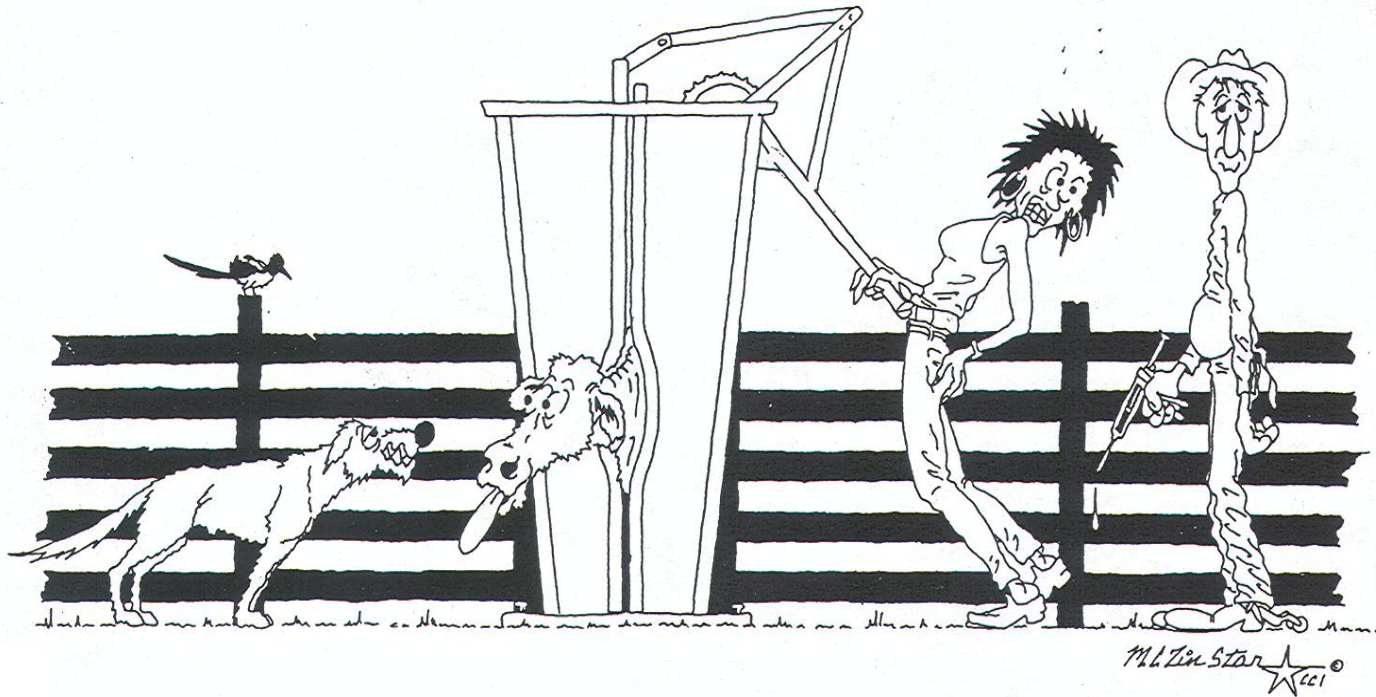


# Grazing Management & Sage Grouse Habitat Maintenance/Restoration

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Rick Peterson  
Rangeland Management Specialists  
Casper, Wy

# Ranching With Earl



EARL SAYS SHE'S MAD NOW BUT SHE'LL THANK HIM LATER WHEN SHE DOESN'T COME DOWN WITH A SNOTTY NOSE AND DIARRHEA...



*What's good for rangelands,  
is good for grouse*



**Good for both**

- Large, intact landscapes
- Healthy perennial grasses/forbs
- Invasive species management
- Well-designed grazing plan



**Bad for both**

- Fragmented landscapes
- Overgrazing, depleted perennial plants
- Conifer encroachment
- Weeds/annual grasses

*Wildlife conservation through  
sustainable ranching*



# Key Grazing Management Objectives for Sage-Grouse :

- Promote long-term health and maintenance of desirable plant species (especially cool season bunchgrasses).
- Promote long-term health and maintenance of Sagebrush-Bunchgrass plant communities.
- Provide adequate residual cover for sage-grouse nesting on an annual basis.

These objectives are compatible with livestock production.





# Important knowledge and skills needed to implement prescribed grazing:

- Basic Plant Identification skills
- How plants grow
- Growth curves
- How grazing management impacts individual plants.
- Effects of timing, and degree of grazing use, and other management decisions on the plant community.
- How plants compete with each other.
- Range Inventory
- Soil Site Correlations
- Ecological site concept (soil, plant relationship).
- State and Transitions concepts
- Range health
- Forage production
- Domestic animal need for food, water, and shelter
- Wildlife needs for food, water, and cover.
- Etc



# Complete Range Inventory





# Web Soil Survey

Good location to start  
the inventory process



**USDA** United States Department of Agriculture  
Natural Resources Conservation Service

## Web Soil Survey

Home About Soils Help Contact Us

You are here: Web Soil Survey Home

**Search**

Enter Keywords **Go**

All NRCS Sites

**Browse by Subject**

- Soils Home
- National Cooperative Soil Survey (NCSS)
- Archived Soil Surveys
- Status Maps
- Official Soil Series Descriptions (OSD)
- Soil Series Extent Mapping Tool
- Geospatial Data Gateway
- eFOTG
- National Soil Characterization Data
- Soil Geochemistry Spatial Database
- Soil Quality
- Soil Geography

The simple yet powerful way to access and use soil data.

**START WSS**

### Welcome to Web Soil Survey (WSS)

Web Soil Survey (WSS) provides soil data and information produced by the National Cooperative Soil Survey. It is operated by the USDA Natural Resources Conservation Service (NRCS) and provides access to the largest natural resource information system in the world. NRCS has soil maps and data available online for more than 95 percent of the nation's counties and anticipates having 100 percent in the near future. The site is updated and maintained online as the single authoritative source of soil survey information.

Soil surveys can be used for general farm, local, and wider area planning. Onsite investigation is needed in some cases, such as soil quality assessments and certain conservation and engineering applications. For more detailed information, contact your local [USDA Service Center](#) or your [NRCS State Soil Scientist](#).

### Four Basic Steps

**1 Define.**

**Area of Interest (AOI)** Use the Area of Interest tab to define your area of interest.

Click to view larger image.

### I Want To...

- Start Web Soil Survey (WSS)
- Know the requirements for running Web Soil Survey — will Web Soil Survey work in my web browser?
- Know the Web Soil Survey hours of operation
- Find what areas of the U.S. have soil data
- Find information by topic
- Know how to hyperlink from other documents to Web Soil Survey

### Announcements/Events

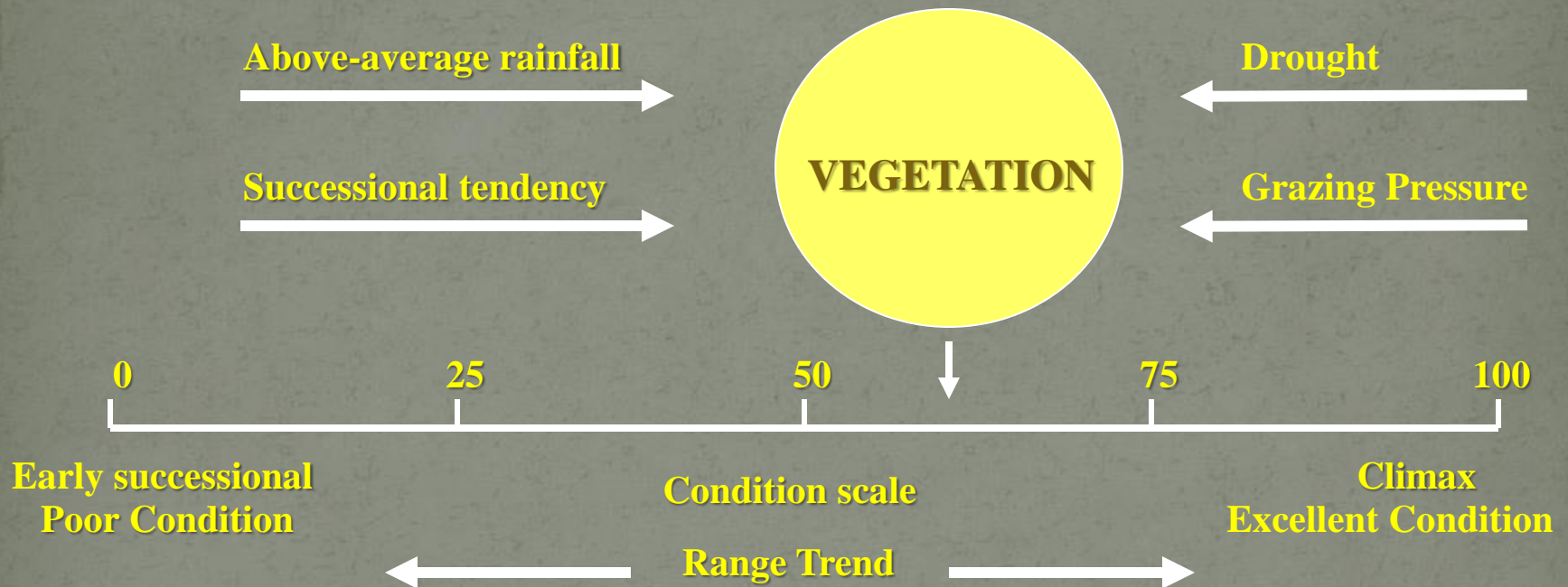
- Web Soil Survey 3.0 has been released! [View description of new features.](#)
- Web Soil Survey Release History
-  Sign up for e-mail updates via GovDelivery

### I Want Help With...

- Getting Started With Web Soil Survey
- How to use Web Soil Survey
- How to use Web Soil Survey Online Help
- Known Problems and Workarounds

- <http://websoilsurvey.nrcs.usda.gov/app/>

# RANGE SUCCESSION MODEL



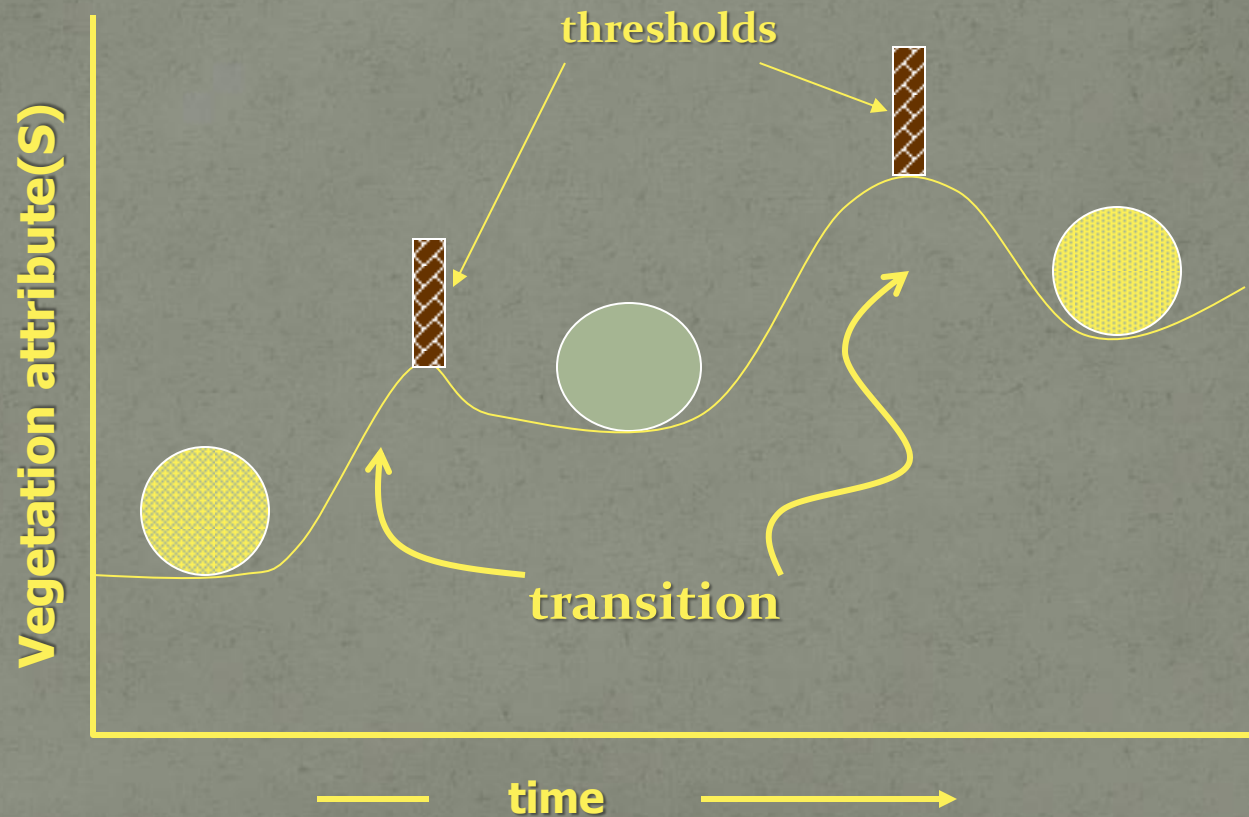
(adapted from Westoby, Walker, Noy-Meir 1989)



# Definition of an Ecological Site

**Ecological Site (ES)**— is a conceptual division of the landscape, defined as a distinctive kind of land based on recurring soil, landform, geological, and climate characteristics that differs from other kinds of land in its ability to produce distinctive kinds and amounts of vegetation and in its ability to respond similarly to management actions and natural disturbances.

# STATE & TRANSITION MODEL CONCEPT



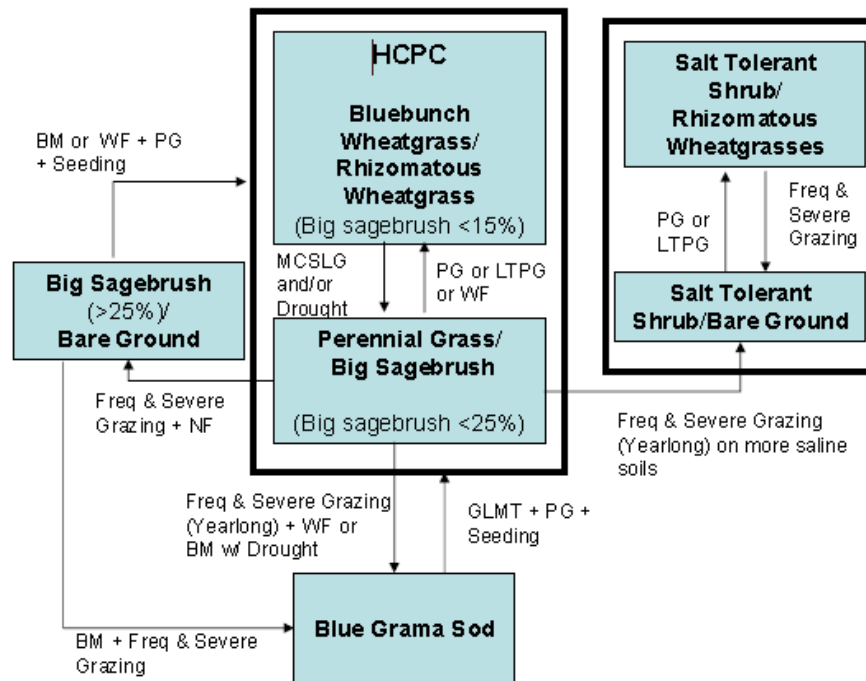


# State and Transition Model

- Used to describe the vegetation dynamics and management interactions associated with each site.
- The model provides a method to communicate complex information about vegetation response to disturbance (fire, lack of fire, drought, insects, disease, etc.) and management.
- What is the potential of the site
- Has the site crossed a threshold, Is there a potential restoration option

Site Type: Rangeland  
MLRA: 32 – Northern Intermountain Desertic Basins

Loamy 10-14" E  
032XY322WY



**BM** - Brush Management (fire, chemical, mechanical)  
**Freq. & Severe Grazing** - Frequent and Severe Utilization of the Cool-season Mid-grasses during the Growing Season  
**GLMT** - Grazing Land Mechanical Treatment  
**LTPG** - Long-term Prescribed Grazing  
**MCSLG** - Moderate, Continuous Season-long Grazing  
**NU, NF** - No Use and No Fire  
**PG** - Prescribed Grazing (proper stocking rates with adequate recovery periods during the growing season)  
**VLTPG** - Very Long-term Prescribed Grazing (could possibly take generations)  
**WF** - Wildfire (Natural or Human Caused)

Technical Guide  
Section III

USDA-NRCS  
Rev. 11-01-05

## State & Transition Model MLRA 32 loamy 10-14" PZ East

- Illustrates site dynamics and what plant communities can be expressed within the natural range of variability within a state.
- Identifies States and potential thresholds.
- Illustrates transition and restoration pathways.
- Could we have a cheatgrass plant community?



# Prescribed Grazing

- The controlled harvest of vegetation with grazing or browsing animals, managed with the intent to achieve a specified objective.
- A grazing prescription can be designed specifically for maintenance or enhancement of wildlife habitat.
- By adjusting the intensity, frequency, timing and duration of grazing and/or browsing, a manager can favor different plant and wildlife species through grazing management and in the process influence the productivity and ecological integrity of the land.

# Grazing Management

- Intensity
  - The amount of plant material removed.
- Frequency
  - The number of times a plant is grazed.
- Time of Grazing
  - The Season of use.
- Duration
  - The length of time a give number of animals graze an area. Duration will greatly influence grazing intensity and frequency.



# Prescribed Grazing - a Management System that Incorporates:

- **Proper Grazing Use** - Grazing at an intensity that will maintain enough cover to protect the soil and maintain or improve the quantity and quality of desirable vegetation.
- **Deferment or Rest** - Delay of livestock grazing in an area for an adequate period of time to provide for plant reproduction, establishment of new plants, or restoration of vigor of existing plants.
- **Planned Grazing System** - A system in which two or more grazing units are deferred and grazed in a planned sequence over a period of time.
- Planned grazing systems are designed and applied to meet the needs of the vegetation, the animals, and the overall objectives of the operator.

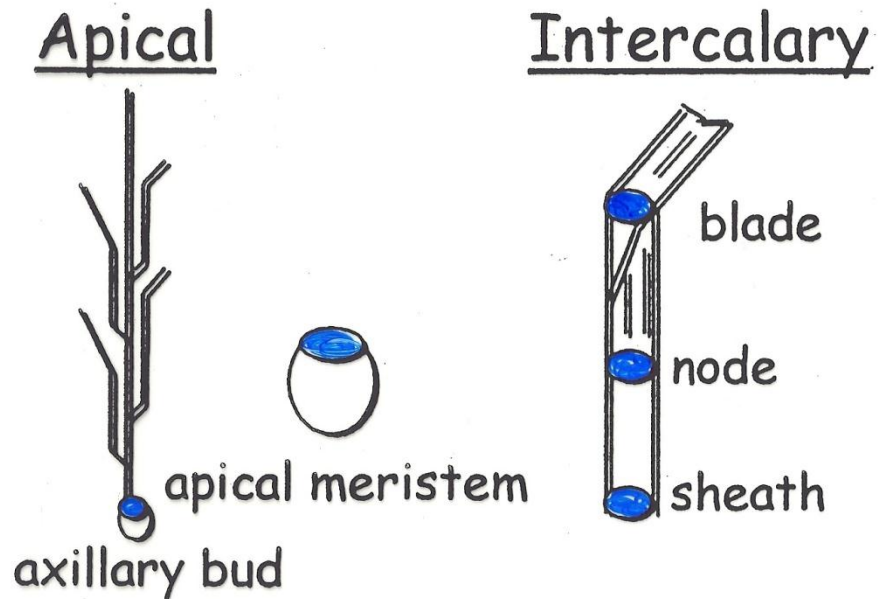
# Plants Response to Grazing

- In general, a grass plant produces twice the volume of leaf area to complete growth, reproduce and remain healthy and vigorous.
- Plants have the greatest grazing tolerance during the early growing season when in a vegetative state and there is soil moisture available for regrowth. Timing of use is especially important in arid areas.
- Location of growing point
  - Elevated or Basal

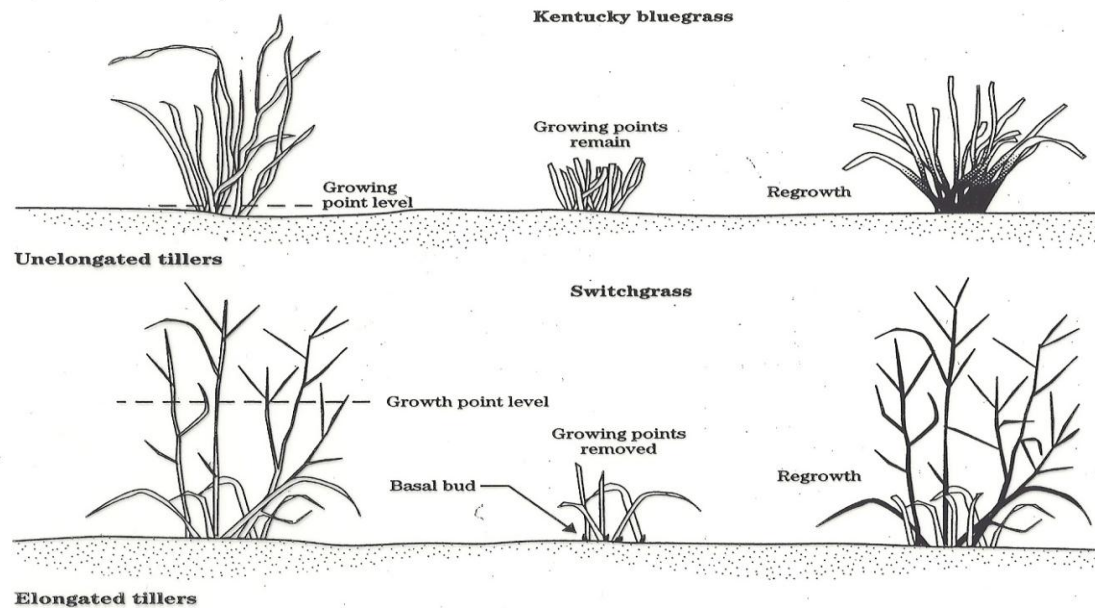


# Growing Points of Grass

## Meristems



**Figure 5-22** Response of a nonjointed grass like Kentucky bluegrass compared to a jointed grass like switchgrass\*  
(from Waller, et al. 1985)



\* Same leaves continue to grow on bluegrass. Switchgrass starts tillers from basal buds. Older stems die.

- Plants tolerate grazing best when lightly or moderately grazed then allowed to regrow.

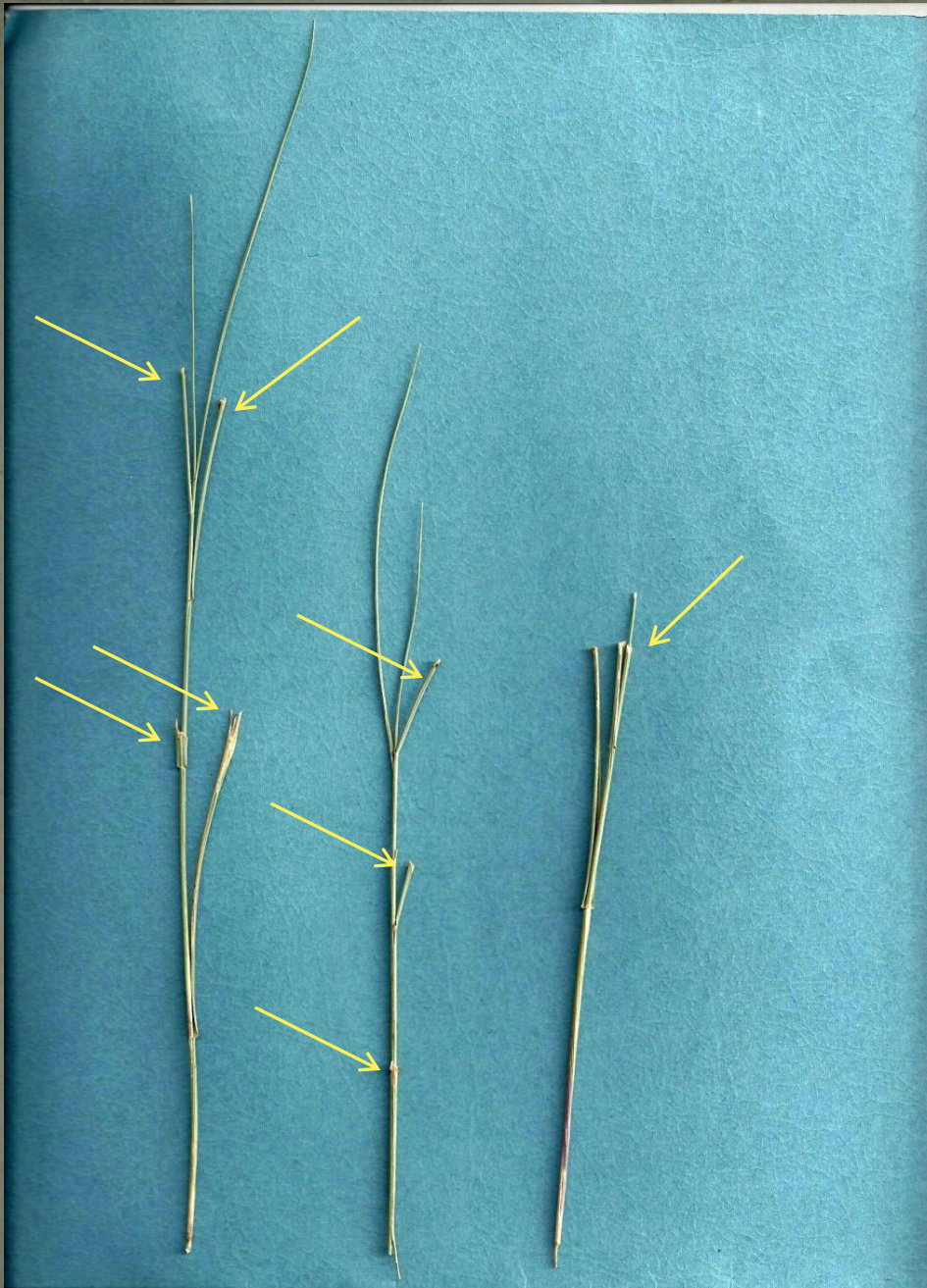


# Rhizomatous wheatgrass

Regrowth following  
grazing.

If apical meristem is  
removed the tiller will  
stop growing.

Any regrowth will occur  
from auxiliary buds at  
the base of the plant.





# Take Half Leave Half

## Harvest Efficiency

- The total percent of vegetation harvested by a machine or ingested by a grazing animal compared to the total amount of vegetation grown in the area in a given year.

- For continuous grazing, harvest efficiency usually averages:

Rangeland 25 percent

Pastureland 30 percent

Grazed cropland 35 percent

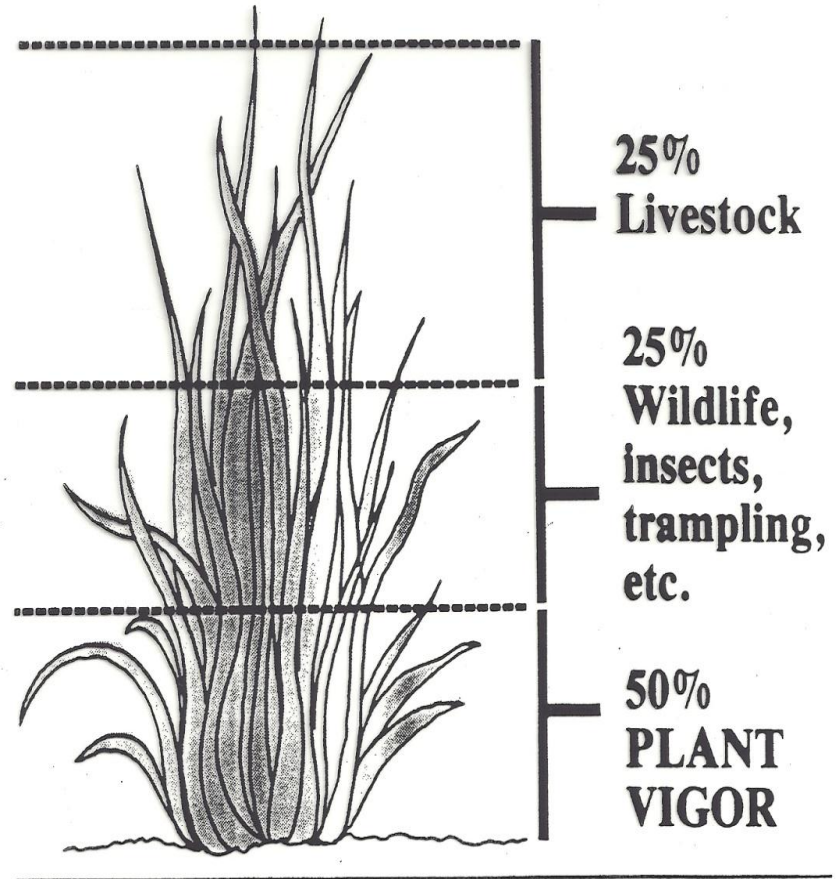


Figure 3. Plant utilization by weight assuming continuous, season-long grazing (i.e. take half and leave half).

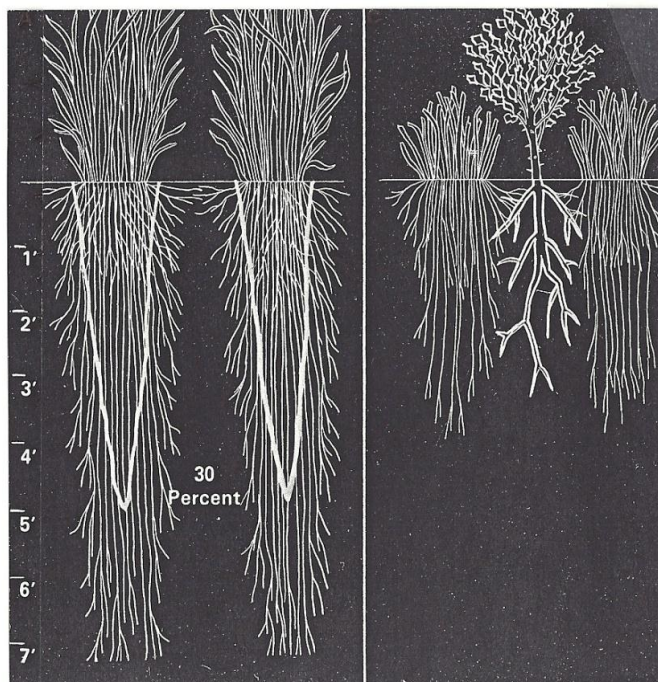


## How Grazing Affects Root Growth

Percent Leaf Volume Removed	Percent Root Growth Stopped
10%	0%
20%	0%
30%	0%
40%	0%
<b>50%</b>	<b>2-4%</b>
60%	50%
70%	78%
80%	100%
90%	100%

Approximately 30% of each grass plant's roots must be replaced annually.

- \* Grazing up to half of the leaf area has little if any affect on root growth.
- \* At 60% of the leaf area removed, half of the root growth is stopped.
- \* 80% removed and root growth completely stops for 12 days.
- \* 90% stops root growth for 18 days.



# Growth Curves – When Should You Graze

High Plains Southeast (10-14" PZ SE)

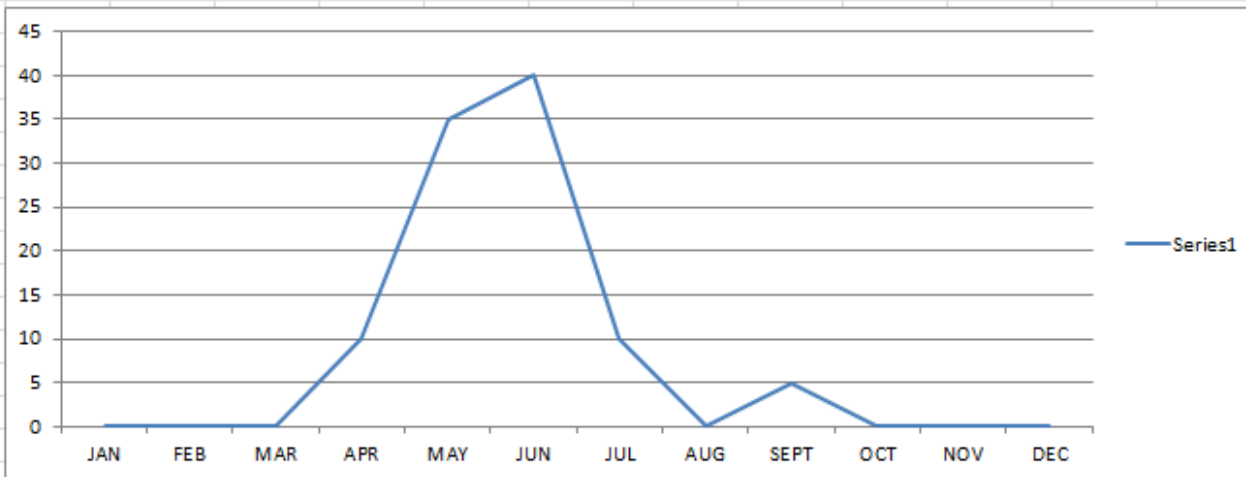


Green River & Great Divide Basin (7-9" PZ GR)



Clayey, Loamy, Sandy

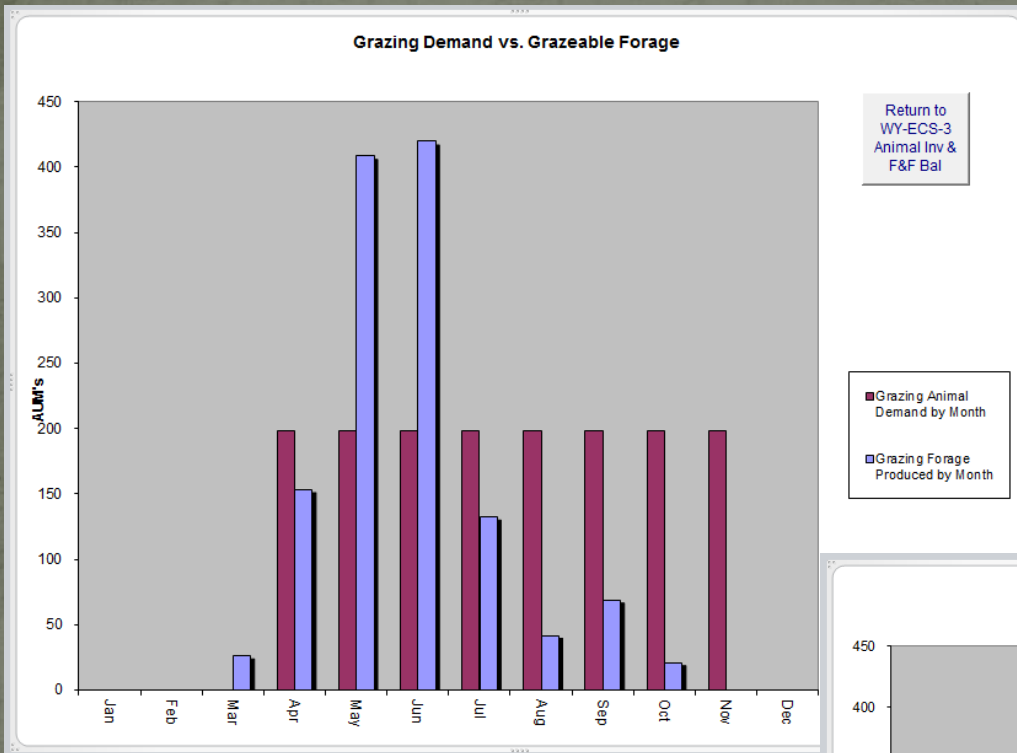
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
0	0	0	10	35	40	10	0	5	0	0	0



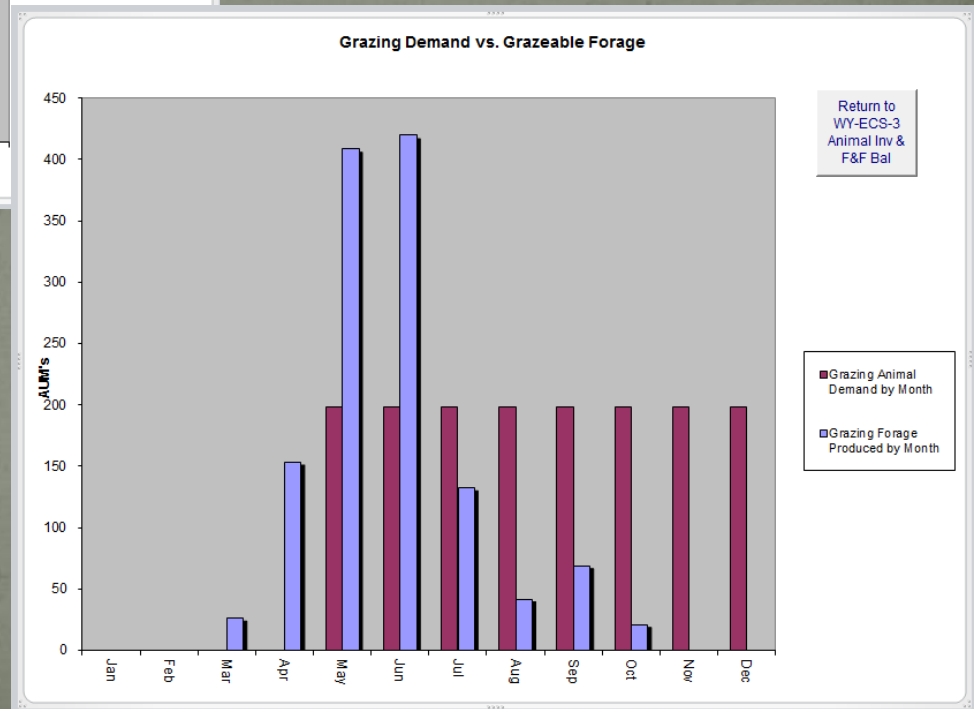


# Timing or Season of Use

Grazing early in the season  
Chasing the Green



Defer grazing to allow plant adequate leaf development



Northern Plains (15-17" PZ NP)

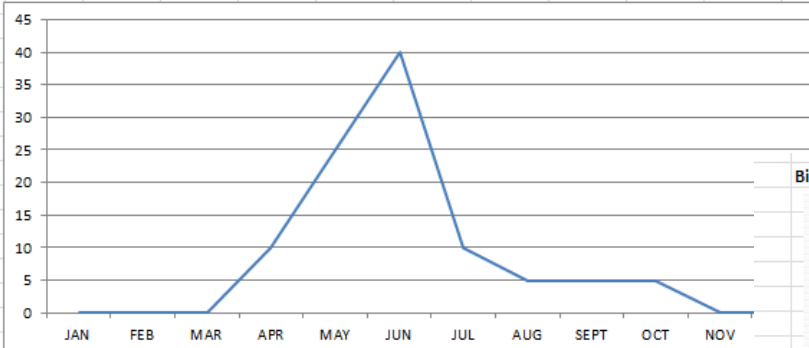


Northern Plains (10-14" PZ NP)



Clayey, Loamy, Sandy

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
0	0	0	10	25	40	10	5	5	5	0	0



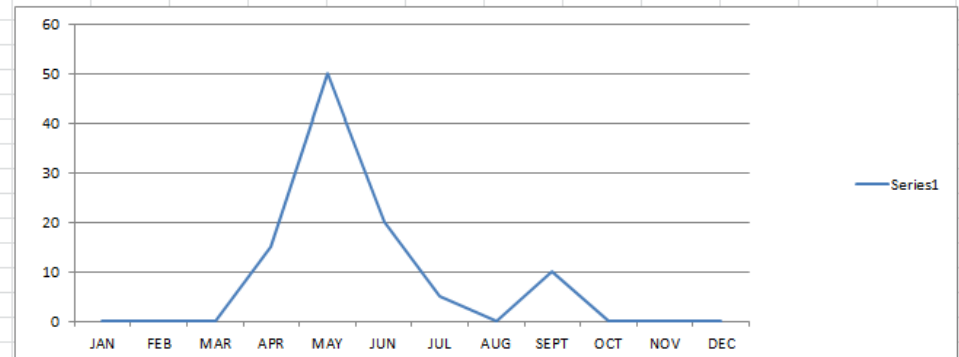
# North Eastern Wyoming Warm-season species Component

Big Horn Basin (5-9" PZ BH)



Clayey, Loamy, Sandy

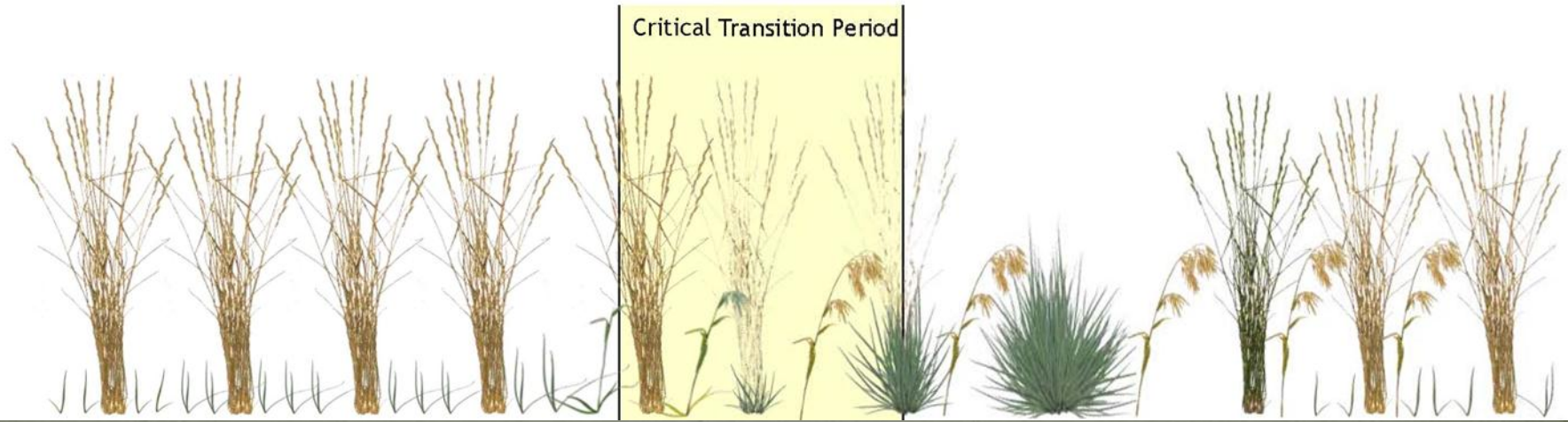
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
0	0	0	15	50	20	5	0	10	0	0	0



# Big Horn Basin Wyoming Predominantly Cool-season species



# Prescribed Grazing designed to promote critical perennial grasses.



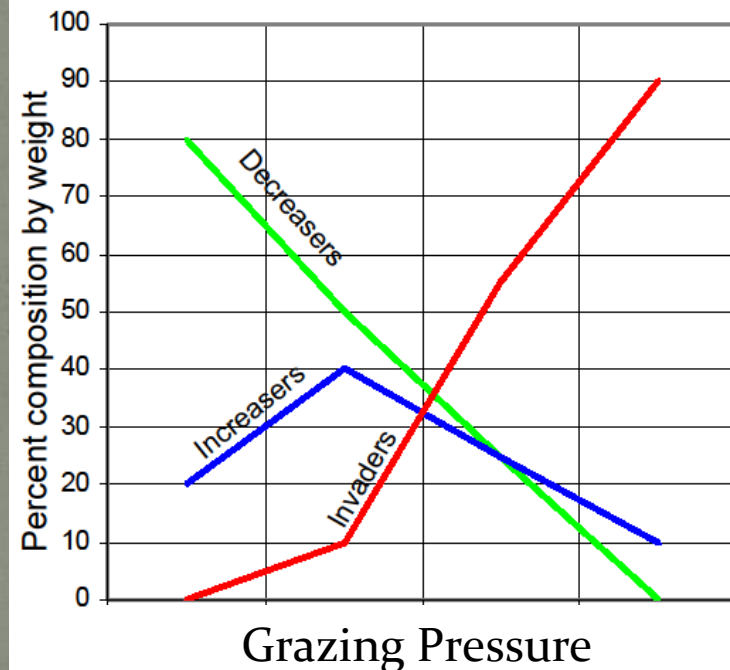
Month	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
<b>Perennial Grasses</b>	Senescence	Dormancy				Growth initiation	Leaf growth	Boot stage & seed head emergence	Flowering & seed development		Seed hardening & scatter & senescence				
<b>Annual Grasses</b>	Germination	Growth initiation				Leaf growth	Boot stage	Flowering & seed development	Seed hardening & scatter		Death	Germination & growth initiation			

**Reducing “gaps” between perennial grasses results in:**

- *Increased hiding cover for grouse*
- *Increased resistance to annuals*
- *Reduced soil erosion and increased water infiltration*
- *More sustainable grazing operations*

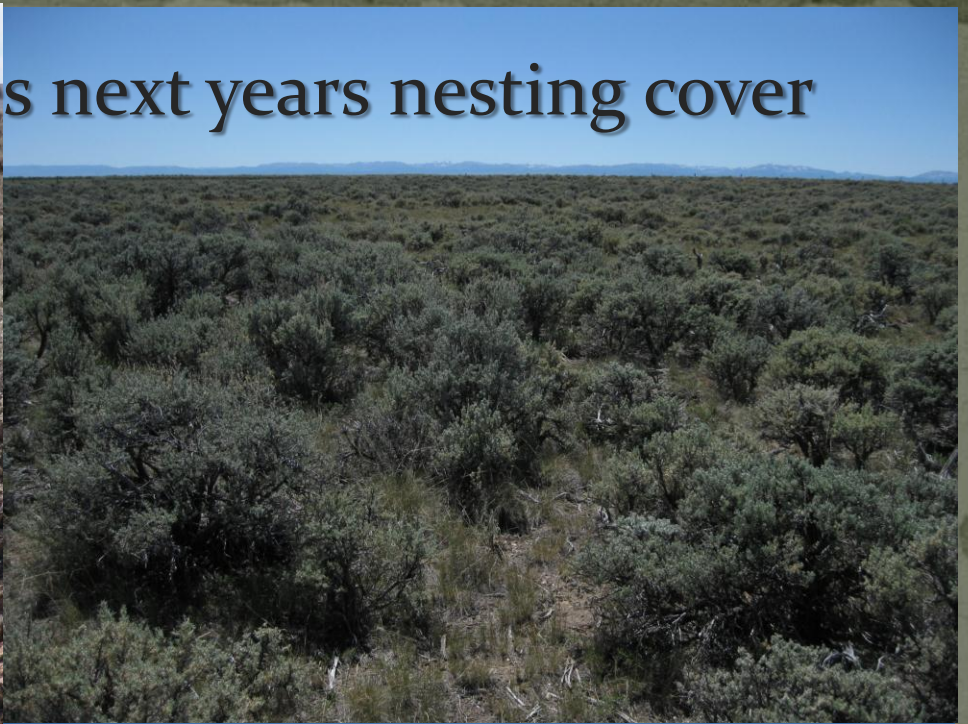
# Decreaser/Increaser/Invader

- Natural Range of Variability
- Animal Preference
- Grazing Tolerance
- Resistance to Grazing
- Competition between plant species
- Open Plant Community - Invasion





This years grass makes next years nesting cover





# A Meta-analysis of Greater Sage-grouse *Centrocercus urophasianus* Nesting and Brood-rearing Habitats

*Hagen et al. 2007 Wildlife Biology 13:42-50*



equates to 10% increase in  
population growth

8% increase in  
nest success



*Taylor, Naugle and Mills BLM Report 2011*



# Benefits to Proper Grazing Use

- Grazing influence on sage-grouse habitat is a function of both long-term management to promote desirable plant communities and annual management of the standing crop to provide cover for sage-grouse habitat.
- With few exceptions leaving adequate residual forage will provide both long and short term benefits.
- Promote Rangeland Health

# Range Health

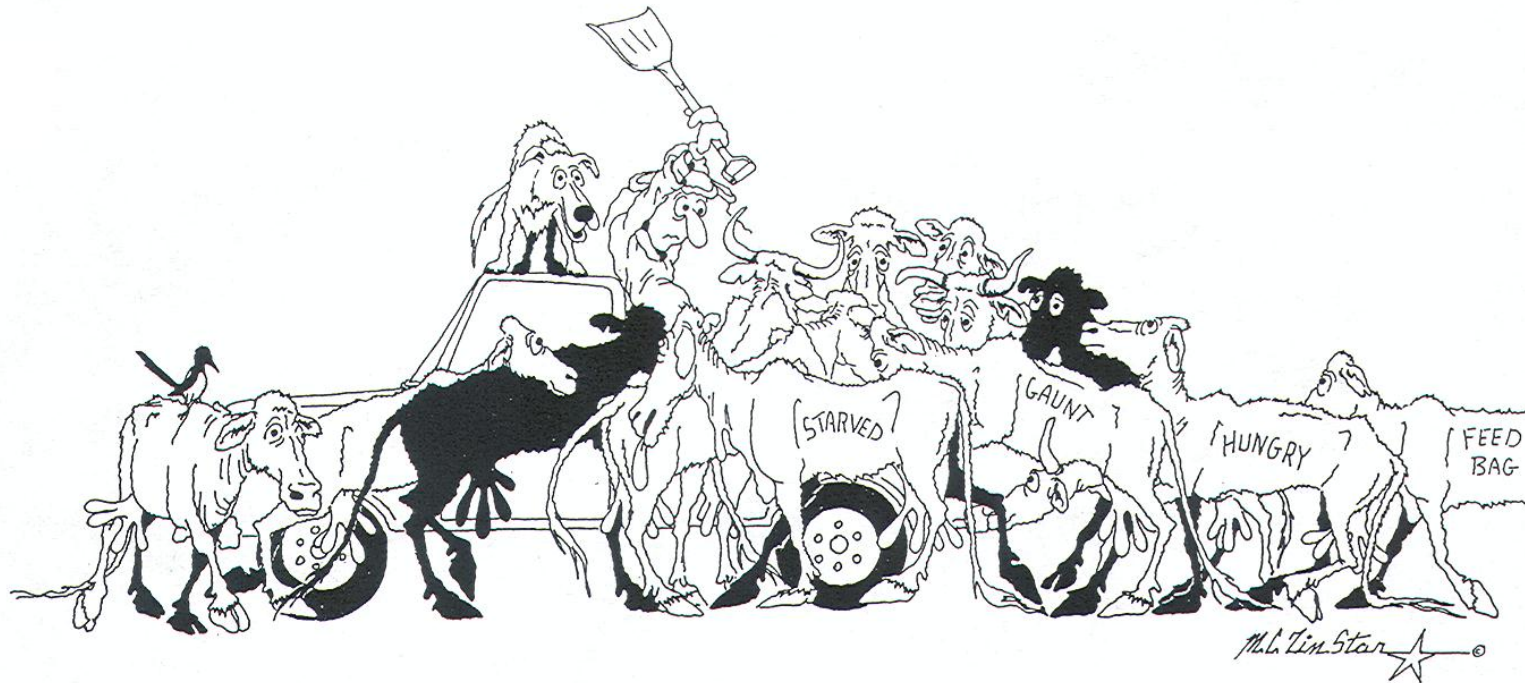
- Soil site Stability – Capacity of an area to limit loss of soil resources including nutrients and organic matter.
- Hydrologic Function – Capacity of an area to capture, store and safely release water from rainfall, run-on, and snowmelt. Stored water available for plants.
- Biotic Integrity – Capacity of the biotic community to support ecological process within a normal range of variability. And resist invasive species.



# Develop a Feed & Forage Balance

- The objective of most grazing management programs is to make optimum use of forage resources while maintaining or improving the resources.
- To accomplish this, a proper balance must be maintained between the number of animals using the forage and the amount and quality of forage produced.

# Feed & Forage Balance



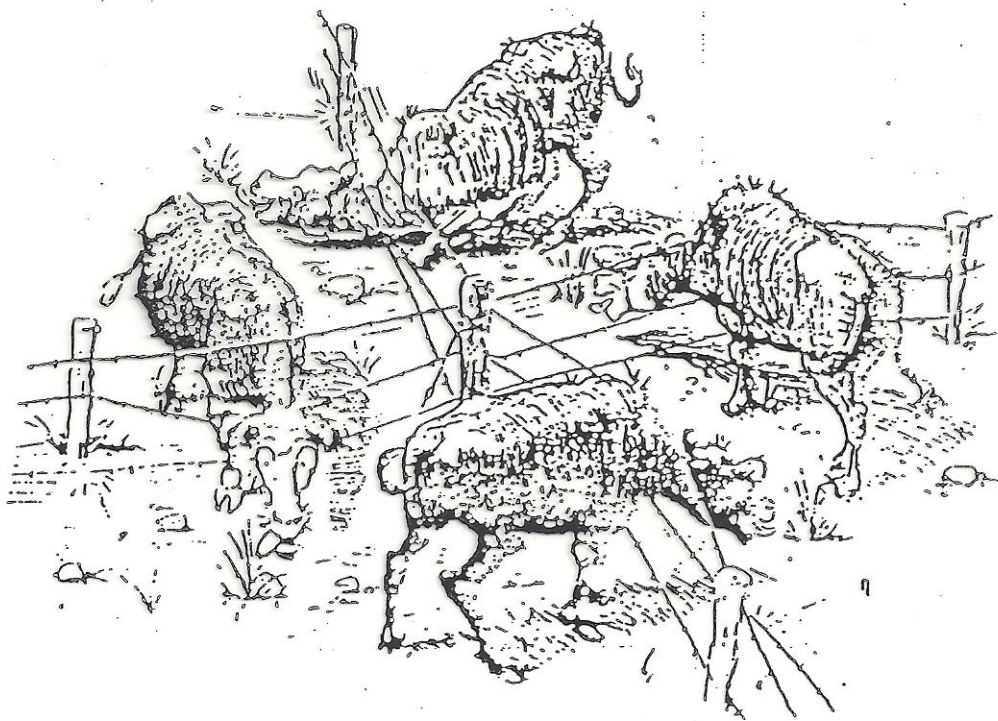
"EARL DECIDES THAT HE IS GOING TO HAVE TO GET ON THE FEED GROUND MUCH EARLIER IN THE MORNING WITH THE CORN AND CAKE ..."



# Planned Grazing System

Manage for Rangeland Health, Livestock Production and Wildlife Habitat.

- Stock grazing units properly
  - Monitor for proper utilization and species selection
  - Allow time for rest and recovery of plants
  - Avoid using the same pasture the same time every year.
  - The system meets the producers goals and objectives while also meeting the needs of plants and animals.
- 
- Intensity, Frequency, Timing and Duration
  - Avoid pushing a vegetative State over a threshold



CONTINUOUS ROTATION SYSTEM



# Questions

