

Definition

Intensive Management Grazing refers to systems of frequent livestock movement, decreased livestock occupancy periods, and increased rest periods to achieve or maintain the desired plant community, animal performance goals, and reduce resource concerns. Two commonly used methods of Intensive Management Grazing are:

- 1) **Strip Grazing** which involves giving animals portions of a larger management unit, usually vegetative stage forages of high quality, in units that will supply them with 2 or less days of forage.
- 2) **High Stock Density Grazing (HSDG)** also known as “mob grazing” uses grazing animal impact to manipulate plant communities and achieve the managers’ objectives. Animal impact encompasses grazing, feeding and browsing behavior, hoof impact, and the deposition of animal waste. Animal impact is present in other grazing systems, but it is distinguished in HSDG by the concentration of the impact.

Practice Purpose(s): (check all that apply)

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

Conditions Where Practice Applies

On native and naturalized pastures, rangeland, tame pasture and other lands where grazing livestock can be used to maintain or create the desired plant community.

Criteria for Both High Stock Density Grazing (HSDG) and Strip Grazing

Identify Management Objectives

Management objectives may include but are not limited to maintaining or moving toward a specific plant community, improving livestock performance, improving soil health, and improving forage production.

Inventory Resources

The following will be part of the inventory:

- 1) Aerial photos to locate existing fence, water sources, environmentally sensitive features, key forage species and invasive species.
- 2) Plant inventory using the Pasture Condition Scoresheet, or a 5 minute plant census.
- 3) Soil maps, soil map unit descriptions, and topographic maps.
- 4) Kinds, classes, weights of livestock. Breeding and calving dates and general management activities and when they occur. Estimate livestock dry matter intake and water requirements.

Forage Balance Sheet

Create a forage balance sheet that estimates current forage production for each month of the growing season and compares it to current livestock needs. If predicted livestock needs exceed forage production estimates, the planned number of livestock will be decreased or more grazing area added. If additional forages will be needed to make the grazing system work use Practice 512, Forage and Biomass Planting.

Maps

Create a map(s) that shows locations of planned and existing fences, water sources, forage types, environmentally sensitive features.

Fences

The plan will show the kind of new fences that will be installed with specifications and estimated quantities. In cooperation with the producer, identify the locations where HDSG will be started and a potential layout of portable fence to achieve the desired stock density. The portable fence locations will be adaptable to conditions of forage density and desired livestock performance. Include Implementation Guides for the type of fence that will be installed, if applicable.

Watering System

The watering system will include sources of water, method of conveyance, delivery method, and water requirements for each class of stock. It will also have an emergency watering plan as a backup to the primary watering system. Include watering system plans if applicable.

Management of Sensitive Features

The plan will describe how environmentally sensitive features such as riparian areas, sinkholes, droughty soils, springs, seeps, forest land, and wetlands will be managed. This will include a description of the current and desired condition of the plant community and how resource concerns will be addressed through grazing management.

Criteria for High Stock Density Grazing

Forage Stage of Maturity

Forages should be grazed when they are physiologically mature, early to mid-head stage. **It will not always be possible to achieve this throughout the growing season, especially during the early years of adaptation. Whenever possible, initiate HSDG on the lowest producing area of the pasture or a portion of it.** Initiate grazing on different paddocks each year so the beneficial effects of allowing forages to reach maturity are distributed throughout the management units until the objective of having at least 50% of the pastures grazed at physiological maturity. If physiologically mature forage is not available, initial forage grazing heights and minimum residual stubble will be based on the key forage species. See guidance in Table 1 below

Table 1 Initial and Final Forage Heights for Vegetative Stage Grazing

Key Forage Species	Start Grazing	End Grazing
Meadow Fescue, Tall Fescue, Orchardgrass, Smooth Bromegrass and most cool season introduced species	8" +	4" or More
Big Bluestem, Indiangrass, Switchgrass and other warm season native grass species	14" +	6-8"

Defoliation and Trampling

. Expect high trampling loss of the forage (>50%), however the objective is to introduce standing forage to the soil surface for improved nutrient cycling and improved plant density via tiller development and/or seed germination. Cattle are moved frequently to balance forage intake, animal performance objectives, and available nutritional quality of the forages.

Identify Stock Density Goals

Stock density is defined as the number of animals or live weight of a group of animals that are placed on a specific area of pasture. Sample stock density calculation:

50 cow/calf pair @ 1500 pounds per pair (50 X 1500 = 75000 pounds of livestock)

This herd would need to consume about 3% of its body weight daily. 75000 X .03 = 2250 pounds of dry matter daily.

Assuming 3000 pounds of standing forage at a 50% utilization rate would mean that the cattle would be consuming about 1500 pounds per acre. Daily dry matter required (2250) divided by forage per acre (1500) would result in the estimated forage needed per day of 1.5 acres.

Starting with a minimum stock density of 50,000 pounds per acre, the goal is to reach a maximum stock density of 250,000 pounds per acre at least one time per year. Higher stock densities have been achieved.

Stock Density Calculations Table 2: This table shows how the herd given in the example above can be grazed at different stock densities.

Stock Density	Paddock Size	Moves per day
50000 pounds/ac	1.5 acre	1
100000 pounds/ac	0.75	2
200000 pounds/ac	0.375	4
400000 pounds/ac	0.1875	8

Method/Implementation

HSDG requires regular planned observation of plant defoliation by grazing livestock, record keeping of plant community composition, plant community yield, animal body condition, and observation of animal behavior to achieve the manager's animal performance and plant community composition goals. It requires the ability to use portable fencing and watering systems to modify animal impact to adapt to changing climatic and other site conditions.

The manager will subdivide the pasture into management units to achieve the desired stock density. In the example see how the larger permanently fenced paddock is subdivided into smaller units to increase stock density and animal impact.

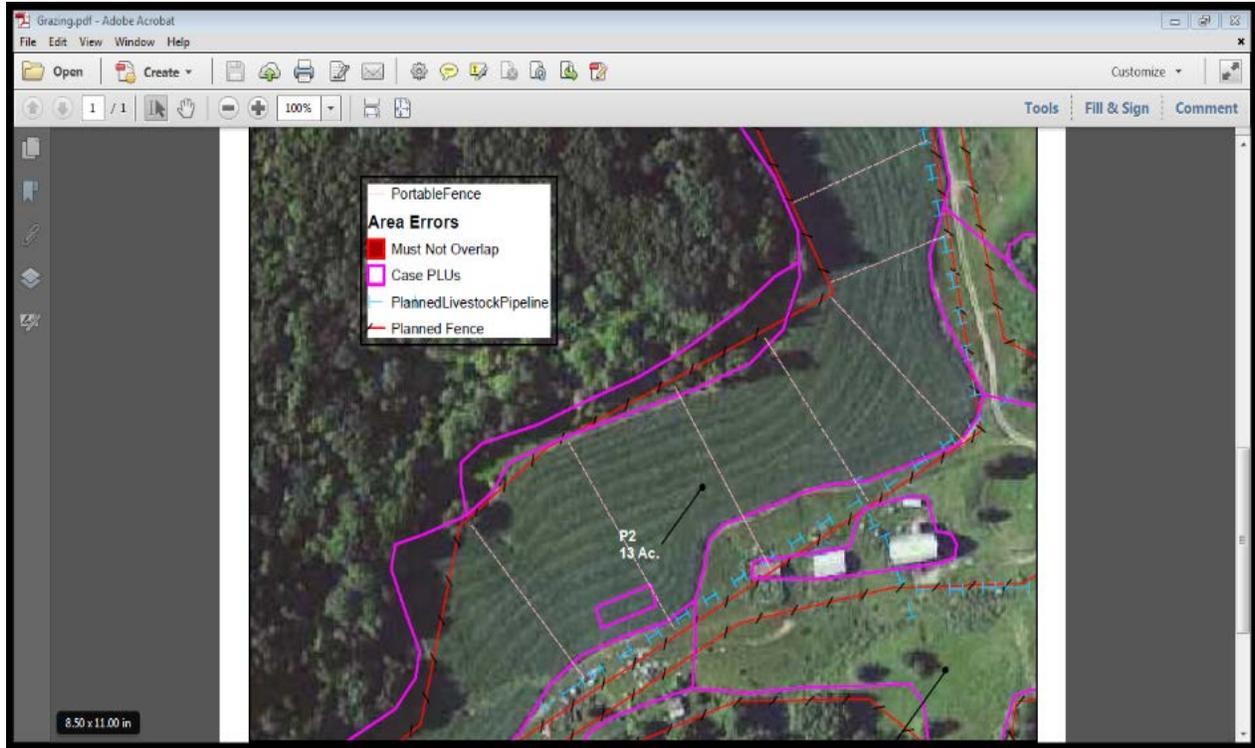


Figure 1

Figure 1 above shows one possible layout of the portable electric fences. Layouts can be varied based on site conditions. Forage density, the standing available forage per unit of height, usually expressed in pounds of dry matter per inch of height depends on precipitation and temperature. Differences in forage density require adjustments in paddock size.

Compared to other kinds of Prescribed Grazing, forages in a HSDG may require more time to recover between grazing events because one of the desired conditions will be to allow the forages to reach physiological maturing between events. Start by deferring grazing and allowing forages to reach the early head stage on 10% of grazing lands. During the first year of adaptation select the lowest productive grazing lands.

If none of the forages are tall enough to graze as outlined in Table 1, a sacrifice area will be selected to contain the animals, mechanically harvested feed will sustain them there until the forages have regrown enough to be grazed.

OPERATIONS AND MAINTENANCE: Monitoring Progress Toward Objectives

Monitoring items will be determined by the initial objectives identified during the resource inventory and other objectives discovered during the implementation of the plan. The following monitoring document gives a minimum framework for monitoring.

Table 3. Monitoring Framework (See Appendix 1 for a blank form)

Management Unit	Unit Objectives	Date Monitored	Notes
1	Improve species diversity, Improve pasture production, reduce invasive weeds	7/2/16	This was last grazed on 5/25 at a stocking density of 100K pounds per acre. It has recovered so that much of it is in the boot stage. There was a lot of damage near the watering tank location that has not recovered.

Livestock body condition and gut fill will be monitored daily to determine if they are being allocated the proper amount of pasture. Note that some kinds and classes of livestock may not be suitable for HSDG depending on the performance goals of the operator. High producing dairy cows and other kinds and classes of animals with high nutrient needs may not be suited to this technique.

Monitor forage species composition with one of the following methods: the pasture condition scoresheet, line intercept method, or five minute plant census.

During the first year of adopting HSDG, the specific details of the moves will be recorded.

HSDG Documentation:

Table 4 Documentation of HSDG (See Appendix 2 for a blank form)

Mgt. Unit/acres	Total Wt. Livestock	Date In/Out	# of Subdivisions	Est. Stocking Density	Stage of Maturity	Est. % Defoliation
1/25	75000	6-12/6-15	25	75000#/ac*	Early Head	50
2/15	75000	6-15/6-17	12	60000/ac**	Early Head	50

*75000#/(25ac/25subdivisions) = 75000#/acre

**75000#/15ac/12 subdivisions) =60000#/acre

Photo Documentation

For each management unit one series of photos will be taken of the forage before the livestock enter, while the livestock are in it, and after the livestock leave. Photos will be date stamped. Example below.



Figure 2: 140000 pounds/acre stock density

Adaptive Management

HSDG requires continuous observation and adjustment of stocking densities, timing and duration of grazing and rest, and the sizing of paddocks based on animal response to forages, climatic conditions, forage utilization and trampling, forage production, and observed trends in forage species composition in each management unit.

Criteria for Strip Grazing

Forage Management

Forages should be grazed when they are in the vegetative or early head stage. For cool season introduced grass species this will usually be from 8-12" tall. See Table 1 for details. Forage quality will be sufficient to meet the needs of the livestock and production goals of the operator. If new forages will be seeded, they must be adapted to the soil types present and be productive, palatable and nutritious enough to meet the production and maintenance needs of the livestock.

Manage to achieve a 50% forage utilization rate with a minimum residual stubble height of 4" in grazed areas. **Size paddocks to achieve the forage utilization rate and stubble height within a maximum of two days.**

Identify Stock Density Goals

See the discussion of stock density in the Criteria for HSDG above. Strip grazing usually uses lower stock densities than HSDG but may on occasion use higher stock densities to achieve a resource management objective. Following are some typical stock densities used while strip grazing a herd with 75000 pounds of live

weight. The assumed standing available forage is 2400 pounds per acre. Assumed residual forage after grazing is 1200 pounds per acre

Table 5 Strip Grazing Stock Densities

Stock Density	Paddock Size	Days/move
10000#/acre	7.5 acre	3
15000#/acre	5 acre	2
30000#/acre	2.5	1
60000#/acre	1.25	0.5



Figure 3: Dairy Cattle Using a Strip Grazing System

Animal Trails and Walkways

Dairy grazing systems may require a constructed animal trail to minimize soil erosion and other resource concerns created when livestock regularly travel back to the milking facility. Plans will be developed to show the location, construction methods and estimated quantities of materials used.

Method/Implementation

Strip grazing requires daily observation of plant defoliation by grazing livestock, record keeping of plant species composition, plant yield, animal body condition, milk production(if applicable), and observation of animal behavior to achieve the manager's animal performance and plant community composition goals. It requires the ability to use portable fencing and watering systems to modify animal impact to adapt to changing climatic and other site conditions.

The manager will subdivide the pasture into management units to achieve the desired stock density. In the Figure 1 in the HSDG section see how the larger permanently fenced paddock is subdivided into smaller units to increase stock density and animal impact. Animals will be moved to parts of the pasture that are tall enough to graze. If none of the pasture is ready to graze (see Table 1 for details), then animals will be moved to a sacrifice area and fed mechanically harvested feeds until the key species are tall enough to graze.

Considerations

Training Animals to Portable Fencing

Animals must undergo a training process before starting high density stock grazing because without prior training to electric fence, they won't respect portable electric fences. Polywire is a twine-like material that consists of interwoven strands of wire and plastic fibers. High metal content polywire carries charge farther because it has less electrical resistance. The animals' first experience with polywire needs to be "memorable" so that they respect it. The training fence needs to have a minimum 5000 volts. Short sections of polywire hooked up to a properly grounded and functional low impedance fencer located just inside a permanent barrier fence in a corral or other secure area or short sections perpendicular to a barrier fence seem to work well for training. To entice the animals to get their noses close to the fence, some have coated the polywire with a sticky and palatable substance such as molasses, honey, or peanut butter. Another method of training livestock to respect a fence is to feed grain just underneath the fence so that they can come in contact with it.

Once trained, the animals need to become accustomed to moving through subdivided pastures. Over a period of two weeks they can be acclimated to moving through shorter grazing cycles starting with moves once each two days followed by daily moves. Once trained, more frequent moves with higher stocking densities can be accomplished. It is important to closely observe the first few days with multiple moves per day. Remove any animals that are not able to adapt to the system and break out because they can cause the whole herd to break out and defeat the training. This doesn't happen too frequently especially if the manager is careful to give the animals enough forage to keep them full and contented.

Slowly increase stocking densities until the target stocking density is reached. Evaluate the condition of the pasture after grazing to determine if higher or lower stocking densities will be required to achieve the desired level of forage utilization, trampling and manure deposition.

Some producers have used common electric fence wire to subdivide pastures for HSDG, especially with larger herds and paddock sizes. The advantage to using common electric fence is that it conducts charge much better than polywire. The disadvantages of common electric fence is that it is harder to handle, slower to put up and take down, and not as visible. Some producers put up flagging to make it more visible.

Intensive Grazing Management Plan

Client:	Date:	Planner:
County:	Location:	Contract #:

Plan Objectives

Is this a high density stock grazing plan or a strip grazing plan? List other objectives here as identified by the client.

Inventory Resources

Attach livestock inventory, forage inventory, and predicted forage consumption and water consumption from the grazing plan to this document.

Forage Balance

Attach livestock monthly forage balance sheet.

Maps

Attach aerial photo with planned fences, water sources, sensitive features and soils.

Sensitive Features

Describe the sensitive features (riparian areas, sinkholes, threatened and endangered species, steep areas, droughty soils, etc.) Locate them on the plan map and describe how they will be managed.

Table 6: Stock Density Goals

Stock Density	Paddock Size	Moves per day

Monitoring Data (See Appendix 1)

Management Unit	Unit Objectives	Date Monitored	Notes

Additional monitoring data entry forms in Appendix 1 will be provided to client. Documentation necessary for certification of practice.

Intensive Grazing Management Documentation (See Appendix 2)

Mgt. Unit/acres	Total Wt. Livestock	Date In/Out	# of Subdivisions	Est. Stocking Density	Stage of Maturity	Est. % Defoliation

Additional grazing management documentation forms in Appendix 2 will be provided to the client. Documentation necessary for certification of practice.

Strip Grazing Documentation (See Appendix 3)

Stock Density	Paddock Size	Days/move

Additional grazing management documentation forms in Appendix 3 will be provided to the client. Documentation necessary for certification of practice.

Practice Specifications Approval and Completion Certification

NRCS Review Only

DESIGN INSTALLATION AND LAYOUT APPROVAL:

Designed By:	Date:	Job Approval Authority (JAA):
Approved By:	Date:	Job Approval Authority (JAA):

LANDOWNER/OPERATOR ACKNOWLEDGES:

- They have received a copy of the specifications and understand the contents including the scope and location of the practice.
- They have obtained all necessary permits and/or rights in advance of practice application, and will comply with all ordinances and laws pertaining to the application of this practice.
- No changes will be made in the installation of the job without prior concurrence of the NRCS.
- Maintenance of the installed work is necessary for proper performance during the life of the practice.
The practice life is _____.

I have reviewed all specifications and agree to install as specified:

Landowner/operator name (type or print):		
Landowner/operator Signature:		Date:

RECORD OF COMPLETION AND CHECK OUT CERTIFICATION:

Treated Acres:	Date Completed by Client:	Date Certified:	Approver's Initials:

CERTIFICATION STATEMENT:

I certify that implementation of this conservation practice is complete, meets criteria for the stated purpose(s), and meets the NRCS conservation practice standard and specifications.

NRCS Signature:	Date:	Job Approval Authority (JAA):
Notes:		

References

Adaptive High Density Stock Grazing; Williams, Allan R.; The Pasture Project, Wallace Center at Winrock International 2015

Grazing Systems Planning Guide; Blanchet, Kevin; Moechnig, Howard; DeJong-Hughes, Jodie; University of Minnesota Extension; 2003

