The Weight-Estimate Method at Work in Southeastern Oregon

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The weight estimate method (Pechanec and Pickford, 1937) has become increasingly used in surveys of range lands of the public domain. This article presents the general principles of the sampling method and a brief evaluation of its application in a sagebrush-grass type in southeastern Oregon.

The objectives of the weight-estimate method as used in conjunction with range surveys might be summarized as: to check the condition and production of the range and to obtain information to aid in its improvement and restoration, if necessary. To accomplish these purposes, the weight-estimate method requires that clipping of usable range forage be done periodically to enable the observer to check original estimates of plant weights.

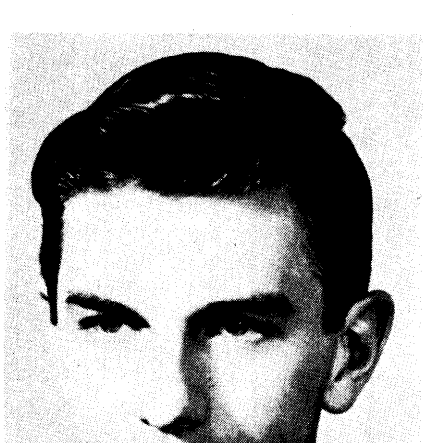
Area Described

The area evaluated by the weight-estimate method consisted of private and public range in a tract extending from Vale, Oregon, to Rome, Oregon, and from the Owyhee River on the west to the Idaho state line. The area was characterized by rolling hills and mountainous terrain with some steep-walled canyons. Vegetation consisted of black sage (*Artemisia nova*), big sagebrush (*A. tridentata*), and mountain mahogany (*Cercocarpus ledifolius*) with an understory of grass. Sandberg bluegrass (*Poa secunda*) was common on poor condition range and bluebunch wheatgrass (*Agropyron spicatum*) predominated on the better private lands and the inaccessible lands within the public domain.

Equipment and Method

The equipment used by our field crew of four members included the following items: clipping shears, spring scales calibrated to 10 gram intervals, binoculars, a staff compass to run ground control, pedometers, and circular steel hoops having a radius of 1.75 feet. The shears and scale were carried in a leather holster attached directly to the range surveyor's belt. The circular hoop provided a sample plot with an area of 9.6 square feet, thus enabling the sampler to convert the weight of forage in grams/plot directly to pounds/acre by multiplying by ten. Clippings were used to check estimated samples on a few plots run weekly by all members of the crew and for daily individual estimates.

Samples were taken along transect lines in major vegetational types at intervals of 0.1 mile between plots. These sample areas were located on aerial photos and plotted, together with topographic and cultural features. The number of plots per section averaged fifteen with a minimum of ten. Personal bias in plot location was avoided as far as possible except that the range-surveyor was allowed to set his course within a particular type to secure a representative sample.



Each member of the party used the initial of his surname followed by his transect number to identify succeeding transects. If H. C. Jones ran his twelfth transect of the unit within a certain type, it would be designated as the following: J-12. Every fifth plot was designated on the aerial photos, also the last plot of each transect. The aerial photos used in conjunction with the survey method furnished rapid ground control.

In the office the data from all transects in a particular type were compiled and the grazing capacity determined from them. Computations were based upon the air-dry weight samples (usually 100 grams for easy computation) collected at the same time each Friday at sites similar in regard to available moisture, exposure, and topography to those where the plants had been found during the week. These samples were weighed two weeks later to determine percent of dry weight in the fresh material.

After multiplying the total pounds/acre of each species by its appropriate percent dry weight, the product was multiplied by the proper use factor for that species (Table 1). The product of pounds of usable forage/acre was finally divided into 800, representing the pounds of dry forage needed in this area to support one animal for one month. The final number thus obtained was acres/animal unit month.

To aid in future range improvement plans for the area particular attention was called to present range condition, water and availability, poisonous plants, topography, vigor of major species and

Table 1. Example of computations used in determining forage production (18 plots) in a sagebrush-grass type in southeastern Oregon.

Species	Green wt.	Dry wt.		Proper use factor	Usable forage
	lbs./acre	%	lbs./acre		lbs./acre
Poa secunda	3,500	.71	2,485	.20	497
Bromus tectorum	850	.44	374	.20	95
Sitanion hystrix	550	.45	248	.40	99
Agropyron spicatum	450	.47	212	.50	106
Festuca idahoensis	950	.52	494	.40	198
Annuals	650	.42	273	.10	27
Lupinus spp.	500	.35	175	.10	18
Artemisia tridentata	13,200	.50	6,625	.10	663
Purshia tridentata	500	.45	225	.20	45
	21,200				1,726

1,726 lbs. usable forage ÷ 18 plots = 95.9 lbs./acre usable forage.
800 lbs. forage per A.U.M. ÷ 95.9 lbs'/acre usable forage = 8.3 acres per A.U.M.

biotic influences. These items were recorded on the back of the transect sheets together with a description of the location of the area.

Advantages and Disadvantages

Among the difficulties the field crew encountered while using the weight-estimate method were the following:

1. The characteristic spreading growth of big sage sometimes made it difficult to place our sample hoops near the ground surface.
2. The hoops were awkward to carry in brush areas and in rough topography.
3. Small variable vegetational areas, particularly areas containing big sage in drainages, were difficult to separate as types or sub-types.
4. Species of this sagebrush-grass type on the lower elevations dried up early in the season sometimes rendering identification difficult.
5. Browse and perennial forbs, especially balsam-root (*Balsamorhiza sagittata*), varied considerably in weight throughout the season and from one site to another. Grasses and annual forbs, however, were more easily estimated with accuracy.

In support of the method used, we found that the weight-estimate method was easy to learn and to apply in the field. The A.U.M. units obtained from the computations are based on actual production and provide an easy "language" to talk to the cattlemen concerning range problems. The greatest value, however, is the ability to check and periodically revise weight estimates.

In conclusion, the weight-estimate method is rapid and indicative of available forage production. Although some difficulties were encountered, the method was satisfactorily employed in a sagebrush-grass type area in southeastern Oregon.

The author wishes to acknowledge the helpful review of this paper by Dr. E. W. Tisdale, Head, Department of Range Management, University of Idaho, Moscow, Idaho.

LITERATURE CITED

PECHANEC, J. F. AND G. D. PICKFORD. 1937. A weight-estimate method for the determination of range or pasture production. Jour. Amer. Soc. Agron. 29(11): 894-904.

DO RANGE STUDENTS NEED AN HONORARY FRATERNITY?

Range management is rapidly becoming a major course of study, particularly in western colleges. Administratively, range management may be offered in a department of agronomy, animal husbandry, botany or forestry. As a consequence, range students are initiated into Alpha Zeta, Beta Beta Beta, Xi Sigma Pi or other honorary fraternities, depending upon the major interest of the department of instruction.

The American Society of Range Management is evidence of the gain in prestige by our profession. This expanding influence of range management should increase the number of students taking formal training in range. An increase in range student enrollment is likely to result in the formation of local range management honor societies, particularly as training in range ascends to departmental level in more schools. Established honorary fraternities are commended for accepting range students as members, but don't you range students feel we should register a brand for our own honor society? — *Wayne G. McCully, Department of Range and Forestry, Texas A. & M. College, College Station, Texas.*