ADAPTIVE MANAGEMENT APPROACH TO LIVESTOCK GRAZING ON THE SANTA RITA EXPERIMENTAL RANGE

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INTRODUCTION

- In 2007, an Adaptive Management (AM) approach to livestock grazing replaced yearlong and seasonal rotational (SR) grazing systems on the SRER.
- There was very little flexibility in annual grazing pressure under the old system despite extreme temporal variability in growing conditions.
- SR did not yield the anticipated improvement in vegetation composition or productivity.
- The AM emphasizes frequent assessment of resource conditions and using the data in adjusting management to optimize grazing intensity during the dormant season.
- The approach enables annual flexibility in livestock management

OBJECTIVES

- Generate peak standing biomass data used as guideline to set winter dormant season grazing schedules in late October and
- Assess utilization rates and use distribution to minimize short- and long-term negative impacts of livestock grazing on vegetation composition and production.

METHOD

- We measure peak standing biomass between September and November using comparative yield method.
- Peak standing biomass of herbaceous plants and shrubs is subdivided into forage categories based on dry weight ranks.
- Vegetation categories are annuals, total perennial and native grasses, forbs and shrubs. (Table 1)
- Conservative stocking rates are set mostly based on ≤40% utilization of perennial forage grasses (Table 1).
- After grazing, utilization across each pasture is measured using grazed-ungrazed plant method on paced transects .
- We create GIS maps showing areas of different utilization levels to visualize distribution and levels of utilization (Fig 1).
- A committee including personnel from UA, NRCS and Santa Rita Ranch develop the grazing plans.

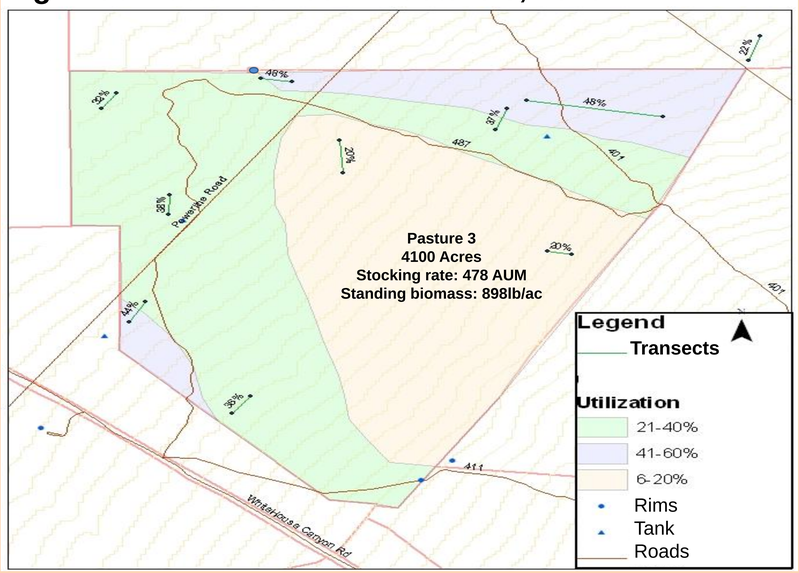
RESULTS

Table 1. Estimated peak standing biomass, carrying capacity (ADA*) of different vegetation categories and actual stocking rates (ADA) per pasture for 2008/09.**

Pasture	2008/09				2009/10			
	Est. Prod (lbs/ac)	ADA* at 40% use		ADA**	Est. Prod (lbs/ac)	ADA* at 40% use		ADA*
		Perennial grass	Native perennial grasses			Perennial grass	Native perennial grasses	
6D	3196	36.0	9.5	3	5332	75.6	25.7	1.94***
5N	2490	16.3	3.8	4.5	4532	63.2	60.4	2.8
5M					2128	20.2	19.8	3.2
2S	2935	33.1	4.2	2.9***	1842	16.7	10.1	3.5
12B					1476	10.7	8.5	2.7
5S	1425	4.9	4.8	5.3				
12A	1467	8.7	0.2	1.7				
3	1682	1.8	1.7	3.5	898	6.0	5.0	4.8

*ADA (Animal Days per Acre) = (Est prod. x 0.40 utilization)/20 lbs per day consumption per Animal Unit.
**ADA (Animal Days per Acre) = (Animal Units * Grazing Days)/Pasture acreage.
***Grazed during growing seas(grazing period is ~10 days).

Fig 1. Utilization zones in Pasture 3, 2010



DISCUSSION

- Productivity varies across the range, and also varies over time (Table 1).
- Production data enables the committee to set grazing pressure annually to levels that optimize use of available biomass and avoid overuse in areas or years of low productivity.
- The data reduce the need for guesswork in making grazing plans.
- During the growing season , grazing periods are limited ~10 days to avoid regrazing of plants while they are most sensitive to defoliation.

- Utilization generally decreases with increasing distance from water (Fig 1), with few instances of higher utilization along washes in spring .
- This is likely because plants green faster along washes than in upland areas.
- Mapping utilization zones show spatial distribution of use and in extreme cases is evidence for need to improve distribution of livestock into areas of low utilization.
- Utilization data is also used to make adjustments to grazing intensity in pastures grazed in future.

- In the long-term this data along with precipitation and vegetation cover data collected on the SRER has potential to
  1. provide insight into sustainability of livestock grazing in semiarid ecosystems and
  2. generate large scale predictive models of relationships among stocking rates, vegetation production , cover and precipitation.
  3. show trends in carrying capacity (ADAs) of the rangeland under the AM management approach.