Practice Specification
Prescribed Grazing (Code 528)

1. GENERAL

Prescribed grazing involves managing a dynamic set of variables to accomplish an identified objective. The following procedures and technical information provide guidance for planning, applying, and certifying Conservation Practice Standard, Prescribed Grazing (Code 528). In order to maintain clarity throughout the document, a grazing unit is a defined or identified area which is to be targeted for grazing. A grazing unit shall contain either a fence or physical feature which allows the manager to keep livestock in or out of the grazing unit. A grazing system is one to multiple grazing units identified as a system where a prescribed level of management or grazing prescription is identified or designed.

1.1 Planning Prescribed Grazing

The core principle in planning prescribed grazing is clearly identifying the objective(s) that will be met with the use of the grazing and/or browsing animals and determining a forage-animal balance (proper stocking rate) to meet the identified objective(s) and monitoring criteria. State the objective(s) and monitoring criteria clearly and concisely in the prescribed grazing plan. Monitoring criteria is based on the identified purpose of using prescribed grazing in the conservation plan. Additional context, as needed, can be provided in conservation planning assistance notes and/or the Pasture and Rangeland Benchmark Inventory and Assessment form (KS-ECS-7). Develop a prescribed grazing plan using the latest version of the Kansas Prescribed Grazing Workbook (KS-ECS-528) that displays a balance between the forage supplied by the grazing unit(s) and the expected animal's forage demand while occupying the grazing unit(s).

1.2 Applying Prescribed Grazing

The core principle in applying prescribed grazing is active monitoring of both the forage and animal resource by the grazing manager. Observations and measurements are used to make informed decisions on how to adapt the grazing plan through time, so that the objective(s) and monitoring criteria are met.

1.3 Certifying Prescribed Grazing

The certification of prescribed grazing will be based on whether the monitoring criteria listed in the prescribed grazing plan is met or not met, along with the producer's management decisions related to animal demand.

In a situation where actual animal demand exceeds the planned animal demand, but monitoring criteria is met, the application will be certified. It is recommended that the grazing plan be evaluated with the grazing manager and the forage inventory updated. A growing season with above-average moisture (and thus growth) would not warrant updating the forage inventory in this situation.

In a situation where actual animal demand matches or is less than planned, the grazing manager considered and implemented a contingency plan, but monitoring criteria is not met, the application of the practice can still be certified. In this instance, it is required that the grazing plan be adjusted in consultation with the grazing manager, prior to the next growing season. Identify and document what action or inaction resulted in not meeting criteria and update the grazing plan accordingly.

In a situation where actual animal demand is in excess of the planned animal demand, no action was considered or implemented to adjust the animal demand, and monitoring criteria was not met, the application of the practice will not be certified.

2. SPECIFICATIONS FOR INDIVIDUAL CRITERIA

Prescribed grazing is designed to meet specific criteria and implemented to achieve a set purpose. The following procedures and technical information provide specifications to meet criteria and achieve the identified purpose(s) for Conservation Practice Standard, Prescribed Grazing (Code 528).

2.1 General - All Purposes and Maintain the Health and Vigor of Desired Plant Communities

Design the prescribed grazing plan using the latest version of the Kansas Prescribed Grazing Workbook (KS-ECS-528). Alternate grazing plan formats can be used for specific programs or unique resource situations, when approved by the State Resource Conservationist. All formats for prescribed grazing planning will contain the following information (refer to Section 3. SPECIFICATIONS FOR GRAZING PLAN of this specification for detailed requirements):

1. Goals and Objectives
2. Resource Inventory
3. Forage Inventory
4. Animal Inventory
5. Forage-Animal Balance
6. Grazing Schedule
7. Contingency Plan
8. Monitoring Plan

Inclusion of substitute feed (harvested or delivered feeds, such as hay or a mixed ration) during the dormant season of the forage supply to meet a forage-animal balance in the grazing plan is permitted. Consider impacts to additional resources (plant community and surface water) as these feeds deliver additional nutrients into the landscape. Inclusion of substitute feed during the growing season of the forage supply to meet a forage-animal balance in the grazing plan is prohibited unless unique situations warrant inclusion and the plan clearly states how criteria and objective(s) will be met through its inclusion.

Provide rationale when including facilitating practices (such as Fence [382] and Watering Facility [614]) to manage the intensity, frequency, timing, duration, or distribution of grazing and/or browsing animals. Rationale will provide definitive need of facilitating practices to meet identified objectives.

Provide adequate quantity and quality of drinking water for the grazing/browsing livestock through on-site water development(s) or by hauling, so that the grazing plan can be implemented as scheduled. Locate water supplies to promote livestock use across all portions of the grazing unit(s) while not causing additional resource concerns. Animal water demand is influenced by dry matter consumption, ambient temperature, and water quality and availability. Water demand can be estimated by the size of livestock and season of water demand, as shown in Table 1.

Table 1. Gallons of livestock water needed per hundred weight per day, based on dominant grazing season.

Grazing Season	Gallons Required per Day per Hundred Weight
Winter	1.0 to 1.5
Summer	1.5 to 2.0

Example: A 1,000 pound (lb) cow with 2.0 gallons per hundred weight, summer demand will need 20 gallons of water supplied each day.

Consider salt and mineral supplements for animals as a grazing distribution tool in the grazing management plan. Placement will encourage increased disturbance or use of the site. Properly locating salt and minerals in underutilized areas can improve grazing use. Locating in or near patches of undesirable plants can improve utilization of less desirable plants through trampling. Placement should be away from livestock water unless placement near water is not creating additional resource issues. The number and location of the salt and mineral feeders will depend 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 the NRCS National Range and Pasture Handbook (NRPH) for additional information concerning general salt requirements for grazing animals.

Designate applicable monitoring criteria based on the land use of the field or grazing unit. Document monitoring criteria (planned and applied) on the monitoring and certification page of the Kansas Prescribed Grazing Workbook (KS-ECS-528). Refer to Section 4. MONITORING in this specification for details on terminology and methods used to evaluate listed criteria. When applicable, 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.

High impact areas—Areas of animal concentration or overuse should not exceed 10% 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—When browse is desired as part of a grazing system, not more than 65% 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 year's twig growth only.

Monitoring Criteria by Land Use

- **Range**
  - Utilization (degree of use) will not exceed 50% by weight of the current year's growth of the designated key forage specie(s) during the growing season. Utilization will not exceed 65% by weight of the total current year's growth of the designated key specie(s) when grazed during the dormant season, as long as no more than 50% is removed during the growing season.
  - In lieu of utilization criteria during the dormant season, minimum residuals can be designated based on key species or group identified.
    - Shortgrass Dominated - 300 to 500 pounds per acre
    - Midgrass Dominated - 750 to 1,000 pounds per acre
    - Tallgrass Dominated - 1,200 to 1,500 pounds per acre
  - At least one key grazing area and one key forage species (or functional group of species) will be designated for each grazing unit or grazing system. When the grazing system contains multiple grazing units where similar grazing pressure is applied, a single or multiple key area(s) may be used to determine degree of use for the system and its grazing units. Utilization will be determined at or near the end of the growing season, using at least one grazing exclosure on each key grazing area for comparison.
- **Pasture**
  - Utilization (leaf removal) of the designated key forage specie(s) will be no closer than the minimum grazing/leaf height designated in Section 5. FORAGE GRAZING HEIGHT TABLE for key growth periods. Dormant season (winter) grazing will designate criteria using the minimum grazing heights column. Managing grazing animals to allow beginning and end of growing season grazing/leaf heights to be achieved while grazing no closer than minimum heights will maintain a healthy, productive pasture.
- **Crop**
  - Utilization (removal) of growing forages and/or crop residues will not exceed the minimum residue amounts (typically designated as pounds per acre or percent cover) as designated in an associated conservation practice or erosion prediction tool. If associated practices or erosion predictions do not designate minimum amounts, leaf heights (refer to guidance under pasture) will be used.
- **Forest or other land uses**
  - Utilization target of key plant species will be guided by a forest stewardship plan or associated conservation practice. If associated practices or management plans do not designate minimum amounts, leaf heights (refer to guidance under pasture) will be used, based on the dominant community present on the land use (use the herbaceous understory community when forest).

2.2 Additional - Improve the Health and Vigor of Desired Plant Communities

Specify the present and desired (based on producer objectives) plant community composition and vigor. The improvement in health and vigor of plant communities will likely require reduced levels of utilization and/or growing season rest for desirable species. It could also require a focused timing and/or intensity of grazing on undesirable plants to reduce their vigor.

Reference the state and plant community phase from the applicable ecological site description state and transition model when land use is range. The current assessment of health and vigor of the plant community will be derived from a Rangeland Health Assessment (RHA) using the latest version of Interpreting Indicators of Rangeland Health (IIRH). Consider Indicator 12. Functional/Structural Groups, 13. Dead or Dying Plants or Plant Parts, and 17. Vigor with an Emphasis on Reproductive Capabilities of Perennial Plants. Consider designating a utilization not to exceed 30 to 40% of the key forage species to improve the rate of recovery or incorporate a minimum of 60 days of rest, up to a full season or year depending upon the departure rating of the indicators. Prioritize seasonal rest at green-up and/or just ahead of dormancy, when needed.

Reference the desirable plants list from pasture condition scoring when land use is pasture. The current assessment of health and vigor of the plant community will be derived from a Pasture Condition Scoring (PCS) using the latest version identified by NRCS. Consider indicators Percent Desirable Plants, Grazing Utilization and Severity, Live Plant Cover, and Plant Vigor. Improvement of the health and vigor of desired communities in pasture due to low indicator scores (3 or less) should consider increased minimum leaf heights and/or growing season rest. Consider increasing minimum leaf heights by one to two inches in order to improve the rate of recovery or incorporate a minimum of 30 days, up to a half season of rest, depending upon the PCS score departure. Prioritize seasonal rest at green-up and/or just ahead of dormancy, when needed.

2.3 Additional - Improve or Maintain Quantity and Quality of Forage for Animal Health and/or Productivity

Specify the expected performance of the grazing or browsing animal. Examples of animal productivity objectives might be designating an expected average daily gain (ADG), percent breed-back, or expected body condition score (BCS) at key production stages. A grazing plan that incorporates a forage-animal balance (proper stocking rate) during the active growing season of the forage resource allows animals the ability to optimize performance. Utilize the forage growth chart within the Kansas Prescribed Grazing Workbook (KS-ECS-528) to identify periods of optimum quality for animal use.

Negative impacts to animal productivity are most commonly associated with limiting intake. Intake is limited when livestock do not have adequate quantities of desired plants present for consumption or when sufficient quality of forage is not available in the grazing area occupied. Quantity without sufficient quality will lead to the slow passage of material through the digestive system and thus negatively impact animal performance. In situations where a grazing system is planned that could limit animal access to available forage (small subdivisions or paddocks), consider designing the system so animal grazing periods do not exceed those shown in Table 2. Manure consistency can be a simple and effective way to monitor quality of forages the livestock are consuming.

Table 2. Optimum grazing periods to maintain animal performance by livestock type.

Livestock Type	Optimum Grazing Period (Days)
Cow/Calf	3 to 5
Stocker	1 to 2
Horse	3 to 7
Sheep or Goat	3 to 5

2.4 Additional - Improve or Maintain Surface and/or Subsurface Water Quality and/or Quantity

Specify a minimum buffer of 100 feet surrounding surface water and identified sensitive areas (as shown on plan map) where supplements (salt, mineral, protein tubs, etc.) and substitute feed (hay, mixed ration, etc.) cannot be located. Designate monitoring on sites near surface water or those sites that directly influence water quality and quantity. When water quality is an identified resource concern, design grazing durations that restrict continuous access to impaired surface water. Grazing plans that maintain adequate soil cover in the form of plants and litter not only slows water across the landscape, but also increases infiltration and in turn protects against erosion.

2.5 Additional - Improve or Maintain Riparian and/or Watershed Function

Specify utilization criteria for the riparian plant community and designate the monitoring location within the riparian area of the grazing unit. Utilization in riparian plant communities is often excessive due to trampling, loafing (shade), and trailing behaviors of the grazing animals due to water availability in these riparian areas. Consider off-site water developments, placement of supplements, animal herding, and/or restricting access when designing the grazing plan. Avoid intensifying grazing in riparian areas during saturated soil conditions.

When hydrologic function is a concern on range land use, monitoring will be designated on an ecological site with a hydrologic function attribute rating of slight to moderate or greater departure. Reference the Rangeland Health Assessment (RHA) to identify indicators that can influence the grazing plan design.

Riparian areas and other sensitive areas located within grazing units are not considered separate units to be managed, but must be considered in the overall management of the grazing system for their specific resource concerns and planned resource conditions. Streambank stability is critical for maintaining or improving riparian condition and function. Streambank disturbance from grazing animals must be managed according to the stream type, planned resource conditions, and management objectives for the stream.

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 independent from uplands. Problematic upland watershed conditions (such as excess runoff and erosion), often reduce the effectiveness of management in the riparian zone. In order to be managed effectively, the whole pasture containing the riparian zone should be considered.

2.6 Additional - Reduce Soil Erosion and Maintain or Improve Soil Health

Specify live plant cover, ground cover, litter/residue amounts, and/or utilization levels that will meet planned conditions, as shown on erosion prediction tools, soil health management plans, and/or associated conservation practice specifications. When erosion is an identified resource concern, livestock concentration areas (supplement or substitute feed areas) will be located to prevent animal trailing on steep or erosive soils, or be periodically moved and managed to prevent trailing if located on or adjacent to steep or erosive soils. When bank erosion is a concern, consider exclusion or deferment (rest) of bank areas to allow plant communities to improve vegetative cover.

2.7 Additional - Improve or Maintain Food and/or Cover for Fish and/or Wildlife Species of Concern

Specify utilization criteria that meets wildlife food or cover objectives, as referenced in the land use or species-specific wildlife habitat evaluation guide and/or wildlife habitat management plan. Designate the monitoring location so that habitat values being managed are best represented. Restrictions on grazing timing (such as during the nesting season) will be clearly identified in the grazing schedule narrative.

Monitoring criteria for wildlife habitat may differ from the general criteria when the effects to plant communities are known. Utilization goals (along with narrative description) will designate criteria specific to the wildlife species habitat type desired.

Patch-burn grazing is an example of a situation where the criteria needed to create habitat conflicts with general criteria listed previously. In the case of patch-burn grazing, the utilization and description of the system are needed and is represented in Table 3. Utilization will vary across the grazing unit and throughout time. In order to capture this variation of intensity and duration through time, a single key grazing area will be used, but the planned utilization of the key area will change throughout the years. The narrative description should explain the details and requirements through time.

Table 3. Example Criteria for Patch-Burn Grazing Plan

Field	Utilization Planned		
	Year 1	Year 2	Year 3
1	70-80% (Year of Burn)	40-50% (1 Year since Burn)	10-20% (2 Years since Burn)
Monitoring will be conducted within a single burn unit within Field 1 and not moved amongst the burn units over time. Variations in utilization will allow diversity in community and structure over time. Evaluate the vigor of key species in year 3, in order to ensure recovery/vigor is adequate.			

2.8 Additional - Management of Fine Fuel Load

Specify fuel load requirements in pounds per acre based on objectives. Designate minimum amounts and continuity of fuel load when designing grazing plans in conjunction with Kansas Conservation Practice Standard and Specification for Prescribed Burning (Code 338).

Designate fuel load maximums and locations within fields or grazing units when designing grazing plans for fine fuel reduction, as part of wildfire management plans. Restrict grazing for fuel load reduction to dormant season only, if planned fuel loads equate to utilization levels that exceed general criteria. Utilizing forages in excess of general criteria in order to meet fine fuel reduction will have fewer negative impacts on perennial plants when completed during the dormant season.

3. SPECIFICATIONS FOR GRAZING PLAN

Prepare a prescribed grazing plan that includes the following information using the Kansas Prescribed Grazing Workbook (KS-ECS-528) or an alternate grazing plan format, if approved by the State Resource Conservationist. The following procedures and technical information provide specifications to meet the grazing plan document requirements for Kansas Conservation Practice Standard, Prescribed Grazing (Code 528).

3.1 Goals and Objectives – The grazing plan will contain a clearly stated narrative (indicating as specifically as possible) the desired goals and objectives of the manager in applying prescribed grazing. The objective will include at least one purpose (as listed in the Kansas Conservation Practice Standard, Prescribed Grazing [528]) that the grazing plan is designed to address. Additional information about the producer's operation, concerns, objectives, and goals will be recorded in the conservation planning assistance notes and on the Pasture and Rangeland Benchmark Inventory and Assessment form (KS-ECS-7).

3.2 Resource Inventory - The grazing plan will be based upon a detailed resource inventory that documents the physical structures, facilities, soils, and plant communities present in each field or grazing unit. Resource conditions and concerns are summarized on the NRCS-CPA-52 Environmental Evaluation Worksheet. The resource inventory specific to the grazing plan will include the following 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:

- Soils and non-technical descriptions (already present as part of the planning process, but consider including specific suitability ratings as applicable)
- Locations of fences and natural barriers, planned and existing
- Locations of gates and animal handling facilities
- Locations of water developments (wells, pipelines, hydrants, troughs, tanks, lakes, streams, and ponds), planned and existing
    - Indicate the size, type, dependability, and other pertinent information for the individual water supplies. Refer to Kansas Range Technical Note KS-10 for details on water development requirements to meet the animal's water demand.

- **3.2a Range** – The following is required for each field or grazing unit designated as range land use:
    - Ecological Site Map – including delineations of ecological sites, associated names, and location of key grazing area(s).
    - Ecological Site Description (ESD) Report – including either reference to ESD information via the Ecosystem Dynamics Interpretive Tool (EDIT), the complete ESD report, or locally adapted descriptions using key features of the ESD report.
    - Ecological Site Inventory – including a summarized report containing the ESD site name, the current plant community phase on-site, the acres of each plant community, and an estimated annual production for each community phase. Production will be displayed in pounds per acre of air-dry forage for an average moisture year, based on the current vigor and health of the plant community. Locally developed formats can be used to best communicate resource condition(s) with the producer.
        - Options for the summary are by soil map unit with associated ecological sites or by ecological site.
    - Rangeland Health Assessment(s) (RHA) – as planning criteria requires and based upon the most current version of Interpreting Indicators of Rangeland Health (IIRH). Refer to Kansas Range Technical Note KS-10 for details on planning using RHA assessments.

    - Record the location of the assessment on an ecological site map or inventory map.
  - Optional Inventory - including Similarity Index (NRPH, Exhibits 4-7), Rangeland Trend (NRPH, Exhibits 4-6), or other inventory procedures that can best communicate resource condition(s) with the producer. Utilize the Kansas Monitoring Workbook for standardized formats.

- **3.2b <u>Pasture</u>** – The following is required for each field or grazing unit designated as pasture land use
  - Site Inventory – including a summarized report containing soil map units and an estimated annual production for each soil map unit by forage type. Production will be displayed in pounds per acre of air-dry forage for an average moisture year, based on the current vigor and health of the forage type. Locally developed formats can be used to best communicate resource condition(s) with the producer.
  - Pasture Condition Score (PCS) – as planning criteria requires and based on the most current version of the NRCS Guide to Pasture Condition Scoring. Refer to Kansas Range Technical Note KS-10 for details on planning using PCS assessments.

- **3.2c <u>Additional Land Uses</u>** – The following are required for each field or grazing unit for the specified land use:
  - Site Inventory – including a summarized report containing soil map units and an estimated annual production for each soil map unit by forage type. Production will be displayed in pounds per acre of air-dry forage for an average moisture year, based on the current vigor and health of the forage type. Locally developed formats can be used to best communicate resource condition(s) with the producer.
  - Site Assessments – as planning criteria requires for resource concerns being addressed via grazing animals and a grazing plan.

3.3 <u>Forage Inventory</u> – Estimate and document the available forage quantity and quality for each field or grazing unit for the year using the Kansas Prescribed Grazing Workbook (KS-ECS-528).

- The forage inventory will include:
  - Field or grazing unit identification
  - Dominant forage type present
  - Total forage production (shown in pounds per acre or animal unit months [AUMS])
  - Estimates of harvest efficiency (HE) considering the grazing animal, season of use, and type of grazing system. Harvest efficiencies to be used in initial calculations are shown in Table 4. Local knowledge of grazing systems and associated HE can be used to adjust these initial values when proven to still meet general or individual criteria listed in this specification.
  - Calculation of available forage production (shown in pounds per acre or animal unit months [AUMS])
  - Supplement and Substitute Feed Inventory (optional) – Obtaining information on kinds, amounts, and quality of supplements and/or substitute feeds used and their locations provided in the grazing system can better inform the planner and producer of potential forage quality concerns or impacts to other resources (such as nutrient addition).
- Locally developed formats can be used as an attachment to KS-ECS-528 to best communicate the forage inventory or display alternative production terminology for the client. An example alternative that may be desired is animal unit days per acre (ADA).

Table 4. Harvest efficiency guidelines for initial forage inventory calculations.

Grazing System or Number of Fields	Range Harvest Efficiency			Pasture Harvest Efficiency[3]		
	Seasonal		Annual[1]	Seasonal		Annual[1]
	Growing	Dormant[2]		Growing	Dormant[2]	
Continuous	25%	7.5%	32.5%	30%	9%	39%
8 or more	30%	9%	39%	35%	10.5%	45.5%

[1]Annual harvest efficiency is determined by adding the individual seasonal values together. For an example of Range land use and continuous grazing, take 25% + 7.5% = 32.5% HE for the year.

[2]Dormant season values are shown with the expectation that growing season HE was already considered for use. In situations where grazing use is during the dormant season only, use the annual HE value in calculations of available forage production.

[3]Use pasture HE values for annual forages, depending upon requirements for resource protection, as a baseline.

3.4 <u>Animal Inventory</u> - Document the number of animals (kinds, class, and size), dates when animals demand forage from grazing, and key stages of production in order to determine the forage intake (demand) by the grazing animals. Animal intake (forage demand) information can be found in Table 5. For animals not listed, refer to the NRPH for guidance. Include grazing demands by wildlife when known and when their demand reduces the forage resources available to the planned grazing livestock.

- Benchmark or current animal inventory will be recorded in the conservation planning assistance notes, the Pasture and Rangeland Benchmark Inventory and Assessment form (KS-ECS-7), or an applicable form from the NRPH.
- Planned animal inventory to meet criteria for the fields or grazing units will be recorded in the Kansas Prescribed Grazing Workbook (KS-ECS-528).
- Calculations can standardize the animal inventory into animal unit equivalents (AUEs), based upon the standard animal unit being an average milking beef cow weighing 1,000 pounds at a body condition score of 5 (using the subjective numeric 1-9 scale) and includes a calf and its demand up to six months old.
- An AUE will consume 30 pounds of air-dry forage per day, based on an intake rate of 3.0% of body weight. This is also referred to as an animal unit day (AUD). Air-dry values assume forage has 13.3% moisture content, therefore, an animal unit day equates to 26 pounds of oven-dry forage.
- An AUM is the amount of forage an AUE demands per month and is calculated at 912.5 pounds of air-dry forage (taking 30 pounds per day, multiplied by 365 days, and then divided by 12 months equates to 912.5 pounds per month for AUE.)
- A standard 3.0% of body weight will be used for animal demand calculations, unless specifically adjusted to the stage of production or animal type, based on the knowledge of a local resource specialist. An example includes adjusting a dry cow intake down to 2.5% of body weight during dormant grazing due to lower forage quality and less nutrient demand due to the stage of production.

Table 5. Animal Demand Guide (values shown are air-dry weights)

Kind/Class of Animal	Animal Unit Equivalent (AUE)	Daily Intake Rate (% of Body Weight)	Forage Consumed (pounds per day)
Cow[1], with calf up to 6 months old	1.00	3.0%	30
Dry Cow	0.85-1.00	2.5-3.0%	25-30
Stocker or Yearling Cattle	0.1 per 100 pounds live weight	3.0%	——
Bull, mature	1.35	3.0%	40.5
Horse, mature	1.25	3.0%	37.5
Sheep, mature	0.20	3.0-3.5%	6
Lamb, 1 year old	0.15	3.0-3.5%	4.5
Goat	0.15	3.0-3.5%	4.5
Bison	1.00	3.0%	30

[1] A cow is defined as an average milking, beef cow weighing 1,000 pounds at a body condition score of 5 (using the subjective numeric 1-9 scale). Add 0.1 AUE for every 100 pounds of body weight in excess of 1,000 pounds.

3.5 Forage-Animal Balance – Document a monthly, cumulative, and annual comparison of forage available from the grazing unit(s) versus animal forage demand (livestock and/or wildlife). Surpluses and deficits will inform the planner if the animal demand exceeds forage growth or if forage growth exceeds animal demand during key growth periods or seasons. The forage-animal balance will be developed in the Kansas Prescribed Grazing Workbook (KS-ECS-528) and the animal inventory adjusted to meet a balance (or surplus) for the growing season, as well as the year. Substitute feed (such as hay) will be documented, if needed, to meet a balance during the dormant season. Substitute feed will not be used to formulate a balance during the growing season of the forages, unless a unique situation warrants its inclusion, when criteria listed in this specification will still be met due to its inclusion and the method of delivery does not create additional resource concerns. An example situation is grazing a forage crop that is extremely high in protein (turnips, early-season grass, etc.) where additional dry matter could help with proper digestion or where a small acreage operation has livestock that can be penned off the grazing unit to feed hay in order to meet demand and allow access to forage for only short durations to maintain plant health.

3.6 Grazing Schedule - Identify and record the periods of grazing, deferment, rest, or other treatment that are needed to meet specific criteria and achieve overall objectives for the grazing unit(s) included. The schedule may be seasonal, yearly, or multi-year and should be based upon specific objectives. Depending upon the size and complexity of the grazing schedule, document the planned and applied schedule using the Kansas Prescribed Grazing Workbook (KS-ECS-528), locally developed format, or applicable forms from NRPH. The schedule will be provided in a format that is best understood by the grazing manager. Considerations when developing the grazing schedule include:

- Calendar dates are provided as a seasonal or yearly guide for the grazing system application, so the grazing manager understands how the system will apply to all grazing units, but dates are only a guide and will likely need altered as climatic conditions change.
- When a rotational grazing system is applied, alternate seasons of use of grazing units amongst years. An example is to start in a different grazing unit each year (when feasible) or rotate in the opposite sequence of grazing units grazed the previous year.
- Grazing systems need to be managed adaptively. Entry or re-entry into a grazing unit needs to be based upon key species recovery and growth (such as leaf height or leaf number).

- Suggested recovery periods for forage types (when grazed no shorter than minimum heights) are found in Table 6. Rapid growth typically occurs in the first 45 days of seasonal growth (incline in growth curve), moderate growth in mid-season (peak of growth curve), and slow growth during the season's end (decline in growth curve). Slow growth can also occur when plants are stressed from climatic conditions or have low vigor. Higher rainfall areas or irrigated pasture will need recovery periods on the lower side of those suggested, while areas of low rainfall will need recovery periods on the higher side of those suggested.

Table 6. Suggested recovery period (days) based on forage type and forage growth rate.

Stage of Growth	Tame Forages	Native Forages
Rapid Growth	14-25	25-45
Moderate Growth	25-30	45-60
Slow Growth	30-50	60-90

3.7 Contingency Plan – Document the expected growing conditions (average precipitation by month) used in formulating the forage-animal balance and grazing schedule. The average annual accumulating precipitation will be provided to the grazing manager as a platform to discuss contingency triggers and planned action considerations. The Kansas Prescribed Grazing Workbook (KS-ECS-528) will be used to document this requirement. Customized plans are encouraged and should supplement form KS-ECS-528. Discuss any environmental events (drought, flooding, lack of livestock water, wildfire, etc.) that are likely to impact the forage and/or animal resource and list potential responses, that when implemented, will ensure objectives are met. A plan of "optimistic inaction" rarely results in positive resource outcomes. Resources that guide decision-making in contingency plans continue to be developed and refined. Resources on preparing for, managing through, and recovering from drought can be found at the National Drought and Mitigation Center (https://drought.unl.edu/) and GRASSCAST (https://grasscast.unl.edu/).

3.8 Monitoring Plan - A monitoring plan will be developed and discussed with the grazing manager. Document the required monitoring method as set by criteria listed in Section 2. SPECIFICATIONS FOR INDIVIDUAL CRITERIA based on the selected purpose(s). Record requirements (method and parameters) on the monitoring and certification page of the Kansas Prescribed Grazing Workbook (KS-ECS-528). The goal of technical assistance via monitoring is to help the grazing manager become confident with completing the selected monitoring method independently. Active, independent monitoring by the grazing manager allows them to make timely observations and adjustments that will ensure they meet the grazing plan objective(s). An annual plan review in the field with the grazing manager is recommended and should be documented on the grazing plan certification section and/or in the conservation planning assistance notes.

Grazing managers may choose to implement monitoring beyond that which is required in criteria and is listed as "advanced" in Section 4.2. Consider the time requirements of the method, as well as the abilities (knowledge of plant identification and ecosystem function) of the grazing manager when selecting additonal methods. Advanced monitoring completed beyond that which is required by criteria will consist of at least one additional method and will be conducted on a minimum of two locations in the grazing unit or grazing system.

4. MONITORING

The following procedures and technical information provide specifications to meet the monitoring procedures for Kansas Conservation Practice Standard, Prescribed Grazing (Code 528).

4.1 Monitoring Terms and Concepts- Obtaining clear understanding of monitoring terms and concepts will allow proper design and installation for specified methods.

- Key Grazing Area - A relatively small portion of a grazing unit is 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 grazing unit or grazing system as a whole. Factors that determine the selection of key grazing areas and species include:
  - Kind and class of grazing animal(s)
  - Ecological 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, and feeding areas
  - Management objectives
  - Climatic conditions
- Key Species - A single plant species (or in some situations, two or three similar species within a single functional group) chosen to serve as a guide to the grazing use of the entire plant community.
  - Range Land Use - If the key species on the key grazing area is properly grazed, the entire plant community will not be excessively grazed. The first priority will be given to a species that is a major component of the reference plant community. If such species are not available in sufficient quantities (>10% of the current community), use a species that is presently providing a major part of the forage supply and desirable to the grazing animal being managed.
- Grazing Exclosure - A grazing exclosure is an area within the grazed pasture, fenced in such a way as to exclude livestock. The exclosure allows a small area to remain ungrazed by livestock, but receive the same environmental impacts as the adjacent site. The ungrazed area will be used for more precise utilization measurements, as well as educational opportunities to identify what rest will do for desired species vigor. The exclosure must be installed correctly to be valuable for subsequent monitoring measurements. Install a grazing exclosure within the designated key grazing area that encompasses the key forage species. The exclosure will:
  - Be in good working condition to properly exclude the specific livestock type that will be grazing. Consider additional bracing for larger livestock species.
  - Provide a minimum of 15 square feet of excluded area.
  - Be moved annually (just prior to the growing season) to a new location within the designated key grazing area when used for utilization measurements.

4.2 Standard Methods - Standard monitoring procedures are those used to certify that criteria is being met. The method and interpretation do not necessarily rely on repeating procedures at a permanently marked location from year to year.

- **Paired Plot with Grazing Exclosure - Range Land Use:** Utilization (degree of use) of a key species within a key grazing area can be determined through a paired plot method. Utilization includes herbage removal by domestic livestock, as well as wildlife, insects, etc.
  - Designate a key grazing area and key species within the ecological site that requires monitoring.
  - Install a grazing exclosure in the key grazing area that encompass the key species in densities that can be “paired” with plots outside the exclosure.
  - Conduct utilization measurements at the end of the growing season. Utilization levels for dormant-only grazing will be completed after the grazing event or just prior to spring green-up.

- Ocular estimates can be completed by NRCS employees with proper field experience and the utilization value entered directly into the certification page of form KS-ECS-528.
- Clipping measurements will be used by new or inexperienced planners and the data will be recorded on the Paired Plot data sheet within the Kansas Monitoring Workbook.

- **Stubble/Leaf Height - Pasture and Additional Land Uses (not for Range):** Utilization (leaf removal) of a key species is indirectly determined using the stubble height (leaf height) method. Instead of determining what was removed (utilized), the goal is to ensure that proper leaf heights remain and that utilization will not exceed that which could maintain plant vigor.
  - A key area is not designated for utilization determinations using leaf heights, but measurements should be taken in an area (or areas) readily accessible to animals. Avoid animal concentration areas when taking measurements.
  - Designate a key forage species and a minimum leaf height (grazing height) for the key species to maintain during key growth stages.
    - The first priority for key species in Pasture will be given to a species found on the Kansas desirable plant list (a supplement to Pasture Condition Scoring [PCS]).
    - For annually planted forages, the dominant species planted will be designated as key species.
  - Obtain leaf height measurements during the key growth stages identified in Section 5. FORAGE GRAZING HEIGHT TABLE. **Measured** leaf height is the average height of leaves lifted to a vertical position.
  - Measurements may be recorded on the Leaf Height / Stubble data form within the Kansas Monitoring Workbook.
  - Certify measurement results on the certification page of form KS-ECS-528.
- **Cover - (Crop and Additional Land Uses):** Cover is determined by using a step point or line transect and identifying cover at specified intervals. Cover will be classified into four groups:
  - Bare Ground (lacking any type of ground cover)
  - Litter (leaf and stem material that is detached from plant or roots)
  - Rock (gravel)
  - Vegetation (growing or dead leaf and stem material that is still attached to the plant or to the soil via roots)

  To determine (measure) cover:

  - Conduct a step point or line transect to determine cover when the grazing plan objective identifies cover as criteria.
  - Measurements may be recorded on the Cover data form within the Kansas Monitoring Workbook.
  - Certify measurement results on the certification page of form KS-ECS-528.

4.3 Advanced Methods - Advanced or long-term monitoring methods rely on repeatability through time (years) and thus require a permanent marker installed as a reference point on the landscape. Utilize local technical specialist guidance, as well as the technical references listed in the Section “Other” below. Refer to the Kansas Monitoring Workbook for fillable forms that can be used to record the measurements taken. State specific criteria for procedures are as follows:

- **Photo Point** - Conduct photo monitoring annually at a location within a key grazing area or as identified by specific grazing plan objective (such as riparian area). A photo point location will be established and an annual photo record created (a minimum of two photos will be taken in opposing directions N-S, E-W, etc.). Photos should be taken during the same time period of growth, from the same location, and in the same direction each year so comparisons can be made. Details for conducting photo points can be found in *Monitoring Manual for Grassland, Shrubland*

and Savanna Ecosystems,Second Edition, Volume 1: Core Methods.

- **Plant Census (Plant Inventory)** - Conduct the plant inventory procedure as outlined in the *Monitoring Manual for Grassland, Shrubland and Savanna Ecosystems*,Second Edition, Volume 1: Core Methods. Record observations on the Plant Census form that includes considerations for plant abundance categories.
- **Production (Grazing Stick)** – Conduct production measurements annually. Measure ungrazed heights of plants to determine an average height of ungrazed forage and convert to an estimated annual production based on the density of the plant community. A minimum of 25 measurements should be conducted in order to determine the average height. Using this procedure in combination with the Total Production method will provide more detailed production estimates.
- **Production (Clipping)** - Conduct production measurements annually using the Harvest method. A minimum of 5 clipping plots will be obtained to perform calculations. Use reconstruction factors, if ungrazed plots are not available.
- **Line-Point Intercept** - Conduct line-point intercept procedures at a minimum of once every five years. The monitoring plan may require a more frequent interval, based on local need and will clearly identify this in the monitoring plan. A minimum of 50 data collection points should be obtained in order to perform calculations. Details for conducting line-point intercept can be found in *Monitoring Manual for Grassland, Shrubland and Savanna Ecosystems*, Second Edition, Volume 1: Core Methods.
- **Landscape Appearance Method – Utilization** - Conduct the landscape appearance method for utilization annually using an identified step transect that crosses through the key grazing area or in a location as identified by specific grazing plan objective(s). A minimum of 25 observations should be made to perform calculations. Details for conducting the landscape appearance method for utilization can be found in *Utilization Studies and Residual Measurements*, Bureau of Land Managment (BLM), Technical Reference 1734-03.
- **Other** - Based on grazing plan objectives, select a procedure that provides valuable data back to the grazing manager. Follow guidance from the local resource specialist to fine-tune procedures that allow successful design and implementation of the monitoring plan. Utilize technical references listed to identify procedures that will adequately evaluate the grazing plan objective.

4.4 Technical References for Monitoring

- Chapter 4 of the NRCS National Range and Pasture Handbook (NRPH)
- Monitoring Manual for Grassland, Shrubland and Savanna Ecosystems - Volume 1: Core Methods
- Monitoring Manual for Grassland, Shrubland and Savanna Ecosystems - Volume II: Design, supplementary methods and interpretation
- Utilization Studies and Residual Measurements, Interagency Technical Reference 1734-03
- Sampling Vegetation Attributes, Interagency Technical Reference 1734-04

5. FORAGE GRAZING HEIGHT TABLE

The forage grazing height table identifies grazing heights (leaf heights) that should be present at various stages of development, so that plant health can be maintained.

- Grazing height is the average height of leaves lifted to vertical position.
- Grass and legume mixtures should be grazed in a manner that favors the desired or dominant species.
- Heights shown in the BEGINNING GRAZING HEIGHT column are the optimum range of beginning heights. Heights taller than those listed may equate to lower forage quality. Grazing can be initiated at heights lower than those shown during an initial “flash” grazing, as long as minimum leaf height remains.

- Dormant season (winter) grazing will use minimum grazing height values as criteria.
- REGROWTH BY FROST - Annuals and biennials do not require minimum heights to be maintained at the end of the growing season.

SPECIES	BEGINNING GRAZING HEIGHT[3] (inches)	MINIMUM GRAZING HEIGHT[4] (inches)	REGROWTH BY FROST[5] (inches)
WARM-SEASON GRASSES			
Bermudagrass	4-8	3	6
Crabgrass[1]	4-6	2	Annual – 6
Eastern Gamagrass	10-24	8	8
Forage Crop: Sudangrass, Pearl Millet, Sorghums	18-36	8	Annual
Native Tallgrass: Big and Sand Bluestem, Indiangrass, Switchgrass	8-16	4	8
Native Midgrass: Little Bluestem, Sideoats Grama	6-10	4	6
Native Shortgrass: Buffalograss, Blue Grama	4-6	2	4
COOL-SEASON GRASSES			
Brome: Meadow, Smooth	6-10	3	6
Creeping foxtail	6	3	5
Forage Crop: Wheat, Cereal Rye, Small Grains	6-8	4	Annual
Orchardgrass	6-8	3	6
Ryegrass: Annual, Perennial	6-8	3	6
Tall Fescue	5-7	3	4
Timothy	6-8	3	6
Wheatgrass: Intermediate, Pubescent, Tall	6-10	3	7
Wheatgrass: Western	6-8	3	5
Wildrye: Canada, Russian, Virginia	6-8	3	4
LEGUMES			
Alfalfa	6-10	4	8
Clover: Alsike, Ladino, White	5-8	2	5
Clover: Arrowleaf, Crimson, Berseem, etc.	6-10	3	Annual
Clover: Red	6-10	3	6
Birdsfoot Trefoil	5-8	3	5
Cicer Milkvetch	8-10	5	8
Forage Crop: Cowpeas, Soybeans, Winter Peas	10-12	4	Annual
Lespedeza[1]: Common, Kobe, Korean	5-8	3	Annual – 6
Sweetclover[1]	6-10	3	Biennial – 12
Vetch[1]: Hairy, Common	5-8	3	Annual – 12

[1]Species is annual or biennial but can readily reseed to persist. Height shown in regrowth by frost column should allow seed production when 6 to 8 weeks of rest from grazing are provided for species to reseed.

Specific Site Requirements