# Ranch-level Economics of Prescribed Grazing in MLRA 52 (northern Montana)

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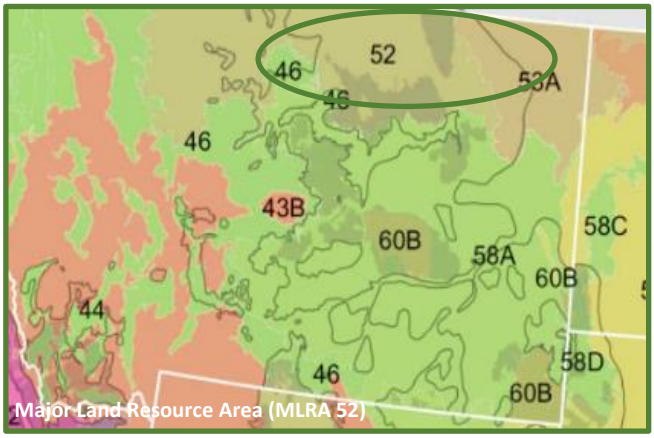
## Introduction

Capturing potential gains from prescribed grazing as the result of increased cattle production requires the development of sophisticated models of cattle production dynamics. To begin filling this information gap, this study seeks to quantify and compare the impact on ranch profits from two prescribed grazing conservation practices: 1) rotational grazing and 2) rotational grazing plus rest. The Natural Resources Conservation Service (NRCS) offers both technical assistance and financial incentives for ranchers interested in adopting prescribed grazing programs, so understanding how these practices affect ranchers' bottom lines is critically important.



Major Land Resource Area (MLRA 52)

## Methods

Four representative ranch types were identified from enterprise budgets for this major land resource area (MLRA). Public ranch types use rangeland managed by the federal or state government (Bureau of Land Management, United States Forest Service, and/or State), as well as private rangeland. Private ranch types operate solely on privately owned rangelands. Representative ranches were modeled as profit-maximizing operations, with a planning horizon of 40 years. The Net Present Value (NPV) of the ranch's net cash flow was calculated using a 7% discount rate,


Photo by Rick McEwan, Sage-Grouse Initiative's Photo Gallery.

averaged from 100 cattle sales price scenarios developed using Cattlefax price data.

Researchers then created impact models, working with a panel of NRCS advisors. Project size in acres was estimated from the number of Animal Unit Months (AUMs) given in enterprise budgets, vegetation production information detailed in Ecological Site Descriptions, and an assumed 25% Harvest Efficiency (HE) and a 70% water distance factor (WDF)[1]. Following implementation of a prescribed grazing conservation practice, at least two new water developments were added to the model. Additional water developments were added if required to achieve 90% WDF. Fencing, water developments, and other costs associated with prescribed grazing were assumed to be supported through the Environmental Quality Incentives Program (EQIP) (3/4 of project costs) and by NRCS incentive payments. Since prescribed grazing also may result in harvest efficiency gains, two harvest efficiency scenarios are considered for each impact model -- no change, and 5% increase (i.e., 30% HE).

## Results

Table 1 and 2 illustrate the results. Table 1 shows that three out of the four representative ranch

[1] A factor of proximity of cattle to a water source

Table 1. Installation costs and net project cost after EQIP and NRCS incentive payments.

| Ranch Type | Project Size (Acres) | Initial Installation cost | Incentive Payments[2] | | Present Value of Incentives Received and Costs of Installation, Operation and Maintenance | |
|---|---|---|---|---|---|---|
| | | | Rotation | Rotation+ Rest | Rotation | Rotation+ Rest |
| **Large Private** | 13,841 | $235,312 | $42,642 | $104,643 | **$5,338** | **$168,074** |
| **Large Public** | 7,123 | $168,588 | $21,940 | $53,854 | -$18,045 | **$65,706** |
| **Small Private** | 2,981 | $111,503 | $9,182 | $22,538 | -$21,641 | **$13,410** |
| **Small Public** | 1,227 | $67,156 | $3,779 | $9,275 | -$19,895 | -$5,471 |

Table 2. Baseline and impact model results, showing changes in cattle production and the Net Present Value (NPV) of the ranch's net cash flow over 40 years.

| Ranch Type | Base-line NPV (000's) | Impact (+/-) | | | Impact (+/-), with 5% HE Increase | | |
|---|---|---|---|---|---|---|---|
| | | Herd Size | Rotation NPV | Rotation + Rest NPV | Herd Size | Rotation NPV | Rotation + Rest NPV |
| **Large Private** | $429.9 | +30% | **+28%** | **+51%** | +50% | **+44%** | **+65%** |
| **Large Public** | $1,218.5 | +7% | **+130%** | **+154%** | +15% | **+147%** | **+169%** |
| **Small Private** | $193.9 | +1% | -5% | **+10%** | +6% | **+5%** | **+20%** |
| **Small Public** | $202.4 | +8% | -6% | -2% | +24% | -2% | **+3%** |

types would see a net gain (highlighted in green) by adopting prescribed grazing rotation plus rest, just from EQIP and NRCS incentive payments alone. However, only the Large Private ranch would experience a net profit gain if adopting the second prescribed grazing option of rotation only, without rest. Table 2 builds upon Table 1 and summarizes the impact for the four representative ranches when modeling cattle production gains as the result of prescribed grazing in addition to incentives. Profit gains are shown in green. A 5% harvest efficiency increase results in profit gains for all but the Small Public ranch (the smallest project size).

## Conclusions

- These results highlight profit gains available to ranches within this MLRA from conservation program participation.
- Our rigorous models show increased cattle production numbers (Table 2) as the result of prescribed grazing. Ranchers may be unaware of this possible added benefit of NRCS programs; education about such benefits may promote conservation program participation.
- Project size (in acres) and assumed harvest efficiency benefits can change practice adoption outcomes from a net gain to a net loss for both types of prescribed grazing. Ranches with larger project sizes may see greater gains in WDF and receive larger total incentive payments.
- There are possible non-market and ecological benefits from prescribed grazing not quantified here. Further research is needed to understand how these values affect program adoption and economic outcomes.

**For additional information, please visit: http://sustainablerangelands.org/projects/economics-of-sage-grouse-management/**

[2] Incentive Payments shown are for a single year. The payment is made each year for the first three years.