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# Appendix J

Methodology for Calculating a Substantial Livestock  
Grazing Reduction under Alternative C2



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## METHODOLOGY FOR CALCULATING A SUBSTANTIAL LIVESTOCK GRAZING REDUCTION UNDER ALTERNATIVE C2

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Under Alternative C2, which reduces livestock grazing, the BLM utilized the Desired Stocking level formula found in BLM Technical Reference 4400-7, Rangeland Monitoring Analysis, Interpretation, and Evaluation (BLM 1985, p. 54), to analyze a reduced animal unit month (AUM) amount. The formula uses actual use over key management area utilization that equals the desired actual use over the desired key management area utilization. The formula is:

$$\frac{\text{Actual Use}}{\text{Key Management Area Utilization}} = \frac{\text{Desired Actual Use}}{\text{Desired Key Management Area Utilization}}$$

The key management area utilization selected was 50 percent. This number was derived from the take half leave half rule of thumb that began with work by Franklin J. Crider in 1955, which considered root growth stoppage resulting from grass defoliation. He states, “Removals during the growing season of half or more of the foliage of grasses—cool- and warm-season species including bunch, rhizomatous, and stoloniferous types—caused root growth to stop for a time after each removal...” This rule of thumb has been employed over time and, from a general perspective, is the limit of utilization set as a management tool by many BLM field offices. This level is reflected in several allotment decisions in the Randolph Management Framework Plan in Rich County, as well as the Vernal and Moab RMPs. The 50 percent utilization limit has been interpreted by some to also mean “moderate use” or “proper use,” with the same idea of leaving half the plant for regrowth and site protection. Current literature is providing more information on moderate use and its relation to specific species on specific sites and geographic locations. Moderate grazing has been defined as low as 35 percent and as high as 65 percent on rare occasions, specifically for crested wheatgrass (Holechek et al. 2004). The 41- to 60-percent class interval found in the key species method (formerly the modified key forage plant method) is used by BLM field offices throughout Utah (Interagency Technical Reference 1734-03, Utilization Studies and Residual Measurements; Coulloudon et al. 1999). This 41 to 60 percent class interval has been interpreted as moderate, and its description states: “Half the available

forage (by weight) on key species appears to have been utilized.” Schmutz et al. (1963) also shows that moderate use is 40 to 60 percent with a mid-point of 50 percent. At this level of planning, the general rule is to take half leave half. Most, if not all, BLM field offices are managing for a 50 percent or less utilization limit, so the 50 percent key management area utilization level was used at the base assumption. It is also assumed that all key management areas across the planning area have a 50 percent utilization limit. There may be situations in which site-specific key management areas have a utilization limit higher or lower than 50 percent that benefits ecological processes.

The formula was used to determine a reduced AUM allocation for Alternative C2. A desired key management area utilization of 30 percent was selected to determine the desired active use (AUM) number for this land use plan amendment. In Pellant et al. (2005), 30 percent is the mid-point of the class interval sometimes referred to as light (21 to 40 percent).

Conservation stocking is a term commonly used by range researchers to define a level of grazing between light and moderate, generally involving about 35 percent use of forage (Holechek et al. 2004). Holechek et al. (2004) continues that, “Conservation stocking involves using about 35 percent of forage resources on arid and semiarid rangelands. There appears to be little biological benefit from lighter use levels.” Schmutz et.al. (1963) shows that light use is 20 to 40 percent with a mid-point of 30 percent. Given the slight variation within the light or conservative use levels as outlined in the literature, the BLM used the 30 percent mid-point of the Pellant et al. (2005) class interval, which is more conservative than Holechek et al. (2004) or Schmutz et al. (1963).

Because actual use is not collected by every BLM field office on every allotment every year, active use, as shown on current grazing permits, was used in its place. Average billed use was not used in the formula because the amount billed may be limited by other factors such as permittees’ livestock operational requirements and fire rehabilitation efforts. The average billed use may also have resulted in lower utilization levels not reflected in the 50 percent utilization level assumption. Active use should more closely reflect a relationship between the active use and the average utilization of 50 percent throughout the planning area because of LUP limitations and existing permit terms and conditions.

The use of 50 percent to 30 percent utilization provides a reduction of 329,521 active AUMs (labeled as “actual use” in the formula) in the calculation for a desired actual use of 197,713 AUMs. This would result in a reduction of active AUMs as well as a reduction of the average billed use and is used for analysis purposes in Alternative C2. Site-specific limits of utilization and the application of the reduction will be determined at the field office level where site-specific information about true actual use, ecological condition, and achievement of applicable habitat requirements can be addressed.

The 50 percent and 30 percent utilization limits used in the formula are not intended to suggest a utilization limit or objective in this planning effort.

## REFERENCES

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