



United States
Department of
Agriculture

Natural Resources Conservation Service

Helping People Help the Land

Grazing Management Plans

Patti Novak-Echenique

Nevada State Rangeland Management Specialist

USDA-Natural Resources Conservation Service

Grazing Management

- The manipulation of grazing animals to accomplish desired results in terms of animal, plant, land, or economic responses (Valentine 1990).
- Grazing management “both a science and an art, should be based on both the knowledge of science and the wisdom of practical experience”.
(Valentine 1990)

Prescribed Grazing – NRCS Conservation Practice 528

Definition:

Managing the harvest of vegetation with grazing and/or browsing animals with the intent to achieve specific objectives.

Purpose:

- Improve/maintain: desired species composition, structure and vigor;
- quantity & quality of forage for animals
- surface and/or subsurface water quality/quantity; riparian/watershed function;
- manage fine fuel loads

- Native Range
- Seeded Range (Crested wheatgrass, etc).
- Riparian Areas
- Permanent Pasture (Irrigated/Non-irrigated)
- Grazed Forest or Woodlands
- Aftermath Grazing of Hayland or Cropland



- Establish goals and objectives for ranch/individual pastures/family
 - Improve economic value of ranch
 - Better management of natural resources
 - Basic needs of families – food, economic stability
 - Sustained forage and livestock production



- Describe present management and identify opportunities, issues, problems
- List what you have to work with (private land, allotments, resources, facilities)
- Determine your objectives
- Determine animal needs and timing
- Determine plant needs and timing
- Determine management tools and techniques
- Design the plan, grazing strategy, contingency plan for disasters
- Determine monitoring design

- What are you doing now that you want to keep?
- Are you managing grazing as well as you could?
- What are you doing now that you want to examine or change?
- What opportunities exist?

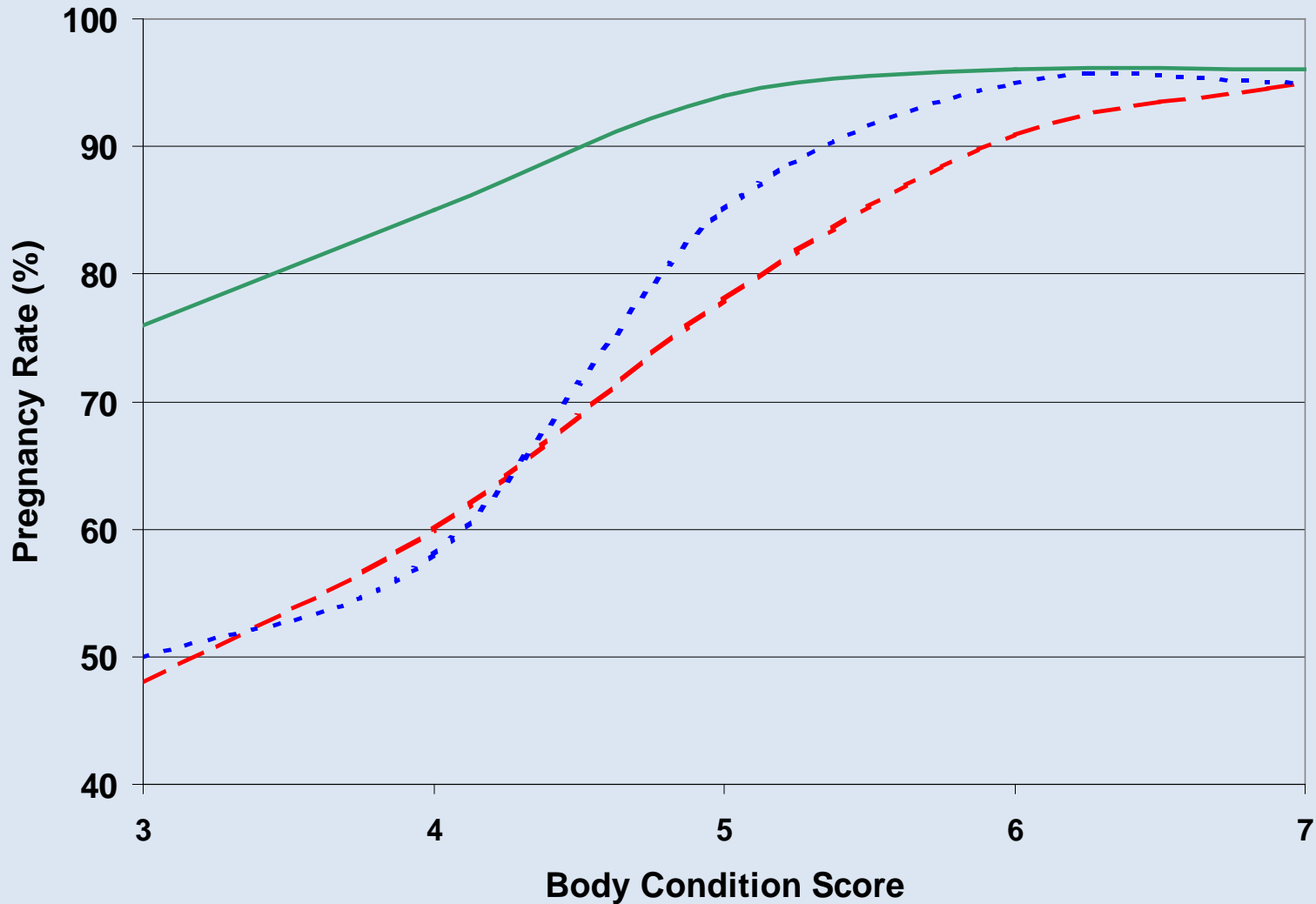


- Natural Resources:
 - Land base (soils, veg) for a year-round ranch plan
 - Private lands – irrigated pastures
 - Public lands – rangelands
- Physical resources (fences, water, facilities, equipment, etc.)
- Animal resources – livestock, wildlife, feral horses
- Human resources - labor, capital

- Profit/Economic Stability
 - Improve body condition/reproduction
 - Better calf weights
 - Reduce costs
- Improve range health
 - Plant health, resiliency
 - Water quality
 - Soil quality
 - Wildlife habitat
- Better use of resources
 - Efficient harvest of range forage
 - Grazing land sustainability

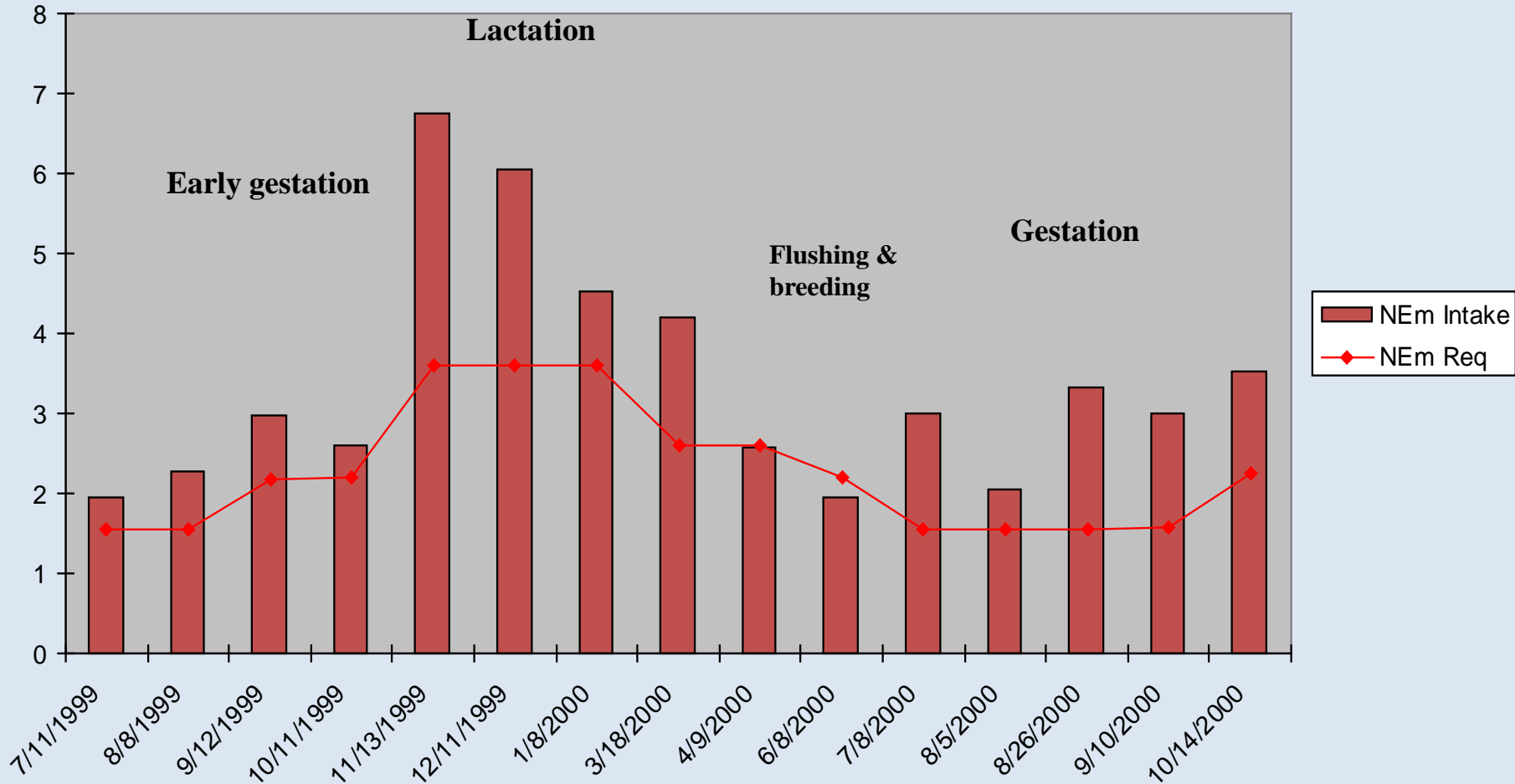
- Nutritional needs at various stages of production
- Forage-animal balance: match forage available with the needs of the grazing animals







Energy Intake vs. Requirement - Sheep

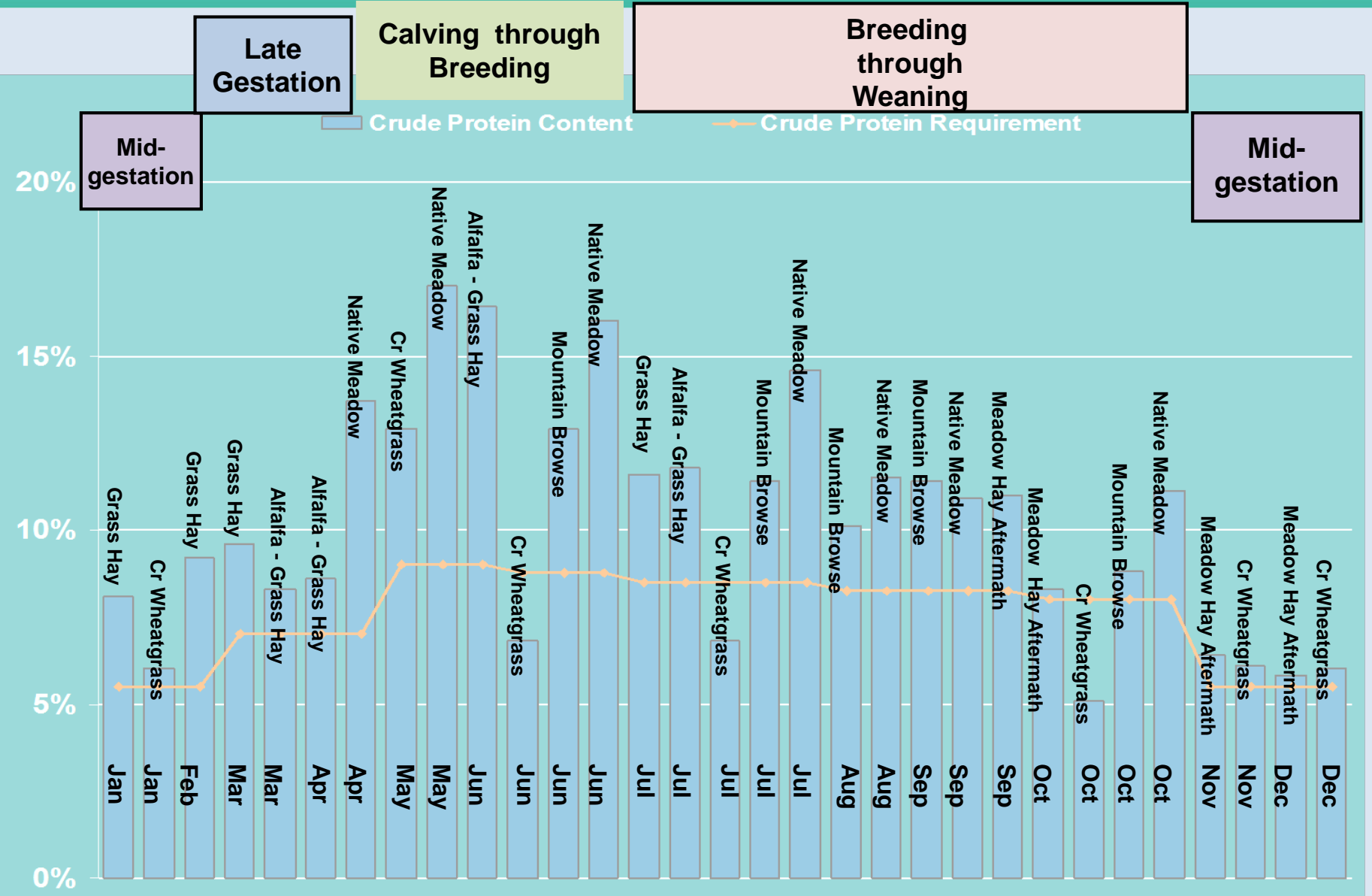




Crude Protein - Cattle

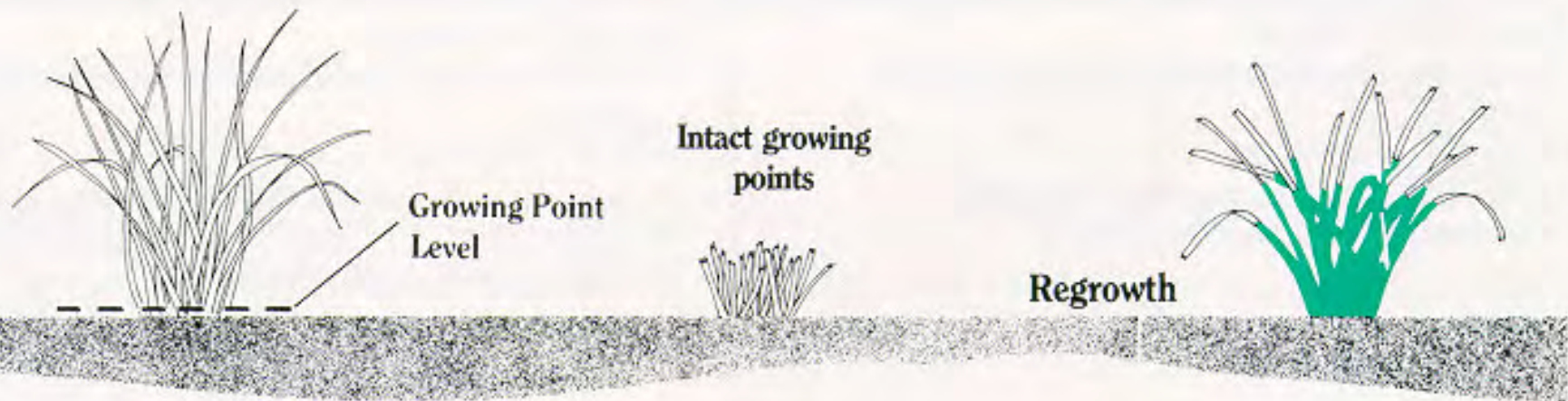
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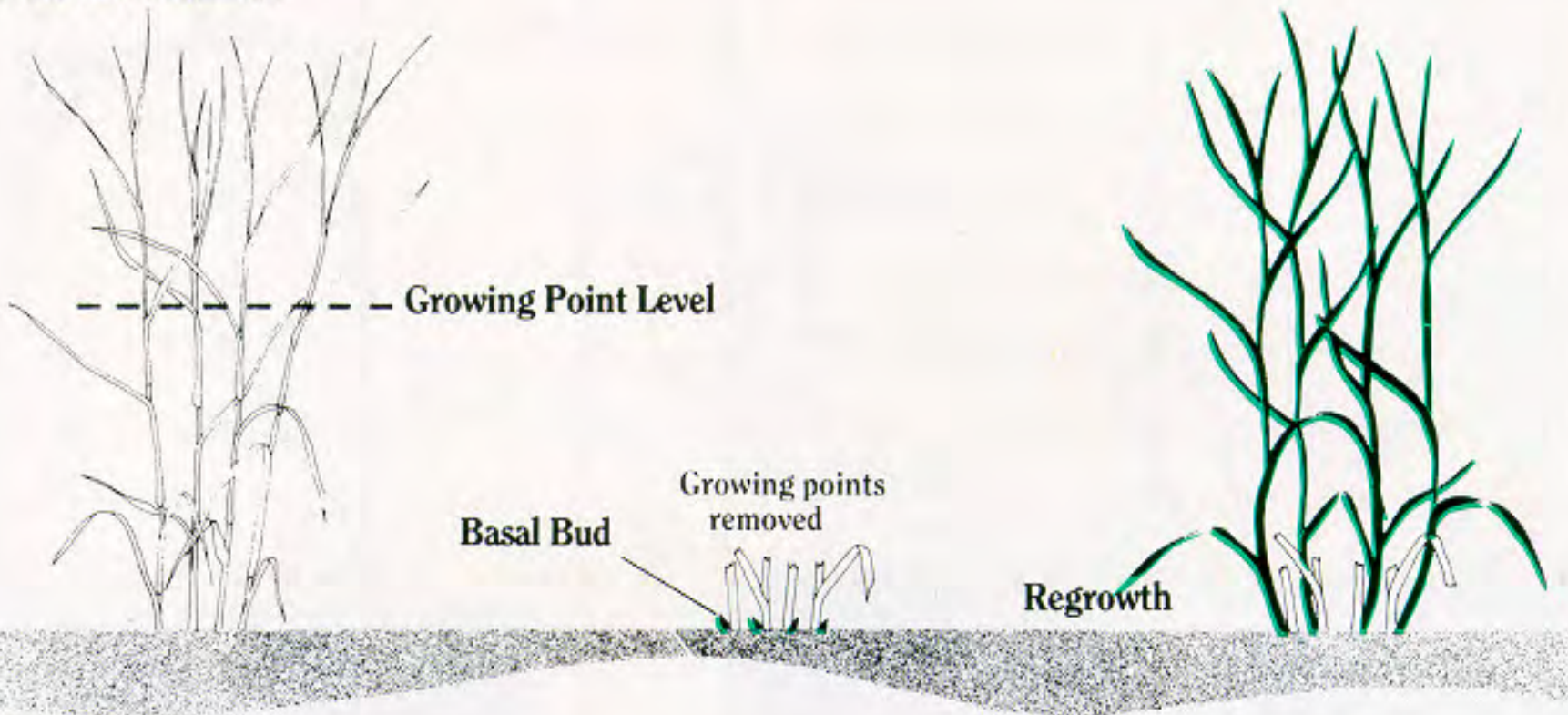


- Leaf area
- Growing points
- Moisture for growth/regrowth
- Opportunity for regrowth
- Frequency and intensity of defoliations (how often and much?)
- Timing of Grazing (when?)





UNELONGATED TILLERS



ELONGATED TILLERS

Short and Long Shoot Grasses

Short shoot grasses (more grazing tolerant)	Long shoot grasses (often less tolerant)
Kentucky bluegrass	Bluebunch wheatgrass
Galleta grass	Crested wheatgrass
Squirreltail	Idaho fescue
Needle and thread	Great Basin wildrye
Blue grama	Indiangrass
Buffalograss	Switchgrass



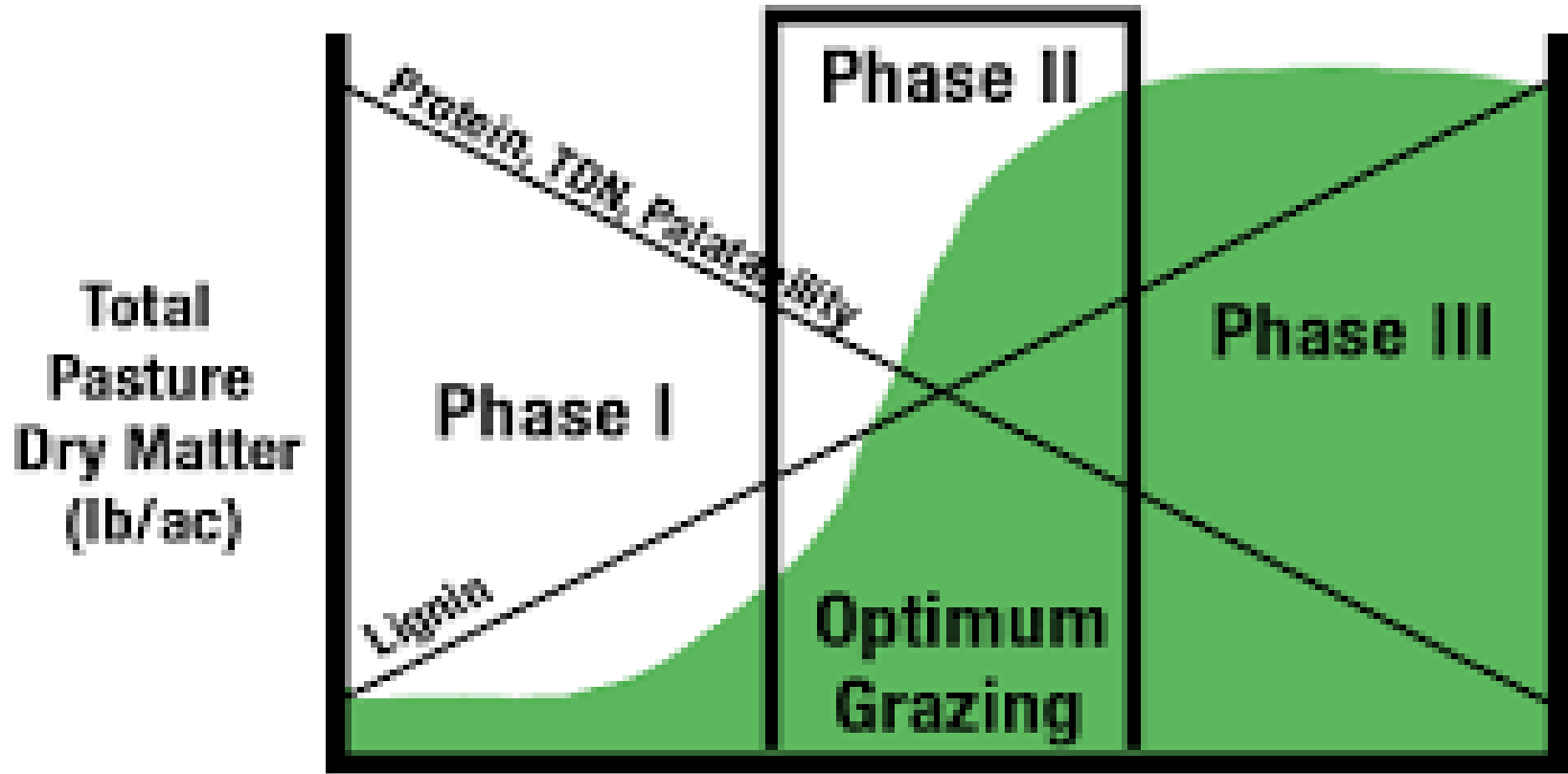
Defoliation Above Growing Points of Leaf Blade

- Growth continues provided water, sunlight and proper temperatures are present.
- Photosynthesis produces carbohydrates
 - Some used for new cells and cell enlargement
 - Some becomes soluble carbohydrate reserves and plant health not affected

Defoliation Below Terminal Growing Point

- Growth stops
- Few carbohydrates produced or stored
- New growth from dormant basal buds
 - Uses soluble carbohydrate pools stored in the root crown and/or lower part of stems
 - ✓ Repeated defoliation below growing points, during the rapid growth phase, across years, reduces and can eliminate stored energy reserves, which kills tillers and plants

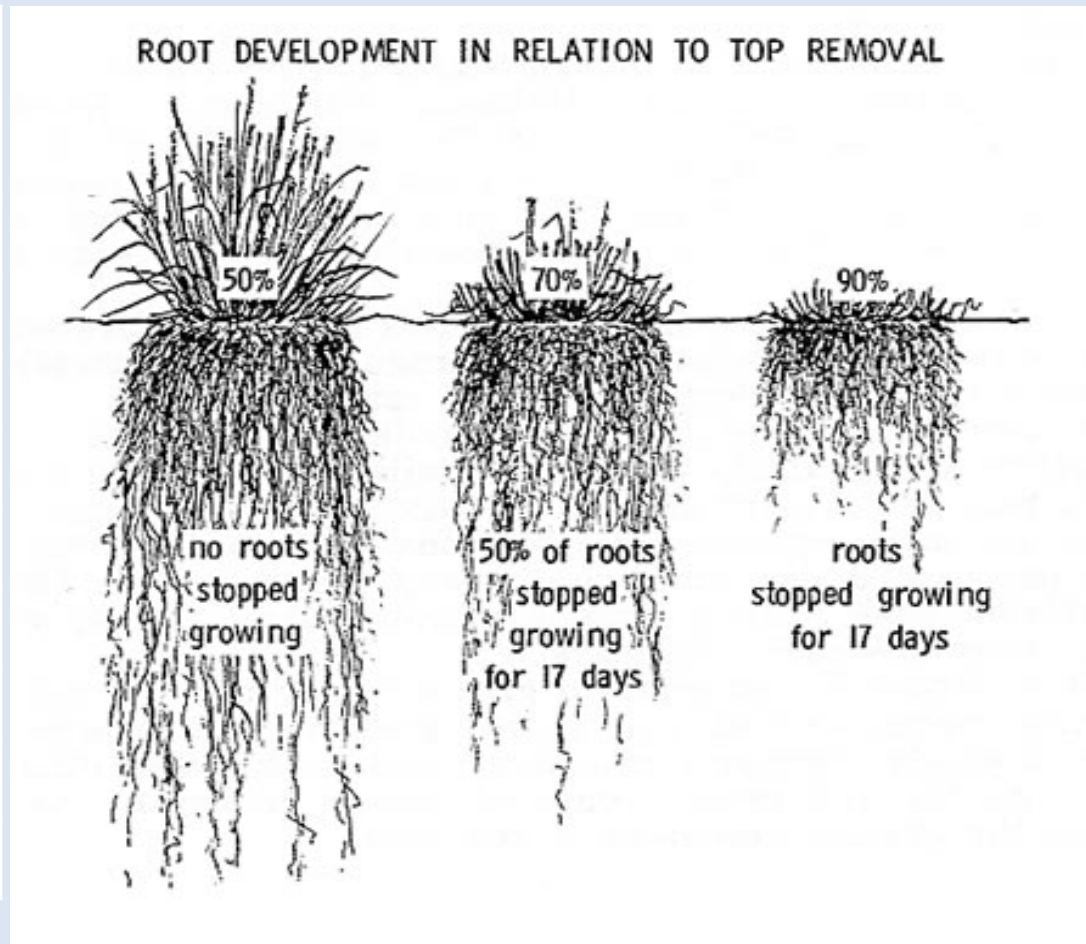
PHASES OF PLANT MATURITY



Growing Season or Regrowth After Grazing

- Grass root growth – 20-50% of roots must be replaced annually (Dietz 1988)

% leaf volume removed	% root growth stoppage
10%	0%
20%	0%
30%	0%
40%	0%
50%	2-4%
60%	50%
70%	78%
80%	100%
90%	100%



- Stocking rate: The number of specific kinds and classes of animals grazing or utilizing a unit of land for a specific period of time (NRCS-NRPH 1997).
- **Selection of the correct stocking rate is the most important of all grazing management decisions (Holecheck et al 1999).**

1. Determine land area
2. Determine forage production
3. Determine individual forage demand (2% of BW or 30 lbs/day air-dry)
4. Select harvest coefficient
5. Adjust for distance from water
6. Adjust for slope
7. Compute correct stocking rate
8. Cross check actual and expected use



- Time – the duration animals remain in a given grazing area
 - Influences frequency and intensity of defoliation
- Number – number of animals on the grazing area (stocking density)
- Area – land available for grazing



Examples of grazing systems

Two-Pasture — Switchback System



Pasture	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F
A	G				Rest				G				Rest											
B	Rest				G				Rest				G											

Three-Pasture One-Herd System

Pasture	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M
1	G				Rest				G				Rest				G				Rest			
2	Rest				G				Rest				G				Rest				G			
3	Rest				G				Rest				G				Rest				G			

Three-Pasture Two-Herd System

Pasture	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M
1	Rest				G				Rest				G				Rest				G			
2	G				Rest				G				Rest				G				Rest			
3	G				Rest				G				Rest				G				Rest			

One-Herd Multi-Pasture System

Pasture	A	M	J	J	A	S	O	N	D	J	F	M	A			
1	G				Rest				G				Rest			
2	Rest				G				Rest				G			
3	Rest				G				Rest				G			
4	Rest				G				Rest				G			
5	Rest				G				Rest				G			
6	Rest				G				Rest				G			
7	Rest				G				Rest				G			

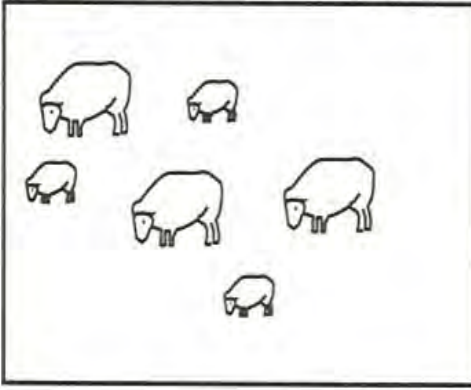
A specialization of grazing management that defines systematically recurring periods of grazing and deferment for two or more pastures or management units (NRCS-NRPH 1997).

Include one or more of 3 basic elements:

1. Deferment (non-use for less than a year)
2. Rest (non-use for a year or more)
3. Rotation (livestock movement on a scheduled basis)

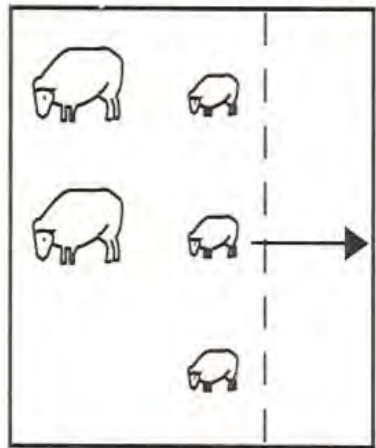
Allocation stocking methods

Continuous set stocking



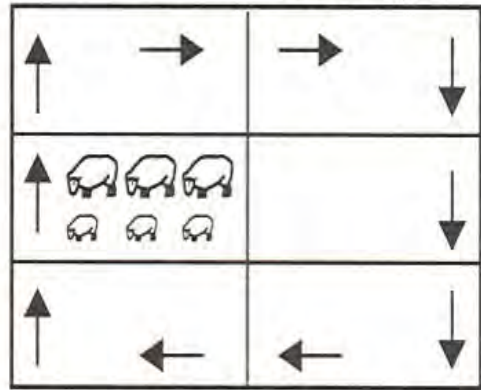
Animals access total area.

Continuous variable stocking



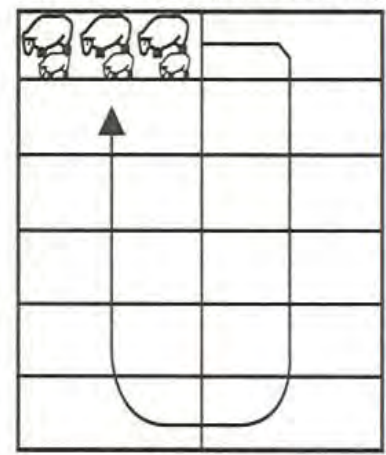
Area accessed by animals expands or contracts as forage supply dictates.

Set rotational stocking



Example: 6 day grazing period and 30 day recovery period.

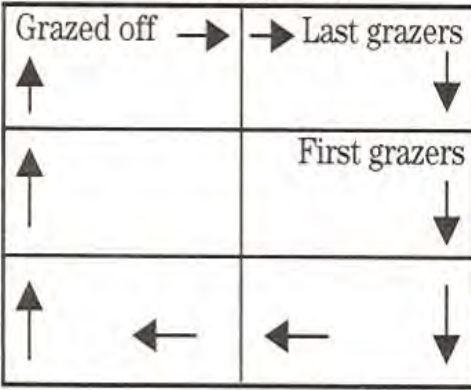
Variable rotational stocking



Example: Grazed 8%; Recovering 92%.

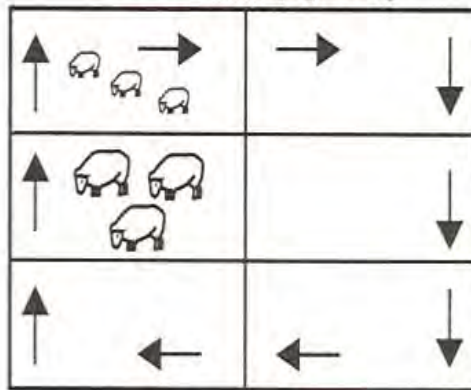
Nutritional optimization stocking methods

First-last grazing



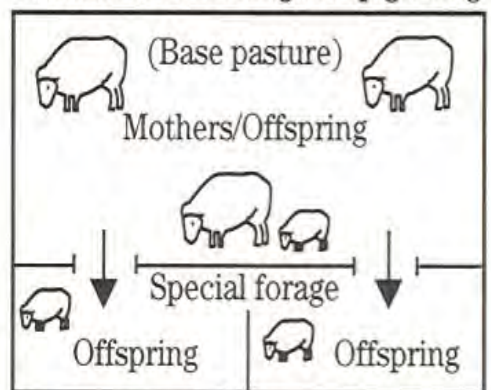
High performers graze first and low performers graze last.

Forward creep grazing



Offspring graze ahead of mothers, using special creep openings.

Continuous stocking-creep grazing



Mothers stay on base pastures, offspring creep graze special forage.

- **Rangeland**
 - Continuous or season-long
 - Deferred rotation
 - Rest rotation
 - Short duration
- **Irrigated Pasture**
 - Continuous or season-long
 - Rotational or Managed Intensive Grazing



- Animals have unrestricted access to the entire pasture throughout the grazing period (seasonal, year-long)
- Advantages:
 - Least capital and management required
 - Allows greatest selectivity of forage quality
 - Generally - greater livestock production per unit area
- Disadvantages:
 - Livestock have preferred areas of grazing
 - Non-uniform distribution of livestock and manure

- Multi-pasture, multi-herd systems
- Each pasture receives periodic deferment (every 2-4 years)
- Designed to maintain or improve range condition and forage productivity
- Works best where considerable differences exist between palatability of plants and convenience of areas for grazing
- Disadvantages:
 - Individual animal performance less than continuous
 - Added expense for fence and fence maintenance

- Multi-pasture, multi-herd or multi-pasture, single herd
- Uses recurring periods of grazing and rest among two or more pastures
- Plants periodically receive a full growing season of rest for recovery
- Disadvantages:
 - Individual animal performance less
 - Added expense of fencing and maintenance

- Multi-pasture, single herd
- Stock density is high to extremely high
- Length of grazing period is moderate to short, with a long rest period
- Grazing units are not grazed the same time of year each year
- Disadvantages:
 - High fencing requirements
 - High levels of grazing intensity may reduce livestock performance
 - Soil compaction – grazing on wet soils



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Managed Intensive Grazing

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- Designed with animal performance, plant productivity, and economic viability in mind.
- Match animal type and nutrient needs to forage availability/quality
- Consider the basic rangeland resources - the type of plants (cool season/warm season grasses, forbs and/or shrubs) and plant growth cycles.
- Combination of management tools and techniques that promote distribution of livestock



- Fencing
- Water developments
- Animal trails and walkways
- **Other Tools:**
 - Herding
 - Behavior modification
 - Salt and supplement placement

- Vegetation Manipulation
 - Brush Management
 - Range or Pasture Planting
 - Nutrient Management
 - Irrigation Water Management
 - Pest Management
 - Prescribed Burning



Mechanical Brush Management



Pasture Planting



Range Planting



Chemical Brush Management



- Attract livestock away from riparian areas
 - Offsite water developments
 - Manipulation of upland vegetation
 - Supplementation
- Excluding use or promoting avoidance of riparian areas
 - Fences, barriers, stream access points, low-stress herding
- Herd management and animal husbandry
 - Culling practices – “riparian huggers”
 - Breeds

Designing the Plan

Guidelines (8):

1. Provide as much growing season recovery time as possible, i.e. reduce duration of grazing for each unit.
2. Consider the rate of plant growth (soil moisture and temperature) in planning duration.
3. Increase the number of pastures (use areas) and stock waters to increase flexibility.

4. Consider combining herds to make more pastures available.
5. Try not to graze the same unit at the same time of the year every year.
6. Adjust the intensity to match the season and duration of use.
7. Make the whole plan fit together.
8. Develop a contingency plan.

- Accounts for potential management problems (i.e., drought, wildfires, insects)
 - Put up additional hay
 - Reduce herd size (cull open cows, replacement heifers, broken mouth, older animals)
 - Early weaning
 - Alternative feeds (corn stalks, alfalfa stubble)
 - Acquire additional grazing land

- Essential to understanding the effects of management decisions and actions on the health and sustainability of rangelands
- Document successes and failures
- Document annual grazing use
- Climatic conditions
- Long-term trend in vegetation – photo points, transects, utilization cages





ADAPTIVE MANAGEMENT

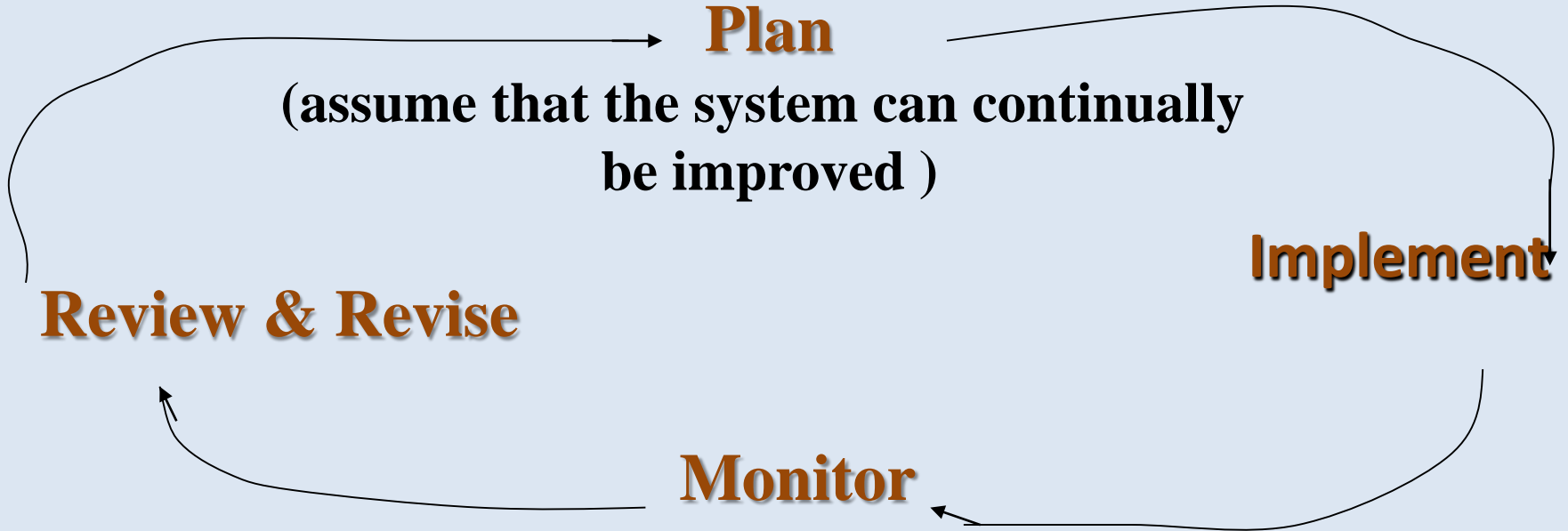
Plan

(assume that the system can continually
be improved)

Implement

Review & Revise

Monitor



Questions?

