Range Improvement Analysis
Lander Field Office

Purpose:

- To analyze other resource values (i.e. riparian habitats, sage grouse and wildlife winter range) while grazing livestock under two alternative scenarios of no new structutal range improvements or fully utilizing all range improvements.
- This model also takes into account distance from any given water source and slope as it relates to grazing management.

- This analysis is not intended to be a forage allocation model, but rather a model to analyze the impacts of rangeland improvement projects within the grazing landscape. Projects are designed and installed to improve grazing management within the Lander Field Office.

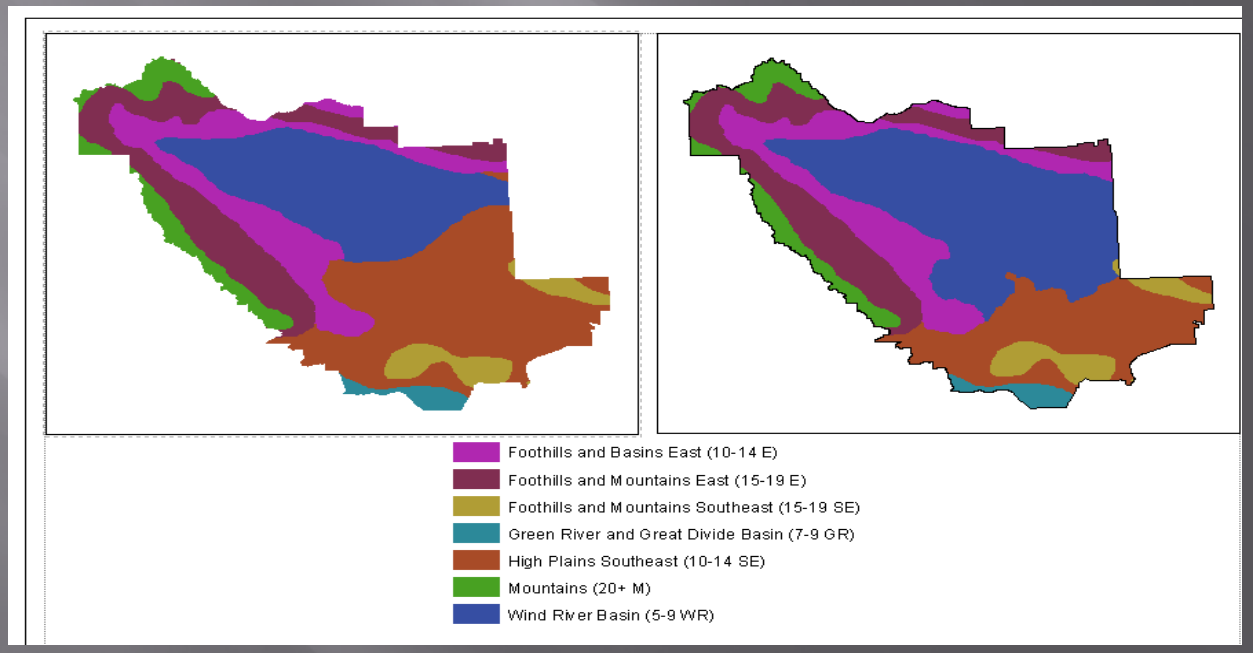
Input Data Used:

- Precipitation (NRCS Maps & BLM field rain guages)
- NRCS (Natural Resource Conservation Service) Ecological Sites
- Median Year Production from NRCS Ecological Sites
- Harvest Efficiency
- Condition of Lander Field Office Rangelands

Precipitation Zones…

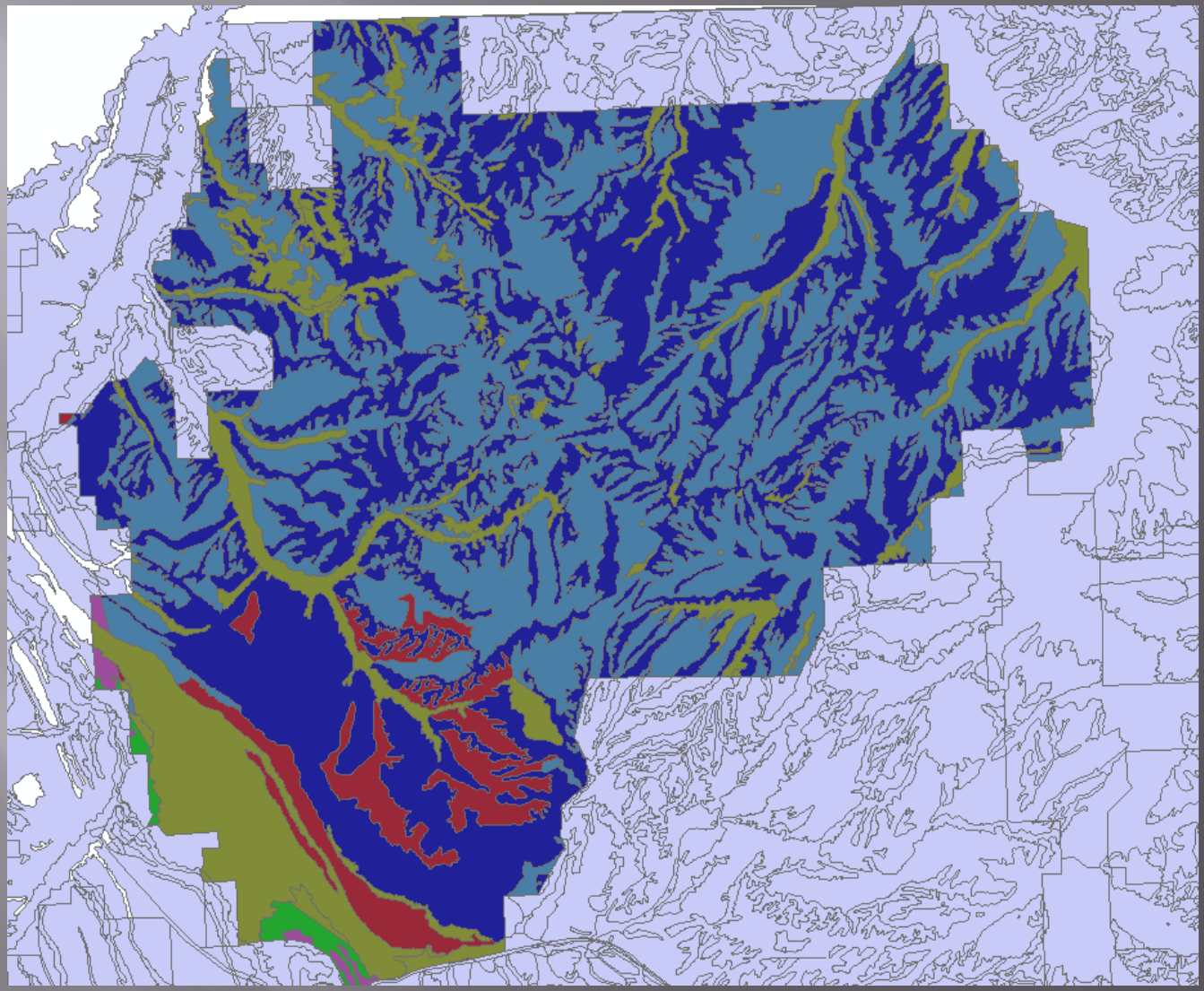
- The NRCS precipitation zones were adjusted to be more consistent with our Field Office rain gauges using reasonable geographic boundaries (Beaver Rim)

Original Modified



Ecological Sites…

- Ecological sites were obtained using GIS from the digitized soil survey information from the NRCS in Wyoming.
- The surveys used are the Lander and East Fremont soil surveys for our Field Office.
- Ecological site were used on a landscape basis for analysis.
- Estimated vegetation production was determined on each ecological site.



Government Draw No. 1803, the dark blue is the dominant ecologic site and so the allotment had a base production value of 154 lb per acre – 5-9” Wind River Basin, Shallow Clayey.

Production

- Using the NRCS ecologic site layer and the modified NRCS precipitation zone to determine which ecological site descriptions to use.
- Production was averaged between mid seral and late seral for the values used in the model.
- Using NRCS median year production values for ecologic sites with an adjustment for condition class.

For Example:

- Shallow Clayey 5-9” Wind River Basin
- 16.25 Acres/AUM Stocking Rate (mid pt. between mid and late seral stages, this is 61.5% of potential)
- 10 Acres per AUM/.615% = 16.25 Acres/AUM
- Production under excellent/potential condition is 250 lbs/acre on a median year.
- Therefore, the production is estimated to be 154 lbs/acre (61.5% of 250 lbs/acre).

What production to which allotment?

- Divided allotments into pieces based on ecologic site
- Calculated Acreage values for each ecologic site within the allotment
- Chose the ecological site with the largest area to determine a base production for the entire allotment

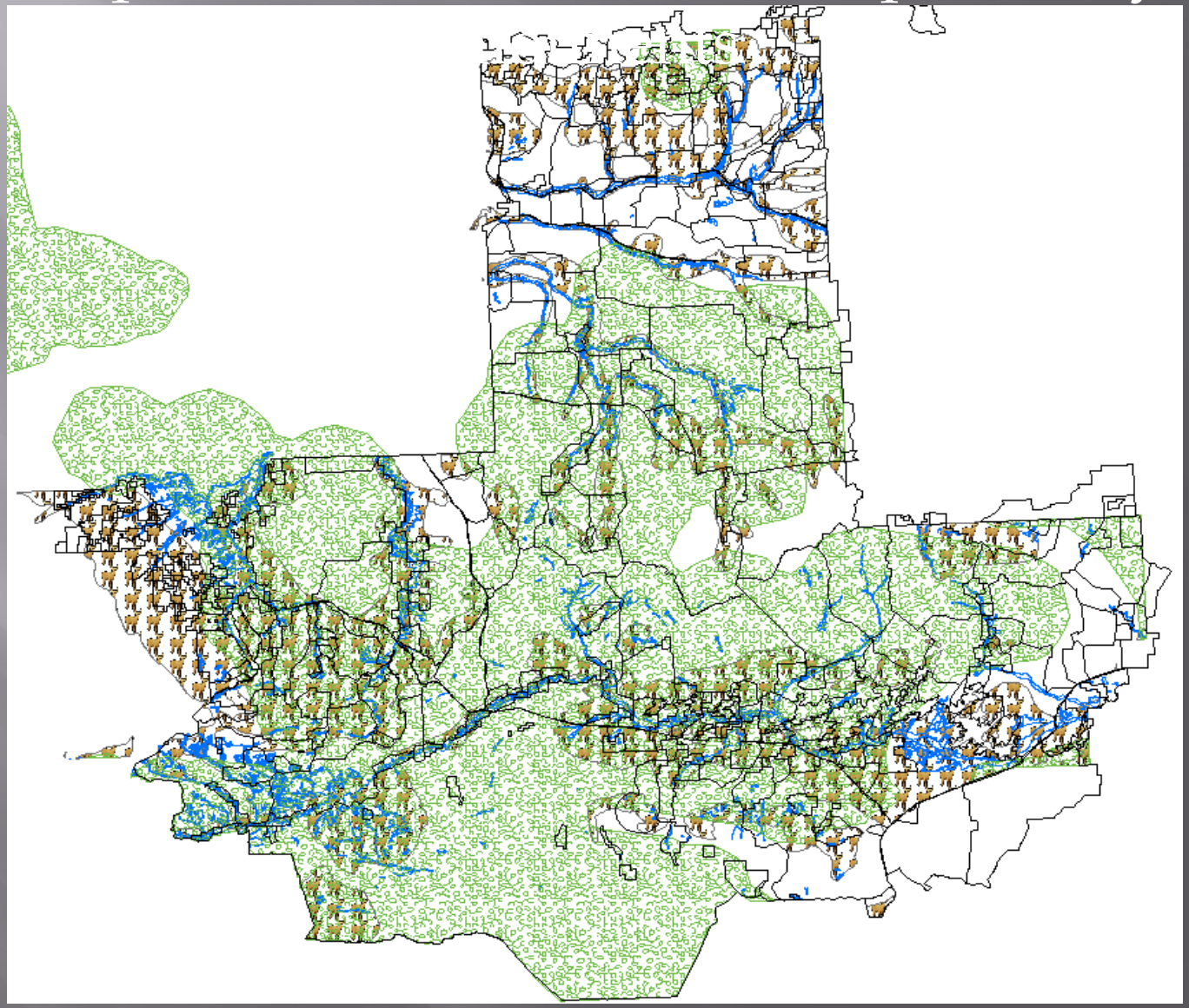
Harvest Efficiency

- What is harvest efficiency?
- The total percent of vegetation harvested by or ingested by a grazing animal compared to the total amount of vegetation grown in the area in a given year.
- Livestock harvest of vegetation must be limited to ensure re-growth and reproduction of perennial range vegetation. As a rule of thumb, if a site is capable of producing 1 000 pounds of forage per year, one-half (500 pounds) must be left to ensure the continued health and productivity of the forage base. Of the one-half reserved for grazing, 50 percent (250 pounds) will be lost to trampling, weathering or consumption by insects and small animals. Only 25 percent (250 pounds) is actually consumed by livestock. ***Texas Agricultural Extension Service - L-5029, Rainfall Effectiveness On Rangeland, Allan McGinty, Thomas L. Thurow and Charles A. Taylor, Jr.***

The "adjustments" (Alt B)

- Adjusted base production based on the following:
  - Harvest efficiency = .25
  - Sage Grouse Core = .90 (leave 10% additional for SG)
  - Big Game CWR = .95 (leave 5% for additional for Big Game)
  - Riparian Health = .40 (Promote Riparian Health)

Overview of Greater Sage-Grouse Core Area, CWR and Riparian areas are located in proximity to

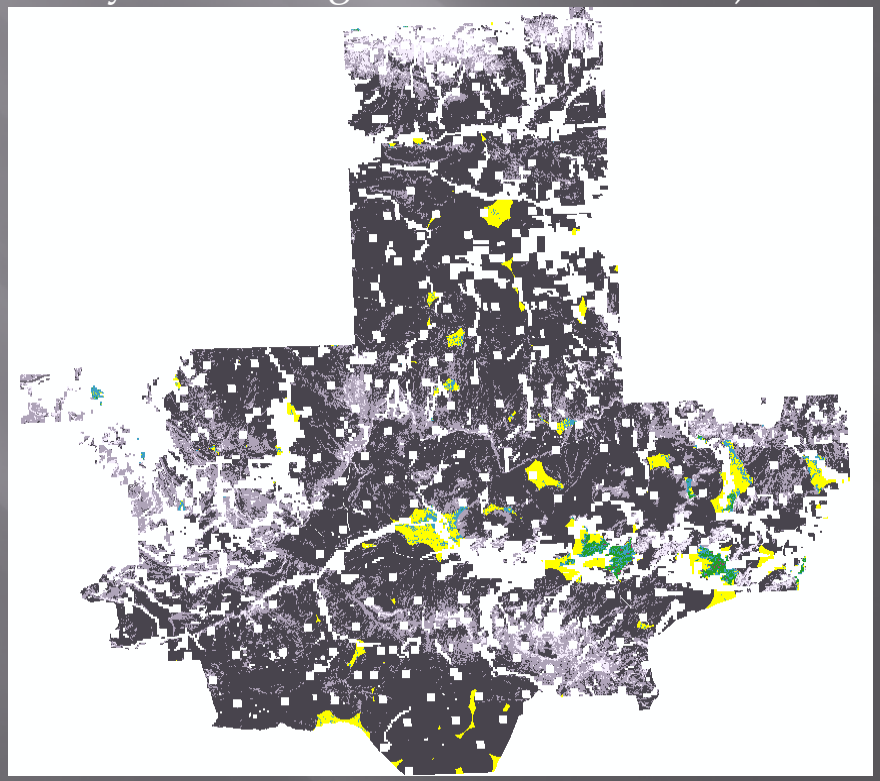


The Math!

- Government Draw Allotment No. 1803 – 5-9" Wind River Basin
- 154 lbs/acre X .25 or 25% = 38.50lbs/acre available for consumption.
- 38.50 lbs./Acre X .90 Sage Grouse Core Area X .95 Wildlife CWR = 32.90 lbs/acre available for consumption by livestock.
- Livestock consumption is estimated using a 1,000 lbs. animal and a 1,200 lbs. animal at the rate of 2.5% of their body weight per day.
- Therefore, they consume respectively 790 to 912 lbs/month based on size.
- These are averaged and then acres per aum are calculated.
- Finally, the distance from water and steepness of slope are factored into the equation for a final forage availability guideline for stocking any given allotment.

Water Availability – What was used

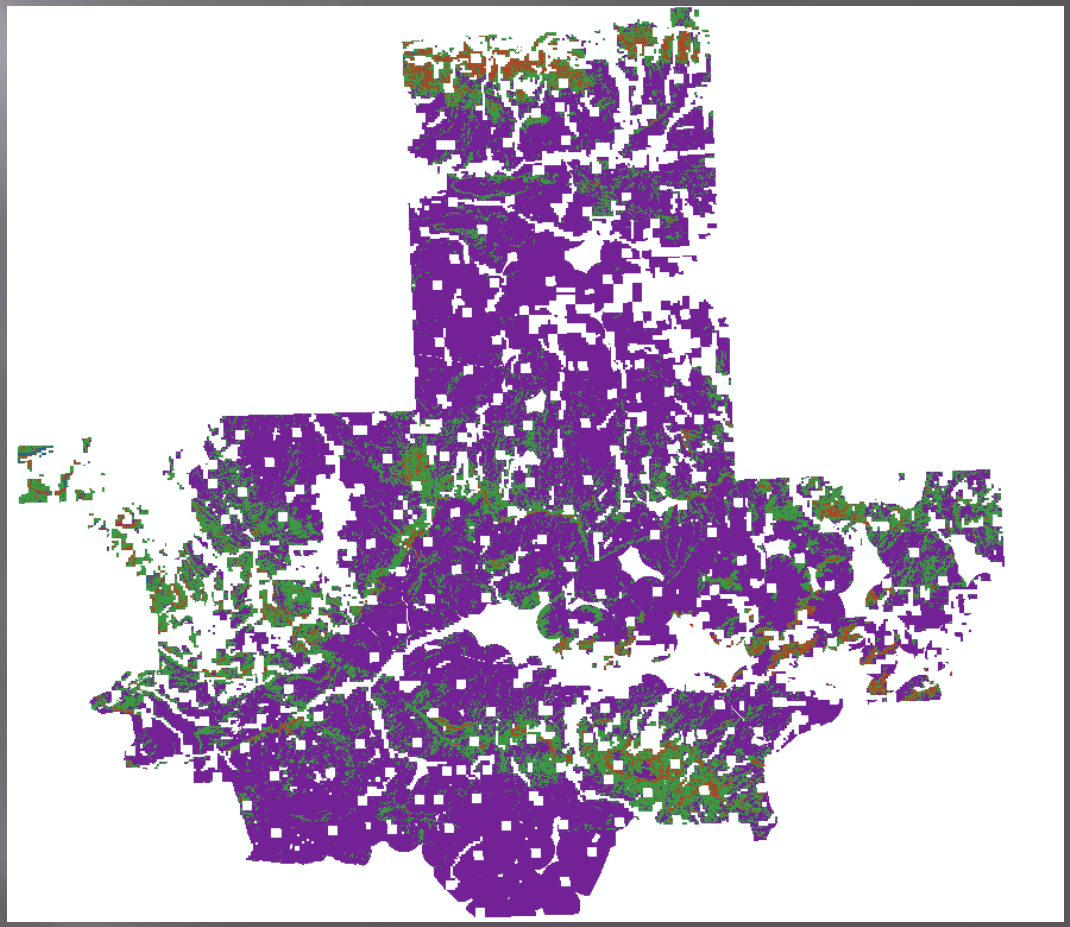
- If it is within 2 miles of developed water and/or riparian areas forage is considered available, if it's not, it's unavailable
- (Greys are available, yellow and green are unavailable)



Slope Adjustment

- Acres per aum are calculated, slope adjustments are made
  - 0-10% = No Reduction in AUMs
  - 10-30% = 30% Reduction in AUMs
  - 30-60% = 60% Reduction in AUMs
  - 60+% = Unavailable AUMs

0-10% =No Reduction (purple)
10-30% =30% Reduction (green)
30-60% =60% Reduction (orange)
60+% = Unavailable(blue)



Alternative C

- Similar Adjustments to B
  - Harvest efficiency = .28 (leave 72% for others, managed grazing)
  - Sage Grouse Core = .90 (leave 10% additional for SG)
  - Big Game CWR = .95 (leave 5% for additional for Big Game)
  - Riparian Health = NA (all areas managed)

*If big game crucial winter range or the Sage Grouse core area exceeds 50% of the allotment then the 95% and 90% adjustment values apply, otherwise they are not counted as the allotment is under some form of grazing management.

Alternative C - But…

- No reduction in AUMs for water availability because BLM will manage through project implementation.
- However, adjustment for slope will still occur.
- Same Slope adjustments as B
  - 0-10% = No Reduction (purple)
  - 10-30% = 30% Reduction (green)
  - 30-60% = 60% Reduction (orange)
  - 60+% = Unavailable (blue)

End Result

- Using a subset of approximately 212 allotments Alternative B results in a 43% reduction and C results in a 9% reduction to AUMs, Field Office wide.

  For Example:

  Government Draw No. 1803

  Under Alternative A: 8,940 AUMs (currently authorized)
  Alternative B: 1,278 AUMs (Sage Grouse, CWR, No Riparian)
  Alternative C: 4,460 AUMs (Sage Grouse, CWR, No Riparian)

References:

Harvest efficiency was obtained from NRCS Pasture and Range Handbook and Dr. Jerry Stuth (Texas A & M)

1990 NRCS Ecological Site Guides-Wyoming

Slope Adjustment obtained from NRCS Pasture and Range Handbook and BLM Suitability Guidelines

Precipitation zones combination of NRCS and BLM rain gauge data