

## NEBRASKA

### DESIGN PROCEDURES Prescribed Grazing – 528

#### **PLANS AND SPECIFICATIONS**

The purpose of a prescribed grazing plan and the specifications tied to it are to help the land manager achieve an objective relating to the plant, animal, soil, and water resources on the land. Grazing management plans that promote economic stability through grazing land sustainability is also the intent of this practice.



*Photo by D. Larsen, USDA-NRCS, Nebraska 2006*

#### **Goals and Objectives**

Clearly defined and recorded goals and objectives will assist the land manager in achieving the desired results on grazing lands. Goals are broad-based, and landscape encompassing, while objectives should be specific, measurable, achievable, and indicate the timeframe in which the planned for results can be expected. Sometimes, a resource inventory will be necessary before grazing land objectives can be adequately defined. Resource and forage inventories, analyses, consideration of alternatives, and the development of practices, treatments, and monitoring plans should all be completed within the scope of the objective. The goals and objectives of the grazing operation will be recorded on the [Prescribed Grazing Jobsheet, NE-ECS-528](#).

#### **Resource Inventory**

The resource inventory will document the physical structures, facilities, and soils contained in each grazing management unit. Information obtained from the resource inventory will be documented on a conservation plan map and include: existing fences, watering facilities, and points where resource concerns such as erosion, stream bank trampling, and noxious weed infestations are occurring.

Rangeland- On rangeland-- the ecological sites (or range sites), and the condition of those sites will be determined. Where ecological site descriptions are not available, condition ratings related to range site descriptions will be determined and mapped. See [Exhibit A](#) for an example of a conservation plan map documenting range sites.

A similarity index rating will be determined on rangeland where ecological site descriptions have been prepared. These indexes will be noted on the conservation plan map. See [Exhibit B](#) for an example of a conservation plan map documenting ecological sites.

The quality and trend of the rangeland resources will be determined at the key area(s). Apparent trend documentation can be recorded on [Apparent Range Trend Worksheet, \(NE-ECS-12\)](#). A rangeland health assessment can be recorded on [Rangeland Health Assessment Worksheet, \(NE-ECS-11\)](#).

*Optional Method:* Where resource concerns are specific to certain management units on rangelands, the range condition or similarity index determination can be limited to only those management units with resource concerns. NRCS planners are required to have job approval authority for prescribed grazing at Job Class level V to use this method.

**Pastureland-** On pastureland-- the forage suitability group (FSG) will be determined for each management unit and a pasture condition score assigned. Additional information is contained in the [Guide to Pasture Condition Scoring](#). The [Pasture Condition Score sheet, NE-ECS-13](#), can be used during the inventory process to rate key indicators and factors when evaluating the condition of pastures. See [Exhibit C](#) for an example of a conservation plan map documenting forage suitability group and pasture condition.

*Optional Method:* Where resource concerns are specific to certain management units on pasturelands, the forage suitability group determination and pasture condition score can be limited to only those management units with resource concerns. NRCS planners are required to have job approval authority for prescribed grazing at Job Class level V to use this method.

### **Forage Inventory**

The purpose of the forage inventory is to obtain enough inventory information for the land manager to know the proper amount of forage to harvest to maintain enough cover to protect the soil and maintain or improve the quality and quantity of desired vegetation. The quantity of the forage by management unit will be documented in terms of Animal Unit Months, (Aims) per acre, pounds per acre, or other quantitative value understandable to the land manager. Special problems that restrict forage availability, use or nutritional quality, such as toxic plants or mixed land uses will also be documented.

Additional feed supplementation for the operating unit or portion of the operating unit should be considered in the inventory of forage and within the forage balance as needed by the operator.

Information on field procedures for inventorying forage resources can be found in the [National Range and Pasture Handbook, Chapter 4 and Chapter 5](#). A variety of forms can be used to document the forage inventory. Selection of the forage inventory method and documentation should be chosen in a manner that will provide pertinent information relating to the resource objectives and be easily understood by the land manager. Worksheets for documenting the forage inventory are located in the [Nebraska Field Office Technical Guide, Section IV](#). The [Prescribed Grazing Jobsheet, \(NE-ECS-528\)](#) will be used to summarize the forage inventory from selected worksheets.

Where forage inventory estimates are expressed in terms of total production, selected harvest efficiency based on the level of management intensity will be determined. Harvest efficiency is the percent of forage actually ingested by animals from the total amount of forage produced. [Forage Inventory, \(NE-ECS-60\)](#), can be used to document production based forage inventories. Table 1. Contains suggested harvest efficiencies based upon various levels of grazing management and corresponding target forage utilization levels. These levels assume normal weather, good plant vigor, uniform grazing patterns, and level consumption. A large proportion of unpalatable plants or plants with low palatability will result in lower harvest efficiency. Adjustments need to be made in estimating the harvest efficiency so that palatable plants are not significantly over-utilized.

Table 1. Suggested Harvest Efficiencies at Various Management Levels

Grazing Management level	Utilization Level	Harvest Efficiency
Continuous, season-long grazing	50%	25%
Rotational grazing system	60%	30%
Dormant season grazing	60 - 70%	30-35%
Improved pastures	70%	35%

See [Technical Note 15. Procedures for Conducting a Grazing Land Inventory](#) additional for guidance.

### Animal Inventory

An inventory of grazing animals occupying or planned to occupy a management unit is necessary so that forage demand can be planned in relation to forage production. A physiological factor will be used to adjust the animal inventory into standardized animal unit equivalents when determining forage demand. An animal unit equivalent guide is located in the [National Range and Pasture Handbook, Table 6-5](#). Estimations of the amount of forage required by wildlife should also be considered in the animal inventory. [Livestock Inventory and Forage Balance Worksheet, \(NE-ECS-61\)](#) can be used for documentation.

### Forage-Animal Balance

The forage-animal balance is a term that indicates a balance in the ratio of forage availability for grazing and the demand for that forage by the grazing animal. A forage-animal balance will be determined for the purpose of developing sustainable grazing plans which insure that forage production or availability meets forage demand by livestock and/or wildlife. Estimates of monthly forage surpluses and deficits as documented on form [Livestock Inventory and Forage Balance Worksheet, \(NE-ECS-61\)](#) can be helpful in calculating stocking rates, and grazing schedules. If the current or planned forage demand exceeds existing forage availability by 20% or more, then a re-evaluation of the range resource objectives with the land manager should be scheduled. An assessment should then be made as to whether the resource objective can be achieved through grazing management alone under the current or proposed stocking rate.

**Grazing Management Plans**

A properly designed grazing management plan will meet the land manager’s goals, and promote the maintenance and/or improvement of the plant, animal, soil, and water resources. The grazing plan should be site specific and based on information obtained from the resource, forage, and animal inventories. The system should be selected by the land manager, and consider the economic factors and time constraints of the land manager in performing scheduled livestock movements. The grazing system should be designed to be flexible in terms of adjusting to climatic conditions and other factors. For more information on grazing management systems, see the [National Range and Pasture Handbook, Chapter 5](#).

Prescribed Grazing Schedule- The grazing plan will include a grazing schedule that identifies periods of grazing, deferment and rest and other treatments or prescriptions over a period of years that will support achievement of the resource objectives. Adequate plant recovery/rest periods during the growing season will help meet the needs of both the plant resources and grazing animal. Alternatives to the number of pastures included or developed for the prescribed grazing sequence and the number of times an individual pasture is grazed during the grazing season should be discussed with the land manager in terms of maintaining forage balance. Livestock movements should be based on plant growth and targeted utilization levels and not on calendar dates. Calendar dates should only be used as a guide when developing grazing schedules. See the [National Range and Pasture Handbook, Chapter 5](#) for additional information on prescribed grazing schedules.

Table 2. Provides general guidance for recovery period in days between grazing periods for Nebraska grazing lands.

<b>*Table 2. RECOVERY/REST GUIDELINES, NEBRASKA GRAZINGLANDS</b>				
<b>Location</b>	<b>Rangeland</b>		<b>Pastureland</b>	
	Fast-growth May-June	Slow Growth July- August	Fast- growth May-June	Slow- growth July-August
Western Nebraska	45 days	65 days	25 days	35 days
Eastern Nebraska	30 days	45 days	15 days	25 days

\*Note Recovery/Rest Guidelines should be adjusted based on actual re-growth. It is important to lengthen the rest period for pastures that do not have adequate re-growth.

Grazing periods that are kept as short as practical with adequate recovery periods, will minimize the opportunity for livestock to re-graze plants prior to adequate recovery. The recovery guidelines should be used to develop the initial prescribed grazing schedule. The periods of vegetative fast-growth and slow-growth fluctuate widely from year to year. Grazing and recovery periods should be adjusted to reflect field observations of annual growing conditions, locality, and the specific needs of key species.

Periods of season-long deferment or rest may be prescribed to meet specific resource needs or to prepare for accelerating practices such as prescribed burns, or to follow treatments such as range seeding and brush management. Rangeland recovery from drought, hail, disease, or insect damage may require periods of extended rest or deferment from grazing.

The prescribed grazing sequence should consider the availability of seasonal forages, such as smooth brome grass, annual forages, or crop aftermath. Livestock movements between pastures should be planned so that livestock stress is minimized. The grazing schedule can also be designed to help break parasite life cycles and address control of livestock diseases.

Grazing prescriptions may also need to be adjusted when significant changes occur in plant vigor or composition, animal kind or class, and management objective. Where needed, grazing prescriptions should be adjusted to help achieve wildlife habitat goals or riparian area objectives.

The grazing schedule will be developed with the land manager and in a manner that is easily understood by the land manager. Diagrams, maps, schedules or charts of grazing/ rest/ deferment periods by management unit will be planned through one cycle of the grazing prescription treatment. [Grazing Schedule, NE-ECS-62](#) can be used to document grazing schedules in chart form.

A follow-up review of the grazing plan with the land manager should be conducted following the first year of implementation as a minimum. Needed adjustments to the grazing treatments or schedule should be discussed with the land manager so that progress toward the grazing land objectives can be evaluated.

## **Monitoring Plan**

A monitoring plan will help assess whether the grazing plan is meeting resource objectives. Short-term monitoring information such as annual records of utilization and long-term monitoring information such as trends in vegetation changes over time as well as observations of climatic conditions should be part of a monitoring program. The monitoring plan should provide enough information so that the grazing plan can be analyzed with the results used to assist the land manager in decisions concerning adjusting grazing schedules and stocking rates. A combination of short-term and long-term monitoring methods will offer the best information from a monitoring program. The monitoring method selected should be repeatable, with the intent of having the land manager becoming familiar with the process so that he can repeat the monitoring method himself. The monitoring plan and schedule will be described on [Monitoring Plan Worksheet, \(NE-ECS-8\)](#). Nebraska Technical Note# 16 Minimum Standards for Nebraska NRCS Photo-Point Monitoring describes procedures for establishing basic photo-point monitoring.

Utilization:

Specifying target utilization levels or residual growth levels for a key plant species will help achieve resource objectives and should be part of the grazing plan. Observations of utilization (degree of use) or stubble heights for plants are short-term monitoring methods that can be used to assist the land manager in adjusting stocking rates and other grazing management factors. “Attaining utilization to a specific degree of use on a key plant species in a key grazing area is not an objective—degree of use specifications for a key plant is merely a planning tool and guideline or reference point by which the welfare of the plant community can be evaluated.” *NRPH*, Manipulating the degree of use through adjustments in stocking rate, timing, season, and duration of grazing will influence the plant community within the capacity of the land. In this way, utilization levels become part of the influence toward a resource objective, not the objective itself. Planned and observed utilization levels recommended to help meet resource goals and objectives for selected key species on rangeland will be documented on [Proper Grazing Use Worksheet, \(NE-ECS-414\)](#).

Table 3. Lists utilization levels recommended to help achieve various resource objectives:

On pastureland, planned target residual heights for key forage species will be documented on [Degree of Use Worksheet for Pasture, \(NE-ECS-14\)](#).

<b>Table 3. UTILIZATION GUIDELINES*</b>	
<b>Resource objective</b>	<b>Recommended use level</b>
Maintain or improve plant health and vigor on rangeland	50 to 60%
Riparian area protection	40-50%
Maintain or improve forage quantity and quality on rangeland	50 to 60%
Provide or improve nesting cover for grassland nesting birds on rangeland	40 to 50%
Maintain or improve forage quantity and quality on pastureland	See Table 4.

*\*Utilization levels in excess of 60% are sometimes used to manipulate undesired plants in a management unit. Managing stocking rates to achieve higher levels of use on targeted plant species should be monitored closely and its purpose defined in the grazing plan.*

Table 4. Lists the recommended beginning graze and residual forage heights for common pasture species in Nebraska.

<b><sup>1/</sup> Table 4. Recommendations for Beginning and Ending Grazing (Heights and Dates) for Nebraska Pastures</b>				
<b>Species</b>	<b>Begin Grazing</b>		<b>End Grazing</b>	
	<b><sup>2/</sup>Minimum Height of Vegetative Growth (inches)</b>	<b>Approximate Date*</b>	<b><sup>2/</sup>Minimum Residual Height (inches)</b>	<b><sup>2/</sup>Minimum Residual Height Before Killing Frost (inches)</b>
Alfalfa	6	May 15	3	6
Alsike and red clover	6	May 15	3	6
Biennial sweetclover	6	May 1	3	6
Big & Sand bluestem	10	June 1	6	10
Birdsfoot trefoil	6	June 1	3	6
Cicer milkvetch	8	May 20	5	8
Creeping foxtail	6	May 1	3	6
Crested wheatgrass	4	April 20	3	6
Eastern gamagrass	18-20	June 1	8	10
Indiangrass	10	June 1	4	10
Intermediate wheatgrass	6	May 1	5	8
Kentucky bluegrass	4	May 1	2	3
Meadow brome	6	May 1	5	6
Orchardgrass	6	May 1	5	8
Pubescent wheatgrass	6	May 1	5	6
Reed canarygrass	8	May 1	4	8
Russian wildrye	6	May 1	3	4
Smooth brome	6	May 1	4	7
Switchgrass	10	June 1	6	10
Tall fescue	6	May 1	3	6
Tall wheatgrass	7	May 1	4	8
Timothy	6	June 1	4	5
Western wheatgrass	6	May 1	3	6

<sup>1/</sup>Grass and legume mixtures should be grazed in a manner that favors the dominant or desired species. Height is the average height when **leaves** are lifted in a vertical position.

<sup>2/</sup>All heights listed in Table 4 can be adjusted downward by 25% for all species in Vegetative Zone I in the Panhandle of Nebraska..

Final degree-of-use and residual forage height determinations should generally be made at or near the end of the growing season. However, reviewing utilization levels

after each grazing event permits the land manager to make adjustments to the grazing plan in order to better achieve the desired objectives. At a minimum, use levels will be documented at key grazing areas during an annual follow-up review. See the [National Range and Pasture Handbook, Chapter 5](#) for additional guidance on selecting key plant species, key grazing areas, and degree of use determinations.

The use of grazing enclosures or utilization cages can be a useful aide in estimating utilization and production. The forage protected by the cage or enclosure allows the land manager to make comparisons of the proportion of herbage consumed by animals, (including wildlife and insects), to that produced in the current year. Ideally, utilization cages should not disrupt normal vegetative growth and should be moved every year at the beginning of a grazing period. See [Utilization Studies and Residual Measurements, Interagency Technical Reference, 1996](#) for more information about utilization cages and design.

If actual utilization levels exceed those identified in the plan or residual forage heights are lower than planned to meet the resource objectives, the reason should be documented (e.g. drought, too much time spent in a pasture, too many animals, or combination of factors) in the notes section of [Proper Grazing Use Worksheet, \(NE-ECS-414\)](#) or [Degree of Use Worksheet for Pasture, \(NE-ECS-14\)](#). As needed, the prescribed grazing schedule and/or the livestock/forage balance will be re-planned for the following year, incorporating necessary changes so that utilization levels are achieved that will enable the resources objectives to be met.

**Photo Monitoring:** A photographic record is a qualitative method for documenting short-term and long-term effects of the prescribed grazing plan. As a minimum, a photo point will be established in the first year of conservation plan implementation at a key grazing area. Photos should be re-taken on a schedule planned with the land manager and recorded in [Monitoring Plan Worksheet, \(NE-ECS-8\)](#). A key area photo point from the first year and last year of plan implementation will be inserted into the *Prescribed Grazing Jobsheet*, (NE-ECS-528). For further guidance, see [Tech Note 16, Establishing Photo Points for Grazing Land Monitoring](#).

## **CONTINGENCY PLANS**

Forward planning for unpredictable events such as flood, fire, drought, hail, insects, and disease can help minimize the potential damage to grazing lands and allow more options and alternatives for a land manager to consider that will help him maintain his resource objectives as closely as possible.

A contingency plan should consider economically feasible alternatives that will guide the land manager in making adjustments to the grazing prescription to ensure that further resource degradation does not occur.

Guidelines to adjusting the grazing prescription should consider the following factors:

1. Condition of existing forage reserves

2. Supplemental forages on hand
3. Past and future stocking rates

Appendix A offers guidance on Drought Contingency Planning.

## **OPERATION AND MAINTENANCE**

**Operation:** The land manager will apply prescribed grazing on a continuing basis; making adjustments as needed to insure that progress toward the objectives are met. The analysis of both short-term and long-term monitoring information, including records of actual use should be used to determine the proper adjustments in stocking rates, season-of-use, and grazing schedules.

**Maintenance:** Periodic on site follow-up with the land manager will be done to evaluate the results of the grazing plan. If the planned goals or objectives are not being met or there is degradation of any of the resources, including animal performance, the grazing plan will be adjusted so that resources can be maintained or improved and objectives met.

## Appendix A

### DROUGHT MANAGEMENT CONTINGENCY PLAN <sup>1</sup>

There is no special prescription for management of drought stricken grazing lands. Years of good grazing management prepares the land manager and the land for drought recovery. This embodies utilizing a prescribed grazing system which permits control of grazing frequency and intensity and provides proper recovery periods after grazing, proper livestock distribution, season of use, and stocking rate as well as considerations of kind and class of livestock.

A basic understanding of the potential capabilities and limitations of all range resources is fundamental to sound management. High levels of plant vigor and range health are critical for the endurance of and rapid recovery from drought. It is equally important to know which practices optimize livestock performance, and minimize risk of financial loss. Drought considerations must be incorporated into each year's management plan.

A drought plan should minimize financial hardships and hasten vegetation recovery after drought. Plans identify action to be taken at the first sign of drought as well as with continued indications of pending forage shortages. Plans for stocking rate adjustments need to be specific in terms of method and date. The timing of actions should be based upon seasonal check points.

#### **Management Preparation for Drought**

Diverse practices can be used to maintain ownership of cows under drought conditions. Some ranches will liquidate or relocate part or all of their breeding stock. The value of keeping breeding herds on the ranch must be weighed against the additional costs that are probable when drought continues. Recovery of additional production costs will depend upon: (1) productivity of livestock, (2) productivity of grazing lands, and (3) livestock market prices during and following drought. The use of excessive stocking rates during drought can reduce animal performance and cause dramatic reductions in plant vigor. Overgrazed land in combination with prolonged drought can cause rangelands to shift across transition zones to states that may not recover to pre-drought production levels for decades. Under severe or prolonged drought conditions the cost of replacement livestock is almost always less than the cost of long-term reductions in grazing land productivity.

#### **Herd Management**

One alternative for drought management is to reduce total forage requirements.

Reducing stocking rates during drought pays dividends in terms of:

- Optimized animal performance
- Reduced supplemental and winter feeding costs
- Minimized damage to forage resources, and
- Enhanced range and pasture recovery following drought

Consider removing or relocating livestock as soon as shortages in forage and feed resources are anticipated to take advantage of best market values. If additional

shortages in forage occur, calculate the additional costs associated with keeping livestock on the ranch (feed, interest, labor, etc.) or transporting livestock to another location with adequate feed or forage. If calculations show an unreasonable high cost of livestock production, it may be prudent to sell or relocate part or all of the livestock. The following practices can help to minimize liquidation of the breeding herd:

- Early weaning can extend the forage base
- Practice early and heavy culling of less productive animals such as late calving cows and older cattle
- Remove yearlings from summer pastures early
- Consider curtailing production of replacement animals for one year
- Supplement vulnerable classes of livestock such as bulls earlier than other classes of livestock to be in acceptable condition when the breeding season begins
- Maintain a percentage of the livestock as a readily marketable class of stock, such as yearlings or stockers

### **Past and Future Stocking Rates**

Grazing management during years proceeding drought is a major factor in range vegetation response to drought. Managers may have assumed that no change in stocking rate has occurred on their ranches because they have not increased livestock numbers. The amount of forage consumed in a pasture depends upon animal size as well as animal numbers and days of grazing. Inadvertent increases in stocking rates due to larger animal sizes may lead to overgrazing and reduced plant vigor before drought. All range livestock land managers need to critically evaluate their animal weights and use an appropriate animal unit (AU) equivalent when calculating stocking rates. Inadvertent overstocking may reduce animal performance and will damage the forage resource.

### **Seasonal Checkpoints**

Critical evaluation dates at which livestock requirements are balanced with available forage and feed resources are:

#### *April*

- Determine average depth of moist soil and estimate probable stocking rates
- Assess growth of introduced cool season pastures.
- Evaluate stand quality and probable forage production of winter and spring cereals.
- Determine if yield of native cool season species on rangeland is above or below average.
- Monitor green-up of native warm season species on rangeland.
- Alternate forages, stocking rate reductions and/or modifications of grazing strategies may be needed if there is a delay in plant growth.

**Note:** Estimate probable stocking rates and alternative (annual) forages based upon April through May precipitation to compensate for forage production shortfalls on pasture and rangeland.

### *June*

- Assess establishment and stand quality of summer annual forages and soil moisture conditions.

**Note:** Most plant growth in Nebraska occurs in June. If drought conditions have occurred in May and continue into June, forage production will be dramatically reduced for the season irrelevant to the amount of moisture received after June 30. Serious consideration should be given to stocking rate reductions and herd management.

### *July*

- Determine if yield of native warm season species on rangeland is above or below average.
- Assess establishment and stand quality of late planted summer annual forages and soil moisture conditions.

### *August*

- Estimate or measure yield of summer annuals harvested for feed or grown for late season grazing.

**Note:** The diet quality of annual forages declines dramatically after the soft dough stage. If maximum tonnage is the objective, then harvesting after the soft dough stage may be desirable. If high forage quality is the objective, harvest at the late boot to soft dough stage.

### *September*

- Assess current year and carry-over winter feed inventories. Purchase hay resources as needed.
- Make a final assessment of yield of annual forages grown for late season grazing.
- Inventory other harvested feed and determine the quantity of crop residue on cropland.
- Estimate amount of forage in winter pastures (if applicable).

### *October 1 – 30*

- Use September through October precipitation to predict stocking rates for the next summer.

**Note:** Even a small amount of spring or fall green-up can cause a false sense of security and delay of prudent management decisions. Premature, aggressive restocking can cause serious economic loss because of long-term reductions in the rate of vegetation recovery. If vegetation recovery is slow or restricted by continued drought, a de-stocking plan will be needed.

*[1 The majority of the information in this section was obtained from "Drought Management on Range and Pastureland – A Handbook for Nebraska and South Dakota," Nebraska Cooperative Extension EC91-123.](#)*