

The background of the slide is a photograph of a vast, green, rolling landscape. In the foreground and middle ground, a herd of cattle of various colors (brown, black, and white) is grazing on the grass. The hills in the background are covered in lush green vegetation under a clear sky.

# The Value of Rangeland Heterogeneity in a High Cost Future

## A Producer's Prospective

(Al Steuter)

*“Biological Diversity is to Ecosystem Health as  
Enterprise Diversity is to Economic Health”*

## **Darwin, Lyell & Hooker – ... on the perpetuation of varieties and species by natural means, 1858**

Recognized the role of the diverse selective forces of nature acting on groups of plants and animals to maintain the seemingly endless variety of organisms, and the ability of plant and animal husbandry practices to narrow the range of variability seen in nature.

## **John F. Vallentine – Grazing Management, 2001**

Historically, heterogeneity was a result of grazing variability in both space and time. Rotational grazing systems are designed to improve grazing distribution, control timing of grazing, and optimize harvest efficiency. Plant species that are tolerant or favored by this type of grazing become dominant, leading to a more homogeneous structure.

# The Species differences between Bison and Cattle are smaller than the Landscape differences between the pre-European and Present

Hartnett, Steuter and Hickman. 1997.

Comparative Ecology of Native and Introduced Ungulates



# Sources of Heterogeneity

A photograph of a herd of cattle grazing in a vast, green, rolling landscape. The cattle are scattered across the field, with some in the foreground and others in the distance. The terrain is hilly and covered in tall grass. The sky is clear and blue.

**Water Distribution**

**Topography**

**Plant Physiology**

**Disturbance History**

**Nutrient Distribution**

**Soils**

**Plant Community Structure**

**Land Management Decisions**

# The Value of Heterogeneity

A wide-angle photograph of a rolling green landscape. The foreground is a grassy hillside with a line of dense, dark green trees. The middle ground is a vast, open field of green grass with scattered trees. The background shows rolling hills under a clear sky.

## Yearlong Forage Availability

**Sustained Forage Quality**

**Reduced Heat Stress**

**Reduced Insect Stress**

**Sustained Production**

**Reduced Cold Stress**

**Reduced Inputs**

# Grassland Structure

## Biomass in Grasses



## Diversity in Forbs



# Management Intensive Grazing



**Can result in:**

- productive, high quality grass forages**
- uniform vegetation profile**
- reduced forb diversity**

**Or not ... depending on stocking rate, season of use, duration of use**

# **Grazing Management**

## **Sandhill & Sun Ranch**

- **Five hill pastures (0.6 – 0.8 AUM/ac/yr)**
- **Five dry valley pastures (0.9 – 1.2 AUM/ac/yr)**
- **Six specialty pastures (0.8 – 1.2 AUM/ac/yr)**
- **Cow/calf and yearling operation**
- **Calve during late-May & June**
- **Sand Hills calving system**
- **Conservative stocking rate based on yearlong ranch-wide use**



# **Grazing Management** (continued)

- **Growing Season Yearling Herd**
  - Season-long grazing with steers
  - 3 pasture deferred-rotation with replacement heifers
- **Growing Season Cow/Calf Herd**
  - 3-5 pasture deferred-rotation
- **Dormant Season Cow/Calf Herd**
  - 3 pasture rotation on growing season rested pastures
- **Dormant Season Cow Herd**
  - Free range of growing season rested pastures
- **Dormant Season Back-grounding of Calves**
  - Grazing of residual forage in previous summer deferred-rotations

# What Birds Can Tell Us

about

## Management induced changes in Mixed Prairie Landscapes

- ***“As a group birds see and respond to the landscape pattern most similar to people”***
  - Curlews to Meadow Larks
  - Dickcissels to Lark Buntings
  - Horned Larks to Lark Sparrows
  - Grasshopper Sparrows to Upland Sandpipers

***“A variety of conservatively stocked grazing systems to meet the needs of target livestock classes and native species habitats at the landscape scale”***



Silka Kempema

[snr.unl.edu/powell/research/kempemathesis](http://snr.unl.edu/powell/research/kempemathesis)

# Managing Diverse and Profitable Rangelands

- **Conservative Stocking Rates:**
  - Are an effective risk management strategy to control volatile input costs
  - Are a cost effective generator of alpha and beta diversity
  - Require increased per animal net value
- **Multiple Grazing Systems:**
  - Allow for matching herd classes to forage quality and management needs
  - Can produce landscape scale heterogeneity in grassland structure