Appendix P
Carrying Capacity Analysis – Devils Gate Allotment

Devils Gate Field

There is insufficient information on utilization within the Devils Gate Field to calculate carrying capacity based on actual use and utilization. The only estimate regarding the carrying capacity for the Devils Gate Field is based on an AUM summary from the range adjudications in 1950. Those AUMs on the public lands as well as the AUMs on private lands owned or controlled by the permittee, and AUMs on private lands not owned/controlled by the permittee within the field, are summarized in the table below.

Devils Gate Field	Public Land AUMs	Private Land AUMs (Owned/Controlled)	Private Land AUMs (Not Owned/Controlled)
	414	215	406

Indian Creek Pasture

Long-term utilization data are available only from Key Areas DG-01 and DG-02, both of which are located in the Indian Creek Pasture; therefore, the carrying capacity analysis based on actual livestock use reports and utilization data collected at the two key areas is limited to the Indian Creek Pasture. In addition, this analysis is limited in time because most of the utilization data are from the years prior to construction of the new pasture/field fences and installation of the Devils Gate Pipeline which have likely altered use patterns.

The formula used to calculate the grazing/carrying capacity for each year that data are available is as follows:

$$\frac{\textit{Actual Use (AUMs) x Utilization Objective}}{\textit{Recorded Utilization}} = \textit{Grazing/Carrying Capacity}$$

The calculated capacities for each year are combined to calculate an average. The analysis then looks at the average and the range of variation among the years in an effort to determine if there is a good relationship between actual use and utilization for the purposes of planning stocking rates and allocating the AUMs available for livestock use (permitted use/grazing privileges).

The utilization objective for the key native grass species is 50% of current year's growth, with the utilization objective for bitterbrush being 25% of current year's leader growth by the end of spring, and 45% by the end of the summer/fall. The BLM believes these levels of use to be compatible with achievement of the land use plan objectives and standards for rangeland health. Recorded utilization is taken from data collected at key areas.

The animal unit months (AUMs) of forage use by cattle in the Indian Creek Pasture, based on 27 years of actual use data, averaged 3,633 AUMs and ranged from a low of 1,278 AUMs to a high of 5,746 AUMs. Sheep use, based on 21 years of actual use data, averaged 1,007 AUMs and

ranged from a low of 69 AUMs to a high of 1,844 AUMs. Please refer to Appendix D for the tables showing actual use.

The average calculated carrying capacity, based on utilization data collected at Key Area DG-01, is 6,702 AUMs (Pre-CAF) with the carrying capacity calculations ranging from a low of 4,175 AUMs to a high of 9,950 AUMs. The Post-CAF average calculated capacity is 5,886 AUMs; however, the differences in calculated carrying capacities between years varies considerably, ranging from 4,007 AUMs to 11,393 AUMs, which indicates there are other variables affecting the carrying capacity calculations that the CAF doesn't take into account. Please refer to Appendix D for the tables showing calculated capacities for each year that data were available, as well as the average. Please also refer to Appendix Q for information about precipitation levels over the evaluation period and the CAF (Climate Adjustment Factor).

The average calculated carrying capacity, based on utilization data collected at Key Area DG-02, is 5,640 AUMs (Pre-CAF) with the carrying capacity calculations ranging from a low of 3,589 AUMs to a high of 9,545 AUMs. The Post-CAF average calculated capacity is 5,425 AUMs; however, the differences in calculated carrying capacities between years varies considerably, ranging from 2,857 AUMs to 9,841 AUMs, which indicates there are other variables affecting the carrying capacity calculations that the CAF doesn't take into account.

Looking at the results from both key areas, it appears the data from Key Area DG-02 is the most limiting in terms of calculated carrying capacity (5,640 AUMs (Pre-CAF) and 5,425 AUMs (Post-CAF).

In general, the calculated carrying capacities vary substantially over the evaluation period, and there doesn't seem to be a strong grouping of annual calculated capacities around the averages. Certainly carrying capacity varies between above normal precipitation years and below normal precipitation years; however, attempting to normalize the calculations to the median precipitation year using the CAF still results in considerable variability.

When we look at the evaluation of conditions and trends at Key Areas DG-01 and DG-02, they appear to be satisfactory in meeting the Upland Standard and likely represent most of the acres in the pasture. With this in mind, the variations in actual use and utilization over the evaluation period also seem to have been compatible with meeting the Upland Standard for most of the acres in the pasture. There are at least a modest amount of acres around the waters and associated main livestock trailing routes that have been adversely impacted by livestock use, and are usually evident on allotments where season-long livestock use occurs on a regular basis. Some of these impacts have probably been reduced through changes in management such as within the Devils Gate Riparian Pasture, and through improved vegetative compositions and cover in the areas seeded after the fires.

Most of the years of data for the Indian Creek Pasture would have included use in the Devils Gate Riparian Pasture before it was fenced in 2006/07. However, there is insufficient information on actual use and utilization to analyze carrying capacities for just the riparian pasture, or for the other pastures that now subdivide the larger pasture into the Upper and Lower

Indian Creek Fields or the Upper and Lower Cottonwood Fields. Collection of additional data, including use patterns, would help with future analysis.

Future Allocation of Grazing Privileges between the Cattle and Sheep Operations

Since the above carrying capacity analysis for the Indian Creek Pasture looks at the capacity regardless of land ownership, one way of allocating the AUMs by land ownership could be based on the percent of acreage represented by each of the three different ownership classifications as follows:

Total Acres in Pasture =	100%
Acres of Public Land =	???%
Acres of Private Land=	???% (Owned/Controlled by Permittee)
Acres of Private Land=	???% (Not Owned/Controlled by Permittee)

When the total number of AUMs available for livestock use in the pasture has been selected, then multiply the total AUMs available by the percentages above (Public, Private/Owned, and Private/Not Owned) to arrive at the AUMs allocated to the three different land ownerships.

Then, from the AUMs allocated to the public lands, split them between the cattle and sheep operators in proportion to their current privileges (active AUMs – cattle operator) and historic use (TNR AUMs – sheep operator).

In addition, a permittee with owned/controlled private lands in the pasture would also be given credit for the AUMs allocated to those lands.