

The following section supplements the analysis found in Chapter Three, [Section 3.14 - Livestock Grazing Management](#) in the Draft EIS beginning on page 3.247, “Effects of Minerals Management”.

### **DIRECT AND INDIRECT IMPACTS**

Disturbances related to oil and gas drilling and related operations (primarily acres disturbed for well pads and road construction) could result in short-term forage loss. Disturbed land and the removal of vegetation can result in the establishment of invasive species and soil loss, and thus reduce forage production potential. The effects of oil and gas leasing and development to livestock grazing depend on where disturbance occurs, development density, and when disturbed areas could be re-claimed. If disturbance occurs on suitable grazing lands on active grazing allotments, there may be a short-term loss of AUMs (Animal Unit Months). However, given current stocking rates, the AUM loss would be minimal.

Disturbed areas would undergo partial reclamation efforts following facility construction and full restoration following the useful life of the well and would restore loss of forage. Typically, livestock concentrate on newly reclaimed areas, resulting in a decreased use of forage on the native rangeland. Temporary adjustments of active use or temporary closures may be warranted when the realization of reclamation objectives is slow. Since all ground-disturbing activities are required to be reclaimed, long-term AUM loss should not occur. The construction and improvement of roads may provide livestock operators with better access to their livestock and enhance their ability to maintain improvements. Other short-term impacts such as the need for gates or cattle guards due to increased traffic could be mitigated through COA for well development.

Specific to the GSGP development, the majority of oil and gas development would occur in Dolores, Montezuma and San Miguel Counties. Table S-3.14.1 below summarizes the projected direct, indirect, and cumulative effects of oil and gas development on livestock grazing as expressed in the number of affected active grazing allotments and potential foregone AUMs. For those acres remaining unleased there would be no disturbance due to oil and gas leasing.

AUMs were calculated by dividing the projection of impacted suitable acres by average livestock stocking rates within the GSGP. AUMs are used as a comparison metric. Any changes to permitted livestock grazing due to oil and gas development would be decided when field development plans are evaluated.

**Table S-3.14.1 - Direct, Indirect and Cumulative Impacts of Oil and Gas Activities within the Gothic Shale Gas Play**

Direct And Indirect Impacts Summary	Alternative A	Alternative B	Alternative C	Alternative D
Affected Active Grazing Allotments	56	56	55	56
Acres of Suitable Rangelands Affected	2,111	2,060	2,035	2,085
Foregone AUMs	240	234	224	299
% of Permitted AUMs Affected	<1	<1	<1	<1
Cumulative Impacts Summary	Alternative A	Alternative B	Alternative C	Alternative D
Affected Active Grazing Allotments	90	88	85	91
Acres of Suitable Rangelands Affected	3277	3226	4201	3251
Total Foregone AUMs	506	330	315	408
% of Permitted AUMs Affected	<1	<1	<1	<1

**Alternative Comparison:** Alternative D followed by Alternatives A, B, and C, respectively, could affect the greatest number of AUMs and suitable rangelands. Overall, the reduction in AUMs would be negligible as less than 1% of permitted AUMs by alternative would be foregone. Well access roads and operating wells themselves, could impact livestock grazing operations through increased traffic, generally increased disturbance to grazing livestock, potential noxious weed invasions, impacts to existing infrastructure, and increased opportunities to steal or rustle livestock. Alternative A followed by Alternatives D, B and C would have the greatest number on well pads and access roads and consequently, the highest potential to produce these impacts. Compared with the approximately 2,000 suitable rangeland acres that could be affected in Alternatives A through D, there would be no suitable rangelands affected under the No Lease Alternative on unleased federal lands.

## CUMULATIVE IMPACTS

The cumulative effects analysis area is the combined conventional area and GSGP within the Paradox Basin of the planning area.

When considering potential effects to livestock grazing from future development on currently leased lands, the impacts to livestock grazing would be minimal. Even if all of the 1,786 acres of disturbance projected to occur on leased lands (from shale gas and conventional development) were to occur on suitable grazing lands, only 97 AUMs would be foregone (based on an average stocking rate), between alternatives, of 12.0 acres per AUM. This is less than 1% of permitted AUMs by alternative.

When considering the direct and indirect effects along with cumulative effects on federal lands, including existing impacts and potential impacts from future development on federal leased and unleased lands, and potential future development on state and private lands, the planned effects are negligible as less than 1% of permitted AUMs by alternative could be affected.

Other resource activities or conditions would not interact measurably with oil and gas to result in additional cumulative range impacts. Some activities such as timber management projects that opens canopy cover in otherwise dense stands, could have a positive impact on rangelands, offsetting the loss of AUMs realized by oil and gas development.