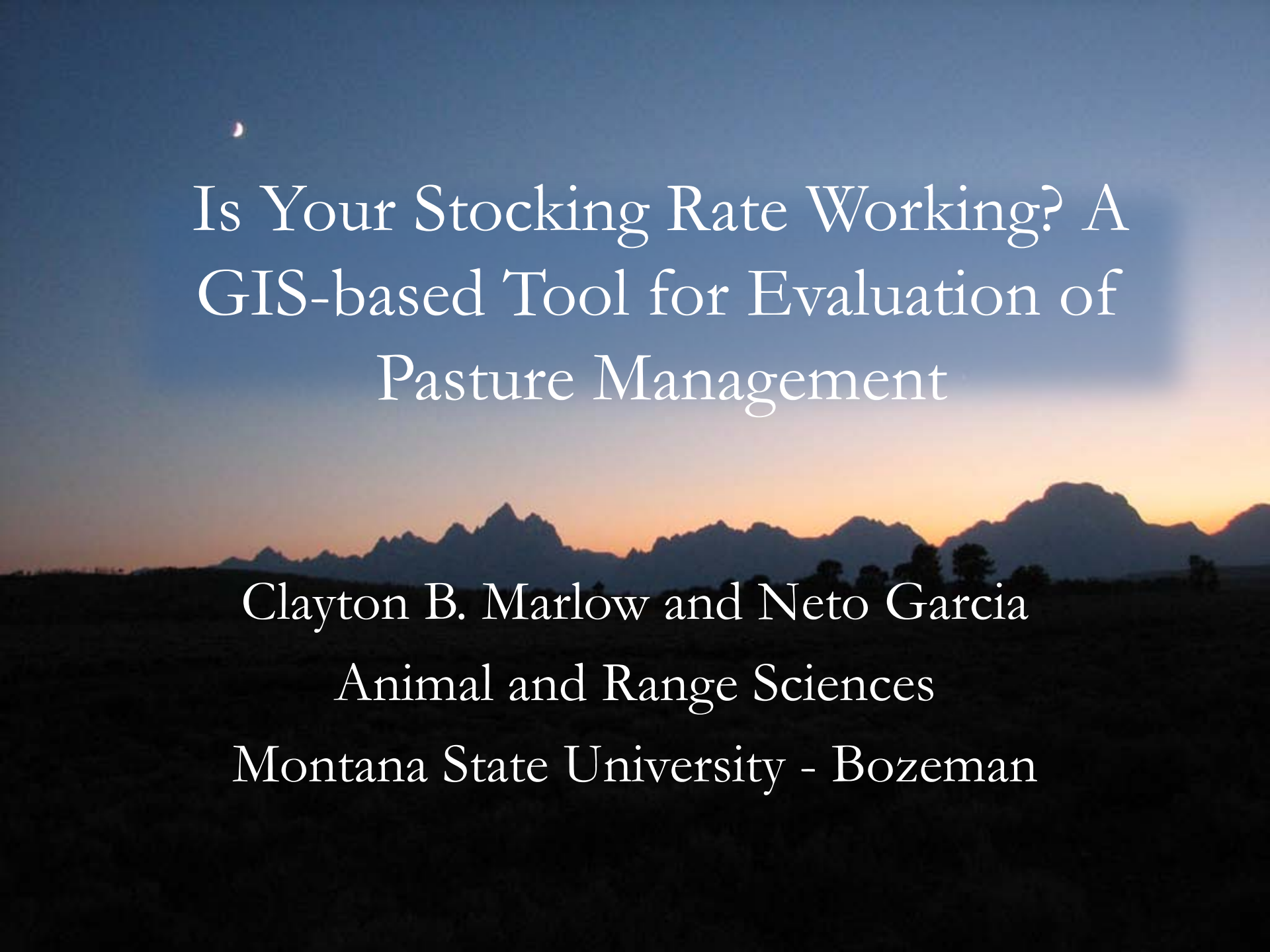

Is Your Stocking Rate Working? A GIS-based Tool for Evaluation of Pasture Management

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You value your forage resource

- Low cost, sustainable nutrient base
- Flexible animal holding areas
- Maintain or improve water quality
- Potential for carbon sequestration
- Aesthetics – "it's just good to look at"

Successful Pasture Management hinges on proper stocking rate

- Stocking rate is the foundational guideline for most grazing systems
- Forage allocation based on:
  a) forage production/ac
  b) production area
  c) animal intake
  d) Sustainable harvest (grazing) level

Critical Assumptions

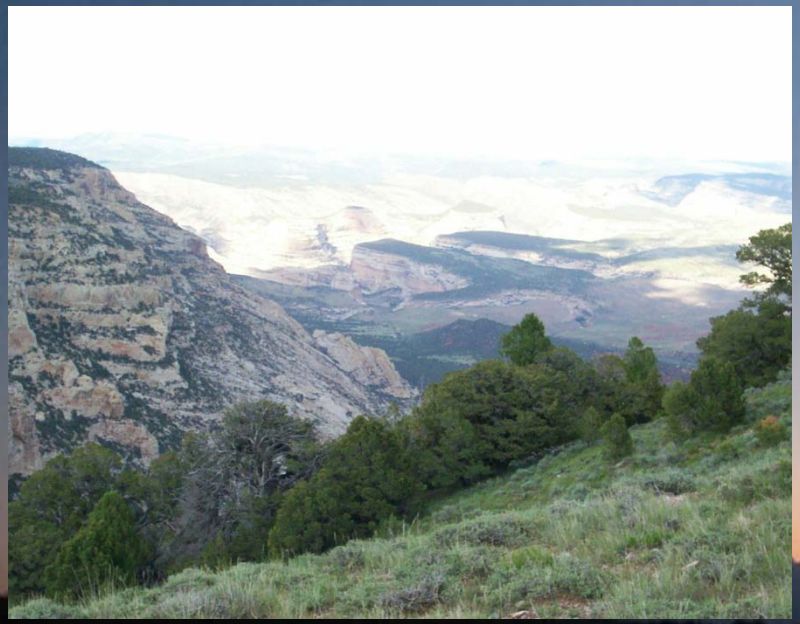
Where are the cows?

- All forage species in the pasture are equally palatable
- Forage palatability remains relatively constant through grazing period and year to year
- All forage in the pasture is palatable and accessible

Conditions where these assumptions are met

- Level to gently rolling native range
  - Common vegetation type
  - Adequate, well distributed water
- Irrigated or improved pastures
  - Single species
  - High animal densities

Conditions where these assumptions fail



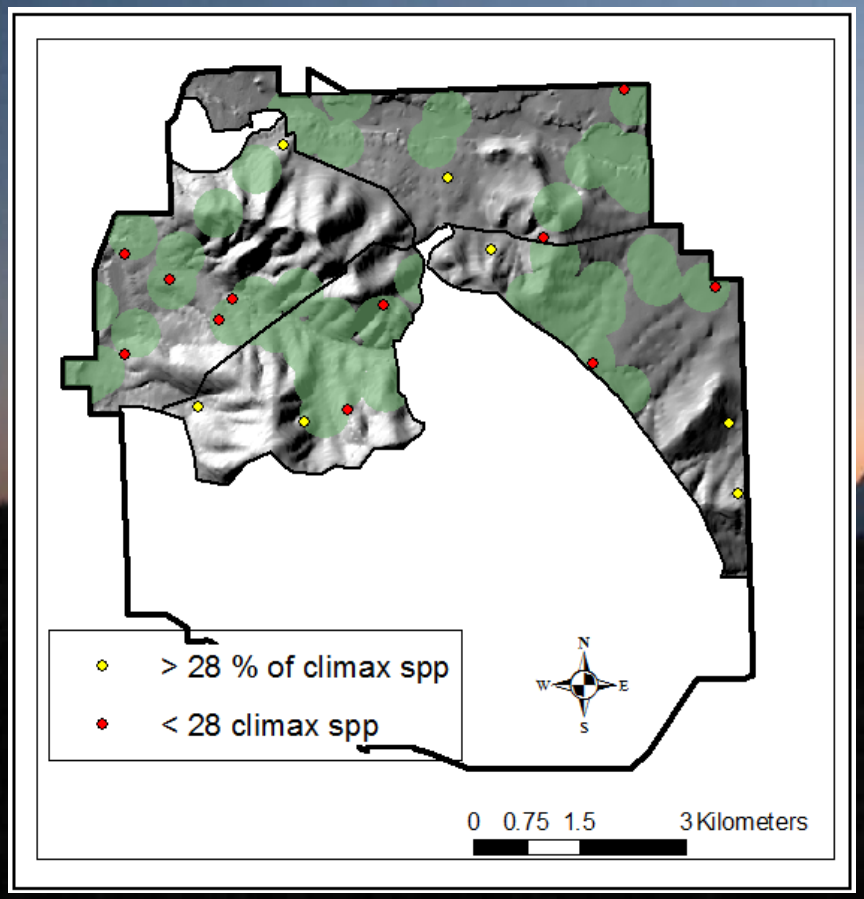
- Rough, broken landscapes
  - Diverse soils, slope and aspect = different plant communities
- Limited or unreliable water
  - 0.5 to 1.5 miles from reliable water source
- Grazing a pasture in a different season each year

Outcomes WITH proper stocking rates

- Inefficient forage use; spot grazing

- Weed infestations
- Higher fire risks
- Lower forage availability
- Ground squirrels and prairie dogs

Real world example



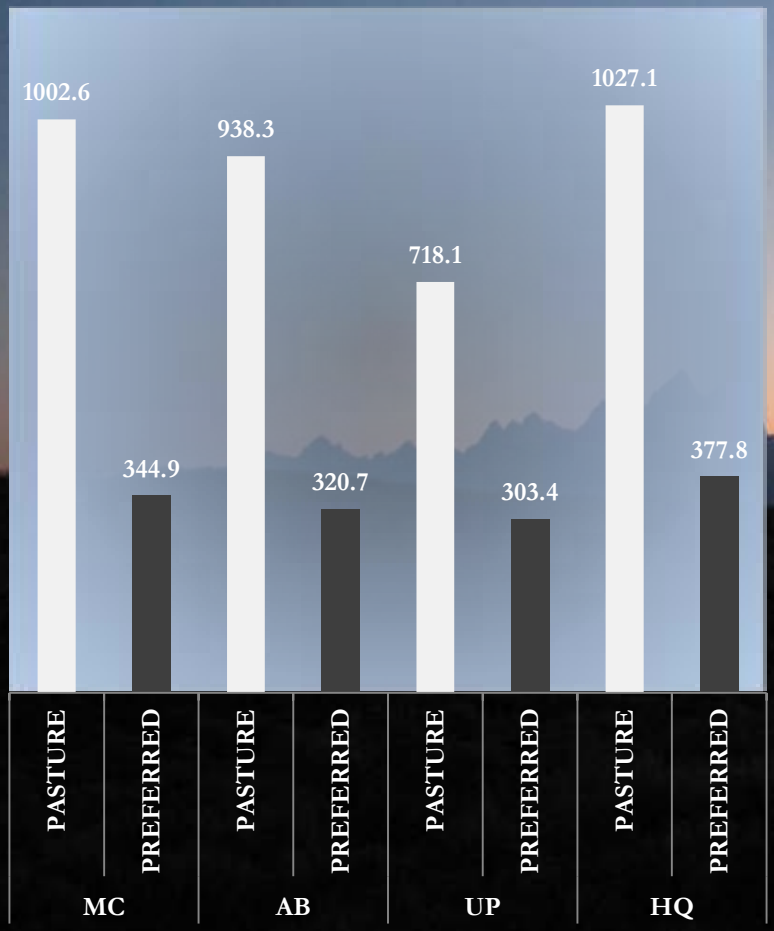
- USFWS National Bison Range – Moiese
- Careful attention to stocking rates since 1963
  - Annual culling
- 11 of 18 permanent range transects exhibit a decline in climax species
- Bison reproduction rates have declined

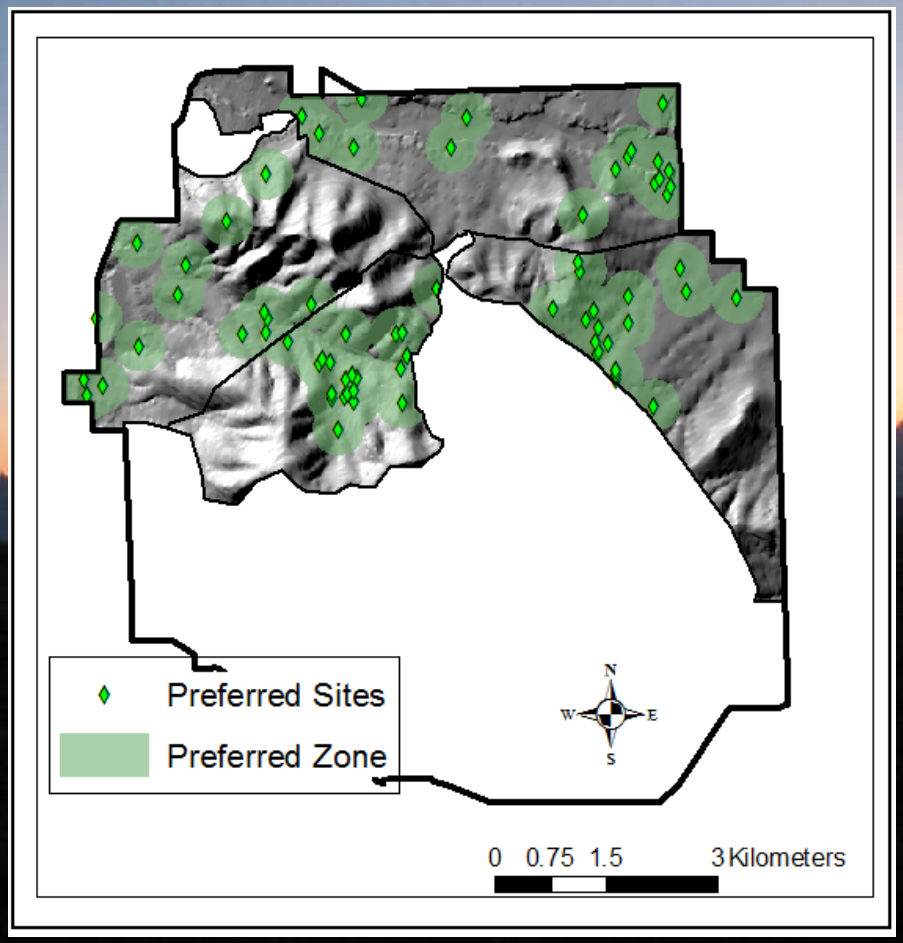
Stocking Rate NOT adjusted for grazing preferences

SLOPE	PREFERRED ZONE (%)				
CLASS	MC	AB	UP	HQ	TOTAL
< 12	34.3	42.4	61.4	55.2	41.1
12 - 22	31.4	29.3	65.1	43.0	38.3
22 - 32	40.3	20.5	49.0	33.3	36.9
32 - 42	38.7	14.0	36.3	21.3	29.2
> 42	45.4	7.9	23.1	16.2	20.4
AVG	**34.4**	**34.2**	**42.3**	**36.8**	**36.5**

124 head rather than the current 357 head

Area used in model was too large





Stocking rate correction

- Adjust the area used in the model to reflect where livestock are actually grazing
- How?
  - Standard approach; utilization monitoring
  - GIS mapping

Utilization measurements

- High accuracy + production measures
- High expense in time, labor and equipment
  - Large number of sample sites to generate objective "picture" of grazing patterns
- Added expense of producing preferred areas map

GIS based mapping

- High accuracy + opportunity for repeat monitoring
- Low cost
  - Hand held units (Garmin) relatively inexpensive
  - Single operator can record information at a large number of sites in a short period
- Already formatted for immediate map production

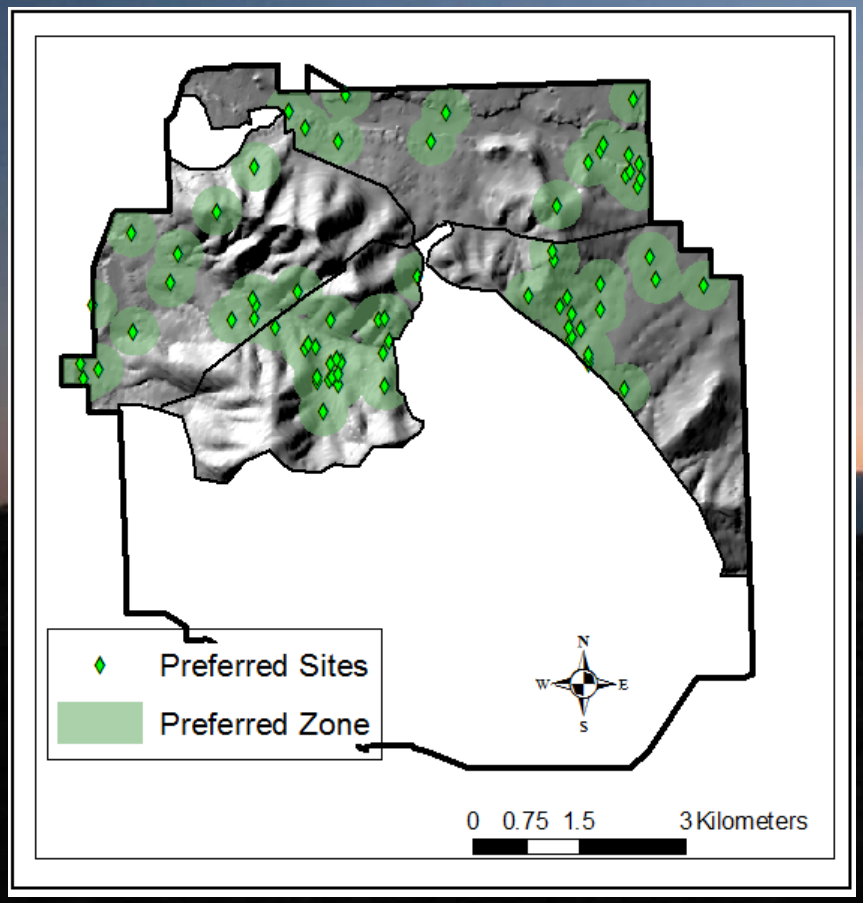
General Approach

- Obtain a good USGS base map of your property
  - Electronic maps can be purchased and downloaded into your GPS unit
- Record location of livestock groups when doing health checks, moving supplement, fixing fences, etc.
  - Record forage stubble height at each GPS location soon after livestock leave.

Producing Your Map

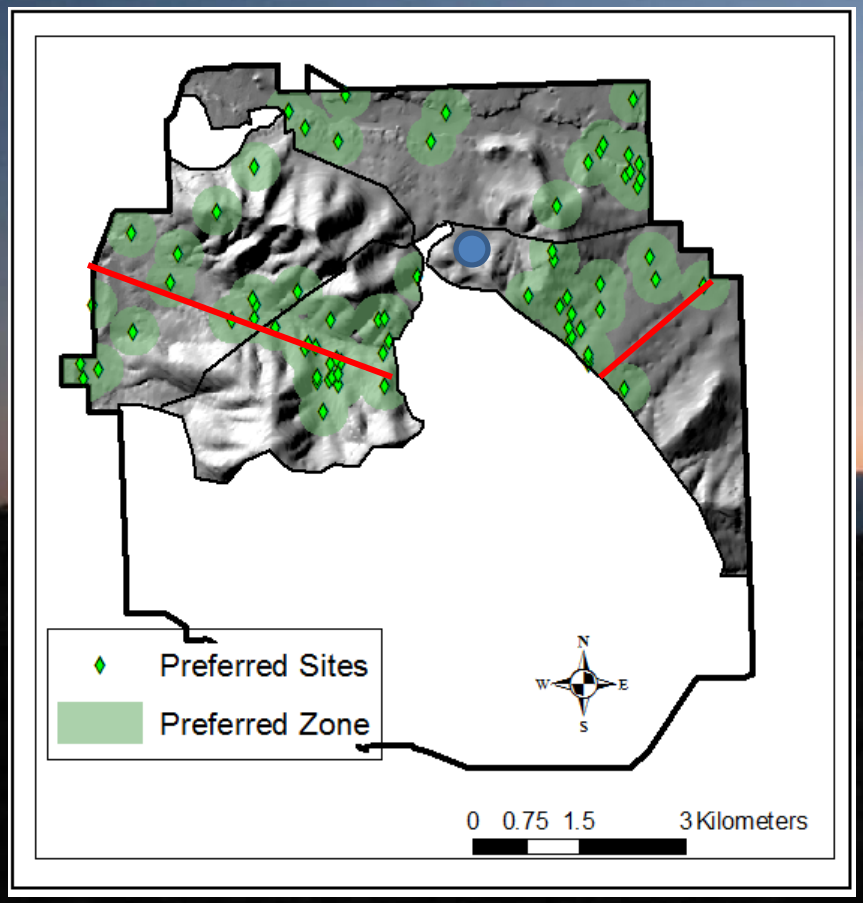
- You'll need access to ArcGIS graphic software like ArcView
  - A personal desktop copy costs about $100
  - Check with local Extension office to see if they already have the software.

What can you do with the resulting map



1. Recalculate stocking rate based on areas livestock are actually using
   a) Use stubble height measures to determine grazing pressure
   b) Track efficiency of forage harvest

What can you do with the resulting map



2. Realign or construct new fences to even out grazing pressure
3. Identify areas for new water developments

INCREASE SUSTAINABILITY OF FORAGE AND LIVESTOCK PRODUCTION!

THANK YOU FOR YOUR TIME

Questions or Comments