

NATURAL RESOURCES CONSERVATION SERVICE CONSTRUCTION SPECIFICATIONS

PRESCRIBED GRAZING

1. General Specifications

The following procedures and technical information provide guidance and supplements the requirements for carrying out selected components and considerations of Conservation Practice Standard 528, Prescribed Grazing.

2. Plans and Specifications

Prescribed grazing schedule. A prescribed grazing schedule, developed as a sustainable grazing plan, will include the following information and support documentation for all fields of the operating unit being addressed.

Goals and objectives –

- Clearly stated list or narrative (Form NRCS-CPA-6, Conservation Assistance Notes) indicating, as specifically as possible, the desired goals and objectives of the manager.

Where wildlife is a primary or secondary planning concern, identify the habitat needs necessary to maintain or improve food, cover, and shelter of the identified targeted specie(s) and adjust grazing intensity, duration, degree of use, and periods of rest or deferment as necessary in the Prescribed Grazing Schedule.

- Completed Field Inventory Sheet – Resource Concerns, Kansas Field Office Technical Guide (FOTG), Section III, indicating the Soil, Water, Air, Plant, and Animal resource concerns.

Resource inventory – The resource inventory will include the following applicable information on the plan map or in the plan folder in a manner that is readily understood by the producer using the listed forms or suitable documentation:

- Locations of fences and natural barriers, planned and existing.
- Field numbers and associated acreage.
- Locations of gates and animal handling facilities.
- Water Developments - Location of water developments (size, type, dependability, and other pertinent information). The livestock water supply must be adequate to meet the demands of the livestock over the specified grazing period in each pasture or grazing cell. Refer to Conservation Practice Standard and Construction Specification 614, Trough or Tank, in Section IV of the Kansas FOTG for additional information concerning water development requirements.
- Range sites with associated acreage and key forage species – Determine range site condition score, trend, and vigor (Form KS-ECS-11) or Ecological Sites with associated acreage and key forage and/or browse species (National Range and Pasture Handbook (NRPH) Exhibits 4-3 and/or 4-5) – Determine Trend (NRPH Exhibit 4-6), Similarity Index (NRPH Exhibit 4-7), and Rangeland Health Ecological Attributes (NRPH Exhibit 4-8).
- Forage Suitability Groups with associated acreage and key forage species for all hayland, pastureland, and grazed cropland

Erosion predictions – If the primary or secondary purpose for implementing Prescribed Grazing on a field is erosion control then erosion predictions will be included for that field.

Forage inventory – The expected forage quantity and quality for each management unit for the year will be estimated, documented and the estimated stocking rate calculated using the following forms or suitable documentation (Form KS-ECS-9 or NRPH Exhibits 5-1 and 5-2).

Hay and grain inventory (optional) – The expected supplemental feed requirements needed to meet the desired nutritional level for the kind and class of livestock in the management unit(s) (Form KS-ECS-9 or NRPH Exhibit 5-5) not supplied by the grazed forages listed in the Forage Inventory.

Animal inventory – Documentation of the projected number of domestic livestock by kinds and class grazed on the management unit(s) (Form KS-ECS-10 or NRPH Exhibit 6-1).

Feed and forage balance inventory – Documentation of average projected forage quantity and quality surpluses and deficiencies by month from the forage resources for each kind and class of livestock in the management unit(s) (Form KS-ECS-9 or NRPH Exhibits 5-3, 5-4, 5-5).

Prescribed grazing schedule – The prescribed grazing schedule will identify and record for all fields and pastures on each management unit or portion of the management unit being addressed the following information:

- Graze, rest, and deferment periods.
- Recommended stocking rates.
- Actual stocking rates.
- Dates for forage and feed supply evaluations (optional).
- Adjustments to the Prescribed Grazing Schedule as determined necessary (optional).
- Other pertinent treatment activities.

The prescribed grazing schedule will be recorded in a manner that is readily understood by the decision-maker. The method of documentation may depend upon the size and complexity of the operating unit and the details required in the grazing plan (Form KS-ECS-10, NRPH Exhibit 5-6, or suitable documentation).

Contingency plan – A contingency plan will be developed, in addition to the Prescribed Grazing Schedule, that details potential problems (i.e., drought, livestock water availability, flooding, etc.) and serves as a guide for adjusting the grazing prescription to ensure proper resource management and economic feasibility without resource degradation.

Monitoring plan – A monitoring plan will be developed and discussed with the land manager to assess whether the grazing strategy is meeting the goals and objectives of the manager and improving or sustaining the grazing resource. The monitoring plan will use an appropriate recording system that is readily understood and usable by the operator in their daily operations.

As a minimum the monitoring plan will include:

Annual plan review with the producer – At or near the end of the growing season the Prescribed Grazing Schedule will be reviewed with the producer to determine:

- If the plan is meeting the desired goals and objectives according to the producer's stated goals and objectives in the NRCS-CONS-6 notes and the documented resource concerns in the Field Inventory Sheet – Resource Concerns.
- If the manager has accomplished the objectives of the plan.

For Rangeland –

- **Document Proper Grazing Use based on key grazing areas with designated key forage species (Proper Grazing Use, Form NRCS-RANGE-414, NRPH Exhibit 4-3).**
- **Locations of grazing enclosure areas or cages (as applicable) on the plan map.** Grazing enclosure areas or cages may be used to measure the degree of use of the key forage species during the grazing season. Enclosures separate herbage loss due to grazing pressure from loss due to natural weathering and wildlife.

- **Identify the locations of permanent transects (as applicable) on the plan map.**
Permanent transects are used to evaluate long term trend, range site condition, or ecological site condition, watershed health, and soil protection. *The step point (Evans and Love, J. Range Management, 1957)*

For Pastureland – Key forage species and minimum leaf length to begin and end grazing periods, and the minimum leaf length required at the end of the growing season (prior to first killing frost for warm season species, prior to summer dormancy for cool season species).

For Cropland – Minimum residue levels required, after grazing, to control wind and water erosion.

Record of the applied grazing schedule – A record, supplied by the grazing manager (that includes the graze, rest, and deferment periods, stocking rate, and other treatment activities determined pertinent and necessary to assist the grazing manager meet the goals and objectives of the plan) will be kept in the plan folder.

Mid-year plan review (optional) – The prescribed grazing schedule may be reviewed with the producer sometime during the middle of the growing season, to determine the degree of use on the key forage species. The review should be timed so the degree of use measurement is practical and that enough time is left in the growing season so management adjustments will attain the final planned degree of use of the key forage species. For example, warm season native range should be reviewed around July 10 to 20, cool season pastures should be reviewed around May 10 to 20. If an imbalance is determined during this review, the plan and management should be adjusted accordingly and recorded as a modification in the prescribed grazing schedule.

3. Criteria for Rangeland

Selecting key areas and key forage species. At least one key grazing area and one key forage species will be designated for each pasture or grazing unit. The key grazing area and the key forage species will be used to determine the degree of use in the pasture or grazing unit. The degree of use will be determined at or near the end of the growing season using at least one grazing enclosure on each key grazing area for comparison. A grazing enclosure is an area within the grazed pasture fenced in such a way as to exclude livestock. The growing season for warm season grasses will be considered as May 1 to October 31. The growing seasons for cool season grasses will be considered March 1 to July 1 and September 1 to December 1.

- The first priority will be given to a species that is a major component of the climax plant community.
- If such species are not available, use a species that is presently providing a major part of the forage supply.

Key grazing area – A relatively small portion of a pasture or management unit selected because of its location, use, or grazing value as a monitoring point for grazing use. It is assumed that key areas, if properly selected, will reflect the current grazing management over the entire pasture or management unit as a whole.

Key species – A single plant species (or in some situations two or three similar species) chosen to serve as a guide to the grazing use of the entire plant community. If the key species on the key grazing area is properly grazed, the entire plant community will not be excessively grazed.

Factors that determine the selection of key grazing areas and species include:

- Kind and class of grazing animal(s);
- Ecological Site(s) (Range Site(s)), vigor, conditions, and trend;
- Grazing system used or planned;

- Season of use;
- Pasture size;
- Topography;
- Location of shade or loafing areas;
- Location of fences and natural barriers, water supplies, salt and mineral, feeding areas;
- Management objectives as described in the Goals and Objectives of the Prescribed Grazing Plan;
- Climatic conditions.

Degree of use –

- **Rangeland** - Remove no more than 50 percent by weight of the current year's growth of the designated key forage species during the growing season. (Use in excess of 30 percent during the first 30 days of the growing season may reduce potential production for that year.) Late season growth is the most beneficial to increase vigor in the key forage species.

A grazing harvest efficiency of 25 percent should be used to calculate available forage for initial stocking rates under season-long grazing. Normally, 25 percent of the current season's dry matter is considered lost through natural processes under season-long grazing. (See Footnote 1.)

A grazing system incorporating 8 or more paddocks or an intensive early stocking system may use a grazing harvest efficiency of 30 percent for initial stocking rate calculations.

Dormant season grazing of rangeland - Remove no more than 65 percent by weight of the total current year's growth of the designated key species when grazed during the dormant season as long as no more than 50 percent is removed during the growing season. It is well recognized that rangeland health depends on plant biomass left to protect soil, watershed, wildlife, and aesthetic values. The recommended minimum residual herbage levels are 300 to 500 pounds per acre for ecological sites historically dominated by shortgrass species, 750 to 1,000 pounds per acre for ecological sites historically dominated by midgrass species, and 1,200 to 1,500 pounds per acre for ecological sites historically dominated by tallgrass species. (See Footnote 2.) Excessive grazing during grass dormancy negatively impacts the hydrologic cycle since water intake rates are typically higher on adequately-mulched sites.

Exceptions - While the percent use specified above is the general rule to maintain or improve the desired plant community, there may be situations where adjustments in the degree of use will be necessary to accomplish specific objectives. In these cases, the degree of use of the key species to achieve the objectives should be specified.

For example:

To assure the desired rate of recovery on a range in low vigor, 30 to 40 percent use of the key forage species might be specified.

To provide open plains of view for Prairie Chicken lek sites, high animal impact as well as 60 to 70 percent use of the key forage species may be necessary on the identified lek site indicated on the plan map.

- **Pastureland** – Refer to Table 1 for beginning grazing height, minimum grazing height, and end of growing season height for key species.

Remove livestock to prevent compaction, pugging, and trampling when soil is wet.

Use the Forage Suitability Group or historic production levels or to determine safe initial stocking rates.

A grazing harvest efficiency of 30 percent should be used to calculate available forage for initial stocking rates under season-long grazing.

An intensive planned grazing system incorporating 8 or more paddocks may use a grazing harvest efficiency of 35 percent for initial stocking rate calculations

Dormant season grazing of pastureland – The minimum height maintained during the growing season is the ending key species height listed in Table 1.

- **High impact areas** – Areas of animal concentration or over use should not exceed 15 percent of the grazing unit. Areas of animal concentration include watering points, loafing areas, crossings, lanes, feeding areas and all other areas where vegetation is reduced due to livestock impacts.
- **Browse** – Not more than 65 percent of the current twig and leaf growth by weight should be removed for key browse species within reach of the grazing animals. Utilization for deciduous browse species during the dormant season is based on current years twig growth only.

4. Animal Unit Equivalents Guide

<u>KINDS/CLASSES OF ANIMALS</u>	<u>ANIMAL UNIT EQUIVALENT</u>	<u>FORAGE CONSUMED</u>	
		<u>Day</u>	<u>Year</u>
Cow*, with calf up to 6 mo.	1.0	26	9,490
Calf up to 800 pounds	.1 AUE per 100 pounds of body weight		
Cattle, 2 years old	.8	20.8	7,592
Bull, mature	1.35	35	12,811
Horse, mature	1.25	32.5	11,862
Sheep, mature	.2	5.2	1,898
Lamb, 1 year old	.15	3.9	1,423
Goat, mature	.15	3.9	1,423
Bison, mature	1.00	26	9,490

(For other species not listed in this table refer to NRPH, Table 6-5, 1997)

(* A cow is defined as an average milking, beef cow weighing 1,000 pound at a body condition score of 5 using the subjective numeric 1-9 scale [See Footnote 3]. Add .1 AUE for every 100 pounds of body weight in excess of 1000 pounds.)

5. Water Consumption Planning Guide

Water is second only to oxygen to the well being of the grazing animal. Water consumption is influenced by dry matter consumption, ambient temperature, and water quality and availability.

Low quality water normally results in reduced water and forage/feed consumption.

Generally, as ambient temperatures rise water consumption increases and feed intake decreases.

Refer to National Range and Pasture Handbook, 1997, Chapter 6, Tables 6-7 and 6-8 on page 6-12, for additional information concerning water consumption and quality standards.

6. Mineral Supplementation

Salt and minerals should not be placed adjacent to livestock water. Properly locating salt and minerals in undergrazed areas encourages good grazing distribution. The number and location of the salt and mineral feeders depends on the size, livestock density, topography, and shape of the pasture as well as the location of other attractants such as shade and water.

Refer to NRPH, 1997, Chapter 6, Table 6-10, pages 6-16, for additional information concerning general salt requirements for grazing animals.

7. Criteria for Riparian Areas and Other Sensitive Areas

This section contains planning considerations for managing riparian areas and other sensitive areas associated with rangeland, pastureland, cropland, and woodland grazing. This section will be used in conjunction with the appropriate planning considerations for the specified land type or use.

Riparian areas and other sensitive areas located within grazing units are not considered separate land units to be managed by themselves but must be considered in the overall management of the grazing unit for their specific resource concerns and planned resource conditions.

Considerations for establishing management objectives on riparian areas should include -

- The ecological site potential and current resource conditions, including the geology, topography, soils, vegetation, hydrology, and stream characteristics.
- The desired plant community, which will have the ability to provide adequate stream stabilization and cover.
- The planned condition of resources including the physical structure of stream channels and characteristics of the potential plant community, given soils, land form, and recovery potential.
- Maintaining a balance between soils, water, and vegetative communities over time.
- Maintaining a balance between the grazing use of upland and riparian plant communities.

Streambank stability is critical for maintaining or improving riparian condition and function. Riparian functions of a stream include sediment filtering and transport, bank building, water storage, aquifer recharge, and energy dissipation. These and other stream functions are necessary to provide for beneficial uses of water and are dependent on stable streambanks. Streambank disturbance from grazing animals must be managed according to the stream type, planned resource conditions, and management objectives for the stream. Areas which should be considered of high concern are those with actively eroding banks, or high erosion potential; those that contain sensitive fish or plant species habitat; and those in poor functioning condition.

Considerations for riparian areas -

- Passive, continuous grazing rarely improves a deteriorated riparian area or maintains a riparian area in good condition without reducing stocking levels to extremely low and typically uneconomic levels.
- Grazing management must provide an adequate cover and height of vegetation on streambanks and overflow zones to promote natural stream functions (sediment filtering, bank building, flood energy dissipation, aquifer recharge, and water storage).
- Grazing management practices that improve or maintain upland sites may or may not improve nor maintain a riparian area. While riparian areas respond uniquely, they should not be considered independently of uplands. Problematic upland watershed conditions, such as excess runoff and erosion, often reduce the effectiveness of management in the riparian zone. To be managed effectively, the whole pasture containing the riparian zone should be considered.

Other sensitive areas include -

- Surface waters (wetlands, lakes, streams).
- Active or abandoned water supply wells.
- Coarse-textured and high-leaching soils.
- Steep slopes.
- Shallow soil to a water table or bedrock.

- Wooded areas.
- Intermittent streams or grassed waterways.

8. Criteria for Grazing Lands Managed for Wildlife

Managed grazing lands provide vast benefits to wildlife. Livestock grazing can be used to create the desired disturbances needed to control excessive vegetation growth; create trails, bugging areas, and annual food plots; or use forage in excess of wildlife needs. Livestock grazing can reduce fuel build-up and reduce wildfire risk. Livestock grazing is often more acceptable in vegetation management than use of prescribed burning, herbicides or mechanical treatments.

Identify the habitat needs necessary to maintain or improve food, cover, and shelter of the identified targeted specie(s) and adjust grazing intensity, duration, degree of use, and periods of rest or deferment as necessary. Generalizations are difficult to make because habitat needs vary tremendously among wildlife species.

Considerations for wildlife -

- Moderately grazed rangelands in late seral ecological condition (about 60 percent to 70 percent of climax vegetation) generally support more diverse wildlife populations than those that are heavily grazed or ungrazed.
- Properly managed livestock grazing can diversify wildlife habitat by creating a mosaic of different landscape patterns. Various sizes, shapes, and vegetative compositions within ecological sites are important to many wildlife species.
- Generally food is not the most limiting factor if rangelands are maintained in a late seral ecological condition. Livestock can be used effectively to create areas of native annual forbs in rangeland using concentrated, high stock densities in small areas in late summer, fall, and winter.

Footnotes:

1. Kansas Grazing Lands Management, Kansas Cooperative Extension Service, 1996, Kansas State University.
2. Tomanek, G.W. and F.W. Albertson. 1953. Some effects of different intensities of grazing on mixed prairies near Hays, Kansas. *J. Range Management* 6:299-306.
Hopkins, H.H. 1954. Effects of mulch upon certain factors of the grassland environment. *J. Range Management*. 7:255-258.
3. Body Condition – An Indicator of the Nutritional Status of Beef Cows, Dr. Larry Corah, *Agri-Practice*, Fall 1989.

Table 1 – Grazing Heights for Grasses and Legumes 1/

SPECIES <u>2/</u>	BEGINNING GRAZING HEIGHT (inches)	MINIMUM GRAZING HEIGHT (inches)	REGROWTH BY FROST <u>3/</u> (inches)
WARM SEASON GRASSES			
Bermuda grass	4	3	6
Big and Sand bluestem	8	4	8
Crabgrass	4	2	Annual <u>4/</u>
Eastern gamagrass	10	8	8
Indiangrass	8	4	8
Native prairie (mixed and tallgrass)	8	4	8
Millet, 'Pearl'	4	8	Annual <u>4/</u>
Prairie sandreed	8	4	8
Reed canarygrass	6	4	6
Sudangrass	8	6	Annual <u>4/</u>
Switchgrass	8	4	8
COOL SEASON GRASSES			
Creeping foxtail	6	3	5
Wheatgrass, Intermediate/Pubescent	6	3	7
Meadow brome	6	3	6
Orchardgrass	6	3	6
Ryegrass, perennial/annual	6	4	6
Small grains	4	4	Annual <u>4/</u>
Smooth brome	6	3	6
Tall fescue	5	3	4
Tall wheatgrass	7	3	7
Timothy	6	3	6
Wildryes	6	3	4
Western wheatgrass	6	3	5
LEGUMES			
Alfalfa	6	4	8
Arrowleaf clover	6	3	6
Alsike clover	6	2	6
Berseem clover	5	3	5
Birdsfoot trefoil,	5	3	5
Cicer milkvetch	5	3	5
Cowpeas	5	3	Annual <u>4/</u>
Crimson clover	5	3	5
Hairy vetch	5	3	5
Ladino clover	5	3	5
Lespedeza, common, 'Kobe', 'Korean'	5	4	5
Red clover	6	2	6
Sweetclovers	6	3	Biennial <u>4/</u>

1/ Grazing height is the average height of leaves lifted to vertical position.

2/ Grass and legume mixtures should be grazed in a manner that favors the desired or dominant species.

3/ Minimum regrowth is critical if stand is to be maintained. On pastures grazed only during the dormant season, height at end of grazing period is applicable.

4/ Annuals and biennials do not require minimum heights to be maintained at the end of the growing season.