

APPENDIX A

Prescribed Grazing Monitoring

Grazing land monitoring is the orderly collection, analysis, and interpretation of resource information which can be used to make both short- and long-term management decisions. Monitoring provides the information needed to determine if current management is moving the resource toward or away from the desired condition and/or goal.

The following tables and diagrams provide information useful for determining utilization levels on key species and recommended leaf lengths for initiating and ending grazing periods. Instructions on the establishment of photo point monitoring are also included. Many other monitoring techniques are available. Each technique varies as to the type of information collected, intensity of data collection, and amount of time required to collect the data. For information on other monitoring techniques, contact the area or state rangeland management specialist.

TABLE 1. Percent Weight Removed as a Relationship to Percent Height Removed

Species	10	20	30	40	50	55	60	65	70	75	80	85	90	95
Big Bluestem	2	6	11	17	23	30	35	41	46	54	62	71	79	89
Blue Grama	2	4	6	9	13	15	17	20	25	28	35	42	53	75
Buffalograss	2	5	7	11	18	21	32	35	38	45	53	62	71	77
Crested Wheatgrass	2	4	7	11	18	24	29	33	38	44	53	60	68	83
Green Needlegrass	2	4	6	11	16	20	25	30	36	44	52	61	71	85
Kentucky Bluegrass	1	3	5	9	14	16	20	26	34	40	47	57	71	85
Little Bluestem	1	4	9	15	23	27	32	37	41	47	53	61	70	82
Needleandthread	1	2	4	6	10	12	15	19	24	29	36	46	56	73
Wetland Sedge	2	5	9	13	18	21	26	31	39	46	54	62	73	86
Prairie Junegrass	2	4	6	9	13	16	18	21	25	30	35	42	55	69
Prairie Sandreed	2	6	11	17	23	30	35	41	46	54	62	71	79	89
Prairie Threeawn	2	6	11	17	26	30	36	42	46	53	61	70	78	89
Sandberg Bluegrass	1	2	4	8	11	14	16	19	24	30	37	46	56	75
Sand Dropseed	1	3	5	8	12	17	21	25	30	35	46	56	68	83
Sideoats Grama	1	3	5	9	14	18	23	27	32	39	47	56	66	80
Slender Wheatgrass	2	6	9	12	17	21	27	31	36	42	51	59	69	80
Smooth Bromegrass	3	6	11	15	19	27	32	37	45	52	58	63	82	92
Switchgrass	2	5	9	13	20	26	30	36	42	50	59	58	76	89
Upland Sedge	2	4	6	10	15	17	21	27	34	41	48	59	73	86
Western Wheatgrass	2	6	11	17	26	32	37	44	50	58	66	74	82	91

To use this table, first calculate the percent of the height of the plant removed by grazing. Find this figure on the top line of the table and then follow that column down to the appropriate species. This figure represents an **estimate** of the percent of the weight removed.

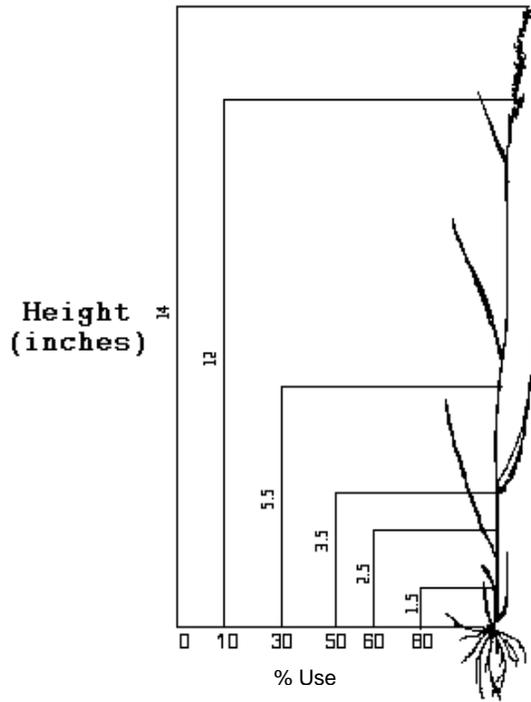


Figure 1. Western wheatgrass.¹

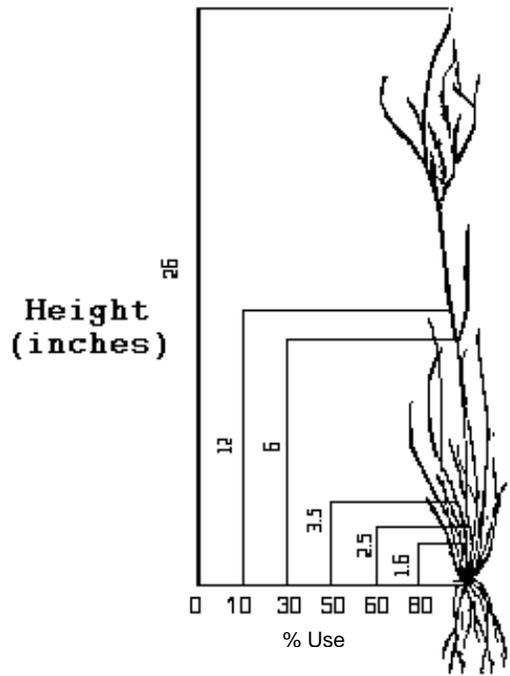


Figure 2. Needle-and-thread.¹

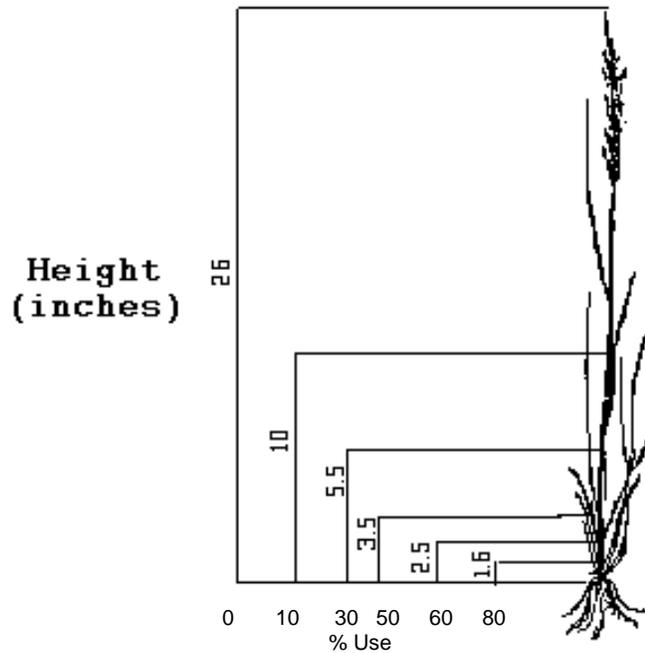


Figure 3. Green needlegrass.¹

¹ "Monitoring Montana Rangeland". Montana State University Extension Service. 1999.

TABLE 2. Minimum Heights of Pasture Species for Initiating and Terminating Grazing

Species	Begin Grazing		End Grazing	
	Minimum & Optimum Height of Vegetative Growth in Inches	Approximate Date	Minimum Stubble Height in Inches	Minimum Regrowth Before Killing Frost in Inches
Alfalfa	6 – 10	May 15	3	8
Biennial sweetclover	6 – 10	May 1	2	-
Big & Sand bluestem	8 – 14	July 1	6	6
Creeping foxtail	8 – 10	May 7	3	6
Crested wheatgrass	4 – 6	April 20	3	4
Green needlegrass	6 – 8	May 15	3	5
Indiangrass	8 – 14	July 1	6	6
Intermediate wheatgrass	8 – 14	May 15	4	6
Kentucky bluegrass	4 – 6	May 7	2	4
Little bluestem	4 – 6	July 1	3	4
Orchardgrass	6 – 10	May 15	4	6
Pubescent wheatgrass	8 – 14	May 15	4	6
Prairie sandreed	8 – 14	June 20	4	6
Reed canarygrass	8 – 8	May 7	4	6
Russian wildrye	4 – 4	May 7	3	4
Sideoats grama	4 – 6	June 20	2	4
Slender wheatgrass	6 – 12	May 7	3	6
Smooth brome	8 – 14	May 7	4	6
Switchgrass	12 – 20	June 20	8	10
Tall wheatgrass	8 – 14	May 7	4	6
Timothy	6 – 10	June 1	3	5
Western wheatgrass	6 – 10	May 15	4	5

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.

PERMANENT PHOTO-POINT MONITORING ¹

Repeated photographs taken at permanent locations are an effective and efficient method for long-term monitoring. When using this method, it is important to: 1) use similar techniques, 2) identify the date and location within the picture, 3) take the picture during the same stage of plant growth, 4) include the same skyline in the landscape picture, and 5) carefully relocate the photo points each time. It is also important to maintain consistency in camera type (lens size), film, timing, and associated documentation.

Repeated landscape scale photographs can provide basic documentation of range trend. Landscape photos should be taken from the same designated point at approximately the same time of year. Photographs that include a distinctive landmark in the background or on the horizon are easier to relocate. It is very difficult to locate previously established photo points without a portion of the horizon in the photograph. Previous photographs (or photocopies) can also be helpful in "framing" the photo consistently from year to year.

Equipment:

- Baseline Information Form and Photo Point Transect form.
- Two, six foot folding carpenter rulers or other suitable device to provide a reference scale.
- A metal or plastic stake, approximately 24 inches in length, for marking the photo point.
- Camera (digital or 35mm with print film) and Photo Information Sheet.

Procedure:

- Establish the photo point, install a permanent marker stake. Stake should be driven into the soil to a depth at which it can be located but will not attract animals, injure an animal or puncture a tire. If available, record GPS coordinates to assist in re-location of the point.
- Complete the Baseline Information Form for the site.
- Using the two carpenters rulers, create a 3 ft. x 3 ft. square frame and lay it next to the marking stake or within a few feet of the stake (if the area adjacent to the stake has been disturbed by livestock) in the direction you will be taking the landscape photo. Standing over the frame, take a photograph looking down at the framed section. Try to avoid casting a shadow across the frame when taking this photo.
- From behind the stake, take a landscape photograph towards a re-locatable bearing point **(This photo is illustrated on the following page).**
- Use the **Photo Information Sheet** in all photographs, if possible. **You will have a total of 2 photos per point.**

Notes:

- **A single photograph** from a permanently marked site (fence post, rock, etc.) of a stream crossing, gully, headcut or other impacted site can be very effective in demonstrating resource recovery or the need to modify current management.
- Finding the location of an old photograph (scenery, fishing trip with a stream in the background, etc.) and retaking it can provide good information on past use and trend of a site.

Things to remember

- Take photos of the plot and of the general view.
- If retaking photos, try to match the plot frame size used previously.
- If the photo plot is difficult to locate use a witness post. Make sure the photo plot is at least 20 feet away from the post. For all photo points consistently document the photo plot location with respect to the witness post.
- Include the Photo Information Sheet in the photo. Colored paper works best as white is too bright. Photo information sheets need to be large enough to be legible in the photo.
- The photo should usually be taken from the north side of the plot to avoid casting a shadow into the photo.
- Photos should be repeated annually, at the same time of the growing season.



Sample of a general landscape monitoring photo

¹ *“Wyoming Rangeland Monitoring Guide”*. August 2001.

Photo Information Sheet

(example)

Transect ID: #1 Date: 9-30-03 Observer: Joe

Pasture name or number: Pasture #6

Period(s) of use: 5/21 to 5/31; 8/10 to 8/21; _____ to _____

Photo point location: SWNE 10-129-38

GPS coordinates: GPS-UTM 5191148 N. 627345 E.

Direction photo was taken: Southeast

Photo subject: General landscape

Purpose of photo: prescribed grazing documentation for 2003

Photo Information Sheet

Transect ID: _____ Date: _____ Observer: _____

Pasture name or number: _____

Period(s) of use: _____ to _____; _____ to _____; _____ to _____

Photo point location: _____

GPS coordinates: _____

Direction photo was taken: _____

Photo subject: _____

Purpose of photo: _____

Sample photo information sheet

Pasture Name:

Transect ID:

Observer:

Date:
