

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD
PRESCRIBED GRAZING

(Acre)

Code 528

DEFINITION

Managing the harvest of vegetation with grazing and/or browsing animals.

PURPOSES

This practice may be applied as part of a conservation management system to achieve one or more of the following:

- Improve or maintain desired species composition and vigor of plant communities.
- Improve or maintain quantity and quality of forage for grazing and browsing animals' health and productivity.
- Improve or maintain surface and/or subsurface water quality and quantity.
- Improve or maintain riparian and watershed function.
- Reduce accelerated soil erosion, and maintain or improve soil condition.
- Improve or maintain the quantity and quality of food and/or cover available for wildlife.
- Manage fine fuel loads to achieve desired conditions.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all lands where grazing and/or browsing animals are managed.



CRITERIA

General Criteria Applicable to All Purposes

Follow all federal, state and local laws, and regulations.

Removal of vegetation will be in accordance with site production limitations, rate of plant growth, the physiological needs of the forage plants, rest requirements, and the nutritional needs of the animal. Stop grazing heights will be the decisive evaluation for compliance of this standard, as indicated in Table 1, and will be maintained on a minimum of 80% of the grazing system except where otherwise noted in this standard.

Duration, time (season), and required rest periods will be based on desired plant community goals, expected productivity of key species, and management unit objectives. Refer to Table 1 for rest periods.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service State Office, or download it from the Field Office Technical Guide for your State.

Table 1. Species Harvest/Rest Information

Forage Type	Start Grazing Height (inches) ^{1/}	Stop Grazing Height (inches) ^{2/}	Average Rest Period (days)	Ideal Minimum Regrowth prior to Killing Frost (inches)	Overwintering Height ^{3/} (inches)	Minimum Paddocks Needed ^{4/}
Mixes of 2 to 4 compatible dominant species including grasses and at least one legume						
Introduced Grasses and Legumes	6 to 8	3 to 4	25 to 45	6 to 8	3 to 4	4
Native Grasses, Legumes and Forbs	12 to 18	6 to 8	30 to 50	10 to 12	8 to 12	5
Mixes of 5 or more compatible species including grasses and at least one legume						
Introduced Grasses and Legumes	6 to 8	3 to 4	25 to 45	6 to 8	3 to 4	6
Native Grasses, Legumes and Forbs	12 to 18	6 to 8	30 to 50	10 to 12	8 to 12	8

^{1/} Begin grazing when energy levels used for initial growth and regrowth are sufficient, generally full canopy. One paddock in an 8 or more paddock system can be started earlier to help prevent the last paddocks in the system from becoming too mature.

^{2/} In continuously grazed systems or systems with only 2 or 3 paddocks, the stop grazing height should be at least one inch taller than in a larger rotated system.

^{3/} Overwintering heights are ideally not reached until forages have become dormant. No restrictions on post dormancy grazing heights on tall fescue dominant pastures where runoff is not a resource concern.

^{4/} Minimum paddocks needed to allow necessary rest periods associated with the appropriate grazing periods. Increasing paddock numbers reduces grazing period and increases rest period enhancing grazing efficiency, increasing manure distribution, reducing runoff, improving water quality and improving forage quality.

Adjust intensity, frequency, timing and duration of grazing and/or browsing to meet the desired objectives for the plant communities, and the associated resources, including the grazing and/or browsing animal and soil health.

Manage the kind of animal, animal number, grazing distribution, length of grazing and/or browsing periods, animal density, and timing of use to manage the desired effect on grazed plants to meet planned objectives. Sufficient recovery time will then be utilized to provide adequate rest to maintain the desired forages. Number of paddocks in a

grazing system will be determined by the following formula:

$$(\text{Average Rest Period}/\text{Grazing Days}) + 1$$

Example: (30 rest days/ 3 grazing days)
+1 = 11 paddocks needed.

Appropriate stocking density will be calculated and used as a guide to optimize utilization of the forage resource or reach the resource goal.

Adjust livestock numbers and/or grazing time to match forage demand to forage yield as indicated in Exhibit A below.

Exhibit A. General formulas to estimate animal numbers or grazing days:

$\text{AN} = \frac{\text{TFP}/\text{Ac.} \times \text{Ac.} \times \% \text{ HE}}{\text{AW} \times \text{IR} \times \text{Days}}$	$\text{Days} = \frac{\text{TFP}/\text{Ac.} \times \text{Ac.} \times \% \text{ HE}}{\text{AW} \times \text{IR} \times \text{AN}}$
<p>AN = Animal Number TFP = Total Forage Production (Total above ground biomass in lbs/acre dry weight) Ac. = Acres % HE = Percent Harvest Efficiency (same as % grazing efficiency) Guide: 1 to 3 paddocks = 25%-35% 4 to 8 paddocks = 35%-50% 8 to 12 paddocks = 50%-65% 12 to 24+ paddocks = 65 – 75%</p>	
<p>AW = Animal weight (pounds) IR = Intake Rate in % body weight Guide: 2.0% for maintenance 2.6% for annual average production 3.0% for lactating and fast growing animals 4.0% for high production</p>	
<p>Days = Days of grazing planned (160-210 days within growing season in Indiana which may be extended with additional management options such as stockpiling)</p>	

Provide deferment from grazing or browsing to ensure the success of prescribed fire, brush management, seeding/establishment, longevity, or other conservation practices.

Manage grazing and/or browsing animals to maintain adequate vegetative cover on sensitive areas (i.e. riparian, wetland, habitats of concern, karst areas).

Develop contingency plans to deal with expected episodic disturbance events (i.e. insect infestation, drought, wildfire, etc). Periodic deferment from grazing will be needed to maintain or restore the desired plant community following episodic events, such as severe drought.

Adequate quantity and quality drinking water will be supplied at all times during period of occupancy. The water requirements for all grazing livestock will be a minimum 30

gallons per animal unit (1000 pound live weight) per day.

Walking distance to water will be minimized in all systems with a maximum walking distance goal of 1200 feet unless restricted by unalterable site conditions. Minimizing the walking distance to water reduces trailing, increases efficiency of the pasture, can allow for smaller sized tanks and can increase animal performance. Pasture layout and distance to water for all grazing livestock will provide for the even distribution of grazing pressure.

Stockpiled forages will be deferred from grazing until the desired stockpiled forage is dormant to reduce stress on carbohydrate reserves of those species to ensure long term productivity of the pasture.

Rest periods in Table 1 will only be used as a guide. Livestock will be rotated into paddocks based on the vegetative condition

and re-growth of the forages. Forages will be allowed to re-grow to reach a height that allows the replenishment of carbohydrate reserves and adequate cover maintained.

Regardless of site, reed canarygrass will be harvested or grazed prior to seed formation.

Additional Criteria to Improve or Maintain the Health and Vigor of Plant Communities

Duration and intensity of grazing and/or browsing will be based on desired plant health and expected productivity of key forage species to meet management objectives.

Fragile or sensitive plant communities or soils will receive particular attention to avoid overgrazing, soil compaction, or animal traffic induced erosion.

Soil test periodically for nutrient status and soil reaction and apply fertilizer and/or soil amendments according to soil test to improve or maintain plant vigor.

Additional Criteria to Improve or Maintain Quantity and Quality of Forage for Animal Health and Productivity

Plan grazing and/or browsing to match forage quantity and quality goals of the producer within the capability of the resource response to management. Animal performance will be a primary goal.

Enhance diversity of pasture plants to optimize delivery of nutrients to the animals by planning intensity, frequency, timing and duration of grazing and/or browsing. Carbon/dry matter and crude protein/nitrogen will be kept in balance to maintain a sufficient mat on the rumen.

Supplemental feed and/or minerals will be balanced with the forage consumption to meet the desired nutritional level for the kind and class of grazing and/or browsing livestock and not negatively impact the ability to digest forages.

Dietary needs of livestock will be based on the National Research Council's Nutrient Requirements of Domestic Animals or

similar scientific sources with appropriate adjustments made for increased energy demand required by browsing or grazing animals foraging for food including travel to and from pasture site.

Bio-security safeguards will be in place to prevent the spread of disease between on-farm classes of livestock and between other livestock farm units.

Shelter in the form of windbreaks, sheds, shade structures, and other protective features will be used where conditions warrant protecting livestock from severe weather, intense heat/humidity, and predators.

Systems will be developed that subject animals to a minimum amount of handling stress.

All livestock on pasture will have free choice access to good quality fresh water. Testing of water supplies will be conducted when there are any problems or if the source is questionable.

Additional Criteria to Improve or Maintain Surface and/or Subsurface Water Quality and Quantity

Plan intensity, frequency, timing and duration of grazing and/or browsing to:

1. Minimize deposition or flow of animal wastes into water bodies.
2. Minimize animal impacts on stream bank or shoreline stability.
3. Provide adequate ground cover and plant density to maintain or improve infiltration capacity and/or filtering capacity of the vegetation.

Livestock will be excluded from flowing streams, spring seep areas and from ponds and lakes except when designated in the prescribed grazing plan when limited access or flash grazing (very short duration, i.e., ½-2 days) is permitted. Grazing will be limited to the planned time periods.

Do not graze riparian areas when soils are saturated.

Minimize concentrated livestock areas to enhance nutrient distribution and improve or maintain ground cover. Locate loafing areas, feeding and watering locations, and sacrifice areas away from watercourses, and maintain adequate vegetative buffers between these concentration areas and water courses.

Ensure optimum water infiltration by preventing compaction and reduce evaporation by maintaining plant cover.

Woodlands with greater than 30% canopy will be excluded from livestock to maintain the natural vegetative cover, under-story and humus. Woodlands with less than 30% canopy that are grazed will be managed to maintain adequate vegetative cover.

Additional criteria to Improve or Maintain Riparian and Watershed Function

Minimize concentrated livestock areas to enhance nutrient distribution and improve or maintain ground cover and riparian/floodplain plant community structure and functions.

Plan the intensity, frequency, timing and duration of grazing and/or browsing to:

1. Maintain or improve infiltration capacity and reduce runoff.
2. Maintain or improve filtering capacity of the vegetation.
3. Maintain adequate riparian community structure and function to sustain associated riparian, wetland, floodplain and stream species.

Additional Criteria to Reduce Soil Erosion and Maintain Soil Condition

Minimize concentrated livestock areas, trailing, and trampling to reduce soil compaction, excess runoff and erosion.

Plan the intensity, frequency, timing and duration of grazing and/or browsing to provide adequate ground cover, litter and canopy to maintain or improve infiltration and soil condition and health.

When crop residues are grazed, the percent ground cover will be monitored during the grazing period and livestock removed when ground cover and residue mass approach the specified minimum amount needed to keep soil loss and soil organic matter to the specified level using current approved erosion prediction and soil conditioning index procedures.

Pasture fencing layouts will provide laneways, as needed that are least prone to livestock trail erosion.

Grazing will be deferred on all somewhat poorly, poorly, and very poorly drained soils, unless artificially drained, during the time of high water table occurrence.

Woodlands with greater than 30% canopy will be excluded from livestock to maintain the natural vegetative cover, under-story and humus. Woodlands with less than 30% canopy that are grazed will be managed to maintain adequate vegetative cover.

Additional Criteria to Improve or Maintain Food and/or Cover for Fish and Wildlife Species of Concern

Identify the species of concern in the objectives of the prescribed grazing plan.

Mechanical treatments will only be used outside of the nesting season (April 1 – August 1) and only if needed to control noxious, invasive or problem species.

Plan intensity, frequency, timing and duration of grazing and/or browsing to provide for the development and maintenance of the plant structure, density and diversity needed for the desired wildlife species of concern.

Develop grazing plans that will provide adequate food, water and cover for the target wildlife species.

CONSIDERATIONS

Native grasses, legumes and forbs will be considered in the planning process as applicable to enhance the wildlife value of the plant community.

The following are suggested ranges for optimal grazing periods. These systems are based on average forage production.

Cow/calf operation	3-7 days
Stocker operation	1-3 days
Dairy operation	0.5-1 day
Ewe/lamb operation	2-5 days
Feeder lambs	1-3 days
Horses	5-7 days

When soil-borne parasite cycles need to be broken, defer grazing long enough to break cycle or defer grazing for one or more grazing seasons when practical or treat livestock. Sheep especially need to “top graze” as much as possible to lessen the impact of parasites residing on lower plant parts. Grazing a non-host species after sheep/goats can reduce parasite loads on the pasture.

Many soils in Indiana are selenium deficient and supplementation may be needed for grazing livestock.

Begin grazing sequence each year in a different paddock as practical to help reduce parasite load, maintain a dense forage stand and to help nutrient distribution. The livestock would benefit from dry material left from the previous year to balance out new green forages.

Animal husbandry requirements, such as handling, feeding and breeding programs, may affect the design of the grazing prescription and must be resolved during the planning process.

When suppression or elimination of weeds and sapling woody species by grazing is feasible and desired, select livestock species that will utilize those woody species. Stocking density, timing, and duration will achieve desired level of control and prevent seed production, or be supplemented with other control methods.

When the suppression of forage plant re-growth is desired on individual pastures to be over-seeded or completely renovated, then graze to or below the minimum stop grazing height possible and document in assistance notes and/or grazing plan. This

will normally be shorter than prescribed in Table 1. Utilize livestock that can tolerate reduced intake during this time period, for example, dry cows in good condition.

Prescribed grazing should consider the needs of other activities that may utilize the same land base, such as wildlife and recreational uses.

A portion of the grazing system during the critical nesting period (April 1st – August 1st) could be utilized to provide essential nesting habitat for the applicable targeted species. Blocks of undisturbed nesting habitat are preferred over linear strips.

When available and applicable, crop aftermath can be included in the grazing system to allow time for forage re-growth before a killing frost to increase the forage supply to extend the grazing season. Crop residues are best used for non-lactating or mature animals which can do better on lower energy feeds unless seeded with fall planted annuals.

Consider improving soil health and organic matter through grazing management.

PLANS AND SPECIFICATIONS

Prepare a prescribed grazing plan for all planned management units where grazing and/or browsing will occur according to state standards and specifications. Seek measures to avoid adverse affects to endangered, threatened, and candidate species and their habitats.

The grazing plan/folder will include the following information:

- Goals and objectives of producer.
- Resource Inventory that identifies:
 - Existing resource conditions and concerns
 - Ecological site or forage suitability group(s)
 - Identifies opportunities to enhance resource conditions
 - Location and condition of structural improvements such as fences,

- water developments, etc, including seasonal availability and quality of watering sites.
- Forage inventory of the expected forage quality, quantity and species in each management unit(s).
 - Forage-Animal balance development for the grazing plan, which ensures forage produced or available, meets the forage demand of livestock and/or wildlife.
 - Grazing plan developed for livestock that identifies periods of grazing and/or browsing, deferment, rest, and other treatment activities for each management unit.
 - Contingency plan developed that details potential problems (i.e., severe drought, flooding, insects) and serves as a guide for adjusting the grazing prescription to ensure resource management and economic feasibility without resource degradation.
 - Monitoring plan developed with appropriate records to assess whether the grazing strategy is resulting in a positive or upward trend and is meeting objectives. Identify the key areas and key plants that the manager should evaluate in making grazing management decisions.

OPERATION AND MAINTENANCE

Operation – Prescribed grazing will be applied on a continuing basis throughout the occupation period of all planned grazing units. Adjustments will be made as needed to ensure that the goals and objectives of the prescribed grazing strategy are met.

Maintenance – Monitoring data and grazing records will be used on a regular basis within the prescribed grazing plan to insure that objectives are being met, or to make necessary changes in the prescribed grazing plan to meet objectives.

All facilitating and accelerating practices (e.g. Indiana (IN) Field Office Technical Guide (FOTG) Standards Fence (382), Forage and Biomass Planting (512), Pest Management (595), etc.) that are needed to effect adequate grazing and/or browsing distribution as planned by this practice standard will be maintained in good working order and operated as intended.

Stocking rates are based on targeted forage yield goals. When soil tests indicate soil pH and nutrient levels are lower than needed to meet the targeted forage yield goal, apply lime and fertilizer according to University recommendations or the Indiana NRCS Pasture Fertility Calculator.

Renovate or over-seed pasture to reintroduce desired forage species into the pasture according to IN FOTG Standard (512) Forage and Biomass Planting and the Indiana Seeding Calculator. Check compatibility with any existing species being retained.

Remove or eliminate any hazard from a pasture that may injure livestock, such as loose wire, other hardware, holes in the ground, and downed trees or heavy limbs.

REFERENCES

National Range and Pasture Handbook, Grazing Lands Technology Institute, 2003.

Forages Volume I, An Introduction to Grassland Agriculture, 5th ed., Iowa State University Press, 1995.

Forages Volume II, The Science of Grassland Agriculture, 5th ed., Iowa State University Press, 1995.

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