



CONSERVATION ENHANCEMENT ACTIVITY

E528R

CONSERVATION STEWARDSHIP PROGRAM

Management Intensive Rotational Grazing

Conservation Practice 528: Prescribed Grazing

APPLICABLE LAND USE: Pasture, Range

RESOURCE CONCERN ADDRESSED: PLANTS

ENHANCEMENT LIFE SPAN: 1 Year

Enhancement Description

Management intensive, multi-paddock grazing system where livestock are regularly and systematically moved to fresh forage to optimize quantity and quality of forage growth, improve manure distribution, improve wildlife cover, and improve soil health.

Criteria

- Management-intensive rotational grazing increases harvest efficiency of vegetation with grazing and/or browsing animals through smaller paddock sizes, higher stock density while maintaining plant residue with enough energy reserves to recover quickly when adequate soil moisture is available for regrowth.
- Must develop and implement a written grazing plan that:
 - increases stock density
 - shortens grazing periods
 - enhances plant recovery
 - matches the forage quantity and quality produced with the grazing and / or browsing animal, and

E528R – Management Intensive Rotational Grazing	August 2019	Page 1
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CONSERVATION STEWARDSHIP PROGRAM

- increases harvest efficiency and manure distribution by significantly increasing the existing stock density per herd.
- Removal of forage will be in accordance with site production limitations, rate of plant growth, the physiological needs of forage plants and the nutritional needs of the livestock.
- Deferment (non-grazing period less than one year) and / or rest (non-grazing period equal to or greater than one year) will be planned for critical periods of plant needs.
- Manage livestock rotation based on rate of plant growth, available forage, and allowable utilization target.
- Manage livestock rotation to provide adequate ground cover and plant density to decrease soil erosion, reduce runoff and improve infiltration and water holding capacity.
- Minimize concentrated livestock areas to enhance nutrient distribution and improve or maintain ground cover.
- Utilize higher stock density and shorter grazing periods in riparian areas to minimize impact to stream bank or shoreline stability and ensure other sensitive areas such as wetlands, habitats of concern, karst areas do not become degraded.
- Implement and maintain a rotational grazing system using a combination of permanent or temporary division fences and water facilities to serve the management needs of operation.
- Develop and follow contingency plans to deal with drought or flooding or other episodic disturbance events.

Develop and implement a monitoring plan that at a minimum evaluates livestock performance, plant community composition and density, and soil function components such as ground cover, infiltration and aggregate stability.



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Documentation and Implementation Requirements

Participant will:

- Prior to implementing, obtain a grazing plan map delineating the existing paddock system, along with a livestock inventory (type, class, average weight, and number) to document the current stocking density and current stocking rate.
- Prior to implementation, acquire a prescribed grazing plan, with a plan narrative delineating the following:
 - The goals and objectives of the plan
 - Map showing the number of paddock subdivisions with water sources, proposed stock densities per paddock associated with different herds in the system.
 - Forage Inventory
 - Forage / Animal Balance
 - A grazing plan narrative describing the basis for when livestock movement or rotation will occur
 - A contingency plan
 - A monitoring plan
- During implementation, keep pasture/ herd in/out records, stock density records and photos of paddock condition and photos of high stock density grazing implementation.
- After implementation, provide the following items for review by NRCS:
 - Written grazing plan with maps showing fencing and water layout and managed stock densities for each herd.
 - Paddock / herd in / out records with actual stock densities documentation.
 - Photos of paddock(s) condition and improved forage utilization and photos of high stock density grazing.
 - Changes made to the grazing management plan.

NRCS will:

E528R – Management Intensive Rotational Grazing	August 2019	Page 3
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CONSERVATION STEWARDSHIP PROGRAM

- As needed, provide technical assistance to participant as requested.
- Prior to implementation, provide and explain NRCS Conservation Practice Standard Prescribed Grazing (Code 528) and supporting documents that are needed to implement this enhancement, such as forage-animal balance forms.
- Prior to implementation, review the existing grazing plan, maps and livestock inventory provided by the participant.
- Review the newly proposed grazing plan fencing and watering layout, associated maps and stock density numbers for each herd.
- After implementation, review the following:
 - Written grazing plan with maps showing fencing and water layout and managed stock densities for each herd.
 - Paddock / herd in / out records with actual stock densities documentation.
 - Photos of paddock(s) condition and improved forage utilization and photos of high stock density grazing.
 - Changes made to the grazing management plan

NRCS Documentation Review:

I have reviewed all required participant documentation and have determined the participant has implemented the enhancement and met all criteria and requirements.

Participant Name _____ Contract Number _____

Total Amount Applied _____ Fiscal Year Completed _____

NRCS Technical Adequacy Signature _____ Date _____

ALABAMA – E528R Supplement- Management Intensive Rotational Grazing

Requirements:

1. Written conservation plan that includes producer goals, objectives and resource concerns. Plan map will show and label all fences, feeding/watering areas, and sensitive areas. Livestock should be restricted from sensitive areas.
2. Average annual livestock dry matter needs will be balanced with available forage without deficiency for the yearly summary. The Forage/Animal Balance Worksheet will be completed to document.
3. Livestock will be rotated every **three days or less** in a particular functional-group (e.g. warm season pastures or cool season pastures) to facilitate intensive prescribed grazing. Fences and water sources should be in place so that trails do not occur, and concentrated livestock areas are minimized. Starting and ending grazing periods will meet the guidelines in the table below. Pastures will be sized and stocked to facilitate meeting the requirements for grazing heights and resting periods. Strip grazing or fast rotation can result in efficiencies of 65-70%.
4. A contingency plan will be developed denoting the use of sacrifice areas for pasture management during drought or other weather-related events. These areas will be labeled on the conservation plan map.
5. Typically, intensive grazing can be accomplished without the addition of permanent cross-fences or water sources though the use of electrified polywire. Configure paddocks with polywire to utilize existing water sources (without creating erosion or water quality problems) or provide portable, temporary troughs. Available forage should be estimated with a grazing stick to size paddocks for no more than 1-3 day's needs. PCS monitoring will be used to document improvements in the grazing system. A monitoring site will be selected in each forage type or forage mixture to be evaluated with the Pasture Condition Scoring (PCS) tool **quarterly** (typically, March or April, June or July, September or October, December or January). Sites should be reflective of average conditions of the pasture and labeled on the plan map. Photographs are required at the time of monitoring. The PCS should note whether forages are being actively grazed or in a rest period.
6. Apply lime and fertilizer according to soil test results. If manure or by-products are applied, follow Phosphorus Index and Nitrogen Leaching Index limitations according to the Nutrient Management Standard (590).
7. Maintain grazing records to include pasture or field number, acres, forage type, animal type and number, forage height in and out-with dates. Sub-fields or paddocks and acres should be noted and shown on the plan map. Records should be submitted quarterly along with the Pasture Condition Score.

Grazing will be managed according to the Prescribed Grazing (528) Standard.

The days of rest needed for plant recovery and regrowth range from 7 to 45 days, depending on the forage species (see below table). Stocking rates and growing conditions can also affect the forage growth. Grazing systems should be designed to meet the rest requirements of a specific forage as well as the needs of the livestock. For example, by using four pastures with 14 days of grazing per pasture, the grazing cycle is 56 days and each pasture rests 75% of the time or 42 days. Refer to Alabama Guide Sheet AL528 and AL528A.

FORAGE GUIDELINES FOR PRESCRIBED GRAZING SYSTEMS

Common Forages	Begin Grazing (in)	End Grazing (in)	Usual days of Rest
Alfalfa grazing types	10	4	35 - 40
Bahiagrass	6	2	10 - 20
Bermudagrass common	5	2	7 - 10
Bermudagrass hybrid	6	3	7 - 10
Big Bluestem	18	10	30 - 45
Dallisgrass	6	3	7 - 15
Eastern Gamagrass	15	8	30 - 45
Tall Fescue	6	3	15 - 30
Indiangrass	12	6	30 - 40
Orchardgrass	8	3	15 - 30
Switchgrass	18	10	30 - 45

IMPLEMENTING ULTRA HIGH DENSITY GRAZING

Alabama Job Sheet No. AL528A



Definition

In this form of rotational grazing, grazing animals, at a very high stocking density, graze a management unit for very short period of time.

The goal is to utilize grazing livestock hoof action from ultra high-density livestock stocking to mix plant residues and manure with soil to improve the nutrient cycling process and microbial activity. The improved soil health will lead to increased plant diversity, vigor and water infiltration. Wildlife should benefit from this grazing system.

Considerations

There are a number of things to consider before and during implementation of this type grazing system. They include:

- Plant diversity is going to occur and is usually desired with this kind of management and is a component of this method's success.
- Complex management ability is required for this method of grazing and is not for beginners or those never using any kind of grazing management before.
- Excess forage must be available to graze at a high stock density (> 50,000 lbs. < 75,000 lbs. of livestock/acre).
- Livestock may have to be moved every few hours to meet the livestock forage needs depending on the specific situation.
- Pasture forages should be allowed to rest and accumulate much longer than in a typical rotational grazing system. It may take up to 90 days for adequate accumulation after being grazed.
- Developing an 'eye' for when to graze and move animals is different from typical rotational grazing system and will take time to develop.
(Ex: determining when 50% of the available forage has been removed).
- It is preferable to end grazing when tame species are grazed down to about 4 to 5 inches; or, when native grasses are grazed down to 8 to 10 inches.
- When starting this grazing method, consider allowing livestock to graze in paddocks for a very short period of time to "quick graze" each area, but continue at high stock densities. This is sometimes called 'top grazing'.
- Producers wishing to maintain "near-pure-stands" of forages such as Bahia grass and bermudagrass should not consider this grazing method. As these forages mature in this type of system, quality and stand is reduced, leading to other species being introduced (one of the goals of this practice).
- It is anticipated that the average beef operation in Alabama will most likely have to feed hay or destock to allow forage accumulation.
- This activity applies to beef operations only.

- Herds used for ultra high density grazing should be of uniform body weight to facilitate management.
- This grazing method should be implemented during the months of March through November and depends on type of forage to be grazed.
- Gully, sheet and rill erosion must be controlled or stabilized.
- Adequate livestock drinking water must be provided by a tank, trough or a stabilized controlled access surface water location.
- Those implementing this type of management should use caution and evaluate risk.
- This grazing method should not be implemented under the following conditions:
 - Sites that are have wet saturated soils or are very shallow to bedrock soils, etc.
 - Live plant canopy cover of the soil surface is less than 75%.
 - A woodlot or forest.

Implementation

The following guidance will aid in implementing this grazing system.

Step 1:

Complete a grazing plan to account for livestock numbers, forage yields, about 50% forage utilization (amount animals actually eat). See Table 1 for estimates of available forage.

Example – Determine operation stocking rate:

- Assume a 6000 lb. dry matter yield per acre for 80 acres.
- $(6000 \text{ lbs.} \times 50\% \text{ (utilization)}) = 3000 \text{ lbs./ac available dry matter.}$
- For 80 acres the available dry matter for consumption is 240,000 lbs. $(80 \times 3000 \text{ lbs.}).$
- If a 1000 lb. cow eats an average of 25 lbs. per day (2.5% of body weight), then the baseline stocking rate for the operation is 26 cows on 80 acres $[(240,000 \text{ lbs. dry matter per } 80 \text{ ac} / 25 \text{ lbs. dry matter needs per day per cow}) \text{ over } 365 \text{ days}] = 26 \text{ cows.}$

Table 1. Total Pounds per Acre of Available Forage (100 % uniform stand)		
Available Forage Height for Grazing (inches)*	Estimated pounds by Plant Density 200	Estimated pounds by Plant Density 250
18	3600	4500
16	3200	4000
14	2800	3500
12	2400	3000
10	2000	2500
8	1600	2000

*Total height minus height of forage when grazing is to be stopped.

Step 2:

Then design the stocking density for each paddock.

- Example: (remember stocking densities should be at least 50,000 lbs. /ac.).

- From the example in step 1: 26 cows at 1000 lbs. each on 1 acre = 26,000 lbs. density.
- If paddocks are changed to ½ acre paddocks then 26,000 lbs. / .5 ac. = 52,000 lbs. /ac (requirement met).

Step 3:

Remove livestock from a paddock when about 50% of available forage has been removed. This is difficult to judge and better decision making comes with experience. At livestock removal time, much of the uneaten forage will be trampled (laid flat) on the soil. Approximately 10%-20% of the original forage/residue should still be standing (See Picture 1).

As an example:

Assume 200 lbs. dry matter per inch of forage. Initially, the average forage height is 20 inches and is to be grazed down to 4 inches. This leaves an average of 16 inches of available forage (above 4 inches). This means that:

- There is about 3200 lbs. of available dry matter per acre (16 in. x 200 lbs. dry matter per inch).
- At 50% utilization, that's 1600 lbs. of dry matter to be consumed per acre.

Using the example in Step 2:

- 1600 lbs. dry matter x .5 acres = 800 lbs. of dry matter in the 0.5 acre pasture.
- 26 cows x 25 lbs. dry matter needs/day = 650 lbs. dry matter needs/day;
- This means dry matter is available for 1.2 days of grazing (800 lbs. of available dry matter/ 650 lbs. daily dry matter needs = 1.2 days).
- Being conservative, allow 1 day of grazing for this 0.5 ac paddock.

Remember, moving of livestock from one paddock to another is about judgment of how much forage has been grazed and how much of the forage is left. Since no one wants to hurt animal health and performance, the manager should be conservative in trying this method by moving animals at least once a day in this example.

Step 4:

- Rotate livestock back to paddocks when the paddocks are fully recovered. Remember, it may take up to 90 days for adequate recovery and accumulation. Forages should be allowed to increase in maturity during each rest period (See Picture 2). Ideally, livestock will only have access to any paddock or area, two times per year (3 times maximum).
- Using the above example, if 90 days are required for recovery before grazing the first paddock again, then:
 - Ninety, 0.5 acre, paddocks will be required to continuously graze using this ultra high density grazing method.
 - Or, a lesser number of paddocks could be grazed using this method, but cattle would have to be moved to another set of pastures to graze or held on feed until the original pastures had received adequate rest and recovery.

Grazing Management Records

Keeping accurate records is a continual and critical process in effective pasture and livestock management.

Pasture ID		Pasture acres		Forage type			
Soil test date		Lime/ Fertilizer rate		Lime/ Fertilizer type		Date applied	
Livestock		Date in	Forage height	Date out	Forage height	Notes (fertilizer applied)	
Type	Number						

Pasture ID		Pasture acres		Forage type			
Soil test date		Lime/ Fertilizer rate		Lime/ Fertilizer type		Date applied	
Livestock		Date in	Forage height	Date out	Forage height	Notes (fertilizer applied)	
Type	Number						

Pasture Condition Score Sheet

Operator:		Date:	
Evaluator:		Pasture ID:	
Soil(s), ESD(s) and or FSG(s):		Livestock type:	
Current Season's Precipitation (check one)	Above Normal °	Normal °	Below Normal °
Seasonal Temperature Trend (check one)	Above Normal °	Normal °	Below Normal °

Evaluate the site and rate each indicator based upon your observations. Scores for each indicator may range from 1 to 5. Sum the indicator scores to determine overall pasture condition score.

Indicator	1 Point	2 Points	3 Points	4 Points	5 Points	Score
Percent Desirable Plants* (Dry Weight; for Livestock Type)	Desirable species <20% of stand.	Desirable species 20 – 40% of stand.	Desirable species 41 – 60% of stand.	Desirable species 61 – 80% of stand.	Desirable species exceed 80% of stand.	
Percent Legume by Dry Weight	<5% OR >50% bloating legumes.	5-10% legumes OR >40% bloating legume.	11-20% legumes.	21-30% legumes.	31-40% legumes. No grass loss; grass may be increasing.	
Live (includes dormant) Plant Cover	Less than 40% is live leaf canopy. Remaining is either dead standing material, or bare ground.	40-65% is live leaf canopy. Remaining is either dead standing material, or bare ground.	66-80% live leaf canopy. Remaining is either dead standing material, or bare ground.	81-95% live leaf canopy. Remaining is either dead standing material, or bare ground.	More than 95% live (non-dormant) leaf canopy. Remaining is either dead standing material, or bare ground.	
Plant Diversity by Dry Weight <small>(*See footnote at bottom of page)</small>	Diversity: Very low <50% desirable species OR 1 dominant desirable species in 1 functional group OR No dominant desirable species and all minor species in each functional group totaling <15%	Diversity: Low 2 dominant desirable species in 1 functional group OR 2 functional groups each represented by minor species totaling ≥15%	Diversity: Moderate 3 dominant desirable species in 1 functional group OR 2-3 dominant desirable species in 2 functional groups OR 3 functional groups each represented by minor species totaling ≥15%	Diversity: High 4 dominant desirable species in 2 functional groups OR 3 dominant desirable species in 3 functional groups OR 3 dominant desirable species in 2 functional groups AND 1 additional functional group represented by minor species totaling ≥15%	Diversity: Very high 4 dominant desirable species in 3 functional groups OR 4 dominant desirable species in 2 functional groups AND 1 additional functional group represented by minor species totaling ≥15%	
	Plant Residue and Litter as Soil Cover (Pull back canopy)	Bare soil is very easily seen; There is <20% cover on the soil surface or it is excessive, and slow to break down.	Openings of bare soil can be seen fairly easily; Soil cover is 21-40%.	Small openings of bare soil can be seen, but minimal; Soil cover is 41-60%.	No bare soil is easily seen; Soil cover is 61-80%.	No bare soil is seen; Soil cover is >80% with good biological activity and decomposition of older residue.
Grazing Utilization and Severity	Pasture is overgrazed throughout.	Pasture consists primarily of overgrazed and/or refused areas (former dung areas, older plants, undesired plants).	Pastures show uneven grazing throughout with heavier grazing near water or feeding areas, or distinct zone grazing.	Pasture grazed evenly throughout with minimal overgrazing with some under grazed small areas and heavier use near water sources.	Pasture grazed evenly throughout with no overgrazing.	

*Use NRCS plant list for livestock species. Functional groups are as appropriate for your state (cool-season grasses, legumes, warm-season grasses, non-leguminous forbs). **Any time there are more undesirables than desirables, it will be 1 point. Desirable species must total more than 50% of the total biomass. Dominant species are ≥15%. Functional groups must be ≥15% of stand to be counted.**

Indicator	1 Point	2 Points	3 Points	4 Points	5 Points	Points
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Livestock Concentration Areas (If field <1 acre, see ** footnote)	Livestock concentration areas are within 100 feet of, or are a direct conveyance to surface water, and cover more than 0.1 acre, including trails.	Livestock concentration areas are within 100 feet of, or are a direct conveyance to surface water, and cover less than 0.1 acre, including trails.	Livestock concentration areas are farther than 100 feet from and are not a direct conveyance to surface water, and cover more than 0.1 acre, including trails.	Livestock concentration areas are farther than 100 feet and are not a direct conveyance to surface water, and cover less than 0.1 acre, including trails.	Livestock concentration areas, including trails, not present.
Soil Compaction and Soil Regenerative Features (**See footnote at bottom of page)	Compaction: Dense or thick platy layer very distinct;	Compaction: Dense or moderate platy layer noticeable;	Compaction: Thin dense or platy layer still present;	Compaction: Minor dense or platy layer; good aggregates common (crumbly soil);	Compaction: No dense or platy layers; crumbly soil throughout;
	Roots: Dominantly horizontal; most shallow/sparse;	Roots: Numerous horizontal; moderate amount shallow/sparse;	Roots: Some horizontal with increasing downward;	Roots: Few horizontal, more downward through the soil profile;	Roots: Abundant growth primarily downward through the soil profile;
	Color: Surface horizon same as subsoil;		Color: Surface horizon moderately darker than subsoil;		Color: Surface horizon dramatically darker than subsoil;
	Soil Life: Few or no signs.	Soil Life: Signs scattered in surface layer.	Soil Life: Signs scattered throughout.	Soil Life: Signs numerous throughout.	Soil Life: Signs abundant throughout.
Plant Vigor	No plant recovery after grazing/harvest. Pale, yellow or brown, or severe stunting of desirable forage.	Some recovery. Yellowish green forage, or moderately or slight stunting of desirable forage.	Adequate recovery of desirable forage. Yellowish and dark green areas due to manure and urine patches.	Good recovery of desirable forage. Light green and dark green forage present.	Rapid recovery of desirable forage. All healthy green forage.
Erosion (Circle all that apply; the overall indicator score will be the lowest rating indicated)	Sheet and Rill: Plant density is insufficient to stop runoff, with poor infiltration. Erosion easily visible throughout pasture;	Sheet and Rill: Plant density slows runoff. Erosion present and easily seen on steeper terrain;	Sheet and Rill: Plant density good and runoff moderate. If present, erosion concentrated on heavily used areas;	Sheet and Rill: Plant density high, runoff low, good infiltration. May have evidence of past erosion if present;	Sheet and Rill: Plant density high, no runoff, good infiltration. No evidence of present or past erosion;
	Wind: Severe scoured areas and deposition throughout;	Wind: Scoured areas common, deposition effecting plants;	Wind: Occasional scoured areas, litter wind rolled;	Wind: Minimal soil exposed, some detached vegetation wind rolled, minor plant damage;	Wind: No exposed soil;
	Streambank and/or Shoreline: Banks bare, major sloughing, no bank vegetation;	Streambank and/or Shoreline: More than half the bank vegetation trampled; sloughing.	Streambank and/or Shoreline: Less than half the bank vegetation trampled; eroding at crossing/entrances.	Streambank and/or Shoreline: Eroding at crossings, entrances; all the bank vegetation is intact and banks are stable.	Streambank and/or Shoreline: Vegetation intact and stable, hardened crossings and alternative water sources used;
	Gully: Very large mass movement, caving sides.	Gully: Advancing upslope, increasing fingering extensions.	Gully: Not all active but extensions present.	Gully: Stable with vegetative cover.	Gully: None, drainage ways vegetative.

** If field size is less than 1 ac. Use 10% of field size in place of 0.1 acre. ***Use a shovel. Root and Compaction subindicators are primary and should be considered first. Soil color and soil life are secondary subindicators which can be considered where applicable.

Overall Pasture Condition Score	Individual Indicator Score	Management Change Suggested
45 to 50	5	No changes in management needed at this time.
35 to 45	4	Minor changes would enhance, do most beneficial first.
25 to 35	3	Improvements would benefit productivity and/or environment.
15 to 25	2	Needs immediate management changes, high return likely.
10 to 15	1	Major effort required in time, management and expense.

Overall Pasture Condition Score =

Comments/Notes: