5.0 - CUMULATIVE IMPACTS ANALYSIS

Cumulative impacts result from the incremental impacts of an action when added to past, present, and reasonably foreseeable future actions, regardless of who takes the action. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time. This chapter discusses cumulative impacts as the incremental effect to specific resources or issues that would occur from Alternatives A and B, in conjunction with other past or reasonably foreseeable actions.

5.1 REASONABLY FORESEEABLE DEVELOPMENT

In support of the cumulative impact discussion, this chapter provides a discussion of past and present oil and gas activities in the Uinta Basin, both of which serve as introductions to the outlook for reasonably foreseeable development (RFD) in the Project Area and the greater Uinta Basin. The Seep Ridge Road is a major access artery serving the Uinta Basin. The cumulative impact and RFD analysis is based upon the level of activities and actions identified in the VFO Mineral Potential Report (BLM 2002) which projected environmental impacts across a 15-year period. This RFD was reviewed in 2008 for oil and gas development, which would be the most significant development activity expected in the VFO Planning Area. During this review the BLM determined that the RFD, as an analytical tool, could only accurately project environmental impacts for up to five years (BLM 2008a), i.e., five years from the time that the ROD for the VFO Approved RMP is signed.

Other activities with the potential to contribute to cumulative impacts would be livestock grazing and recreational projects. Spatial boundaries for cumulative impact assessments vary and are larger for resources that are mobile or migrate (i.e., air quality) compared to resources that are stationary or that have defined boundaries. For the analysis purposed of this EA, the Cumulative Impact Analysis Area (CIAA) for most resources is the VFO Planning Area which encompasses approximately 5.5 million acres in Duchesne, Daggett, Uintah, and Grand Counties.

5.1.1 OIL AND GAS

The Uinta Basin is a significant source of natural gas and oil, and it is currently one of the most active oil and gas producing areas in the onshore U.S. Development is currently proposed throughout the Uinta Basin, encompassing BLM, Tribal, and National Forest lands, with exploratory drilling taking place in the western and southern portions of the Basin.

Future oil and gas development in the Uinta Basin will depend upon the feasibility of exploration, as determined by the underlying geology and further infill development projects within the Basin. Future development will be dependent upon the geologic feasibility of each prospect, the cost to develop the resources, and continued engineering technological advancements. s of January 2008, according to UDOGM data, approximately 9,171 wells had been drilled in the VFO Uintah Basin. The cumulative scenario for this EA is based on the number of existing wells in the VFO RMP Planning Area, as well as the estimated total number of wells anticipated to be drilled over the coming 5 years in this same area as analyzed in the Vernal Field Office's final EIS associated with the proposed RMP (2008c). Under the VFO Approved RMP, an estimated 6,530 additional oil and gas wells are anticipated in the VFO Planning Area through 2013. This number may be conservative. Currently the BLM is considering three field development plans that could involve an estimated total of approximately 13,000 wells over the next 10 years.

5.1.2 WILDLIFE

Hunting generates considerable revenue for the State of Utah; hunters can generate considerable funds to local economies during popular and well-attended hunting periods. The State of Utah has current Herd and Wildlife Management Plans in place covering wildlife management in the Uinta Basin. These plans outline management herd objectives that would maintain and/or allow increased wildlife numbers over the next 10 years. Specific management actions identify habitat improvement projects that would sustain wildlife habitat, and thus desired wildlife populations, for the long-term. Many of these management goals and objectives have been considered and carried forward into the VFO Approved RMP (BLM 2008a). It is reasonable to expect that the State of Utah will continue to actively realize their management goals and population objectives for key wildlife species occurring in the Uinta Basin.

5.1.3 LIVESTOCK GRAZING

Livestock grazing is currently a permitted use of public lands within the VFO Planning Area. The BLM currently administers livestock grazing on 147 allotments, involving 153,370 AUMs. Although livestock industry changes may be expected over the next few years, primarily related to marketing trends and conditions, it is reasonable to expect that livestock grazing would continue with only minor changes. However, current and anticipated trends in other authorized uses involving public lands are expected to increase over the next several years. These authorized uses can have long-term cumulative impacts to livestock grazing, as surface disturbance associated with these projects can directly affect the continued usability of livestock allotments by livestock, reduce the amount of available forage to livestock, and reduce the quality of the forage by the spread of invasive plants and noxious weeds. Successful reclamation and aggressive control of invasive plants and noxious weeds are expected to minimize these impacts to livestock grazing over the long-term.

5.1.4 RECREATION

Continued population growth in the region, primarily due to continued energy development, will result in developed and dispersed recreational opportunities. The recreation designations and developments implemented to meet the expected increased demand would have beneficial impacts on recreation, but would also affect the management of other resources in the Cumulative Impact Analysis Area (CIAA).

5.2 CUMULATIVE IMPACTS

5.2.1 INTRODUCTION

This section discloses the impacts expected when the Proposed Action or alternative assessed in this EA are added to the past and reasonably foreseeable actions.

5.2.2 AIR QUALITY

The CIAA for air quality is defined as the Uinta Basin and northwestern Colorado. Cumulative air quality impacts are defined as the combination of emissions resulting from the Proposed Action or alternatives, existing nearby permitted sources, and RFD within the region. Areas of concern include the Uinta Basin, the High Uintah Wilderness Area, as well as nearby mandatory federal PSD Class I areas such as Arches and Canyonlands National Parks and Flat Tops Wilderness. Potential Air Quality Related Value (AQRV) impacts to sensitive areas include regional impacts on visibility, total nitrogen and sulfur deposition, and Acid Neutralization Capacity (ANC).

It is anticipated that the level of natural gas development within this region of the State will continue over the next few years; however the pace of such development will likely depend on market conditions. This development will add incrementally to air quality impacts from emissions sources. The Draft EIS and RMP for the VFO (BLM 2005a) has recently addressed the impacts to air quality in the Uinta Basin and surrounding areas of special concern, considering both existing permitted sources and an extended look at development over a fifteen year timeframe. The development alternatives were based on BLM's proposed plans for resource development, which included energy development along with other foreseeable development activities by non-BLM entities. The air quality models developed to analyze impacts to air quality were developed for the Uinta Basin and surrounding areas of special concern, i.e., on a regional basis. In general, results from this analysis indicate that existing air quality in the region is good, and based on reasonable development scenarios in conjunction with existing sources, is not of great concern. Cumulative energy development activities in the Uinta Basin are not expected to affect attainment of NAAQS standards or regional PSD increments.

In general, the increase in fugitive dust levels associated with the proposed improvements to the Seep Ridge Road would be temporary and localized; over the long-term, paving the road would reduce fugitive dust levels in the Project Area. In relation to the other ongoing and planned actions affecting air quality, the upgrade and paving of the Seep Ridge Road would have a limited positive effect on regional air quality. Therefore, it is unlikely that the proposed project would result in a detectable cumulative change to air quality at a regional scale.

5.2.3 CULTURAL RESOURCES

The CIAA for cultural resources is the Project Area because cultural sites are discrete which means impacts are not necessarily additive across a landscape. Impacts to the cultural resources in the CIAA would primarily result from activities associated with surface and subsurface disturbance. Historical and previous development activities have resulted in considerable surface disturbance within the CIAA. Impacts to cultural resources have been minimized by the requirement to conduct field surveys prior to surface-disturbing actions and to avoid or otherwise mitigate adverse impacts to significant and/or important cultural resources. Future impacts to the cultural resources in the CIAA would result primarily from surface disturbance associated with continued oil and gas development projects and increased visitation to the Project Area. Impacts may also result from specific cultural resource management decisions and from non-surface-disturbing activities that create atmospheric, visual, and/or auditory effects. These latter impacts would apply to sites or locations that together comprise the overall cultural experience for all visitors to the area, and especially to those deemed sacred or traditionally important by Native American Tribes and used by these groups in such a manner that atmospheric change, visual obstructions, and/or noise levels impinge upon that use. These types of impacts cumulatively affect not only the historic setting, feeling, and viewshed of cultural properties, but also their eligibility potential for nomination to the NRHP.

5.2.4 PALEONTOLOGY

As potential impacts to paleontological resources across a geographic landscape are not additive, the CIAA for paleontological resources is defined as the existing Project Area. Cumulative impacts to the paleontological resources in the CIAA would primarily result from activities associated with surface and subsurface disturbance. Surface-disturbing activities could affect paleontological resources by damaging or destroying fossils. Adverse effects include physical damage to or destruction of fossils, as well as increased vandalism and theft that result from improved access to fossil localities. However, if paleontological resources are discovered during surface-disturbing activities in the Project Area, mitigation measures would be implemented before surface-disturbing activities in that area are allowed to continue, cumulative impacts associated with the Proposed Action or alternatives are expected to be

minimal. Improved public access could increase vandalism and theft of significant paleontological resources in the immediate Project Area.

Surface-disturbing activities could also have a beneficial effect on paleontological resources by drawing the attention of a qualified paleontologist to areas that are not currently being researched, resulting in the collection of specimens and data that would not otherwise be recovered.

5.2.5 SOILS

The CIAA for soil resources is the VFO Planning Area. Past, present, and future surface disturbance in the CIAA is estimated at 49,029 acres, or less than 1 percent of the CIAA. Any land-disturbing activity that removes native vegetation and topsoil can result in an increase in erosion rates and sediment yield. Authorized actions that could result in increased erosion and sediment yield within the CIAA include oil and gas development, livestock grazing, recreation, mining activities (Gilsonite, sand and gravel, and, potentially oil shale), and road construction and maintenance operations. Of these potential soil-disturbing activities, existing and proposed roads are the features of highest concern. Active roadways would not be reclaimed, thus sediment yield from roads could continue at rates two to three times above background rates into the indefinite future.

Compaction due to construction activities at well pads, along access roads, and in other disturbed areas would result in a small increase in surface runoff from the area. This increased runoff could in turn cause increased sheet, rill, and gully erosion.

Surface disturbance associated with the Proposed Action and alternatives when added to past, present, and reasonably foreseeable actions would have minimal impacts on soil resources across the CIAA. BMPs and applicant-committed protection measures, adherence to current federal and state design requirements including berms, sediment control and stormwater structures, paving and adherence to regular maintenance operations, would reduce the impacts of the Proposed Action on soil resources by minimizing soil erosion, and by reducing the potential for soil contamination.

5.2.6 WATER QUALITY (SURFACE/GROUND)

The CIAA for water resources (including floodplains) is the BLM VFO Planning Area. The Proposed Action would result in a slight temporary increase in erosion rates and sediment yield. Impacts to water resources would be similar to those discussed above for soil resources. Rapid and successful reclamation/re-vegetation of temporarily disturbed areas not associated with the running surface and shoulder areas of the proposed road, use of erosion control devices, and implementation of BMPs are particularly important in minimizing water quality impacts and in assuring maintenance of long-term stream health. Design features of the Proposed Action and alternatives, including berms and sediment control structures would minimize additional erosion and delivery of sediment from the proposed project.

The existing road would continue to contribute slightly greater runoff than undisturbed sites. Increased runoff could lead to slightly higher peak flows in the Green River, potentially increasing erosion of the channel banks. Increased erosion would also potentially increase turbidity in the river during storm events.

The Proposed Action and alternatives when added to past, present, and reasonably foreseeable actions would have minimal impacts on soil resources across the CIAA.

5.2.7 FLOODPLAINS

The CIAA for floodplains is the BLM VFO Planning Area. Impacts to floodplains would be similar to those impacts discussed above in Sections 5.2.5 and 5.2.6 for soils and water quality. Implementation of best management practices to minimize impacts to soils and water quality would have similar, positive impacts to floodplains.

5.2.8 VEGETATION, INCLUDING INVASIVE PLANTS AND NOXIOUS WEEDS, SPECIAL STATUS PLANT SPECIES AND FORESTRY/WOODLANDS

The CIAA for vegetation and invasive species is the BLM VFO Planning Area. Existing and RFD development projects in the CIAA have or would construct and/or upgrade approximately 2,724 miles of road, and disturb approximately 49,029 acres of existing vegetation. In addition, existing and reasonably foreseeable forage used by livestock grazing, wild horses, wildlife, and recreational use of habitats, mining activities, and prescribed burns would also potentially disturb existing vegetation throughout the CIAA. Specific negative effects associated with the proposed development in the CIAA could include 1) reduction in the overall visual character of an area; 2) reduction or fragmentation of wildlife habitats; 3) increased soil erosion; and 4) increased potential for weed invasion.

Invasive weed species are a major concern in the Uinta Basin. Weed Management Areas have been established through interagency planning and coordination and treatment to find and effectively control stands of invasive and noxious species. Specific negative effects of invasive plants and noxious weeds associated with proposed development in the CIAA could include (1) reduction in the overall visual character of the area; (2) competition with, or elimination of native plants; (3) reduction or fragmentation of wildlife habitats; and (4) increased soil erosion.

The CIAA for special status plant species is the known occurrences of Graham beardtongue because they occur in discrete impacts, and impacts to those areas are not necessarily additive across the landscape. However, as the habitats have not been fully mapped and the population estimates are unknown, disturbance in the CIAA cannot be accurately quantified.

The Proposed Action and alternatives could impact the Graham beardtongue and its suitable habitat, which would incrementally contribute to cumulative impacts affecting habitats and populations of this special status plant species. Existing and reasonably foreseeable oil and gas projects have and would continue to contribute to incremental loss and fragmentation of suitable plant habitat within the Project Area and surrounding areas for this species. These activities could also have indirect effects, such as sedimentation and weed invasion, which would cumulatively decrease the plants' recovery potential. In addition, forage use by livestock grazing, wild horses, wildlife, and additional recreational use could also disturb plant habitat in and near the Project Area. These reductions of habitat could be compounded by other losses resulting from non-human induced conditions such as a prolonged drought.

Adherence to conservation measures/practices to afford protective distances from proposed development to plants and/or their occupied habitats could reduce cumulative impacts. Assuming adherence to the above mentioned conservation measures, activities related to other activities in the CIAA would not lead to the need for federal listing of the Graham beardtongue.

The CIAA for forestry/woodlands is the BLM VFO Planning Area. Reasonably foreseeable future actions primarily related to locate and develop mineral and other hydrocarbon resources would have the potential for the greatest impacts on woodland resources. The removal of the woodland and timber

forests would result in cumulative long-term impacts to the forestry resources in the area. Surface management agencies planning efforts to manage prescribed burns and wildfires in these forested areas would have direct impact on stand diversity and overall forest health. These plans would result in cumulative positive, long-term impacts. Failure to complete proper planning coordination could result in the potential increased loss and/or degradation of woodland resources. The VFO Approved RMP outlines habitat improvement on approximately 156,425 acres of woodland per decade. The Proposed Action would involve 255 acres of pinyon-juniper woodlands and montane brush/woodland areas, less than 1 percent of BLM's management strategy for woodland habitat management.

5.2.9 WILDLIFE AND FISHERIES, INCLUDING SPECIAL STATUS ANIMAL SPECIES

The CIAA for wildlife (including special status wildlife and fishery species) is the VFO Planning Area. Past and present actions in the CIAA (including minerals development, road construction, and livestock improvements among others) have caused direct habitat loss and/or degradation of habitat, contributed to habitat fragmentation, displaced individual wildlife species, increased collisions between wildlife and vehicles, and potentially contributed to the poaching and general harassment of wildlife. Recreation and livestock grazing within the CIAA has also contributed to cumulative impacts to wildlife; however, the incremental contributions of these activities are not quantifiable. Total cumulative surface disturbance from existing active wells and estimated RFD of oil and gas activities in the CIAA is estimated to be approximately 49,029 acres.

While surface disturbance somewhat corresponds to associated wildlife habitat loss, more accurate calculations of total cumulative wildlife habitat loss are not determinable because impacts are species-specific and dependent upon the following: (1) the status and condition of the population(s) or individual animals being affected; (2) seasonal timing of the disturbance; (3) value and quality of the habitats; (4) physical parameters of the affected and nearby habitats (e.g., the extent of topographical relief and vegetative cover); and (5) the type of surface disturbance. However, surface disturbance calculations are considered a useful indicator of habitat loss because as habitats are removed to support oil and gas development, mining, and other development activities, wildlife carrying capacities of an area would be reduced.

Development activities could temporarily displace wildlife or preclude wildlife species from using areas of more intense human activity. Surface disturbance impacts could disrupt migratory routes and seasonal ranges, increase general distress, or result in deteriorated physical condition, decreased reproductive success, and nutritional condition due to increased energy expenditure.

It should also be noted that this analysis assumes cumulative impacts to special status wildlife species would be similar in nature to those discussed above for wildlife. However, given their ongoing habitat losses, sensitivity to disturbances, and declining population numbers, special status wildlife species would be expected to be more sensitive to impacts related to development within the CIAA than other, more common wildlife species. Based on these sensitivities, existing and RFD land uses have reduced and would likely continue to reduce the quality and quantity of habitats in the CIAA for special status wildlife species. Field inventories for special status wildlife species are conducted prior to construction, and if seasonal and/or spatial buffers (or avoidance) and other such protective measures are employed in sensitive areas, project-related impacts to special status wildlife species could be reduced. As such, the additive impacts of the Proposed Action with other existing and RFD activities could affect but would not likely cause a trend towards federal listing of the WTPD, spotted bat, bald eagle, golden eagle, ferruginous hawk, greater sage-grouse, short-eared owl, burrowing owl, or sage sparrow.

Similar to special status wildlife discussed above, existing and RFD land uses (including livestock grazing, mineral development, and recreation) have reduced and will likely continue to reduce habitat quality in the CIAA for special status fish species through depletion and sedimentation.

5.2.10 LIVESTOCK GRAZING

The CIAA for livestock grazing is the combined area of the four grazing allotments. Cumulative impacts from oil and gas development to livestock grazing would include the loss of AUMs during the life of the disturbances and disturbance to range facilities. Recreation activities also contribute to cumulative impacts to livestock grazing, but the incremental contribution is impossible to quantify. Table 5.2-1 displays the past, present and reasonably foreseeable development for the livestock grazing CIAA.

Table 5.2-1. AUMs Lost from Existing and Reasonable Developments in the Livestock Grazing CIAA

Allotment Name	Total AUMs in CIAA	AUMs Lost from Project Alternative	Past and Present AUMs[1] Lost	RFD AUMs[1] Lost	Total Reasonably Foreseeable AUMs[2] Lost in CIAA	% of Total AUMs in CIAA
Olsen AMP	9,268	24	77	44	158	1.7
Sand Wash	4,526	24	74	44	118	2.6
Sunday School Canyon	3,667	13	60	35	97	2.6
Sweet Water	8,391	11	75	46	157	1.8
TOTAL for CIAA	**25,852**	**52**	**286**	**169**	**530**	**8.7**

[1] Loss for this calculation were assumed to be allotmentwide

[2] The Reasonable Foreseeable AUMs were calculated by adding the following columns: Past and Present AUMs lost, RFD AUMs lost, and Total AUM's lost from Project Alternative.

These past, present, and future construction activities, and other visual and noise impacts in the CIAA could cause livestock to move to adjacent undisturbed areas, thereby leading to additional livestock impacts on vegetation in those locations. Vegetative recovery, via revegetation efforts, may become increasingly more difficult as grazing animals compete for resources that may become less available due to drought conditions. Successful interim and final reclamation would reduce adverse effects on livestock resources.

5.2.11 RECREATION (INCLUDING TRAVEL MANAGEMENT)

The CIAA for recreation is the Book Cliffs area south of the White River to the Book Cliffs Divide and east of the Green River to the Utah-Colorado state line. Disturbances principally from oil and gas development have reduced the value of the Book Cliffs area for recreationists seeking undeveloped landscapes and remote and primitive recreation opportunities. Improved access from paving the Seep Ridge Road would contribute to these cumulative impacts by lessening the recreational experience for some visitors to the area and causing them to seek remote and primitive recreation opportunities elsewhere.

Improvements to and paving of the Seep Ridge Road would improve access to the Book Cliffs area, enhancing future development of resources in the area, but not necessarily causing such development. The cumulative impact of the reasonable foreseeable development in the Book Cliffs area, including the proposed improvements to the Seep Ridge Road would be to increase the number of roads in the Book

Cliffs area and improve vehicle access to the area. These cumulative improvements would be a long-term benefit to motorized visitors to the Book Cliffs area.

5.2.12 LANDS/ACCESS

The CIAA for lands/access is the Project Area. Potential cumulative lands and access impacts are associated with future natural gas development and recreation in the CIAA. These impacts include increases in industrial traffic and associated user conflicts on segments of Uintah County roads. Improved access to the Book Cliffs area enhances development of the area. As other roads in the area are upgraded and improved to accommodate development and connections are made to the Seep Ridge Road, increasing conflicts would arise involving existing co-located ROWs along these roadways. However, improved and increased road activities in the area would offer greater options for co-located placement of new ROWs, reducing the impacts to other resources and uses in the area from such ROWs. Continued coordination with existing ROW holders prior to any surface disturbance along existing access routes would minimize impacts to these ROWs and ensure their continued function.