Sustainable

Prolonged production of a resource under management principles which insure replacement of the part harvested by regrowth or reproduction before another harvest occurs.

Before We Arrived!

- Migratory Grazing Animals
- Small Human Population
- No fences
- Mother Nature Ruled
- Plants and Animals Adapted to Environment
- Good to Excellent Rangeland Condition

Not sustainable without proper management

Soil Erosion

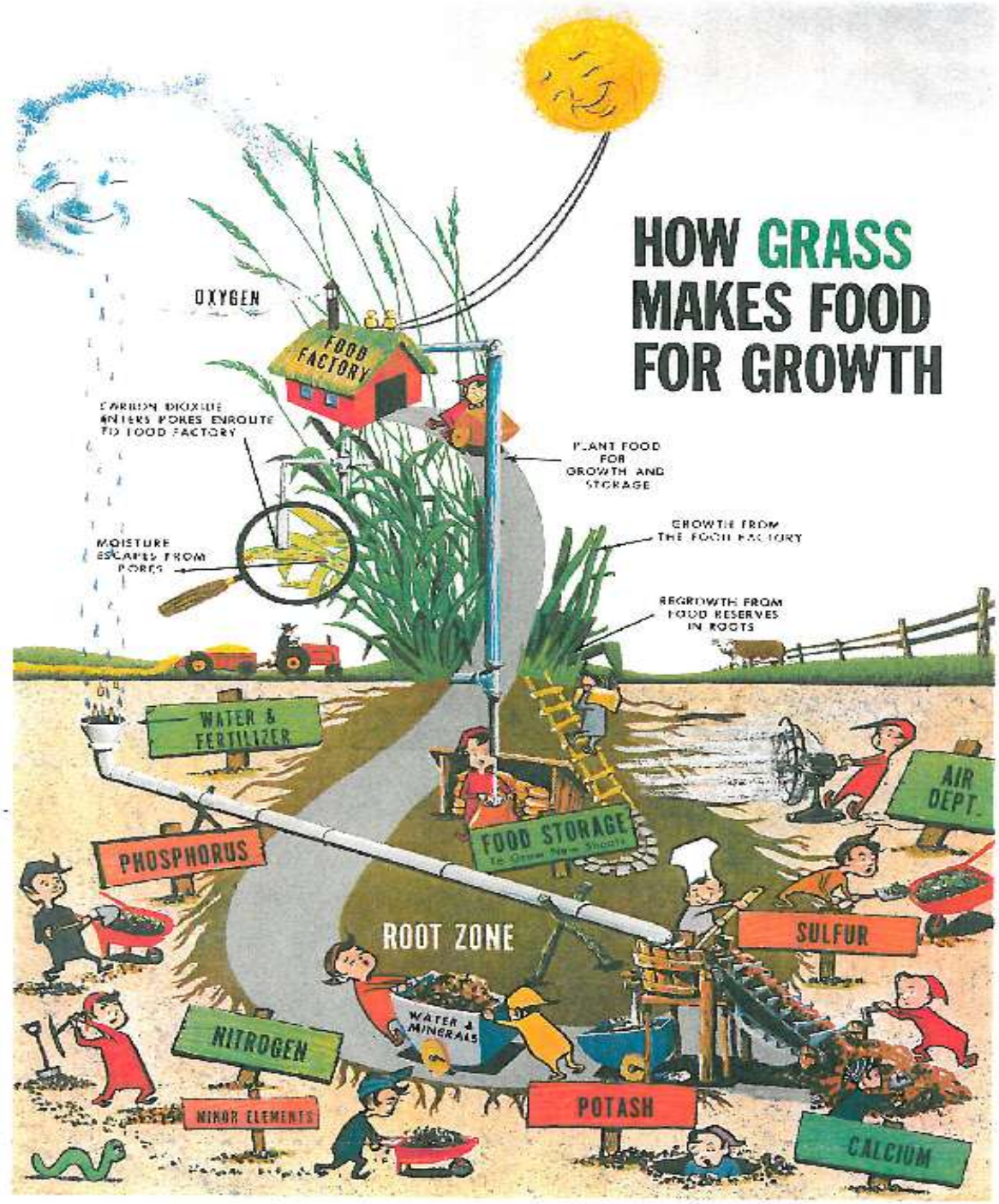
Soil Development Takes Thousands of Years

&

Riparian Degradation

Consequences

- Decreased Native Vegetation
- Increased Undesirable Plants
- Riparian Function at Risk
- Bare Ground
- Accelerated Erosion
- Loss of Topsoil
- Air and Water Pollution
- Land Devaluation
- Not Esthetically Pleasing
- Loss of Wildlife Habitat


HOW GRASS MAKES FOOD FOR GROWTH
OXYGEN
FOOD FACTORY
CARBON DIOXIDE ENTERS PORES ENROUTE TO FOOD FACTORY
PLANT FOOD FOR GROWTH AND STORAGE
GROWTH FROM THE FOOD FACTORY
MOISTURE ESCAPES FROM PORES
REGROWTH FROM FOOD RESERVES IN ROOTS
WATER & FERTILIZER
AIR DEPT.
FOOD STORAGE
PHOSPHORUS
ROOT ZONE
SULFUR
WATER & MINERALS
NITROGEN
MINOR ELEMENTS
POTASH
CALCIUM

Effects of Grazing on Plants

- Timing – growth stage of plant when it is grazed.
- Frequency – number of grazing events during the growing season.
- Intensity – amount of leaf removed when it is grazed.
- Recovery – amount of time allowed for plant to regrow and restore energy reserves after being grazed.

How Grazing Affects Root Growth

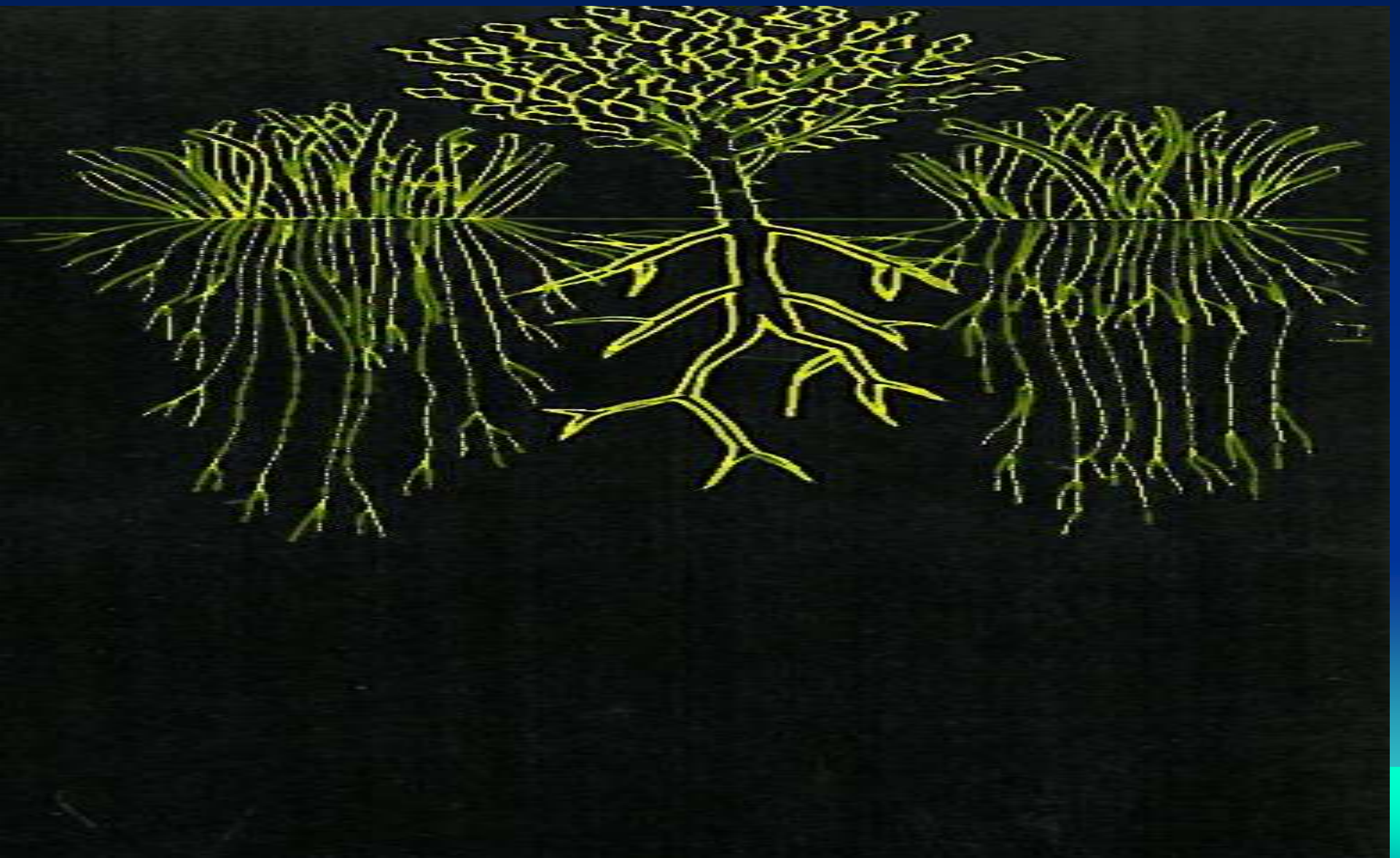
Percent leaf volume removed:	Percent root growth stoppage:
10%	0%
20%	0%
30%	0%
40%	0%
50%	**2-4%**
60%	50%
70%	78%
80%	100%
90%	100%

Effects of defoliation on grass root structure

Grazing is One Tool to Manage Vegetation

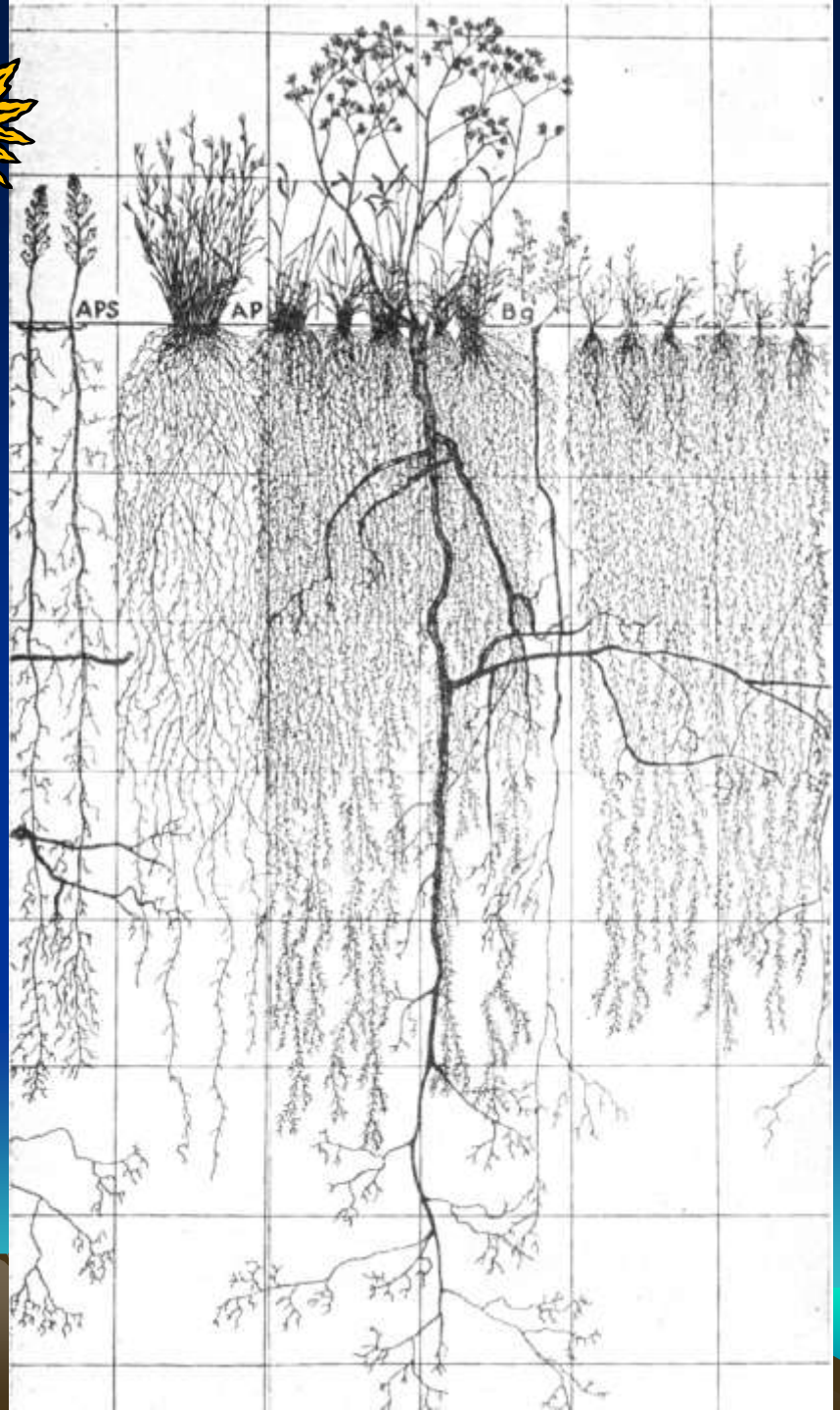
- Grasslands Evolved with Grazing Animals
- Is all grazing created equal?
- Continuous vs rotational grazing

Invasive/Increasers



Plants Compete!

70 – 90% of Grass Biomass Is Below Ground



Above

and

Below Ground

Carrying Capacity

The number of animals that a parcel of land can support without overgrazing.

Carrying Capacity

A function of:

Type and Size of Animal

Number of Animals

Range Condition

Ecological Sites (Correlated to soils)

Production (Variable depending on past use and climate)

Number of Acres

Rangeland Productivity

Limited by:

- Soil type
- Topography
- Vegetative species present
- Climate
- Management (past and present)

Is Proper Carrying Capacity/Stocking Rate Enough?

If rotation grazing is not practiced then range condition may not improve and may even continue to decline, even with proper carrying capacity.

Why?

- Selective Grazing
- Desirable plants are overgrazed
- Undesirable plants are not grazed
- Shift in species composition

Overgrazing vs. Overstocking

- Overgrazing – individual plants are grazed too frequently and too intensively with inadequate periods of recovery. Invariably happens to plants under continuous grazing.
- Overstocking – too many animals for the amount of forage available. Heavy defoliation. Plants may recover depending on the length of the grazing period and the length of the recovery period.

Rotation Grazing Systems

Defined as a practice in which two or more pastures are alternately rested and grazed in a planned sequence for a period of years.

Essential Concepts of Prescribed Grazing Management

Grazing Periods – Should be kept short. 10 days or less is preferred during the growing season.

Recovery – plant must be allowed enough time to replenish energy stores after defoliation. Throughout the majority of the growing season in our semi-arid climate, 90 days of recovery is required after each grazing event.

Cell Center With Rotation Grazing

Successful Grazing Systems

- Simulate migratory bison grazing.
- Proper stocking rate.
- Distribute livestock equitably.
- Control the length of grazing period. Formula = recovery period desired/number of pastures being rested. Prevent livestock from grazing each plant more than once during the grazing period. (10 days or less is preferred)
- Provide sufficient recovery period. Dependent on growth rate. (at least 45 days during fast growth, at least 90 days during slow growth)
- Rotate as one herd.
- Begin grazing in a different pasture each year.