or community surveys have not been conducted; little objective data is available regarding specific visitor and community preferences or demand that could be used to evaluate reasonably foreseeable significant impacts. The deficiency is relevant because it hinders the objective assessment of the positive (beneficial) and negative (adverse) outcomes of recreation management versus other resource uses or the differences in outcomes among alternatives. However, qualitative data generated from scoping provide a basis for some qualitative evaluations.

Activities, settings, and experience/benefit outcomes are consequential to people who live in adjoining communities and those who recreate in the Planning Area. Since recreation is not a management focus but an allowable multiple use, the effects to participants and their recreation opportunities are inconsequential to achieving the general management objective of any alternative.

### ***Recreation Management Guidelines to Meet Standards for Public Land Health in Colorado.***

In February 1997, Standards for Public Land Health in Colorado (Appendix F) were approved by the Secretary of the Interior and adopted as decisions in all of BLM's resource management plans. The standards describe natural resource conditions needed to sustain land health and encompass upland soils, riparian systems, plant and animal communities, threatened or endangered and other special status species, and water quality. The standards relate to all uses of public lands. Based on the increased awareness and understanding of the environmental impacts of outdoor recreation, recreation management guidelines (Appendix E) were developed to help achieve and maintain healthy public lands. The guidelines are tools, methods, and techniques

that help managers maintain or meet the standards.

***Effects on Recreation from Oil and Gas Development.*** Oil and gas development and production facilities often adversely impact recreation opportunities through physical/visual disturbance, noise, odors, and additional traffic and people. Within appropriate densities, effectively designed and implemented gas development can be compatible with maintaining middle-country, front-country, rural, or urban ROS classes and the connected recreational opportunities.

Oil and gas facilities, including pads, pipelines, compressors, and new or widened access roads, would fragment leased lands, including the Hubbard Mesa OHV riding area. Maintenance and improvement of the road system is critical for accessing gas wells but improvements can ruin the opportunity for challenge and the thrill of driving on rough four-wheel drive roads. Having a mixed system of routes in which some are open only for administrative use by oil and gas companies and some are open to the public would create confusion and would require a more intensive field presence to monitor and manage use.

Oil and gas development is likely to displace big game by distances of 0.25 to 0.5 mile from roads, depending on traffic, road quality, topography, and density of vegetation cover near the road (Noss 2002). Changes in big game habitats and habits would alter the experience or even displace people who visit because they enjoy the wildlife, scenery, views, and aesthetics of the area. Onsite outfitter/guide operations would be affected. Offsite changes would likely involve reduced economic contributions from hunting-related tourism to the towns of Rifle, Silt, New Castle, Meeker, and Parachute, as well as Garfield County.

***Effects on Recreation from Wildlife and Special Status Species Management.*** Wildlife management would directly affect recreation settings and opportunities. Access changes, in both type and mode, to protect wildlife or special status species habitat would concentrate

motorized recreationists on fewer miles of open routes. Those same changes would expand recreation opportunities for people desiring to escape the sights and sounds of motorsport activities. Depending on the activity, the recreational experiences — such as escaping everyday responsibilities and other people; enjoying frequent access to outdoor physical activity; and enjoying area wildlife, scenery, views, and aesthetics — would be altered positively or negatively. Timing restrictions and seasonal closures during sensitive periods such as winter would temporarily displace visitors to other areas.

### ***Effects on Recreation from Livestock Grazing.***

Signs of livestock grazing, such as the presence of cattle or sheep, fences, driveways, stock tanks and ponds, cropped forage, trampled vegetation, or manure affect the natural aesthetics for some recreationists and impair their ability to enjoy the scenery, views, and aesthetics of the area. Visitors who prefer a livestock-free experience yet choose to visit areas that are actively grazed are most keenly affected.

### ***Effects on Recreation from Travel Management.***

Recreational roads and trails enhance the quality of life for many community residents by providing convenient access to the outdoors for enjoyment and relaxation while promoting health and fitness. A system of designated routes would reduce recreation impacts on other resources and could reduce recreational trespass on adjacent private lands. However, visitors who enjoy freedom of access and movement would be displaced. Directional signing assists visitors in finding their destinations but distracts from naturalness. Travel and transportation directly affects setting remoteness, naturalness, site management, and social encounters. Hunting, wildlife viewing, outfitters, and tourism would be negatively affected by an increase in cross-country travel if big game animals are displaced or habitats are fragmented.

### ***Effects on Recreation from Transportation Management and Access.***

Maintenance of the road system is critical for recreational access but can ruin the challenge and thrill of driving on

rough four-wheel drive roads. Having a mixed system of routes where some are open only for administrative uses (e.g., livestock permittees, oil and gas companies) and some are open to the general public would create confusion and require a more intensive field presence to monitor and manage use. It would also necessitate better informational signing and brochures. Since the Planning Area is open country, it is unlikely that gating roads would be a successful way to manage users. Hunting, wildlife viewing, outfitters, and tourism would be negatively affected by an increase in the transportation system routes and access whenever big game animals are displaced or habitats are fragmented.

#### **4.5.3.1 Alternative I**

All public lands would remain part of the custodially managed Glenwood Springs ERMA. Continued custodial recreation management with the proposed land uses would allow incremental and cumulative changes to the physical, social, and managerial recreational settings and current recreation opportunities. Cross-country travel would allow freedom of access and movement but create unplanned reductions in the backcountry and increased middle-country recreational settings (Map 39). Resource problems and conflicts with owners of adjacent private lands would likely rise with anticipated increases in recreational use and landscape-wide unrestricted travel.

Public lands within existing oil and gas leases would be further developed consistent with existing lease rights and shift toward a more rural recreation setting. This alternative would represent the lowest amount of cumulative change to current recreation activities, settings, and outcomes area-wide.

The development of recreational facilities is not probable unless determined necessary on a case-by-case basis to protect resources. Recreation management could be accomplished with current staffing and funding levels.

#### 4.5.3.2 Alternative II

Most public lands would remain part of the custodially managed Glenwood Springs ERMA. Generally, this alternative provides decreased opportunities for people seeking backcountry and middle-country recreational settings and increased opportunities for people seeking front-country and rural settings. Depending on the setting preferences of visitors, the recreational opportunities would be altered positively or negatively.

Within moderate densities appropriate to the ROS class, effectively designed and implemented oil and gas development could be compatible with maintaining recreational settings and opportunities. However, the direct and indirect impacts of the anticipated oil and gas development, plus other land-use activities, limiting travel to designated routes, rerouting around private lands, and an overall increase in visitor use would cumulatively shift recreation toward a more front-country/rural setting.

Management challenges would arise if mechanized and motorized users want to be separated on designated routes. A system of designated routes would reduce recreational trespass on adjacent private lands and protect other resources from indiscriminant OHV use.

The development of recreational facilities is unlikely unless necessary on a case-by-case basis to protect resources. Recreation administrators would need additional field staff and funding to implement and manage travel and the combination of land uses.

Areas having wilderness character usually support non-motorized activities and backcountry experiences in relatively unmodified settings. However, because these areas are mixed with areas that are open for oil and gas leasing, the overall effect is an acreage reduction of the backcountry ROS class (Table 4-36 and Map 40). Road improvements and the presence of gas facilities would alter the recreational experience by decreasing remoteness and naturalness. Consequently, visitors would not be able to attain setting-

dependent experiences/outcomes that normally go hand-in-hand with areas having wilderness character.

#### Hubbard Mesa SRMA

Alternative II delineates a 2,460-acre OHV/biking SRMA to be managed for motorized and mechanized sports (Appendix E). Administratively, an inconsistency exists between identifying an SRMA for concentrated recreation use and managing for intensive oil and gas development. SRMAs are normally defined to direct recreation funding and personnel to lands where a commitment has been made to provide specific recreation activities, settings, and desired experience/outcome opportunities. Alternative II does not propose a long-term commitment to managing the physical, social, and managerial settings to sustain the current and targeted recreational experience/outcome opportunities (Appendix E). Furthermore, SRMAs usually identify a need for major investments in facilities, visitor services, or funding. None is identified under this alternative.

From a visitor's point of view, changes in the front-country recreation setting need not be balanced within a natural-appearing environment (Appendix E). The proposed oil and gas development alone will cause observable and long-term physical and social changes and shift the SRMA to a more rural recreation setting. This will inherently change the recreational experience/outcomes. Recreationists who prefer the current or targeted recreation setting will likely be displaced.

Managerially, traveling on a system of designated routes will offer a recreational experience no different from that found elsewhere in the Planning Area. Since no other riding/driving area comparable to Hubbard Mesa exists locally on public land, the recreation opportunities currently afforded on Hubbard Mesa will be lost.

**4.5.3.3 Alternative III – Preferred Alternative**

Most public lands will remain part of the custodially managed Glenwood Springs ERMA. This alternative represents decreased opportunities for people seeking backcountry or middle-country recreational settings and increased opportunities for people seeking front-country and rural settings (Table 4-36 and Map 41).

Atop the plateau, the deferment of oil and gas leasing for an estimated 16 years would delay the transformation of recreation opportunity settings from the current backcountry and middle-country settings to the largely front-country setting that would become established after oil and gas development. During the deferral period, the closure of some existing roads and the limitation of motorized and mechanized travel to designated routes would increase the likelihood of current settings being maintained. This would permit continued opportunities on the top of the plateau for people seeking backcountry or middle-country recreational settings.

After development begins atop the plateau, the transformation to a front-country setting would begin. Depending on the setting preferences of visitors, recreational opportunities would be altered positively or negatively. The rate of change from backcountry to front-country could be slower and not as complete as if it were to occur earlier in the planning period. Improvements in drilling and production technology and management could reduce the number of well pads and the amount of traffic, either of which might work toward maintenance of a middle-country setting. However, the direct and indirect impacts of anticipated oil and gas development, plus other land-use activities, limiting travel to designated routes, rerouting around private lands, and an overall increase in visitor use would still tend to shift the recreation setting toward a more front-country or rural setting.

Most public lands would remain part of the custodially managed Glenwood Springs ERMA.

This alternative represents decreased opportunities for people seeking backcountry or middle-country recreational settings and increased opportunities for people seeking front-country and rural settings (Table 4-36 and Map 41).

Management challenges would arise if mechanized and motorized users want to be separated on designated routes. A system of designated routes would reduce recreational trespass on adjacent private lands and protect other resources from indiscriminant OHV use.

**Hubbard Mesa SRMA**

Alternative III delineates a 2,460-acre OHV/biking SRMA to be managed for motorized and mechanized sports (Appendix E). Administratively, an inconsistency exists between identifying an SRMA for concentrated recreation use and managing for intensive natural gas development. SRMAs are normally defined to direct recreation funding and personnel to lands where a commitment has been made to provide specific recreation activities, settings, and desired experience/outcome opportunities. Alternative III does not propose a long-term commitment to managing the physical, social, and managerial settings to sustain the current and targeted recreational experience/outcome opportunities (Appendix E). Furthermore, SRMAs usually identify a need for major investments in facilities, visitor services, or funding. None are identified.

From a visitor's point of view, there is no recognition that front-country recreation setting changes must be balanced within a natural-appearing environment (Appendix E). The proposed gas development alone will cause observable and long-term physical and social changes and shift the SRMA to a more rural recreation setting. This would inherently change the recreational experience/outcomes. Recreationists who prefer the current or targeted recreation setting would likely be displaced.

Since no other riding/driving area comparable to Hubbard Mesa exists locally on public land, the

recreation opportunities currently afforded on Hubbard Mesa will be lost.

#### 4.5.3.4 Alternative IV

Most public lands will remain part of the custodially managed Glenwood Springs ERMA. This alternative represents decreased opportunities for people seeking backcountry or middle-country recreational settings and increased opportunities for people seeking front-country and rural settings (Table 4-36 and Map 4-41).

Oil and gas development would cause the most change in recreation opportunities. Within moderate densities appropriate to the ROS class, effectively designed and implemented oil and gas development can be compatible with maintaining recreation settings and recreational opportunities. However, the direct and indirect impacts of anticipated oil and gas development, plus other land-use activities, limiting travel to designated routes, rerouting around private lands, and an overall increase in visitor use will cumulatively shift the recreation setting toward a more front-country/rural setting.

The development of recreational facilities is unlikely unless determined necessary on a case-by-case basis to protect resources. Recreation administrators will need additional field staff and funding to implement and manage travel and the combination of land uses.

#### Hubbard Mesa SRMA

Alternative IV delineates a 2,460-acre SRMA OHV/biking area to be managed for motorized and mechanized sports (Appendix E). Under this alternative, off-route travel would be allowed. Administratively, an inconsistency exists between identifying an SRMA for concentrated recreation use and managing for intensive natural gas development. SRMAs are normally defined to direct recreation funding and personnel to lands where a commitment has been made to provide specific recreation activities, settings, and desired experience and outcome opportunities.

Alternative IV does not propose a long-term commitment to managing the physical, social, and managerial settings to sustain current and targeted recreational experience/outcome opportunities (Appendix E). Further, SRMAs usually identify a need for major investments in facilities, visitor services, or funding. None are identified.

From a visitor's point of view, there is no recognition that front-country recreation setting changes must be balanced within a natural-appearing environment (Appendix E). The proposed gas development alone will cause observable and long-term physical and social changes and shift the SRMA to a more rural recreation setting. This would inherently change the recreational experience and outcomes. Recreationists who prefer the current or targeted recreation setting would likely be displaced.

Since no other riding/driving area comparable to Hubbard Mesa exists locally on public land, the recreation opportunities currently afforded on Hubbard Mesa will be lost.

#### 4.5.3.5 Alternative V

All public lands would become part of the Glenwood Springs ERMA. Continued custodial recreation management and proposed land uses under this alternative would allow unavoidable changes to the physical, social, and managerial recreational settings and current recreation opportunities. The result would be decreased opportunities for people seeking backcountry or middle-country recreational settings and increased opportunities for people seeking front-country and rural settings (Table 4-36 and Map 42). A system of designated routes will reduce recreational trespass on adjacent private lands and protect other resources from indiscriminant OHV use. The direct and indirect impacts of oil and gas development would cause the most change in recreation activities, settings, and outcome opportunities. Landscape-wide, Alternative V would cause the greatest cumulative change in recreation opportunities by allowing the greatest modification to the current physical, social, and managerial conditions of the recreational setting.

Visitors who enjoy freedom of access and movement would be displaced. Since no other riding/driving area comparable to Hubbard Mesa exists locally on public land, the recreation opportunities currently afforded by Hubbard Mesa would be lost. Management challenges would arise if mechanized and motorized users want to be separated on different designated routes. A system of designated routes would reduce recreational trespass on adjacent private lands and protect other resources from indiscriminant OHV use.

The development of recreational facilities is unlikely unless found to be necessary on a case-by-case basis. Recreation administrators would need additional field staff and funding to implement and manage travel and the combination of land use issues.

### 4.5.3.6 Cumulative Impacts

The demand for recreational activities and the associated recreation settings/opportunities in the Planning Area would have individually minor but cumulatively moderate or greater impacts, as follows:

- Increased traffic on recreation routes
- Population growth, especially in surrounding communities and within easy driving distance (USFS 2002)
- More diverse values within a changing population and less understanding of traditional uses
- Continued changes in land uses and the different expectations of land users
- Potential reconstruction and upgrading of I-70, resulting in increased use
- Increases or decreases in oil and gas development and other activities on public lands
- Recreation management changes, especially OHV restrictions, in the White River National Forest
- Expansion of destination resorts in the region

- Development on adjacent private property and in-holdings
- Continuing changes in recreational equipment that affect where and how people may recreate – of particular concern to those who pursue activities such as hiking or hunting in less developed and less used areas
- Displacement of some recreationists to other public lands or to other regional providers of dispersed recreation opportunities in undeveloped settings, assuming that capacity is available
- Growth in the extent of the economic benefit of tourism, which may cause a demand for increased recreation opportunities on public lands
- Increased public demand to provide motorized trails in suitable areas
- Increased traffic on recreation routes

### 4.5.3.7 Mitigation Common to All Alternatives

Within the ERMA, maintaining a specifically identified recreation opportunity is not a management priority, so no mitigation is proposed. If crowding during the hunting season becomes an issue, CDOW has the ability to limit the numbers of hunters in GMU 32. Within the SRMA, mitigation will be useful only if surface development and disturbance are clustered to reduce impacts to the physical and social settings needed for targeted recreation opportunities.

### 4.5.3.8 Managing, Monitoring, and Marketing

The decision to designate an SRMA under Alternatives II through IV means that intensive and coordinated resource management will be required if BLM is to offer targeted recreational opportunities (objectives). A subsequent SRMA plan that addresses managing, marketing, and monitoring will be necessary to outline how BLM and its partners will specifically manage

the recreation activities and settings to offer the targeted SRMA objectives (Appendix E).

#### 4.5.4 Rangeland Management and Health

##### Introduction

A number of proposed management actions for the Planning Area as part of this RMPA/EIS have the potential to impact rangeland management and health. Two categories of actions are described and assessed, by alternative:

1. Management actions specifically directed at rangeland resources in terms of the resources (i.e., range condition) and the grazing permittees who use BLM lands to graze their livestock.
2. All other proposed land uses and management actions that would affect rangeland management and resources, including vegetation management (focused on the ecological aspect of vegetation rather than as forage for livestock), oil and gas development, special land use designations, management of travel and recreation, and actions taken to protect or enhance habitat for fish and wildlife.

Direct impacts to rangeland health are defined primarily in terms of forage production. These impacts may be negative, resulting in disruption or removal of vegetation, or positive, resulting in increased forage quantity, quality, or availability. Direct impacts to range management are defined as those that affect the allotment permittees in terms of lease conditions such as allowable AUMs (animal-unit months, see Section 4.5.4), and season of use.

A number of indirect impacts to rangeland management and health are possible as a result of proposed management actions. Indirect impacts associated with surface disturbance are assumed to occur in proportion to the relative amount of disturbance. These include a general loss of forage area or availability of forage due to surface occupancy for other uses, construction or widening of roads, direct and indirect impacts

to soils and vegetation, and closure of specific areas to livestock to protect or enhance another resource. Livestock may be harassed by on- or off-road vehicular traffic, human visitors, and their dogs. Introduction or expansion of noxious weeds through various vectors can poison livestock but more commonly replaces palatable species with unpalatable species.

Impacts to soils or vegetation cover can also result in transport of eroded soils to streams and ponds, where the sedimentation reduces the availability and quality of watering areas. A catastrophic release of a chemical pollutant into a watering source could cause direct harm to livestock or make watering areas unusable; such releases are infrequent, but could occur during oil and gas development or chemical control of weeds.

Cumulative impacts are discussed in terms of past, present, and future actions on private lands within the Planning Area and both public and private lands in nearby offsite areas.

This section discusses vegetation primarily as a resource that supports productivity requirements of livestock nutrition. However, the plants and plant communities in the Planning Area are also managed for their intrinsic values. Colorado Public Land Health Standards #2 and #3 acknowledge the multiple uses of the vegetation resource by discussing management along a continuum of characteristics. Managing vegetation for one aspect of the resource can result in conflicts with the other. For example, precluding livestock use of sensitive plant communities such as riparian corridors would enhance the vegetation (and associated fish and wildlife) values but would reduce the amount and quality of forage for livestock and force grazing permittees to provide additional sources of water.

The converse would also be true. Managing vegetation for maximum livestock productivity, palatability, and nutrition often involves planting non-native forage species to supplement native species suppressed or lost due to prolonged grazing use. Maximizing livestock production generally also means placing these large grazers

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into plant communities that are less resilient to the impacts of trampling and selective plant removal. This is acknowledged by Stoddart et al. (1955): “It is impossible to obtain the best use of a range without some disturbance, and the rancher cannot always have climax vegetation as his goal.” These conflicts are addressed throughout this analysis; additional ramifications to vegetation are discussed in Section 4.3.1.

Vegetation is also a resource for wild herbivores, ranging in size from mice to elk. Wildlife species must compete directly with livestock for the forage and thermal cover this vegetation provides, as well as for space and water. Any changes in livestock or wild herbivore use of these resources necessarily affects the other — and, because livestock occupy an area at greater-than-sustainable levels (i.e., they are grazed in numbers that exceed the long-term carrying capacity of an area and then removed seasonally or when conditions are poor) — the result of the direct competition is generally in favor of livestock and at the expense of wildlife.

Some of the alternatives analyzed in this RMPA/EIS incorporate management actions that skew this situation in favor of one type of herbivore over another. For example, where focused livestock use of riparian areas is allowed, the quality of the plant community as an intrinsically valuable resource and important wildlife habitat is reduced. Likewise, increased areas of human activity can cause wildlife to avoid an area with suitable forage, leaving more of the resource available to livestock than might otherwise occur. In some locations — not the Planning Area — where large native herbivores are not hunted, they quickly habituate to human presence or occupy the land at abnormally high densities due to the refuge effect (e.g., parks and residential areas on the margins of cities and towns). In these situations, large native herbivores can adversely affect ranching operations by removing substantial amounts of forage planted and managed primarily for livestock.

Other land use and resource management considerations would cause BLM to apply

various stipulations and other restrictions on use to protect specific resource values. These protective stipulations and other restrictions are listed and defined in Section 2.2. Note that NGD/NSO stipulations do not affect use of an area for grazing but would affect the ability of a permittee to construct a stockpond or other ranching-related facility. This is also true of the SSR/CSU stipulations that give BLM the authority to require relocation of a proposed ground-disturbing activity by more than 200 meters if necessary to protect a specific resource value. Similarly, the SSR/CSU and special mitigation designations (the latter applied as a condition of approval of a permit) may require that a grazing permittee undertake supplemental (“non-standard”) mitigation as part of a proposed action. Examples include:

- A higher standard of revegetation for restoring temporarily disturbed areas, including a requirement to use native species, plant woody species, or use a biodegradable erosion-control fabric to enhance germination and seedling establishment
- A requirement that revegetation use drill-seeding at a rate of 100 seeds per square foot (or double that rate for broadcast-seeding or hydroseeding) and be preceded by adequate site preparation, including decompaction of soil and control of annual or biennial weeds
- A requirement that all revegetated areas be fenced to exclude livestock for at least two full growing seasons
- Use of a culvert for any new road constructed across a stream
- Construction of fences and gates to ensure that livestock do not enter areas being protected for another resource that would be diminished by grazing or trampling
- Construction of alternative water sources to disperse livestock use and reduce dependence on natural streams and riparian corridors

Note that TL stipulations (seasonal restrictions on use) intended to protect raptor nests, waterfowl nests, and big game winter range, do not apply to livestock but could be applied to applications for ground-disturbing activities such as construction of a stockpond, road, fence, or water pipeline.

Under all alternatives, the continuing authorization of livestock grazing in the Planning Area would be managed for conformance with BLM's Colorado Standards for Public Land Health and Guidelines for Livestock Grazing Management (Appendix F). Therefore, categories used to define impacts of specific land use or management actions on rangeland management and health are defined in terms of these standards and guidelines.

The following terms are used in this RMPA/EIS to describe levels of adverse impacts to range condition and livestock grazing:

- **None** – Effects are unlikely to impair the resource value, with no amount of physical disruption to the resources. Permittees would see no impacts to current lease terms and conditions, allotment sizes, stocking rates, or season-of-use conditions.
- **Negligible** – Detectable effects could occur but would last no more than one year (that is, not detectable after one full growing season). Anticipated effects are unlikely to result in noticeable impairment or enhancement of the resource value in terms of Land Health Standards. Permittees would see no noticeable impacts to current lease terms and conditions, allotment sizes, stocking rates, or season-of-use conditions.
- **Minor** – Effects are likely to result in noticeable but not substantial impairment of the resource value in terms of Land Health Standards, but the total area of disruption would include less than 5 percent of the resource. Permittees would see less than 5-percent impairment to current lease terms and conditions, allotment sizes, stocking rates, or season-of-use conditions.
- **Moderate** – Effects would be noticeable and could include substantial impairment of the

resource value in terms of Land Health Standards. These effects could increase over time, or be long-term or permanent. The total area of disruption would include 6 to 15 percent of the resource. Permittees would see 6- to-15-percent impairment of current lease terms and conditions, allotment sizes, stocking rates, or season-of-use conditions.

- **Major** – Effects would be noticeable and are likely to include important of the resource value. These effects may increase over time or be long-term or permanent. Permittees would see more than 15-percent impairment in current lease terms and conditions, allotment sizes, stocking rates, or season-of-use conditions.

Note that the same terms are used, although in a more relative sense, to describe anticipated beneficial impacts.

The following subsections describe the anticipated impacts of proposed rangeland management activities, as well as impacts of all other resource values, on rangeland management under the five alternatives. Impacts are summarized in Table 4-37 at the end of this section.

#### 4.5.4.1 Alternative I

Under Alternative I, the general objectives for range are to ensure that all land uses and management actions are authorized in a manner that would meet, or make progress toward, land health standards. Current ecological values and processes and biological diversity would be maintained through existing management direction and activities.

Rangeland projects and administrative solutions (season-of-use revisions, stock level adjustments, pasture exclusions, and utilization stipulations) would be implemented to meet these general resource objectives. High-intensity monitoring would occur on allotments where land health assessments or previous monitoring have identified resource conflicts. Allotment management plans would be developed for administrative units that are not meeting, or have identified concerns with, land

health standards. However, land treatments are required only for allotments not meeting a minimum ecological condition rating of 40 percent (failing standards).

As under all other alternatives, projects that do not function to meet management objectives would be abandoned and rehabilitated.

### **Direct and Indirect Impacts**

**Rangeland Management and Health** — This alternative is expected to result in static to general and gradual long-term improvements to range condition and trend. These actions would be expected to result in negligible to minor positive impacts to range resources. Under continuing management actions, no impacts to permittees are expected.

**Resource Development and Other Management Actions** — Some upland plant communities below the rim would continue in fair to poor condition with a declining (“decreasing”) trend. This would result in negligible to minor negative impacts to range resources in these areas as well as negligible to minor negative impacts to the permittees with allotments in these areas due to potential adjustments to stocking levels and/or season of use.

Most riparian-wetland areas would be expected to be at PFC, or FAR in a static or upward trend and making progress toward meeting land health standards. This assumes that precipitation is adequate, riparian restoration projects are implemented, and rangeland improvements continue to be realized. Negligible to minor positive impacts to range resources would be expected.

Under a continuation of existing noxious weed management (Section 3.3.1), such populations are expected to increase in frequency, density, and diversity over the 20-year period of this analysis. This presents the potential for minor negative impacts to rangeland resources.

Although no new oil and gas, coal, or oil shale leasing would occur on top of the plateau, an

estimated seven new oil and gas pads would be developed on existing leases, resulting in approximately 31 acres of long-term disturbance. The remaining area, representing more than 99 percent of BLM lands atop the plateau, would not be subject to these impacts. This would result in negligible impacts to rangeland resources above the rim.

Below the rim, 28 percent of the Planning Area (10,912 acres) would remain unleased, resulting in no impacts from oil and gas. Continued development of areas currently leased for oil and gas development would cause an estimated 1,120 acres of long-term impacts to areas below the rim, representing 2.9 percent of this part of the Planning Area. An additional 730 acres (1.9 percent) of short-term impacts would be expected. The combined 4.8 percent of long-term plus short-term surface disturbance in areas below the rim under this alternative would result in minor impacts to rangeland resources.

Alternative I would place NGD/NSO stipulations on 13,912 acres and SSR/CSU stipulations on 8,256 acres. Potential positive impacts could include improved forage conditions in NGD/NSO areas due to fewer long-term ground-disturbing activities than would occur outside these areas. The remaining 7,167 acres of the Planning Area would be available to oil and gas with standard lease terms.

This alternative would allow the most unrestricted travel throughout the Planning Area, all of which would be open to motorized or mechanized cross-country travel. Based on current levels of use in the Hubbard Mesa area and expected increased recreational OHV use throughout the Planning Area, this could be expected to result in increasing numbers of pioneered roads. Continued dispersed recreation and OHV use is likely to result in gradual decreases in range condition and trend in areas of concentrated use and to have minor negative impacts to range vegetation resources. Negligible indirect impacts from disturbance of livestock could also increase.

### **Offsite and Cumulative Impacts**

The general condition of rangeland resources throughout the Planning Area would be expected to remain static or continue an upward trend under specific management actions for this alternative. However, this would be somewhat ameliorated by continuation of fair to poor condition with a declining trend in some upland vegetation below the rim. Rangeland health would also be negatively impacted by continued increases in noxious weeds throughout the Planning Area. The overall impact would be negligible to minor.

#### **4.5.4.2 Alternative II**

The general objectives under this alternative are to protect ecological values and processes and biological diversity and promote natural ecosystem processes and functions in all systems. Administrative rangeland management actions (season-of-use revisions, stock level adjustments, pasture exclusions, and utilization stipulations) would be emphasized over rangeland projects as the preferred solution to meet these objectives.

In addition, this alternative provides for high-intensity monitoring of highest-priority allotments and allotments not meeting land health standards. Allotment management plans would be developed for several situations, including (1) not meeting or having identified issues in meeting standards and (2) direct conflicts with wildlife, watershed, riparian/wetland, botanical, or wilderness values. Land treatments would be required for allotments not meeting a minimum ecological rating of 70 percent.

As under all other alternatives, projects that do not function to meet management objectives would be abandoned and rehabilitated.

### **Direct and Indirect Impacts**

**Rangeland Management and Health** — Implementation of administrative rangeland actions could be expected to result in faster progress towards meeting or achieving land

health standards in terms of long-term improvements to range condition and trend than under the other four alternatives. This would result in minor to moderate positive impacts to rangeland resources. Individual grazing permittees would be subject to more administrative solutions, which could result in minor to moderate impacts to permittees from adjustments to potential stock levels and/or season of use.

**Resource Development and Other Management Actions** — Vegetation would be managed with a specific focus on achieving goals for diverse native composition and production on upland sites, including using only native species in revegetation seed mixes and emphasizing natural processes to rehabilitate or restore natural plant communities. The condition of upland vegetation communities throughout the Planning Area would be expected to continue to be good, moving in an upward trend under management actions for this alternative and having minor positive impacts to rangeland resources over time.

Riparian areas and river corridors and associated aquatic habitat would be protected and managed. This includes a specific objective for maintaining proper hydrologic function and protecting areas adjacent to these resources. Due to these protections and specific management actions, a large number of riparian reaches would be expected to return to PFC over time, resulting in minor positive impacts to rangeland resources.

Due to protection of range resources in riparian areas and river corridors, individual grazing permittees may be subject to more administrative solutions than under Alternatives I. This could result in minor impacts to affected permittees from potential adjustments to stock level and/or season of use.

This is the only alternative with a stated emphasis on noxious weed inventory, detection, and monitoring. These actions would allow a more focused and effective application of the current weed management program by providing data and information upon which to base a

number of important decisions. These would include incipient population locations, priority-to-control strategies, and the efficacy of different integrated methods for particular species and locations. Over time, this would indirectly provide a minor to moderate positive impact to range resources.

Oil and gas development under Alternative II would allow an estimated 310 new pads and 1,348 acres of new long-term disturbance (1.9 percent of the BLM lands) during the 20-year analysis period (Table 4-2b). An additional 916 acres of short-term impacts (1.2 percent) would also be expected, for a total anticipated disturbance of up to 3.0 percent. Minor negative impacts to range resources would be expected from these activities.

A total of 21,382 acres (29 percent of BLM lands in the Planning Area) would remain unleased for oil and gas due to special management designations. The 31,200 acres (41.4 percent of the Planning Area) with NGD/NSO stipulations could have minor impacts to grazing permittees due to limits on rangeland projects. An additional 7,015 acres would be designated as SSR/CSU, while standard restrictions and limitations would apply to 14,006 acres, primarily below the rim. A small area carrying standard restrictions and limitations would be located near the northern edge of the Planning Area. If short-term disturbances in the SSR/CSU and special mitigation areas were revegetated using the special mitigation actions described above, these would result in negligible impacts to range resources and permittees.

OHV use could be expected to decrease due to restrictions on off-road vehicle use, and would be likely to result in minor increases in range condition and trend and decreased livestock disturbance. Designation of an SRMA for OHV recreation in Hubbard Mesa could necessitate a stock level adjustment, resulting in minor to moderate impacts to affected permittees. Potential increases in recreational use of areas with wilderness character could result in negligible impact to livestock grazing.

### Offsite and Cumulative Impacts

The general condition of rangeland vegetation throughout the Planning Area would be expected to continue with an upward trend under management actions for this alternative. Due to specific focus on achieving goals for diverse native composition and production on upland sites, including using only native species in revegetation seed mixes, this improvement in range condition would not be expected to affect vegetation negatively. In addition, specific emphasis on noxious weed inventory, detection, monitoring, and specific project actions would contribute to this upward trend. These actions could have minor to moderate positive impacts to range condition, although they could have negligible to minor negative impacts on permittees in terms of adjustments to stocking levels, restrictions on particular sites, and season of use.

#### 4.5.4.3 Alternative III – Preferred Alternative

Under Alternative III, the most important ecological values and processes would be protected by developing and implementing management prescriptions that would limit ground-disturbing activities, implement active management, and mitigate effects of disturbances. Appropriate management actions would be implemented on a landscape basis and would result in meeting land health standards with an emphasis on intensive management.

In terms of range management, Alternative III would use a combination of range improvements and administrative solutions (season-of-use revisions, stock level adjustments, pasture exclusions, and utilization stipulations) to make progress towards meeting land health standards. Only native species would be used for revegetation seeding. However, land treatments would be required only within allotments identified as not meeting a minimum ecological condition rating of 50 percent. Alternative III also provides for development of allotment management plans for several situations, including direct conflicts with wildlife,

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watershed, riparian-wetland, botanical, or wilderness values.

As under all other alternatives, projects that do not function to meet management objectives would be abandoned and rehabilitated.

### Direct and Indirect Impacts

#### **Rangeland Management and Health** —

Because of its emphasis on improving vegetation to increase range utilization, this alternative is expected to result in more rapid general improvements to range condition and trend than Alternative I and similar improvements as under Alternatives II, IV, and V. Generally improving conditions could produce minor to moderate positive impacts to rangeland resources

Individual grazing permittees could be subject to more administrative solutions than under Alternative I, less than under Alternative II, and the same as under Alternatives IV and V. This could result in negligible to minor impacts to permittees from potential adjustments to stock level and season of use.

#### **Resource Development and Other Management Actions** —

Under proposed management actions, condition of upland vegetation communities above the rim would be expected to continue to be good except for an expected increase in noxious weed population frequency, density, and diversity. Some communities below the rim would probably continue in fair to poor condition with a decreasing trend. Noxious weeds would be expected to increase below the rim to an even greater extent, given current conditions. Over time, this would result in minor to moderate negative impacts to most of the range resources of these communities. Minor negative impacts to permittees with allotments in these areas due to potential adjustments to stocking levels and/or season of use would also be expected.

As in Alternative II, riparian areas and river corridors would be a focus of protection and management under this alternative. This includes a specific objective for maintaining

proper hydrologic function and protecting areas adjacent to these resources. Due to these protections and specific management actions, a large number of riparian reaches would be expected to return to PFC over time, resulting in minor positive impacts to rangeland resources.

As a result of protection of range resources in riparian areas and river corridors, individual grazing permittees could be subject to more administrative solutions for these areas than under Alternatives I and V. This could result in negligible to minor impacts to affected permittees from potential adjustments to stock level and/or season of use.

Under a continuation of existing noxious weed management, such populations would be expected to increase in frequency, density, and diversity over the 20-year period of analysis. This presents the potential for minor negative impacts to rangeland resources.

Approximately 1,761 acres (2.4 percent of BLM lands) of long-term surface disturbance related to oil and gas activities are anticipated under Alternative III. These ground-disturbing activities include road, pipeline, and facilities construction and would make this area unavailable for grazing. In addition, 1,187 acres (1.6 percent) of short-term impacts could negatively affect rangeland resources and range health. A portion of the short-term impact acreage would be fenced to allow for successful revegetation, resulting in short-term loss of livestock forage. Successful reclamation of surface disturbances could result in increased forage production compared to the undisturbed condition. Reduction in available livestock forage could necessitate stock level adjustments on affected allotments to prevent over-grazing of remaining range. In some allotments this could have minor to moderate impacts. The overall impact of oil and gas activities on rangeland resources and health would be minor to moderate due to loss of forage, disturbance of livestock, and livestock management problems associated with oil and gas development.

Based on the surface-use stipulations included in this alternative, specific rangeland impacts could

be anticipated. Approximately 30,928 acres of NGD/NSO stipulations (42.0 percent of BLM lands in the Planning Area) could result in negligible to minor impacts due to access restrictions, inability to use a specific area for range improvement projects, and potential livestock exclusion. The 27,486 acres of SSR/CSU stipulations could result in negligible to minor impacts to permittees.

This alternative would restrict travel to designated routes throughout the Planning Area, including the Hubbard Mesa SRMA but excepting over-snow travel by snowmobile. When combined with the closure and revegetation of existing routes, these proposed management actions are likely to result in minor improvements to range condition and trend and decreased livestock disturbance, although access for livestock management and maintenance of range improvements may result in a minor impact to allotment permittees.

### **Offsite and Cumulative Impacts**

The general condition of rangeland resources throughout the Planning Area would be expected to show an upward trend under specific management actions for this alternative, particularly if they are enacted early in the estimated 16-year deferral period atop the plateau. However, the magnitude of improvement would be diminished by impacts from several other management actions. These include continuation of fair to poor condition with a declining trend in some upland vegetation below the rim and near the proposed Hubbard Mesa SRMA. Rangeland health would also be negatively affected by continued increases in noxious weeds throughout the Planning Area. In addition, oil and gas development would negatively affect the range resources to a minor to moderate degree.

#### **4.5.4.4 Alternative IV**

Under Alternative IV, the most important ecological values and processes would be protected by developing and implementing management prescriptions to limit ground-disturbing activities, implement active

management, and mitigate effects of disturbances. Appropriate management actions would be implemented on a landscape basis and result in meeting land health standards with an emphasis on intensive management.

In terms of range management, Alternative IV would use a combination of range improvements and administrative solutions (season-of-use revisions, stock level adjustments, pasture exclusions, and utilization stipulations) to make progress towards meeting land health standards. In addition, Alternative IV would require that only native species be used for revegetation seeding. However, land treatments would be required only within allotments identified as not meeting a minimum ecological condition rating of 50 percent. This alternative also provides for development of allotment management plans for several situations, including direct conflicts with wildlife, watershed, riparian-wetland, botanical, or wilderness values.

As under all other alternatives, projects that do not function to meet management objectives would be abandoned and rehabilitated.

### **Direct and Indirect Impacts**

#### **Rangeland Management and Health —**

Because of its emphasis on improving vegetation to increase range utilization, this alternative would be expected to result in more rapid general improvements to range condition and trend than Alternative I and similar improvements under Alternatives II and III. Generally improving conditions could produce minor to moderate positive impacts.

Individual grazing permittees could be subject to more administrative solutions than under Alternative I, less than under Alternative II, and about the same as under Alternatives III and V. This could result in negligible to minor impacts to permittees from potential adjustments to stock level and season of use.

#### **Resource Development and Other Management Actions —**

Under proposed management actions, condition of upland vegetation communities above the rim would be

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expected to continue to be good except for an expected increase in noxious weed population frequency, density, and diversity. Some communities below the rim would probably continue in fair to poor condition with a decreasing trend. Noxious weeds would be expected to increase below the rim to an even greater extent, given current conditions. Over time, this would result in minor to moderate negative impacts to most of the range resources of these communities. Minor negative impacts to the permittees with allotments in these areas due to potential adjustments to stocking levels and/or season of use would also be expected.

As in Alternative II, riparian areas and river corridors would be a focus of protection and management. This includes a specific objective for maintaining proper hydrologic function and protecting areas adjacent to these resources. Due to these protections and specific management actions, a large number of riparian reaches would be expected to return to PFC over time, resulting in minor positive impacts to rangeland resources.

As a result of protection of range resources in riparian areas and river corridors, individual grazing permittees could be subject to more administrative solutions than under Alternatives I and IV. This could result in negligible to minor impacts to affected permittees from potential adjustments to stock level and/or season of use.

Under a continuation of existing noxious weed management, such populations are expected to increase in frequency, density, and diversity over the 20-year period of analysis. This presents the potential for minor negative impacts to rangeland resources.

Approximately 1,940 acres (2.6 percent) of long-term surface disturbance related to oil and gas activities would be anticipated. These ground-disturbing activities include road, pipeline, and facilities construction and would make this area unavailable for grazing. In addition, 1,329 acres (1.8 percent) of short-term impacts could negatively affect rangeland resources and range health. A portion of the

short-term impact acreage would be fenced to allow for successful revegetation, resulting in short-term loss of livestock forage. Successful reclamation of surface disturbances could result in increased forage production compared to the undisturbed condition. Reduction in available livestock forage may necessitate stock level adjustments on affected allotments to prevent over-grazing of remaining range resources. These could have minor to moderate impacts in some allotments. The overall impact of oil and gas activities on rangeland resources and health would be minor to moderate due to loss of forage, disturbance of livestock, and livestock management problems associated with the oil and gas development.

Based on the surface-use stipulations included in this alternative, the following rangeland impacts are anticipated. Approximately 30,928 acres of NGD/NSO stipulations (42.0 percent of BLM lands in the Planning Area) could result in negligible to minor impacts due to access restrictions, inability to use a specific area for range improvement projects, and potential livestock exclusion. The 27,486 acres of SSR/CSU stipulations could result in negligible to minor impacts to permittees.

This alternative would restrict travel to designated routes, except that cross-country travel would be permitted in the SRMA for OHV recreation on Hubbard Mesa. When combined with the closure and revegetation of existing routes, these proposed management actions are likely to result in minor improvements to range condition and trend and decreased livestock disturbance, although access for livestock management and maintenance of range improvements may result in a minor impact to allotment permittees.

### **Offsite and Cumulative Impacts**

The general condition of rangeland resources throughout the Planning Area would be expected to show an upward trend under specific management actions for this alternative. However, the magnitude of improvement would be diminished by impacts from several other management actions. These include

continuation of fair to poor condition with a declining trend in some upland vegetation below the rim and near the proposed Hubbard Mesa SRMA. Rangeland health would also be negatively affected by continued increases in noxious weeds throughout the Planning Area. In addition, oil and gas development would negatively affect the range resources to a minor to moderate degree.

#### 4.5.4.5 Alternative V

Under Alternative V, modifications to ecological values and processes and biological diversity would result from ground-disturbing activities related to more intensive oil and gas development while ensuring that mitigation or management conditions are imposed to lessen impacts to identified key resources.

Rangeland projects and land treatments would be emphasized as the preferred solution to meeting resource management objectives – making significant progress, where practical, toward meeting land health standards. This would emphasize planning and implementing structural rangeland projects and land treatments to improve forage availability. Proposed management actions would include rehabilitation and revegetation of communities not meeting desired range conditions due to dominance of annual or weedy species. This would include using seed mixes with forage-producing perennials that support livestock production and other commodity values. Use of native species would not be required.

Like Alternative I, this alternative would include high-intensity monitoring of allotments where resource conflicts have been identified. However, land treatments would be required only for allotments not meeting a minimum ecological condition rating of 40 percent (failing standards). Conflicts with other resources such as watershed, wetland/riparian, or botanical would not require management plans.

As under all other alternatives, projects that do not function to meet management objectives would be abandoned and rehabilitated.

### Direct and Indirect Impacts

**Rangeland Management and Health** — Alternative V is expected to result in the most rapid and broadest improvements to range condition and trend; minor to moderate positive impacts to rangeland resources would be expected. Individual grazing permittees may be subject to more administrative solutions than under Alternative I, and fewer than under Alternatives II through IV. This could result in negligible to minor impacts to permittees from potential adjustments to stock level and/or season of use.

Because of the emphasis on forage production and availability, improvements in general range resources would not result in corresponding improvements for native upland and riparian/wetland conditions.

**Resource Development and Other Management Actions** — Some plant communities below the rim would be likely to degrade on a steeper downward trend under this alternative, because they are already in fair to poor condition and contain larger areas of noxious weeds. In the long term, this could result in localized minor to moderate negative impacts to range resources.

The condition of many riparian/wetland areas could be expected to decline due to continued expansion of noxious weed populations and more intensive, focused livestock grazing in these areas. In the long term, this could result in localized minor to moderate negative impacts to rangeland resources.

Under a continuation of existing noxious weed management (Section 3.3.1), such populations would be expected to increase in frequency, density, and diversity over the 20-year period of analysis. This presents the potential for minor negative impacts to range resources.

Approximately 2,495 acres (3.4 percent of BLM lands in the Planning Area) of long-term ground-disturbing activities related to oil and gas would be anticipated under this alternative. These include road, pipeline, and facilities construction

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that would make this area unavailable for grazing. In addition, 1,726 acres of short-term impacts could negatively affect rangeland resources. A portion of the short-term impact acreage would be fenced to allow for revegetation, resulting in short-term loss of livestock forage. Successful reclamation of surface disturbances could result in increased forage production compared to the undisturbed condition. Reduction in available livestock forage could necessitate stock level adjustments

on affected allotments to prevent over-grazing of remaining range resources. This could have minor to moderate impacts in some allotments. The overall impact of oil and gas activities on range resources and health would be minor to moderate due to loss of forage, disturbance of livestock, and livestock management problems associated with oil and gas development.

**Table 4-37. Summary of Impacts by Alternative to Rangeland Management and Health**

Action	Alternative				
	I	II	III	IV	V
Rangeland Management	<i>Resources:</i> Negligible to Minor (+) <i>Permittees:</i> None	<i>Resources:</i> Minor to Moderate (+) <i>Permittees:</i> Minor to Moderate (-)	<i>Resources:</i> Minor to Moderate (+) <i>Permittees:</i> Negligible to Minor (-)	<i>Resources:</i> Minor to Moderate (+) <i>Permittees:</i> Negligible to Minor (-)	<i>Resources:</i> Minor to Moderate (+) <i>Permittees:</i> Negligible to Minor (-)
Upland and Riparian/Wetland Vegetation Management	<i>Resources:</i> Negligible to Minor (-) <i>Permittees:</i> Negligible to minor (-)	<i>Resources:</i> Minor (+) <i>Permittees:</i> Minor (-)	<i>Resources:</i> Minor (+) <i>Permittees:</i> Negligible to Minor (-)	<i>Resources:</i> Minor (+) <i>Permittees:</i> Negligible to Minor (-)	<i>Resources:</i> Minor to Moderate (-) <i>Permittees:</i> None
Noxious Weed Management	<i>Resources:</i> Minor to Moderate (-) <i>Permittees:</i> None	<i>Resources:</i> Minor to Moderate (+) <i>Permittees:</i> None	<i>Resources:</i> Minor to Moderate (-) <i>Permittees:</i> None	<i>Resources:</i> Minor to Moderate (-) <i>Permittees:</i> None	<i>Resources:</i> Minor to Moderate (-) <i>Permittees:</i> None
Oil and Gas Development	<i>Resources:</i> Minor (-) <i>Permittees:</i> None	<i>Resources:</i> Minor (-) <i>Permittees:</i> Negligible to Minor (-)	<i>Resources:</i> Minor to Moderate (-) <i>Permittees:</i> Negligible to Minor (-)	<i>Resources:</i> Minor to Moderate (-) <i>Permittees (some):</i> Minor to Moderate (-)	<i>Resources:</i> Minor to Moderate (-) <i>Permittees(some):</i> Minor to Moderate (-)
Special Land Use Management and Designation	<i>Resources:</i> Negligible (-) <i>Permittees:</i> None	<i>Resources:</i> Negligible (-) <i>Permittees:</i> Minor (-)	<i>Resources:</i> Negligible to Minor (+) <i>Permittees:</i> Negligible to Minor (-)	<i>Resources:</i> Negligible to Minor (+) <i>Permittees:</i> Negligible to Minor (-)	<i>Resources:</i> Minor (+) <i>Permittees:</i> Negligible to Minor (-)
Travel and Recreation Management	<i>Resources:</i> Minor (-) <i>Permittees:</i> None	<i>Resources:</i> Minor (+) <i>Permittees (some):</i> Minor to Moderate (-)	<i>Resources:</i> Minor (+) <i>Permittees (some):</i> Minor to Moderate (-)	<i>Resources:</i> Minor (+) <i>Permittees (some):</i> Minor to Moderate (-)	<i>Resources:</i> Minor (+) <i>Permittees (some):</i> Minor (-)

Based on the surface-use stipulations included in this alternative, specific rangeland impacts could be anticipated. Approximately 21,609 acres of NGD/NSO stipulations could result in minor impacts due to inability to use particular areas for range improvement projects and access restrictions. Approximately 21,517 acres of

SSR/CSU could result in negligible to minor negative impacts to permittees.

This alternative would restrict travel to designated routes throughout the Planning Area, including the Hubbard Mesa SRMA but excluding over-snow travel by snowmobile.

Dispersed OHV use could be expected to decrease due to restrictions on off-road travel. This is likely to result in minor improvements in range condition and trend and decreased livestock disturbance, although access for livestock management and maintenance of range improvements could result in minor negative impacts to grazing permittees.

#### 4.5.5 Oil and Gas

##### Introduction

Table 4-38 shows the estimated number of wells that would be drilled on Federal mineral estate in the Planning Area under each of the five alternatives. In general, the number of wells drilled depends on the amount of surface acreage made available for drilling. Areas available for drilling are open to oil and gas development and have no attached NSO stipulation (although fluid minerals beneath NSO areas are available using directional drilling). Alternative V, which is entirely open to leasing and has the fewest drilling restrictions, also has the greatest number of estimated wells, recoverable reserves, and long-term surface impacts. The length of time required to recover the resource fully is unknown. The 18,670 acres of previously leased Federal mineral estate in the Planning Area is already being developed. It is possible that most of the oil and gas resource within those leases will be recovered before substantial development on newly leased lands occurs.

The currently unleased Federal mineral estate in the Planning Area (about 55,000 acres) is likely to be developed in two groups: about 13,000 acres at lower elevations and 42,000 acres above the rim. It is probable that the latter area would be developed more slowly because of the greater costs of drilling and production associated with longer travel distances, less reliable access (including snow cover), the additional 2,000 to 3,000 feet of drilling depth required, and limitations on directional drilling.

Estimating future well numbers and recoverable reserves requires a number of assumptions about the location and quality of the oil and gas resource and the density of well bore placement

needed for recovery. This analysis is based on the following assumptions from the RFD (Appendix H):

1. The oil and gas resource is assumed to be distributed uniformly throughout the Planning Area
2. Production would come from both the Mesaverde Group and the Wasatch Formation.
3. Recoverable gas reserves in the Planning Area would be similar to those in the rest of Region 4 on a per-well basis; i.e., 1.17 BCF of gas from Mesaverde wells and 0.7 BCF from Wasatch wells.
4. Recoverable oil reserves in the Planning Area would be 0.0023 MBO (thousand barrels of oil) per BCF of Mesaverde gas produced.
5. Surface spacing on well pads would be 40 acres throughout the Planning Area, except for 20-acre surface spacing for sites where directional drilling would be used to access reserves by directional drilling beneath the plateau from the edge of the steep-slope NSO.
6. Downhole spacing for Mesaverde wells would be 10 acres on 80 percent of the area below the rim and 20 acres on the remaining 20 percent of the area below the rim. Downhole spacing would be 40 acres for Mesaverde wells above the rim (i.e., one vertical well per pad).
7. Downhole spacing for Wasatch wells would be 160 acres throughout, and wells would be collocated with Mesaverde pads.
8. Directional drilling and multiple wells per pad would be used where the allowable downhole density is greater than the allowable surface density.
9. Stipulations on existing leases would remain, and new stipulations under the five alternatives would apply only to new leases unless the existing lessee operator voluntarily agrees to conform to the new standards.

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Table 4-38. Number of Wells and Reserves of Oil and Gas in BLM Portions of the Planning Area

Planning Area Oil and Gas Components		Alternative				
		I	II	III	IV	V
Total Planning Area Land Area		127,000 ac				
Federal Mineral Estate		73,602 ac				
Area of Federal Minerals Currently Leased		18,670 ac				
No-Lease Area		44,267 ac	21,382 ac	0 ac	0 ac	0 ac
Deferred-Lease Area <sup>1</sup>		0 ac	0 ac	34,758 ac	0 ac	0 ac
NSO Stipulations		13,912 ac	31,200 ac	30,928 ac	30,928 ac	21,609 ac
CSU Stipulations		8,256 ac	7,015 ac	29,594 ac	29,594 ac	21,517 ac
Standard Lease Terms, including Areas with TL Stipulations		7,146 ac	14,690 ac	13,080 ac	13,080 ac	30,476 ac
Total Areas Available for Oil and Gas Development (excludes No-lease and NSO)		15,423 ac	21,021 ac	42,674 ac	42,674 ac	51,993 ac
Potential New Wells at Full Field Development <sup>2</sup>		1,439	1,607	2,288	2,288	2,783
New Wells in 20 Years <sup>2, 32</sup>	Atop the Plateau	10	87	51	168	New Wells in 20 Years <sup>2, 32</sup>
	Below the Rim	845	818	1,273	1,156	
	Total	855	905	1,324	1,324	
Total Recoverable Reserves on BLM Lands in Planning Area <sup>3</sup>		2,239 BCF				
Gas Recovered from Wells Developed on BLM Lands in 20 Years <sup>3</sup>		983 BCF	1,041 BCF	1,523 BCF	1,523 BCF	1,819 BCF
Percent of Gas Reserves Recovered in 20 Years		44%	46%	68%	68%	81%
Approximate Number of Colorado Households that could be Served Annually by Gas Recovered from Wells on BLM Lands <sup>3, 4, 5</sup>		523,000	555,000	810,000	810,000	968,000

<sup>1</sup>Leasing and drilling on BLM lands atop the plateau would be deferred until at least 80% of the total wells anticipated below the rim under Alternative III have been effectively completed to total depth and a production test performed.

<sup>2</sup>Mesaverde Wells – Above the Rim: 40-acre downhole spacing; Below the Rim: 80% @ 10-acre downhole spacing and 20% at 20-acre downhole spacing. Wasatch Wells: 160-acre downhole spacing throughout.

<sup>3</sup>Natural gas produced over operational life of wells drilled on BLM lands in Planning Area during 20-year period of analysis.

<sup>4</sup>Based on development rate used in RFD (Appendix H); assumes 1.17 BCF per Mesaverde well and 0.7 BCF per Wasatch well; weighted average approximately = 1.15 BCF per well.

<sup>5</sup>Based on 2.5 persons per household and 94 MCF per customer per year; see Section 3.5.5.4.

4.5.5.1 Alternative I

Oil and gas development under this alternative would be severely limited by the continuing closure to leasing of 44,267 acres in the former NOSRs, including all of NOSR 1. Any oil and gas development under this alternative would

occur on the 8,379 acres of NOSR 3 that was leased at the direction of Congress in 1999 and the 20,952 acres of Federal mineral estate in the Planning Area that lies outside the NOSRs, a total of 29,331 acres.

Of the mineral estate that is open to leasing under this alternative, 13,912 acres would be closed to surface disturbance by an NSO stipulation. The principal NSOs are those protecting the I-70 viewshed, slopes steeper than 50 percent, and ecologically important areas. A number of CSU stipulations would also apply, totaling 8,256 acres. These include protections for various visual and ecological resources, as well as slopes steeper than 30 percent in areas of severe or very severe erosion hazard. The CSU stipulations would allow BLM to require that a proposed oil and gas well or other facility be relocated by more than 200 meters if necessary to protect a specific resource value (compared to relocation of up to 200 meters under standard lease terms) (Appendix B).

With the reduction in available acreage due to NSO stipulations, a total of 15,423 acres of Federal mineral estate would be available for location of drill pads, of which 14,241 acres would be below the rim. The RFD assumes that approximately 25 percent of the area beneath steep-slope NSOs along the cliffs could be developed by directional drilling to a lateral distance of approximately 1,400 feet. Approximately 112 wells could be developed beneath the cliffs NSO at the surface spacing of 20 acres assumed in the RFD (Appendix H).

As indicated in Table 4-38, an estimated 855 wells would be developed on Federal mineral estate under Alternative I during the 20-year period of analysis. All but ten of these (845) would be below the rim. The RFD estimates an average per-year drilling rate of 43 under this alternative.

Recoverable reserves accessed by these wells are estimated at 983 BCF, compared to recoverable reserves on private land of 2,195 BCF.

### 4.5.5.2 Alternative II

Under this alternative, more than half of former NOSR 1 would be made available for oil and gas leasing, but 21,382 acres would remain no-lease due to management prescriptions to protect areas identified as having wilderness character (see

Appendix G). Of the 52,220 acres remaining, 31,200 acres would be within areas of NSO stipulations to protect other resource values. These include visually sensitive areas, slopes steeper than 50 percent, and sensitive ecological components, including moderate- and high-risk areas for the Colorado River cutthroat trout and streams eligible for designation as WSRs. An additional 7,015 acres of CSU stipulations would also protect sensitive scenic and ecological qualities and slopes greater than 30 percent with erosive soils.

After accounting for no-lease areas and NSO stipulations, approximately 21,021 acres of BLM lands would be available for oil and gas development. This area would support approximately 905 new wells, of which 818 would be below and 87 would be above the rim, including an estimated 112 directional wells below the steep-slope NSO. The RFD estimates that an average of 45 wells would be drilled per year under this alternative.

Recoverable reserves accessed by these wells during the 20-year period of analysis are estimated at 1,041 BCF, compared to recoverable reserves on private land of 2,195 BCF.

### 4.5.5.3 Alternative III – Preferred Alternative

Under this alternative, the entire 44,267 acres of the former NOSRs currently closed to oil and gas leasing would be made available. However, Alternative III would defer leasing and drilling in the 34,758 acres of BLM lands on top of the plateau until 80 percent of anticipated wells below the rim under this alternative have been effectively completed to total depth and a production test performed. While the exact time to reach this point cannot be predicted, a reasonable estimate is 16 years. This estimate is based on the following:

- A total of 1,273 projected new wells on BLM lands below the rim under this alternative.
- A total of 1,244 projected new wells on areas of private mineral estate below the

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rim, again derived from numbers and assumptions in the RFD.

- A total of 411 existing wells on Federal and private mineral estates as of June 1, 2001. (Note that wells constructed since that date increase the number of existing wells but decrease the estimate of new wells, and the total number is therefore not affected.)
- A resultant 80-percent threshold of the sum of these numbers of 2,342 wells ( $1,273 + 1,244 + 411 = 2,928 \times 0.8 = 2,342$ ).
- A resultant 80-percent threshold of 2,342 wells ( $1,273 + 1,244 + 411 = 2,928 \times 0.8 = 2,342$ ).

The actual point at which the 80-percent threshold is met could range from 10 years to more than 20 years, depending on technical, geological, and economic factors, as well as the annual drilling rate. The drilling rate used for Alternative III is 173 wells for both Federal and private lands, of which 148 would be below the rim. The assumed portion of the drilling rate on BLM lands (66 wells per year) is derived from information presented in the RFD (Appendix H) and reflects the area of available lands, assumptions on surface and downhole spacings, and extent of NSO stipulations.

Additionally, it is assumed that drilling atop the plateau would not begin immediately when the threshold below the rim is met, due to the leasing and drilling permit processes that would have to be completed first. This RMPA/EIS assumes that the leasing and permitting process would take up to a year. Note also that BLM could also issue some leases on top of the plateau during leasing of lands below the rim if necessary to prevent drainage.

Annually, or more frequently as appropriate, BLM will monitor the number of wells on Federal and private mineral estates below the rim as part of the lease sale process. Numbers of private-estate wells will be obtained using COGCC data. Figure 1-3 depicts the location of areas above and below the rim; the latter would be used by BLM to monitor progress toward reaching 80-percent threshold.

Although the threshold number of 2,342 wells used in this RMPA/EIS is considered a reasonable estimate, it is subject to revision in response to changes in downhole densities and refined delineation of the oil and gas reservoir. Also, leases could be granted atop the plateau during the deferral period to protect against drainage, but subject to the stipulations otherwise applicable under Alternative III.

The numbers of wells atop the plateau and below the rim at the end of the 20-year period could also vary from the assumed numbers of 51 and 1,273, respectively (total = 1,324). The relative numbers above and below the rim used throughout the impact analysis are based on an assumed drilling rate on top of the plateau of 17 wells per year for the 3 years of drilling. The assumed drilling rate below the rim is 66 wells per year during the deferral period, decreasing to 50 per year when drilling begins above the rim. The annual rate of 66 wells is the same as the combined (above/below the rim) drilling rate assumed for Alternative IV, which has the same amount of land available for oil and gas development (Table 4-38). As described previously, this RMPA/EIS assumes a lower development rate on top than below due to more difficult access, a shortened drilling season due to winter snow accumulation, a lower downhole density, thicker overburden, and more restrictions related to environmental protection.

Of the total area of leasable lands under this alternative, 30,928 acres would be within areas of NSO stipulations to protect specific resource values. The acreage of CSU stipulations under Alternative III would also be quite large (27,486 acres), although this typically would not result in loss of a drilling opportunity. CSU protection would be applied to the same types of resources described for the previous alternatives.

After accounting for the productive acreage lost to NSO areas, a total of 42,674 acres would be available for oil and gas development, and an estimated 1,324 wells would be drilled in 20 years, including 1,273 below and 51 above the rim. The total below the rim includes 112 directional wells drilled beneath the steep-slope NSO.

Recoverable reserves accessed by these wells during the 20-year period of analysis are estimated at 1,523 BCF, compared to recoverable reserves on private land of 2,195 BCF.

### 4.5.5.4 Alternative IV

Under this alternative, the entire 44,267 acres of the former NOSRS currently closed to oil and gas leasing would be made available at the beginning of the 20-year period, of which 30,928 acres would be in areas with an NSO stipulation to protect one or more specific resource values. The acreage of CSU stipulations under Alternative IV would also be quite large (27,486 acres), although this typically would not result in loss of a drilling opportunity. CSU protection would be applied to the same types of resources described for the previous alternatives.

After accounting for the productive acreage lost to NSO areas, a total of 42,674 acres would be available for oil and gas development, and an estimated 1,324 wells would be drilled in 20 years, including 1,156 below and 168 above the rim. The total below the rim includes 112 directional wells drilled beneath the steep-slope NSO. The RFD estimates that an average of 66 wells would be drilled per year under this alternative.

Recoverable reserves accessed by these wells during the 20-year period of analysis are estimated at 1,523 BCF, compared to recoverable reserves on private land of 2,195 BCF.

### 4.5.5.5 Alternative V

Under Alternative V, the entire 44,267 acres of the former NOSRs currently closed to oil and gas leasing would become available. Far less acreage would be protected by NSOs under this alternative than under Alternatives II through IV, but the area of NSO would still be nearly 22,000 acres, primarily for slopes over 50 percent; high-risk habitat for the Colorado River cutthroat trout; and protection of Federally listed threatened or endangered or BLM sensitive

wildlife and plant species. The acreage of CSU stipulations is also reduced by this alternative, due mainly to the removal of VRM II and moderate-risk plant habitat from CSU protection.

After accounting for the acreage of NSO stipulations, about 51,993 acres would remain available for oil and gas production. On that acreage, an estimated 1,582 wells would be drilled, including 1,348 below and 234 above the rim. The number below the rim includes 112 directional wells drilled beneath the steep-slope NSO along the cliffs. The RFD assumes an average per-year drilling rate of 79 wells under this alternative.

Recoverable reserves accessed by these wells during the 20-year period of analysis are estimated at 1,819 BCF, compared to recoverable reserves on private land of 2,195 BCF.

### Indirect, Offsite, and Cumulative Impacts

Indirect impacts associated with oil and gas development within the Planning Area under the five alternatives are related primarily to reduced habitat quality from erosion and sediment transport to area streams, increased vehicular activity (including much larger vehicles than at present), reduced solitude on Planning Area roads, and decreased scenic and primitive recreational opportunities. The increased traffic and reduced solitude could result in decreased quality of life for area residents and have adverse economic impacts on local communities that rely heavily on recreational visitors. These impacts are described in other sections of Chapter 4.

Offsite impacts of development of oil and gas resources beneath the Planning Area include impacts associated with increased human population size in the region. This growth would continue with or without additional development in the Planning Area but would be more rapid at the increasing levels of development. Offsite impacts could also include shifting of some recreational use to other areas

in the region, potentially affecting those areas adversely.

In excess of 2,000 new wells could be drilled on the 53,405 acres of private mineral estate within the Planning Area during the 20-year period of analysis, after subtracting areas with slopes steeper than 50 percent and currently developed areas. This level of development would be in addition to the development scenarios for Federal minerals described above for the five alternatives (Table 4-38). The combination of drilling on new and existing Federal lands, plus private lands, would have cumulative adverse impacts resulting from ground-disturbing activities and associated operation of drilling- and production-related vehicles and other equipment. The cumulative impact in terms of additional production of natural gas and petroleum would be beneficial in terms of the National Energy Policy.

### Impact Summary

The combined level of oil and gas development under Alternative V would result in the greatest impact on other resources and land uses, but it would also represent the most effective utilization of the recoverable reserves of natural gas and petroleum beneath the Planning Area. However, even Alternative V would produce only about 36 percent of the estimated gas reserves in BLM portions of the Planning Area during the first 20-year period of development.

Development on private lands in the Planning Area is estimated to be capable of producing approximately 2,300 BCF, or 43 percent of the reserves beneath those lands based on the RFD. The higher recovery rate for private lands reflects assumptions about greater spacing density and availability of essentially the entire area except for slopes steeper than 50 percent.

The total reserves in the Planning Area represent approximately 37 percent of the total gas reserves in Colorado. The estimated recovery volumes in Table 4-38 indicate that development of this oil and gas resource at the levels of the five alternatives analyzed would be sufficient to meet the natural gas needs of more than a half

million – and potentially close to one million – households during the 20-year period of analysis. As described in Section 3.5.5, the total estimated reserve beneath the Planning Area would produce enough gas over a period of 20 years to meet the needs of approximately 3.1 million households.

### 4.5.6 Other Minerals

As described in Section 3.5.6, substantial oil shale deposits are located within the Planning Area (including NOSRs 1 and 3 and areas of private land), and these have been the subject of considerable investigation. However, the low likelihood of development in the foreseeable future was a major factor in the decision to transfer the former NOSR lands to BLM to make available for oil and gas development and other uses consistent with FLPMA. Moreover, even if a market for shale oil arises within a reasonable timeframe, apparently more viable sources occur outside BLM lands within the Planning Area.

Based on the limited resource potential of other mineral resources (coal, coalbed natural gas, construction materials, and soda ash/sodium bicarbonate), implementation of any of the five alternatives is unlikely to adversely affect the potential for development. The exception is that Alternative I (No Action) would retain the current withdrawal of NOSRs 1 and 3 from development of other mineral resources.

Possible future extraction of oil from oil shale, such as following development of a cost-effective *in-situ* process, could occur at some point in the future depending on technologies and market factors. However, this is not currently considered likely to occur during the 20-year period of analysis for this RMPA/EIS.

Production of coalbed natural gas would also not be precluded by implementation of Alternatives II through V (or Alternative I for areas outside the NOSRs) should future technologies and market factors affect feasibility. Because the oil and gas leases under these alternatives would include coalbed natural gas, it is possible that it

could eventually be incorporated into the overall production of natural gas.

Construction materials could potentially become a valuable resource within the Planning Area. However, only certain portions of the site would likely be suitable in terms of materials present, and localized quarries or other mining operations could probably be developed within portions of the Planning Area outside the oil and gas leases. It is also possible that construction materials could be produced following termination of an oil and gas lease upon completion of economic recovery.

Soda ash and sodium bicarbonate do not appear to occur at developable concentrations beneath the Planning Area.

Although no locatable minerals (e.g., metals) are known or believed to occur in the Planning Area, revocation of the withdrawal of NOSRs 1 and 3 from entry under the Mining Act of 1872 could conceivably result in speculative claim filings, including in some sensitive resource areas. This potential is considered remote.

In summary, implementation of any of the alternatives in this RMPA/EIS would not adversely affect reasonably foreseeable development of these other types of mineral resources. Therefore, no indirect, offsite, or cumulative impacts associated with the development, or lack of development, of these other resources is anticipated. However, some land uses and management actions could represent an irreversible and irretrievable commitment of mineral resources (see Section 4.6).

### 4.5.7 Areas of Critical Environmental Concern

#### Introduction

By definition, the analysis of impacts on ACECs is necessarily an analysis of impacts on the relevant and important values and resources that are given special management attention through the creation of ACECs. This section summarizes the analysis of impacts on the

relevant and important scenic, geological, fisheries, wildlife, and botanical values delineated and described in Section 3.5.7. A complete evaluation of impacts to these values is incorporated into the appropriate impact analysis sections addressing geology and paleontology (Section 4.2.1), vegetation and riparian/wetland areas (Section 4.3.1), wildlife and fisheries (Section 4.3.2), special status species and communities (Section 4.3.3), and visual resources (Section 4.4.1).

#### 4.5.7.1 Alternative I

No ACECs would be designated under this alternative. Therefore, identified relevant and important values would receive no special management consideration due to their inclusion in ACECs. Values that occur above the rim would not be subject to negative impacts from oil and gas development due to continuing no-lease conditions. However, these resources would receive no special management mitigation in terms of potential impacts from all other ongoing management actions and activities. Below the rim, impacts to relevant and important values would be managed under existing surface-use stipulations.

#### 4.5.7.2 Alternative II

This alternative provides the most protective management for relevant and important values by designating four ACECs comprising 36,184 acres (49 percent) of the Planning Area (Map 3). The ACEC designations would provide special management to protect and prevent irreparable damage to relevant and important scenic, geological, fisheries/wildlife, and botanical/ecological values (Tables 2-2a-d).

#### Direct and Indirect Impacts

Under Alternative II, each of the four ACECs would be entirely covered by NGD/NSO management stipulations specific to relevant and important values. Entire watersheds and estimated areas of ecosystem processes, and large areas of potential habitat would be provided maximum protection from disturbance. Most negative direct impacts to these values

would be prevented. Alternative II would also provide the greatest degree of protection from indirect impacts.

A complete evaluation of direct and indirect impacts to specific relevant and important values under this alternative is located in the individual impact analysis sections.

### **Offsite and Cumulative Impacts**

A positive impact to offsite areas could occur should some or all existing populations of special status plant species within the Planning Area expand, or new populations be recruited, as a positive result of management actions. These populations could potentially serve as larger sources for propagation into new offsite areas. In addition, information collected from monitoring these species could be useful to management on other sites.

Similar positive offsite impacts could potentially occur if populations of sensitive wildlife species on the Planning Area increase due to special management; they could emigrate out of the Planning Area to establish new populations offsite. In the case of the Colorado cutthroat trout, should populations expand due to protection and enhancement of habitat under ACEC management, individuals from streams on the Planning Area could be used to inoculate new populations in designated restoration sites.

Negative impacts to relevant and important resources are likely to occur from ongoing human development throughout the general region, which will occur regardless of management actions within the Planning Area. This development results in a number of activities that directly and negatively impact these resources, including new roads, housing projects, commercial development, and increased recreational use of wildlands. A number of indirect impacts are also expected as a result. These impacts will continue to occur on a regional scale and will have an additive relationship to the impacts expected from management activities within the Planning Area. If negative impacts continue to increase as expected, their condition on public lands

becomes even more important in terms of their contribution to global species viability, as well as their intrinsic value and the biodiversity they represent.

Under Alternative II, most relevant and important values will experience positive impacts as a result of special stipulations due to their inclusion in designated ACECs. These would be cumulative to comprehensive surface protections, resulting in general positive impacts.

### **4.5.7.3 Alternative III – Preferred Alternative**

Two ACECs would be designated under this alternative: East Fork Parachute Creek and Trapper/Northwater Creek, representing approximately 11,529 acres or 16 percent of the Federal lands Area (Map 5). The ACEC designations would provide special management to protect and prevent irreparable damage to relevant and important fisheries/wildlife and botanical/ecological values (Tables 2-2a-d).

### **Direct and Indirect Impacts**

In addition to reducing the number of designated ACECs, the entire area of the two designated ACECs would be excluded from NGD/NSO management stipulations specific to relevant and important values. Instead, NGD/NSO in these ACECs would provide substantial protection of identified relevant and important fish and plant values from direct impacts (Map 6), while SSR/CSU stipulations and designation of permit-level special mitigation areas would provide less protection for remaining portions of the watersheds, areas of crucial ecosystem processes, and additional areas of potential habitat. While these measures are more protective than standard restrictions and limitations, they do not provide the same level of protection as NGD/NSO stipulations and would allow some indirect negative impacts.

### **Offsite and Cumulative Impacts**

A positive impact to offsite areas could occur should some existing populations of special

status plant species within the Planning Area expand, or new populations be recruited, due to positive responses as a result of management actions. These populations could potentially serve as larger sources for propagation into new offsite areas. In addition, information collected from monitoring these species could be useful in managing them on other sites.

Similar positive offsite impacts could occur if special management of sensitive wildlife species on the Planning Area causes populations to increase to the point that they would emigrate and establish new populations or augment existing populations offsite. In the case of the Colorado cutthroat trout, any future expansion of populations due to protection and enhancement of habitat under ACEC management could be sufficient to allow individuals from streams on the Planning Area to be used to establish new populations in designated restoration sites.

Negative impacts to relevant and important resource values are likely to occur from ongoing human development throughout the general region, regardless of management actions undertaken within the Planning Area. New roads, residential and commercial development, and increased recreational use of wildlands affect these resource values directly and negatively. A number of indirect impacts to relevant and important resources would also be expected. These impacts will continue to occur on a regional scale and will have an additive relationship to impacts expected from management activities within the Planning Area. If negative impacts continue to increase, the condition of these resources on public lands would become even more important in terms of contribution to global species viability, as well as the intrinsic value and biodiversity they represent.

Under Alternative III, some relevant and important resource values may benefit from special stipulations associated with their inclusion in designated ACECs. These would be cumulative to potential positive impacts from other surface protection measures as well as the potential negative onsite and offsite impacts described above.

### 4.5.7.4 Alternative IV

Two ACECs would be designated under this alternative: East Fork Parachute Creek and Trapper/Northwater Creek. This represents approximately 11,529 acres or 16 percent of the Federal lands Area (Map 7). ACEC designations would provide special management to protect and prevent irreparable damage to relevant and important fisheries/wildlife and botanical/ ecological values (Tables 2-2a-d).

#### Direct and Indirect Impacts

In addition to reducing the number of designated ACECs, the entire area of the two designated ACECs would be excluded from NGD/NSO management stipulations specific to relevant and important values. Instead, NGD/NSO in these ACECs would provide substantial protection of identified relevant and important fish and plant values from direct impacts (Map 8), while SSR/CSU stipulations and designation of permit-level special mitigation areas would provide less protection for remaining portions of the watersheds, areas of crucial ecosystem processes, and additional areas of potential habitat. While these measures are more protective than standard restrictions and limitations, they do not provide the same level of protection as NGD/NSO stipulations and would allow some indirect negative impacts.

#### Offsite and Cumulative Impacts

A positive impact to offsite areas could occur should some existing populations of special status plant species within the Planning Area expand or new populations be recruited due to positive responses to management actions under this alternative. These populations could potentially serve as larger sources for propagation into new offsite areas. In addition, information collected from monitoring these species could be useful in managing them on other sites.

Similar positive offsite impacts could occur if special management of sensitive wildlife species causes populations to increase to the point that they would emigrate and establish new

populations or augment existing populations offsite. In the case of the Colorado cutthroat trout, future expansion of populations due to protection and enhancement of habitat under ACEC management could be sufficient to allow individuals from streams on the Planning Area to be used to establish new populations in designated restoration sites.

Negative impacts to relevant and important resource values are likely to occur from ongoing human development throughout the general region, regardless of management actions undertaken within the Planning Area. New roads, residential and commercial development, and increased recreational use of wildlands directly and negatively affect these resource values. A number of indirect impacts to relevant and important resources would also be expected. These impacts will continue to occur on a regional scale and have an additive relationship to impacts expected from management activities within the Planning Area. If negative impacts to continue to increase, the condition of these resources on public lands would become even more important in terms of contribution to global species viability, as well as the intrinsic value and biodiversity they represent.

Under Alternative IV, some relevant and important resource values may benefit from special stipulations associated with their inclusion in designated ACECs. These would be cumulative to potential positive impacts from other surface protection measures as well as the potential negative onsite and offsite impacts described above.

### 4.5.7.5 Alternative V

As with Alternative IV, no ACECs would be designated under this alternative, and the relevant and important values identified for the ACECs would receive no special management considerations unless dictated by another resource value.

Special management of relevant and important values would be the least focused under this alternative. Approximately 21,609 acres (29 percent) would be covered by NGD/NSO

stipulations, and SSR/CSU stipulations would apply to an additional 21,517 acres (29 percent). These would likely protect most identified relevant and important values, and their occupied habitat, from most direct impacts. However, larger portions of watersheds, areas of crucial ecosystem processes, and areas of potential habitat would not benefit from any special considerations other than provided by standard management. Therefore, more substantial impacts to these resources could occur than under the previous four alternatives.

### 4.5.8 Areas Managed to Protect Wilderness Character or Specific Wilderness Values

#### Introduction

Inventories for wilderness characteristics within the Planning Area were conducted following the transfer of NOSRS 1 and 3 (Section 3.5.8.1). As described in Table 2-1, no WSAs will be designated under any of the alternatives analyzed by this RMPA/EIS. Alternative II would apply a management prescription to 21,382 acres to protect roadlessness, naturalness, and outstanding opportunities for solitude and primitive and unconfined types of recreation (Map 35). Appendix G summarizes the management prescriptions for preserving wilderness characteristics in these areas under Alternative II. Alternative III would manage 9,006 acres to protect roadlessness and naturalness, including allowing no modification, waiver, or exceptions to NGD/NSO restrictions in those areas (Map 36).

#### 4.5.8.1 Alternative I

Although no areas having wilderness character would be provided special management protection under this alternative, a no-lease designation for oil and gas for East Fork Parachute Creek and portions of the Northeast and Southeast Cliffs would result in a lack of short-term activity that would directly impact wilderness characteristics.

Over time, other resource development and associated uses would impact the wilderness

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characteristics of naturalness, outstanding opportunities for solitude or primitive and unconfined types of recreation, and identified supplemental values. Without specific management in place to maintain and preserve areas with wilderness character, degradation of those characteristics would occur from (1) the areas being open to cross-county motorized or mechanized use, (2) grazing activities which may include new roads and developments, and (3) no recreation direction or emphasis to promote primitive recreation. Supplemental values would decline and wilderness characteristics would be lost over 10-20 years. This includes naturalness, opportunities for solitude and for primitive and unconfined types of recreation, and roadless areas over 5,000 acres.

Roadlessness, naturalness, and outstanding opportunities for solitude or primitive and unconfined types of recreation would be lost over time due to lack of special management protection on 21,382 acres within the three wilderness inventory units described in Alternative II.

### **Cumulative Impacts**

The loss of areas containing wilderness character would reduce opportunities to meet the increasing regional demand for primitive and unconfined recreation experiences, solitude, naturalness and roadlessness, and preservation of ecological diversity found within the current system. No new opportunities would be provided to preserve these areas.

#### **4.5.8.2 Alternative II**

To meet management goals and objectives described in Alternative II (Table 2-1) a total area of 21,382 acres in the three inventory units found to have wilderness character — East Fork Parachute Creek (10,389 acres), Northeast Cliffs (5,801 acres), and Southeast Cliffs (5,192 acres) — would be managed specifically to protect wilderness characteristics and wilderness character in the units as a whole (Map 3). The area would be managed as described in Appendix G.

Naturalness, roadlessness, outstanding opportunities for solitude and unconfined types of recreation, and identified supplemental values would be preserved on 21,382 acres due to the specific management actions described in Appendix G and the associated no-lease designation for oil and gas in effect for all units. Additional on-site resources such as recreation, ecological systems, wildlife, fisheries, air quality, special status species, water quality, vegetation, and riparian areas would also benefit from protection and maintenance of wilderness characteristics (see individual resource sections). Conversely, as a result of the management prescriptions (Appendix G) some negative effects on uses and resources such as grazing, minerals, lands and realty, and motorized and mechanized recreation could occur (see individual resource sections).

Scientific and educational benefits would be realized; natural environments offer a living laboratory for research and for many high schools, colleges, heritage programs, and outdoor leadership schools. Areas perceived and used as natural areas also provide natural control sites for studying the effect of human development on natural systems and for understanding unfettered ecological systems (Loomis and Richardson 2001).

Protection of wildlands and other natural areas can generate off-site benefits such as passive use values. These include (1) existence values — the benefits of knowing that wildlands exist and are preserved; (2) option values — the benefits of having the option to visit the area in the future; and (3) bequest values — the benefits of knowing that future generations would have opportunities to use wildlands or enjoy their existence (Richardson 2002). Numerous benefits accrue to communities from the presence of intact natural environments nearby. Public demand for wilderness designations and experiences generally corresponds with increasing urban populations. Benefits include, but are not limited to, preservation of scenic backdrops for adjacent communities and scenic viewsheds along important travel corridors, as well as the economic benefits associated with recreation, education, scientific research, and tourism.

Tourism and recreation are important to the Colorado economy and are based on visitors attracted to opportunities for recreating and sightseeing in the Rocky Mountains (USFS 2002). Scenic landscapes contribute to the success of recreation and tourism. These benefits can enhance property values and increase tax revenues, in addition to enhancing recreation and tourism, which represent \$7 billion of the Garfield County and Colorado economies (Section 3.4.3.4).

Roadlessness, naturalness, outstanding opportunities for solitude or primitive and unconfined recreation, and identified supplemental values would be maintained and protected due to special management on 21,382 acres within the three wilderness inventory units described above.

### **Cumulative Impacts**

The protection and maintenance of roadlessness, naturalness, outstanding opportunities for solitude or primitive and unconfined types of recreation, and identified supplemental values would protect and maintain ecological diversity on a regional scale, and enhance opportunities to meet the increasing regional demand for areas containing these characteristics.

#### **4.5.8.3 Alternative III**

Roadlessness and naturalness would be maintained on 9,006 acres of the three wilderness inventory units described for Alternative II, as follows: Southeast Cliffs Unit – 3,014 acres, Northeast Cliffs Unit – 2,291 acres, and East Fork Parachute Creek Unit – 4,241 acres (Map 36). This protection would result from NGD/NSO restrictions established for other resources, and portions of the NGD/NSO areas within the 9,006 acres would not be subject to modification, waiver, or exceptions. Although these restrictions would maintain naturalness and roadlessness in the main drainage of East Fork Parachute Creek, including the falls, and on visible portions of the cliffs, opportunities for solitude or primitive and unconfined recreation would be limited by the narrow configuration of the areas (Map 36). The

units as a whole would not retain wilderness character.

Other resources and identified supplemental values (Section 3.5.8) within the units such as recreation, ecological systems, wildlife, fisheries, air quality, special status species, water quality, vegetation, and riparian areas would benefit from protection of key areas through the use of NGD/NSO stipulations (see individual resource sections for the above resources). Conversely, some negative effects could occur as a result of the NGD/NSO stipulation with no modification, waiver, or exceptions within the areas shown on Map 36. Affected resources could include grazing, minerals, lands and realty, and motorized and mechanized recreation.

Some scientific and educational benefits would be realized in that natural environments offer a living laboratory for research and for many high schools, colleges, heritage programs, and outdoor leadership schools; however, opportunities would be reduced due to the unit's size and narrow configuration.

As compared with Alternative I, roadlessness and naturalness would be maintained on portions (9,006 acres) within the Southeast Cliffs, Northeast Cliffs, and East Fork Parachute Creek Units due to NGD/NSO restrictions for other resources (Map 36). Outstanding opportunities for solitude or primitive and unconfined types of recreation would be lost over time due to lack of special management protection on 21,382 acres, roadlessness and naturalness would be lost on 11,836 acres, within the three wilderness units described in Alternative II.

### **Cumulative Impacts**

Roadlessness and naturalness will be protected and maintained on 9,006 acres. The units (Map 36) will provide some opportunities to meet increasing demand for areas containing roadlessness and naturalness and will contribute to preservation of ecologic diversity within the Planning Area. No contribution would be made toward meeting increasing demand for

outstanding opportunities for solitude or primitive and unconfined types of recreation.

### 4.5.8.4 Alternatives IV and V

No areas having wilderness character would be provided special management protection under this alternative. Oil and gas leasing and other resource development, would result in permanent impairment of roadlessness, naturalness, outstanding opportunities for solitude or primitive and unconfined types of recreation, and identified supplemental values within each unit (Section 3.5.8). These impacts would be long-term and irreversible. This would be especially true under Alternative V, which would have the fewest and smallest areas of NGD/NSO stipulations. NGD/NSO stipulations may have exceptions applied and therefore cannot be relied upon to protect wilderness characteristics.

Other resources and identified supplemental values (Section 3.5.8) such as recreation, ecological systems, wildlife, fisheries, air quality, special status species, water quality, vegetation, and riparian areas could benefit from protection through the use of NGD/NSO restrictions (see individual resource sections).

As compared with Alternative I, roadlessness, naturalness, and outstanding opportunities for solitude or primitive and unconfined types of recreation would be lost on 21,382 acres within the three wilderness inventory units described in Section 4.5.8.2.

### Cumulative Impacts

Opportunities to meet increasing demand for areas containing roadlessness, naturalness, and outstanding opportunities for solitude or primitive and unconfined types of recreation would not be realized.

## 4.5.9 Wild and Scenic Rivers

### Introduction

The process of designating a Wild and Scenic River (WSR) under the authority of the Wild

and Scenic Rivers Act (WSRA) involves a threshold determination of eligibility, a further assessment of suitability of eligible rivers, and Congressional action. BLM has already assessed the eligibility of rivers found in the Planning Area and described its findings in the Roan Plateau Eligibility Report for the National Wild and Scenic Rivers System (BLM 2002e) (see Section 3.5.9 and Map 14).

For analytical purposes, Alternatives II, III, and IV assume that 8 streams have been found suitable for inclusion in the NWSRS. These alternatives therefore contain measures to protect the 7,883 acres and 24 miles of stream corridors found to be eligible. The principal method of protection for identified “outstandingly remarkable values” (ORVs) is an NGD/NSO that would apply to all ground-disturbing activities within the corridors.

BLM’s policy is to protect the values contained within the eligible stream segments until the suitability analysis has been conducted and Congress has acted. However, for purposes of analysis, this RMPA/EIS assumes that no special protection is provided by Alternatives I or V. Alternative I would continue current management, while Alternative V assumes that the streams are either (a) found to be unsuitable for designation or (b) found to be suitable but not designated as WSRs by Congress.

### 4.5.9.1 Alternative I

This alternative assumes that no eligibility determinations have been made in the RPPA and continues current management. No specific measures would be put in place to protect ORVs in the eligible streams. However, since no oil and gas leasing would occur atop the plateau, the only impacts to eligible streams would be associated with current management actions and existing land uses. Because the NOSR withdrawals would remain in place, entry under the 1872 Mining Law would also continue to be prohibited. Precluding oil and gas leasing or mineral activities eliminates a potentially major source of adverse impacts on water quality and related stream values. However, the extensive road system already in existence, the

unregulated nature of OHV use, and the continuation of current grazing practices are likely to contribute to a gradual decline in ORVs for streams atop the plateau.

### Scenic Value

East Fork Parachute Creek, including the falls and box canyon, is the only stream segment evaluated that was found to have an ORV for scenic quality. This stream would be very likely to retain its outstanding scenic quality under Alternative I because large-scale development of oil and gas would not occur in this watershed. Activities that could continue, such as motorized and mechanized travel, livestock grazing, and dispersed recreation, would not affect scenic quality. However, motorized travel and/or development on adjacent private lands within the lower box canyon could affect scenic values.

### Fisheries Values

The populations of genetically pure Colorado River cutthroat trout in five of the eligible streams would continue to be at some risk because of habitat degradation brought about by livestock grazing. Overuse of the riparian zone by livestock reduces protective vegetation cover and increases soil disturbance, water temperature, and turbidity.

### Botanical/Ecological Values

Seven of the 31 stream segments evaluated as WSRs support rare or imperiled plant communities (Table 3-31). These would not be protected under Alternative I; some would be at risk from livestock grazing and unregulated OHV activity.

### Indirect, Offsite, and Cumulative Impacts

The cumulative effect of this alternative on the preliminary eligibility classification of Roan Plateau streams would be low in the short term because the classification would probably be maintained. The scenic ORV would remain intact; fisheries and botanical/ecological ORVs would be subject to continuing, low-level, dispersed impacts but would also remain. Over

the long term, the cumulative effect could be moderate to major due to loss of the preliminary classification in one or more of the stream segments. While the scenic ORV would probably remain intact, the fisheries and botanical/ecological ORVs could eventually decline to the point that they are no longer found in all of the stream segments.

### 4.5.9.2 Alternative II

This alternative would protect the 8 streams, representing a combined 7,883 acres and 24 miles of stream length found to be eligible for designation as WSRs. The principal method of protection for identified ORVs is an NGD/NSO designation that applies to all ground-disturbing activities in the WSR corridors (Maps 3 and 4).

Most areas adjacent to the WSR corridors in the Trapper Creek and East Fork Parachute Creek ACECs are also protected by an additional NGD/NSO designation aimed at protecting visual quality. Some portions of the uppermost tributary reaches are protected by SSR/CSU designation; upland areas in portions of the watersheds outside the ACECs would be subject to special mitigation measures (as LNs or COAs) to protect water quality and aquatic habitat (see Section 4.2.4). Because the ACEC boundaries generally extend well beyond the stream corridors, the streams and their corridors are protected not only from direct impacts but also from indirect effects of ground-disturbing activities outside the corridors. Supporting management of livestock grazing and motorized and mechanized travel under this alternative would further reduce impacts on soils and vegetation that could affect ORVs.

The East Fork Parachute Creek WSR area has another layer of protection because it is almost entirely within the boundaries of an area identified as having wilderness character and thus subject to the protective management prescription in Appendix G.

It is expected that scenic, fisheries, and ecological/botanical values would be preserved by the protective stipulations applied to WSR-eligible stream segments in addition to the

protective management provided for the other special designations noted above.

### **Scenic Value**

East Fork Parachute Creek, including the falls and box canyon, would retain its outstanding scenic quality under Alternative II because of the limited amount of oil and gas development in the associated viewshed. Existing activities that could continue, such as livestock grazing and dispersed recreation, would have some impacts but would not affect scenic quality. The restriction of activities that could continue, such as motorized and mechanized travel on designated routes, would also reduce impacts on scenic quality. However, new impacts on private lands within the same scenic viewshed could degrade overall ORV scenic values.

### **Fisheries Values**

The populations of genetically pure Colorado River cutthroat trout in 5 of the streams that were found to be eligible would be enhanced and subject to reduced risk under this alternative. The NGD/NSO designation for the WSR corridors and complementary protection outside the corridors would prevent major ground-disturbing activities, while the Trapper/Northwater WMA would provide additional management flexibility for protecting the watershed. Supporting management of livestock grazing and restrictions on motorized and mechanized travel would reduce impacts on soils and vegetation, resulting in improved fish habitat.

### **Botanical/Ecological Values**

The seven WSR-eligible stream segments with rare or imperiled plant communities (Table 3-31) would be protected under this alternative by the stream corridor NGD/NSO and complementary protection outside the corridors. These measures and supporting management of livestock grazing and motorized and mechanized travel would combine to enhance the significant plant communities and ensure their long-term viability.

### **Indirect, Offsite, and Cumulative Impacts**

The cumulative effect of Alternative II on the preliminary eligibility classification of Roan Plateau streams would be to ensure that the classification is maintained until Congress makes a determination.

#### **4.5.9.3 Alternative III – Preferred Alternative**

Like Alternative III, this alternative would protect the 8 rivers and corridors (a total of 7,883 acres and 24 stream miles) found to be eligible for designation as WSRs. The principal method of protection for identified ORVs is an NGD/NSO designation that would apply to all ground-disturbing activities within the eligible stream corridors. Compared to Alternative II, Alternative III would have narrower NGD/NSO zones along the streams and rely on SSR/CSU designations and special mitigation measures to protect the watershed (Maps 5 and 6). However, the entire Parachute Creek drainage atop the plateau would be included in a WMA, providing flexibility for protective management across the watershed.

While not as restrictive as NGD/NSO, an SSR/CSU designation nonetheless provides considerable management authority to prevent or mitigate impacts to the streams, riparian corridors, and other portions of the watershed. The greater use of SSR/CSU instead of NGD/NSO would probably result in some increase in indirect impacts on the WSR corridors from adjacent areas and tributaries. Impacts from motorized and mechanized travel are not likely, due to the restriction to designated routes. Supporting management of livestock grazing would further reduce impacts on soils and vegetation.

Additionally, 9,006 acres with roadless and naturalness would be protected under Alternative III by NGD/NSO stipulations not subject to modification, waiver, or exceptions, for other values in these areas (Map 36).

One of the key features of Alternative III is that leasing and drilling for oil and gas atop the

plateau would not occur until 80 percent of anticipated wells below the rim have been drilled. While the estimated 16-year deferral period would not affect the WSR-related protections described above, the overall character of the upper plateau would be essentially unchanged for most of the 29-year period of analysis.

#### **Scenic Value**

East Fork Parachute Creek, including the falls and box canyon, would retain its outstanding scenic quality under Alternative III due to the limited amount of oil and gas development atop the plateau. However, new impacts on private lands within the scenic viewshed could degrade overall ORV scenic values.

#### **Fisheries Values**

The populations of genetically pure Colorado River cutthroat trout in five of the streams that were found to be eligible as WSRs (Trapper, Northwater, East Fork Parachute, East Middle Fork Parachute, and JQS) would be at reduced risk under this alternative. The NGD/NSO stipulation in the WSR corridors would prevent any major ground-disturbing activities in those corridors. Supporting management of livestock grazing and motorized and mechanized travel, as well as the management related to the Parachute Creek WMA, would have direct and indirect benefits to fish habitats by reducing impacts to soils and vegetation in the corridors and watersheds.

#### **Botanical/Ecological Values**

The 7 WSR eligible stream segments with rare or imperiled plant communities would be largely protected under this alternative by the stream corridor NSO. Those measures and supporting management of livestock grazing and motorized and mechanized travel would combine to ensure the long-term viability of those plant communities.

#### **Indirect, Offsite, and Cumulative Impacts**

The cumulative effect of this alternative on the preliminary eligibility classification of Roan Plateau streams would be to ensure the maintenance of that classification pending Congressional determination.

##### **4.5.9.4 Alternative IV**

This alternative would also protect the 8 rivers and corridors (a total of 7,883 acres and 64 stream miles) that have been found to be eligible for designation as WSRs, as well as the East Fork Parachute Creek and Trapper/Northwater Creek ACECs. The principal method of protection is application of NGD/NSO stipulations to activities proposed or anticipated in these areas. Compared to Alternative II, however, Alternative IV would have narrower NGD/NSO zones along the streams and rely on SSR/CSU and special mitigation designations to protect the watersheds (Maps 7 and 8).

While not as restrictive as NGD/NSO, the SSR/CSU designation provides considerable management authority to prevent or mitigate impacts on streams, riparian corridors, and other portions of the watersheds. The greater reliance on SSR/CSU protection than Alternative II would probably result in some increase in indirect impacts on the WSR corridors from adjacent areas and tributaries. Impacts from motorized and mechanized travel are not likely, due to the restriction to designated routes. Supporting management of livestock grazing would further reduce impacts on soils and vegetation.

#### **Scenic Value**

East Fork Parachute Creek, including the falls and box canyon, would retain its outstanding scenic quality under Alternative IV because of the limited amount of oil and gas development atop the plateau. However, new impacts on private lands within the scenic viewshed may degrade the overall ORV scenic values.

### **Fisheries Values**

The populations of genetically pure Colorado River cutthroat trout in five of the streams that were found to be eligible as WSRs (Trapper, Northwater, East Fork Parachute, East Middle Fork Parachute, and JQS) would be at reduced risk under this alternative. The NGD/NSO stipulation in the WSR corridors would prevent any major ground-disturbing activities in those corridors. Supporting management of livestock grazing and motorized and mechanized travel would improve fish habitat both directly and indirectly by reducing impacts to soils and vegetation in the corridors. However, protection in the adjacent watersheds would be less than Alternatives II and III due to the lack of a WMA designation.

### **Botanical/Ecological Values**

The seven WSR eligible stream segments with rare or imperiled plant communities would be largely protected under Alternative IV by the stream corridor NGD/NSO. Those measures and supporting management of livestock grazing, restrictions on motorized and mechanized travel would combine to ensure the long-term viability of the rare or imperiled plant communities.

### **Indirect, Offsite, and Cumulative Impacts**

The cumulative effect of this alternative on the preliminary eligibility classification of Roan Plateau streams would be the maintenance of that classification until a determination by Congress has been made.

#### **4.5.9.5 Alternative V**

For the purpose of analysis, this alternative assumes that none of the eligible stream corridors is suitable for designation as WSR or, if suitable, that Congress declines to enact the designation. In reality, BLM is required by the WSRA to provide protection for the 8 eligible streams until that time.

Some of the protections afforded the streams and corridors in Alternatives II through IV are also

components of Alternative V. Although this alternative does not include specific NGD/NSO protection for the full width of the WSR corridors, other NGD/NSO designations for riparian/wetland zones and high risk fish habitat which would protect some portions of the corridors. Additionally, several SSR/CSU designations are aimed at minimizing impacts to BLM sensitive plants and significant plant communities, other plant habitat at high risk, and fish habitat at moderate risk. Motorized and mechanized travel would be limited to designated roads and trails, excepting over-snow travel by snowmobile. This restriction would have minimal impact on ORVs. However, grazing management specifically in support of the WSR corridors would not occur, posing some elevated risk of degradation of water quality and watershed vegetation.

### **Scenic Value**

East Fork Parachute Creek, including the falls and box canyon, would be somewhat less likely to retain its outstanding scenic quality than under Alternatives II through IV because more substantial oil and gas development could occur within view of segments of the canyon on both public and private lands, although not in the canyon itself. Activities that could continue, including livestock grazing, motorized and mechanized travel on designated routes, and dispersed recreation would have impacts but on a scale that would not affect scenic quality.

### **Fisheries Values**

The populations of genetically pure Colorado River cutthroat trout in five of the streams that were found to be eligible as WSRs (Trapper, Northwater, East Fork Parachute, East Middle Fork Parachute, and JQS) would continue to be at risk (as they are under current conditions and Alternative I) due to habitat degradation resulting from livestock grazing and permitted ground-disturbing activities adjacent to the riparian zones and in the tributaries of the WSR-eligible segments. Surface disturbance in the watersheds from management activities and overuse of the riparian zone by livestock reduce protective vegetation cover and increase soil

erosion, causing higher water temperature and increased turbidity.

### **Botanical/Ecological Values**

The seven WSR-eligible streams with rare or imperiled plant communities would not receive the same protection under Alternative V as under Alternatives II through IV but would still receive indirect protection from the riparian and fish habitat NGD/NSO and a variety of SSR/CSU designations..

### **Indirect, Offsite, and Cumulative Impacts**

The cumulative effect of this alternative on the preliminary eligibility classification of Roan Plateau streams would be low in the short term, because the classification would probably be maintained. The scenic ORV would be likely to remain intact, and the fisheries and botanical/ecological ORVs would undergo continuing, low-level dispersed impacts but also remain in place. However, over the long term, the cumulative effect could be minor to moderate adverse impacts because the preliminary classification could be lost in one or more of the currently eligible stream segments. Although limitations on ground-disturbing activities adjacent to the eligible streams and the restrictions on OHV travel would reduce impacts on the fisheries and ecological/botanical values of the eight WSR-eligible streams, the level of protection would be less than under Alternatives II through IV. Furthermore, the proximity of oil and gas development or other surface disturbances in portions of the watersheds could compromise the preliminary classifications.

#### **4.5.10 Forest Products**

This RMPA/EIS assumes no management actions for forest products. All 5 alternatives propose management to maintain and promote forest health, consistent with other resource objectives. Because demand for forest products from the Planning Area is apparently low or non-existent, and no forest management activities are proposed, anticipated impacts on

forest products are considered none to negligible under each alternative.

The only recognizable impact is the possible access limitation to forest stands for implementation of pest control, thinning operations, or potential future harvesting due to varying combinations of road closures, timing limitations, and other measures. If timber harvesting were to become economically viable, the approximately 11,000 acres of mature aspen atop the plateau would be the resource most likely to be sought. Old-growth Douglas-fir generally occurs in relatively rugged and inaccessible areas. However, if this resource were sought, Alternatives III, IV, and V would allow up to 10 percent of these trees to be removed, with restrictions on the harvest pattern and method to reduce other impacts.

See the Fire Management discussion below concerning the potential need for fire suppression or vegetation treatments (e.g., fuel load reduction) as a result of increased oil and gas development.

#### **4.5.11 Fire Management**

Wildland fire management and prescriptive vegetation treatments are tools to alter vegetation communities to achieve beneficial resource outcomes. Due to different management prescriptions proposed under the five alternatives in this RMPA/EIS, reclassification of the fire management zones (FMZs) will be necessary, as described below. The following discussion focuses on how wildland fire management and prescriptive vegetation management would change to achieve resource objectives by alternative. For a definition of FMZs A through D, please see Table 3-32 in Section 3.5.11.3.

##### **4.5.11.1 Alternative I**

Under Alternative I, current wildland fire management direction, suppression guidelines, and general guidance for prescribed vegetation treatments as identified in the GSFO and WRFO Fire Management Plans (FMPs) would stay in place. Thus, approximately 25 percent of BLM

lands in the Planning Area would remain in FMZ B, 30 percent in FMZ C, and 45 percent in FMZ D (Map 38).

### **Top of the Plateau**

The top of the plateau would continue to be managed as FMZ D. If predetermined criteria are met, fires could be managed under a Wildland Fire Use (WFU) strategy to achieve desired objectives such as improving vegetation, wildlife habitat, or watershed conditions. Under a suppression strategy, wildland fires are managed using the appropriate management response commensurate with predetermined constraints (negative effects to values and zone goals); they are contained within natural or man-made barriers/firebreaks. FMZ D areas have the lowest priority for suppression in a multiple fire situation. Within the GSRA, no more than 50 percent of the area in this zone should burn over a 10-year period. Wildland fire suppression guidelines apply for Colorado River cutthroat trout, northern leopard frog, and Parachute penstemon along the Anvil Points rim. Restrictions for commercial wood product (CWP) areas would also apply.

### **Northeast Cliffs and Southeast Cliffs**

The GSFO FMP acknowledges that fire is a desirable component of the ecosystem. However, constraints must be considered, including private lands and homes, topography, archaeological and historical sites, visual aesthetics, wilderness characteristics, rare plants, and the old-growth Douglas-fir community. Wildland fires would continue to be managed using the appropriate management response commensurate with predetermined constraints. Management strategies try to ensure that wildland fire is contained within natural or man-made barriers/firebreaks. FMZ C areas have a lower suppression priority in multiple wildland fire situations than FMZs A or B but the same goal of no more than 50 percent of the zone burning over a 10-year period. Wildland fire suppression guidelines apply for northern leopard frogs; wildland fire suppression restrictions for CWP areas also apply.

### **Lower Elevations along the I-70 Corridor**

The lower elevation terrain below the rim would continue to be managed as FMZ B. The GSFO FMP recognizes that fire plays a natural role in the function of the ecosystem. However, in this area an unplanned ignition could have negative effects unless or until some form of mitigation takes place. All wildland fires, regardless of ignition source, would be high priority and promptly suppressed to protect human health. Fire suppression is usually aggressive to minimize spread. Wildland fire suppression guidelines apply for bald eagle winter range, Federally listed Colorado River fishes, and the Great Basin spadefoot toad and northern leopard frog. Restrictions for CWP areas and ACECs would also apply. Managers emphasize prevention/mitigation programs that reduce unplanned ignitions and threats to life, property, and natural and cultural resources.

#### **4.5.11.2 Alternative II**

Approximately 25 percent of BLM lands in the Planning Area would be managed as FMZ B and 75 percent as FMZ C.

### **Top of the Plateau**

Fire is still a desirable component of the ecosystem under this alternative. However, reclassification and management as FMZ C is more appropriate. This alternative includes 4 ACECs, 8 stream systems that are WSR eligible, and 3 areas having wilderness character that would be managed to protect wilderness values. Although FMZ D is the preferred classification for these resources, changes in management direction combined with potential islands of oil and gas development, private in-holdings, the highly dissected topography atop the plateau, special status species constraints, the historic low occurrence of wildland fire, and seasonally intensive uses such as hunting, make it unrealistic to manage the area as FMZ D.

Ecological and resource constraints, along with human health and safety and other considerations, would be used by the incident commander and subunit line officer to determine

the appropriate wildfire suppression response on a case-by-case basis. Wildland fire suppression restrictions from the GSFO FMP for the areas having wilderness character, CWP areas, and ACECs would apply. Areas in this category would generally receive lower suppression priority in multiple wildland fire situations than would areas designated FMZ A or B.

Prescribed vegetation treatments instead of wildland fire use would be used to achieve objectives for vegetation, special status species, habitats that support these species, and watersheds. Fire and non-fire fuels treatments could be used to ensure that constraints are met or to reduce any hazardous effects of unplanned wildland fire. Significant prescriptive fire activity would be expected to help attain desirable resource or ecological conditions. Vegetation treatments for hazard/fuel reduction are of a lower priority than in FMZ B.

#### **Northeast Cliffs and Southeast Cliffs**

The Northeast and Southeast Cliffs areas would be managed the same as under Alternative I, i.e., FMZ C.

#### **Lower Elevations along the I-70 Corridor**

Lower elevations along the I-70 corridor would be managed the same as under Alternative I, i.e., FMZ B.

#### **4.5.11.3 Alternative III – Preferred Alternative**

Approximately 25 percent of BLM lands in the Planning Area would be managed as FMZ B and 75 percent as FMZ C.

#### **Top of the Plateau**

The top of the plateau would be managed the same as under Alternative II. Although fire is still a desirable component of the ecosystem, reclassification and management as FMZ C is more appropriate. A major feature of this alternative is that leasing and drilling for oil and gas would not occur atop the plateau until an estimated 16 years into the 20-year period of

analysis. The result of the deferral at the higher elevations is twofold: (1) total wells, pads, pipelines, and new or widened access roads would be less than under the generally more protective Alternative II, but (2) the annual drilling rate, once development begins, would be approximately twice that of Alternative II.

During the deferral period, prescriptive fire activity could be used to help attain desirable resource or ecological conditions. Once development on top of the plateau begins, however, the construction of well pads, pipelines, and new or widened access roads would tend to act as firebreaks to prescriptive fires. Therefore, prescriptive vegetation treatments would be a more realistic means of achieving resource objectives.

#### **Northeast Cliffs and Southeast Cliffs**

The Northeast and Southeast Cliffs areas would be managed the same as under Alternative II, i.e., FMZ C. Due to the lack of homes and people, the cliff areas would continue to be a lower suppression priority in multiple wildland fire situations, making an FMZ B classification inappropriate.

#### **Lower Elevations along the I-70 Corridor**

Lower elevations along the I-70 corridor would be managed the same as under Alternative I, i.e., FMZ B.

#### **4.5.11.4 Alternative IV**

Approximately 25 percent of BLM lands in the Planning Area would be managed as FMZ B and 75 percent as FMZ C.

#### **Top of the Plateau**

The top of the plateau would be managed the same as in Alternative II. Although fire is still a desirable component of the ecosystem under this alternative, reclassification and management as FMZ C is more appropriate. The increased oil and gas development is the major difference between this alternative and Alternative II.

Road, pad, and pipeline construction has the effect of creating firebreaks that act as barriers to the spread of natural wildfires as well as prescriptive fires. Therefore, prescribed vegetation treatments would be a more realistic means of achieving resource objectives.

#### **Northeast Cliffs and Southeast Cliffs**

The Northeast and Southeast Cliffs areas would be managed the same as under Alternative II, i.e., as FMZ C. Due to the lack of homes and people, the cliff areas would continue to be a lower suppression priority in multiple wildland fire situations, making an FMZ B classification inappropriate.

#### **Lower Elevations along the I-70 Corridor**

Lower elevations along the I-70 corridor would be managed the same as under Alternative I, i.e., FMZ B.

#### **4.5.11.5 Alternative V**

Approximately 25 percent of BLM lands in the Planning Area would be managed as FMZ B and 75 percent as FMZ C.

#### **Top of Plateau**

The top of the plateau would be managed the same as in Alternative II. Although fire would continue to be a desirable component of the ecosystem, reclassification and management as FMZ C is more appropriate. The change in management direction, with substantial oil gas development and associated construction of roads, pads, and pipelines, means that prescriptive vegetation treatments would be a more realistic means to achieve resource objectives. Due to the lack of homes and people, the top of the plateau would continue to have a lower suppression priority in multiple wildland fire situations, making an FMZ B classification inappropriate.

#### **Northeast Cliffs and Southeast Cliffs**

The Northeast and Southeast Cliffs areas would be managed the same as under Alternative II, i.e., FMZ C.

#### **Lower Elevations along the I-70 Corridor**

Lower elevations along the I-70 corridor would be managed the same as under Alternative I: FMZ B.

#### **4.5.11.6 Indirect, Offsite, and Cumulative Impacts**

The change from FMZ D to FMZ C means that naturally occurring wildland fires would not be managed to achieve targeted resource objectives. Instead, other prescriptive vegetation treatments would be used to accomplish targeted resource management objectives. From an ecological perspective, prescriptive vegetation treatments can be designed to mimic wildland fires and accomplish targeted resource objectives. Large wildland fires can be extremely complex, often with potentially disastrous effects, whereas prescriptive vegetation treatments are planned and designed to minimize the emission of smoke, control the area burned, and maximize benefits to the site.

Site-specific data on the economics of wildland fire use versus vegetation management strategies for the region are lacking. Attempting to derive economic measures for evaluating management strategies is made difficult by inadequate data and the question of what values to include in the analysis. Due to these uncertainties, no quantitative economic analysis is made in this document.

#### **4.5.12 Hazardous Materials**

Impacts from hazardous materials would most likely be in the form of discharges of wastestreams from oil and gas development to local water resources. Primary wastestreams from oil and gas extraction are typically those associated with drilling wastes and produced water. This section summarizes potential

impacts; see Section 4.2.4 for an evaluation of impacts to water resources from these materials.

### **Drilling Muds**

Drilling muds may contain various contaminants such as mercury, cadmium, arsenic, and hydrocarbons, among others. Drilling mud is typically not removed from the site. Up to 2,000 cubic yards of drilling mud per well may be air-dried and buried at each drill pad. The mud pits are typically unlined, which would allow some seepage. However, to protect sensitive riparian and aquatic habitats within the Planning Area, all operations would be required to either line the burial pits and limit the disturbed area to the area of the pad, or haul the material offsite for disposal in an approved facility.

### **Produced Water**

Produced water is highly saline and may contain other dissolved solids or contaminants. Tanks, wellheads, piping, other structures, evaporation ponds, and transport trucks have the potential to release produced water. This could occur as a result of an accident, tank or pipe failure, or pond breach or failure. To reduce these potential risks — including the presence of dissolved constituents at concentrations harmful to vegetation or above standards for aquatic life and stock watering — drilling operations in watersheds atop the plateau would be required to use a self-contained operation in which the produced water is reused onsite and either disposed onsite by reinjection or offsite by containerized transport to a regulated facility such as Black Mountain.

Other potential releases could result from leaking tanker trucks, onsite tanks, and evaporation ponds. The average wellhead condensate tanks typically hold 300 barrels per wellhead, and produced water tanks generally hold between 200 to 300 barrels per wellhead. Transport trucks range in capacity from 60 to 120 barrels. Produced water typically contains about 10 percent condensate. Tankers and/or ponds can contain more than 25 gallons of natural gas condensate at any given time. BLM

requires reporting of brine releases that exceed 100 barrels.

Refer to Section 4.2.4 (Water Resources) for a discussion of impacts of these types of spills.

Indirect, offsite, and cumulative impacts may result from hazardous materials spills occurring at facilities not regulated by BLM, including RCRA/Hazardous Waste Notifiers (see Table 3-34). Additionally, the EPA National Response Center (NRC) has been notified of 9 known releases in the study area. Impacts of spills are highly dependent on the type and amount of material, and the location of discharge (see Section 4.2.4 for an impacts analysis of spills).

### **4.5.13 Renewable Energy**

No development of renewable energy is currently anticipated for the Planning Area. Section 3.5.13 includes a discussion of the low potential of the Planning Area for wind generation. However, thinning of timber for fire risk management or removal of timber in conjunction with construction of oil and gas well pads, pipelines, and new or widened access roads could be used as a fuel source if biomass energy generation becomes a reality during the life of this RMP Amendment.

## **4.6 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

Any project involving significant changes in land use and management results in the consumption of one or more resources — materials, fuel, and monies — during and after its implementation. Thus, the land use and management activities incorporated into the 5 alternatives analyzed as part of this RMPA/EIS would result in permanent loss of resources within or intricately related to the Planning Area. Potential irreversible and irretrievable commitments are noted throughout the appropriate sections of the impact analysis in this chapter and are summarized below.