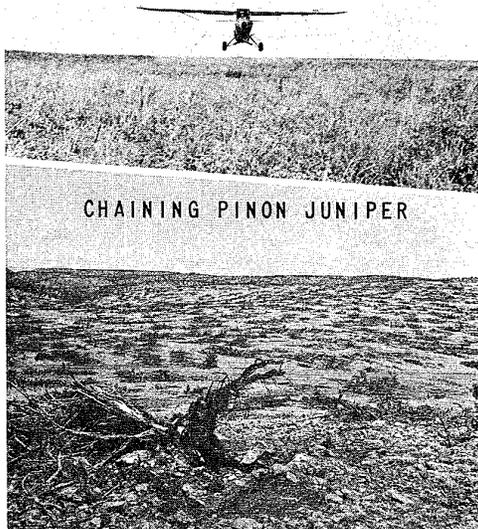
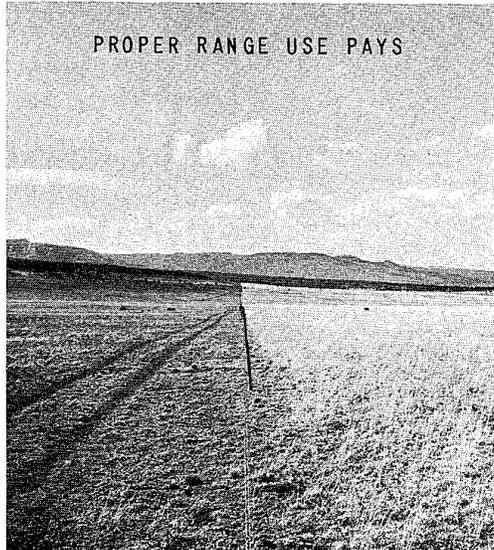


RANGE CONSERVATION - TECHNICAL NOTES

AERIAL CHEMICAL PLANT CONTROL



PROPER RANGE USE PAYS



GOOD LIVESTOCK WATERING



RANGE TECHNICAL NOTE NO. 68

RE: Elements of Practical Plant Ecology as Applied to Native
Grass Management (For use in Ranch Planning Assistance)
compiled by Henry E. Wall, Jr.

Natural vegetation can be evaluated at any given time by considering
basic principles of plant ecology.

The attached outline, prepared by Henry E. Wall, Jr., Range Conserva-
tionist, Santa Fe, is an excellent refresher in the use of plant
ecology in ranch planning.

Attachment

AC's - 1 ea.

DC's - 1 ea.

Area Range Conservationists - 1 ea.

Adjoining States - 1 ea.

WTSC, Portland - 2

Director, Plant Sciences Division, SCS, Washington, DC -2

REVIEW OF THE ELEMENTS OF PRACTICAL PLANT ECOLOGY AS APPLIED TO
NATIVE GRASS MANAGEMENT (FOR USE IN RANCH PLANNING ASSISTANCE)
Henry E. Wall, Jr.

I. Plant Succession

A. Primary succession

Successions that start from bare areas

B. Secondary succession

Successions within a normal primary succession after an interruption caused by external factors or disturbances

C. The mechanics of succession

1. Causes of succession

- a. Initial causes - Bare areas respond to natural processes - climate, topography, and biotic conditions
- b. Continuing causes - Competition, migration of invaders, fluctuations in rainfall, changes in topography, etc.

2. Migration and Invasion

Mobility of reproductive parts of plants

3. Establishment

4. Competition

- a. Selects best adapted plants
- b. Effects of grazing on competition

D. Equilibrium and the Climax

1. True climax is final stage of succession.

2. Subclimax is the arresting of succession before climax is reached and is a relatively permanent stage, maintained by grazing.

3. Postclimax is the development of a plant community more complex than that reached by the broad climax of the area - Valleys populated with trees along stream courses in the Great Plains.

4. Preclimax is the development of a plant community less complex than that reached by the broad climax of the area, usually caused by less favorable moisture conditions. Shallow or droughty soils with drought tolerant vegetative species

E. Succession and Range Management

1. The plants on a range indicate:
 - a. Type of use it is receiving
 - b. The trend of improvement or deterioration
2. Key species or indicator plants
By observation and experience indicators denote the position of the range
3. The goal in vegetation management is to be able to guide plant succession in a definite direction, and at the most rapid rate possible.
4. Present known available tools are:
 - a. Kinds of livestock using the range.
 - b. Intensities of use
 - c. Knowledge of key species
 - d. Systems of grazing
 - e. Establishment of species
 - f. Mechanical aids
 - g. Use of chemicals

II. Effects of Grazing on the Individual Plant

A. How animals graze

1. Palatability and species selection as affected by:
The forage composition (Tobosa versus Blue grama)
2. Season of use
 - a. Development of individual plants

- b. Time of year highest in minerals
- 3. Class of livestock
- 4. Portion of plant eaten
 - a. When in pure stands
 - b. When in good forage composition
- 5. Grazing Intensity
 - As grazing intensity increases, more of plant is used.
- B. Injurious effects of grazing
 - 1. Effects on growth and vigor
 - a. Decrease in photosynthetic surface
 - (1) Food manufacture decreased
 - (2) Food storage decreased or stopped
 - (3) Reproductive organs few if any produced
 - (4) Plant may die from starvation
- C. Beneficial Effects of Grazing
 - 1. Moderate grazing may increase production.
 - a. Grazing often stimulates bud and leaf growth.
 - b. Tillering and vegetative propagation may be induced by moderate cropping.
 - c. In times of drought, production may be increased by removal of leaves and stems and reduction of transpiration and evaporation.
- D. Recognizing the effects of grazing
 - 1. Evidence of past range abuse
 - a. Dead or dying browse plants
 - b. Grass clumps with dead centers
 - c. Absence or scarcity of highly palatable plants
 - d. Abundance of low palatability perennial plants

- e. Barren areas, erosion pavement, and gullies
 - f. Excessive number of trails
2. Evidence of recent range deterioration
- a. Low plant vigor of perennial plants and little evidence of seed production
 - b. Broken grass sod
 - c. Invasion of low value plants indicated by seedlings and young plants
 - d. Erosion pavement, pedestaled plants, gullies forming
 - e. Indications of erosion by turbid condition of runoff waters
3. Evidence of current abuse
- a. Grazing of shrubs in excess of current twig production
 - b. Very close cropping of palatable plants; heavy cropping of coarse grasses
 - c. Dry edges, knolls and stream banks conspicuously trampled, showing evidence of search for more variety of better quality feed
4. Evidence of range improvement
- a. Accumulated growth of hedged browse plants, shrubs growing out into trails from above, new basal growth of shrubs
 - b. Moderate grazing of key species
 - c. Seedlings and young plants of desirable species present
 - d. Plants becoming established on trails, congregating places healing up or improving, perennial plants in gullies, gullies "rounding out"
5. Evidence of satisfactory use
- a. Vigor and abundance of forage plants, reproduction by seeds or other means very evident

- b. Slight or no use of unpalatable species
- c. Absence of gully and sheet erosion in active formation, normal soil layers present (especially litter and humus in the A horizon)

III. Range Indicators and Their Use

A. Indicators are expressions of the environment and the resultant processes and conditions that may be found.

B. Kinds of Indicators

1. Plant community

Component species are adapted both to each other and to their common environment

2. The species

a. Usually reflects a disturbance, successional trends, overuse, etc.

b. The individual species may indicate several things, as - depth to available water, presence of salts, depth of soils, degree of disturbance, extent of erosion, fertility, etc.

3. Succession

The sequence in succession must be known to use

4. Soil condition

a. Physical condition of A horizon

b. Humus or litter versus erosion pavement

5. Overgrazing

Includes a composite of most all the above factors. They are: loss of plant vigor, failure to produce seed, disappearance of palatable species, invasion of unpalatable and noxious plants, appearance of bare spots, erosion, many annuals, dead and dying shrubs, pedestalled grass clumps, deep trails, and absence of seedlings.

C. Key species

1. Different plants have different values as indicators.

2. Factors that usually determine their value as a key species:
 - a. Their dominance in the composition
 - b. Constant species are most valuable
 - c. Plants of high palatability
 - d. Plants that are palatable over as long a season within the year as possible
 - e. Ability to reproduce and invade
 - f. Sensitiveness to grazing