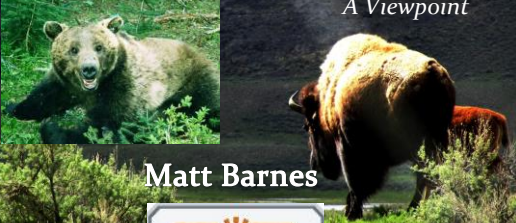



**Livestock Management for Coexistence with Large Carnivores, Healthy Land and Productive Ranches**  
*A Viewpoint*



**Matt Barnes**



August 2014

for thriving **SOCIAL & NATURAL** systems in the Northern Rockies




Keystone Conservation partners with land owners and managers to develop and apply solutions for holistic stewardship and coexistence with large carnivores

Grazing in nature's image

- Rangeland plants, grazing animals, and predators evolved together
- Large, dense, mobile herds



**Strategic Grazing Management for Complex Creative Systems**



Barnes and Hild [Eds.], 2013. *Rangelands* 35 (5 [October]).

*Rangelands* 35(5), October 2013

- **Complex creative systems**
  - Foreword (Barnes & Hild [eds.])
  - Processes, principles, practices (Provenza et al.)
- **Optimum stocking rate**
  - Principles (Frasier & Steffens)
  - Case study (Ortega-S. et al.)
- **Temporal distribution**
  - Principles (Steffens et al.)
  - Case study (Grissom & Steffens)
- **Spatial distribution**
  - Principles (Norton et al.)
  - Case study (Barnes & Howell)
- **Diet selection**
  - View point (Peterson et al.)

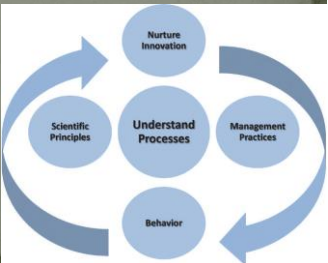


Provenza et al. 2013, *Rangelands* 35(5)

**Complex creative systems**  
Principles, processes, and practices of transformation

- Landscapes are complex creative systems
- Ever-changing assemblages of relationships
- Organisms actively create their environments

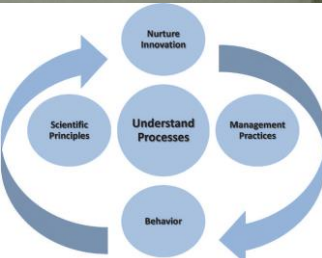
- Both researchers and managers work with these relationships, and need to work in partnership



Provenza et al. 2013, *Rangelands* 35(5)

**Complex creative systems**  
Principles, processes, and practices of transformation

- Are there processes and principles that apply generally across time and space?
- Grazing intensity
- Distribution over
  - Time
  - Space
  - Plants




Provenza et al. 2013, *Rangelands* 35(5)

**Strategic grazing: creative management**

Targeted grazing at pasture & ranch scale

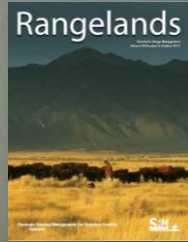
Not a grazing “system” in the rigid sense



“Plan-monitor-control-replan”

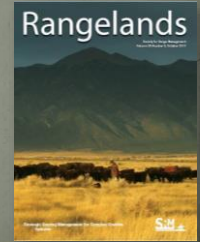
## Strategic grazing management for complex creative systems

- Debate over grazing “systems”
- Grazing “systems” to imply rigid application
  - Opposite of “systems” in systems theory
- Studies comparing grazing “systems”
- Inconsistent
- Overall conclusion: they don't work
  - Heady 1961, 1980;
  - Holecheck et al. 1999, 2000;
  - Briske et al. 2008, 2011



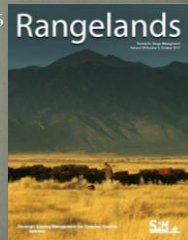
## Strategic grazing management for complex creative systems

- Evidence that grazing management can work
  - Scientific case studies
    - Earl & Jones 1996
    - Stinner et al. 1997
    - Teague et al. 2003, 2004
    - Jacobo et al. 2006
    - Barnes et al. 2008
    - Teague et al. 2011
  - Ranchers' practical experience
    - Dagget 1995
    - Savory with Butterfield 1999
    - Howell 2008
    - White 2008



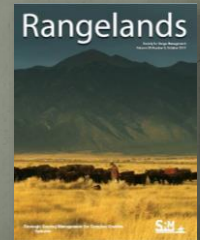
## Strategic grazing management for complex creative systems

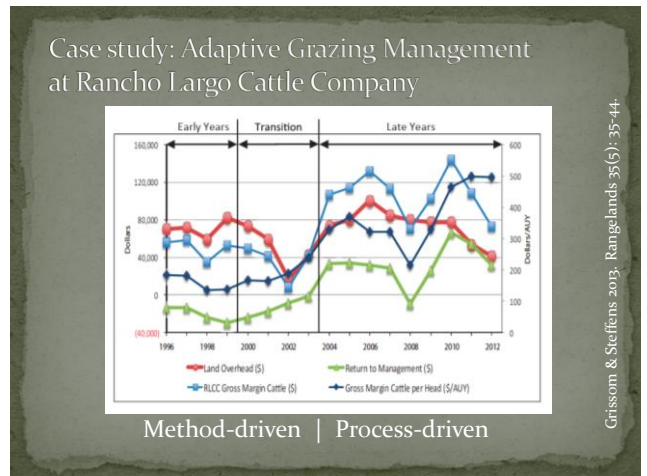
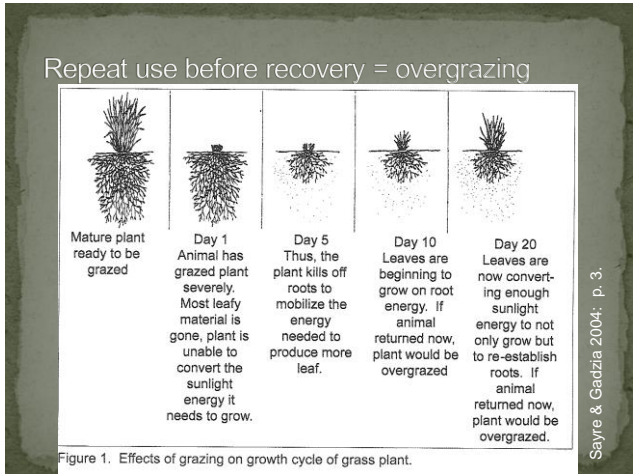
- Evidence that grazing management can work
  - Scientific arguments
    - Norton 1998
      - *Animal Production in Australia* 22:15-26
    - Norton 2003
      - *Proc. 7th IRC*, p. 810-820
    - Teague et al. 2013
      - *Journal of Environmental Management* 128:699-717



## Strategic grazing management for complex creative systems

- Calls to move the profession beyond debate
  - Brown and Kothmann (2009)
  - Briske et al. (2011)
- And to put in framework of Complex adaptive systems
  - Briske et al. (2011)






### Improving spatial distribution

- Smaller paddocks
- Higher stocking density
- Shorter grazing periods
- Longer recovery periods

} More even grazing pressure across the landscape over time



### Steep slopes & riparian areas

**Previous management:**  
Season-long grazing at relatively low SR

- Riparian areas high de facto SR
- Uplands very low de facto SR



## Howell Ranch Strategic Grazing

- Grazing season: May/June – Sep/Oct
- Grazing periods: 1 - 27 days
- Cerro
  - ~1200 ac (490 ha), 10 + 6 small paddocks
  - 70 - 90 AU cow-calf pairs
- Middle Blue
  - ~7000 ac (~2800 ha), 23+ paddocks
  - 312 AU cow-calf pairs
- Little Blue
  - ~670 ac (270 ha), 8 paddocks
  - 40-50 AU heifers

## Fencing

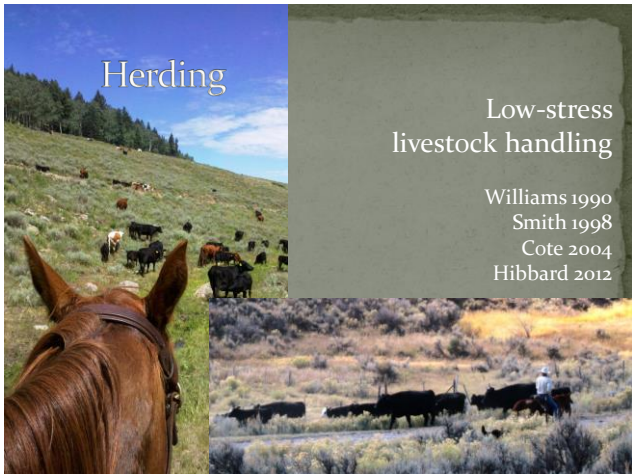


The image shows a landscape with a fence line in the foreground. A cow is grazing in a separate paddock to the right. The background features rolling hills under a blue sky with some clouds.

## Herding

Low-stress livestock handling

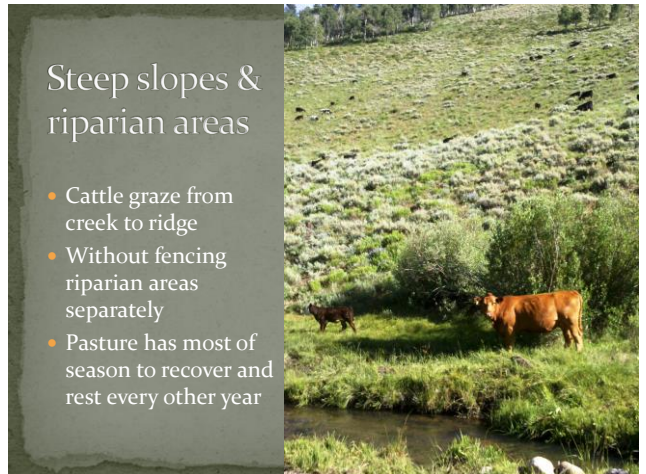
Williams 1990  
Smith 1998  
Cote 2004  
Hibbard 2012



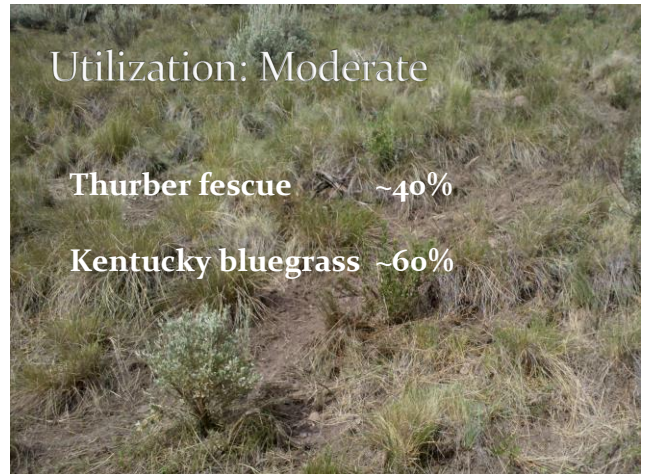
The collage includes a view from the back of a brown horse looking out over a herd of cattle on a grassy slope, and another photo showing a herd of cattle being moved across a field.

## Steep slopes & riparian areas

- Cattle graze from creek to ridge
- Without fencing riparian areas separately
- Pasture has most of season to recover and rest every other year



The photo shows a brown cow grazing in a lush green area next to a small stream. The background is a steep, grassy hillside.



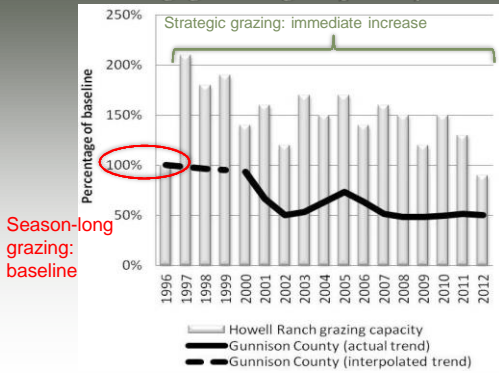


### Increasing grazing capacity

	Baseline SR	Current mgt. avg. adj. SR	Relative change
	(Animal Unit days / acre)		
Cerro & Little Blue range	9.6	15	+ 160%
Middle Blue range	7.4 *	18	+ 250% *
Middle Blue irrigated	43	77	+ 180%



### Increasing grazing capacity



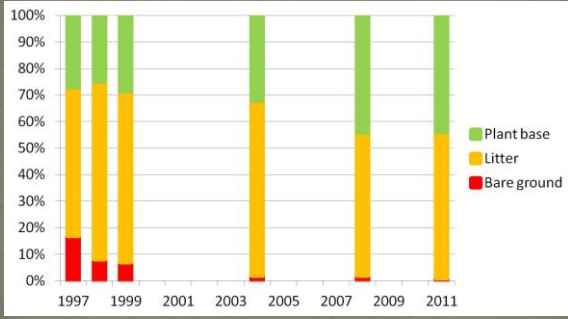
### Land health: biological monitoring

Line-point transect with 100 points  
Cover, distance to nearest perennial, life-form

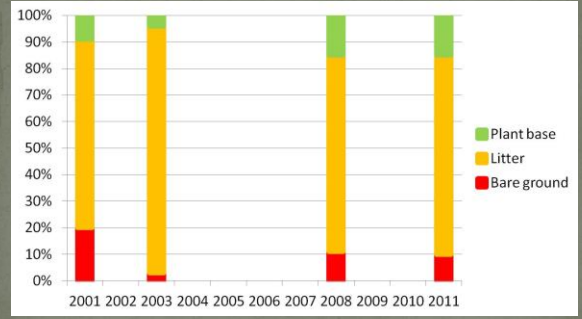




### Cover: Little Blue (subalpine)



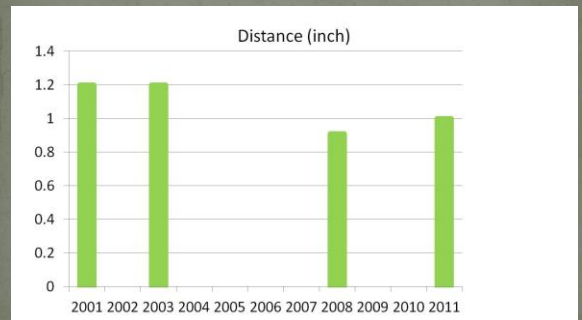
### Cover: Cerro (montane)



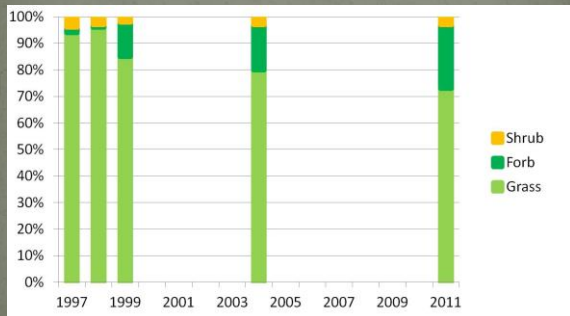
### Distance to nearest perennial: Blue



### Distance to nearest perennial: Cerro



### Life-form composition by cover: Blue



### Howell Ranch: Results summary

- Shift from bare ground to basal plant cover
- Increasing plant diversity (forbs)
- Greater change on mesic site and/or with longer recovery periods
- Happened under stocking rates
  - 1.5-1.6x the previous stocking rate
  - About 4x adjacent public land permits
- Happened mostly during drought

### Strategic Grazing Management: Conclusion

- *Well-planned, adaptive multi-paddock grazing management can be used to improve distribution across landscapes and plant species*
- This spatial aspect of grazing management
  - May have been lost in many small-plot studies
  - Is central to resolving the grazing management debate

### Livestock Management for Coexistence with Large Carnivores



#### A Viewpoint



March 2014

## Rangeland Stewardship

- Ranchers may be able to apply some of the same approaches for
  - Rangeland health
  - Livestock production
  - Coexisting with wildlife
  - Preventing depredations

Now documented

Rangelands

Hypothesis  
Wildlife behavior  
Rangelands 35(5), Oct. 2013  
Experimental  
evidence  
Keystone projects

## Grazing in nature's image

### Plant-herbivore-carnivore interactions

Large, dense, mobile herds

Attack-abatement effect (Turner and Pitcher 1986)  
Group size related to predator density (e.g., Heard 1992)

## Grazing animals' anti-predator behavior

In the presence of a predator, animals that stand their ground are more likely to survive

## Isolated animals are easy prey

## Rangeland Stewardship projects

Collaborate with conservation-minded ranchers



## Rangeland Stewardship projects

- Start with existing rotations
- Intensify management by
  - Rotational grazing (subdividing pastures)
  - Herding



## North Meadow Creek

Partnership with Germann Ranch & The Rodear Initiative



Very intensive management:

Daily herding at high stocking density ("rodearing")

Night penning in temporary electric fence or fladry

Regrowth after high-stocking-density grazing



### Dog Creek

Partnership with Sieben Live Stock and The Rodear Initiative

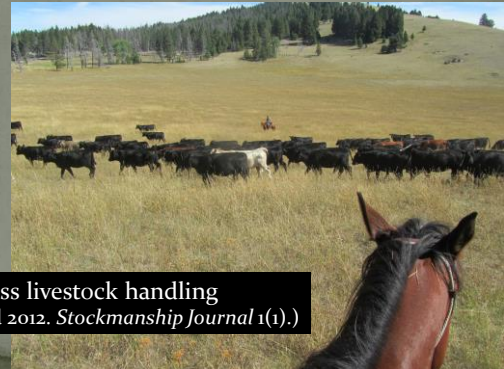


Before project: comingled heifers spread out into small groups

Phase 1: Close herding (“rodearing”) and night penning in temporary paddock



Phase 2: Low-stress herding only (no temporary fence)



Low-stress livestock handling  
(Hibbard 2012. *Stockmanship Journal* 1(1).)



Rekindling the herd instinct (Hibbard [ed.] 2013, *Stockmanship Journal* 2(1).)  
After several days of daily herding with LSLH,  
comingled heifers began to stay together.



Rekindling the herd instinct. Photo 24 hours after herding:  
Comingled heifers moving together with no herders present.



New projects



Paradise Valley



Wind River Range

### Rangeland Stewardship: Results 2012-2013

Herds with intensified grazing management

- Rotational grazing + herding
  - No livestock losses

One herd which previously had no grazing mgt

- History of substantial livestock losses

• Low-stress herding

- Reduced losses: one confirmed, three probable

• *No carnivore losses*

### Grazing management as context for tools

Fladry works at small scales, but is labor-intensive

Use fladry when it makes sense  
-- not randomly or excessively

Photo by Garl Germann / The Rodear Initiative



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