THE CARIBOO METHOD FOR EVALUATION BROWSE RANGES

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Moose are an important natural resource in central British Columbia. Anyone familiar with this area in the falls knows that the annual invasion of hunters into the Cariboo, Chilcotin, and neighbouring areas involves many individuals adding many dollars to the local economy. Ranchers and townsmen alike recognize moose as an economic asset to their districts. This has been clearly demonstrated by recent widespread interest in changing game laws concerning moose.

Like most resources, the moose resource has its conflicts with other interests. These conflicts have been given recognition but little penetrating investigation. No corrective action has been undertaken on a significant scale. The problem results from conflicting opinions on the relative values of cattle range, moose range, and pine forest in the central and southern Interior. The situation is complicated by forest slowly invading once open ranges as a natural process aided by modern fire prevention activities. Deterioration of range, for both moose and cattle, is a result of this forest succession.

Evaluation of the moose range problem, and its variation in different areas, requires a standard method of range survey. No such standard has been used in the past. This report attempts to define the information needed from surveys, and proposes a suitable survey method. This proposal is preliminary, for improvement is invited from others possessing a different background of experience in such work.

The Need

Most survey methods used on browse ranges in British Columbia have put emphasis upon the degree of browse use on an annual basis. In their various forms, these methods seek to determine the percentage of browse used on winter ranges. Thus, a range found 80 percent browsed in spring 1955 is a range in which 80 percent of the total twig length produced in the 1954 growing season was removed during the winter 1954-55. This method may also be used without percentages, but with more general descriptive terms, such as “heavy”, “moderate”, etc.

This approach is inadequate for the problem at hand. It gives no data beyond a snapshot picture of browse use expressed in a relative manner, which is incapable of defining range quality or trends in range dynamics. It does, however, give an idea of the intensity of browse use and, if repeated at intervals, can indicate trends in the degree of browse use. By doing so, it has an important place in management techniques. But it cannot indicate range excellence, trends in range excellence, or reasons for range excellence. This can be a serious omission.

Use of browse surveys in the field has had another fault. Everyone, including ourselves, whom we have observed using this approach has a tendency to class browse plants which receive light use in the past browsing season but which are nearly dead from previous heavy use, as heavily used. Resulting data gathered with hybrid objective has limited value.

The range survey method presented here is designed to evaluate excellence and trends in excellence. It deals with range condition rather than with degree of browse use. By doing so, it aims directly at evaluating moose range. These evaluations are necessary information for any moose problem that goes beyond, on an annual basis, balancing hunting regulations with the severity of range use. Currently used browse surveys provide for this specific need, but only when they adhere rigidly to evaluating current browse.

The Method

This method was devised specifically for evaluating upland willow on moose winter range. It may or may not be useful for other browse plants, or, with modification, for other species of browsing mammals.

The basis of this method is that willow is usually the main component of moose range in British Columbia. Where other browse species seem important, this or another method must be used for each other species.

The data recorded is simply (1) plant form, and (2) the dynamics of that form, for each plant in the sample.

Plant form: three forms are recognized:

1. basal: low; below 3 feet; twigs originating at or near ground; usually below snow-line.
2. shrub: twigs originating 3 - 4 feet from ground
3. tree: twigs originating over 9’ from ground

These forms will grade into one another. The height limits are arbitrary here, and must be chosen to suit conditions on particular ranges. Note that shrub form is the main contributor of available browse.

Plant dynamics: this term is ponderous but descriptive. Here again there are three categories:

I. Retrogressive: degenerating from present form
II. Static: present form being maintained
III. Progressive: progressing from present form

Note that the attribute Plant Dynamics is the result of two variables: (1) the vigour with which the plant is attempting to change form as a natural life process, and (2) the operation of forces opposing this attempt to change. This opposition may be apparent, as from browsing, or obscure and reflected merely in low plant vigour.

Plant abundance: In sampling range, successive nearest bushes should be classified, and the distances between them determined by pacing.

Results

Sampling methods are not discussed here. Many procedures area applicable.

For each range unit sampled, then, there will be an expression of will spacing, presumably expressed as an average distance in fee with standard deviation. Spacing is obviously a factor in range excellence.

Each plant in the sample will be given one of nice (3 x 3) categories. Some plants may appear to be in more than one category, as in a plant part "tree" and part "bush" because of breakage by moose. Such plants may, for purposes of survey, be two plants. In a sense they are two plants. It may also be of value to tally such plants so that dual form is evident from the raw data (see Figure 2). The fact that a plant is 3 I/1 III (tree retrogressing, basal progressing) maybe of use in evaluating range dynamics. It may also be useful to denote dead plant form by means of a circle (③/1 III) for such evidence is essential in evaluating range trends. These refinements are not essential. Their use depends upon the final data required.

Data may be recorded in the field as 2: III (form 2 or shrub; dynamics III or progressing, in this case towards tree form).

Final presentation of data may be most convenient in a nine-compartment box:

Figure I

Form

	1	2	3		
I	2	10	2	- 14	average

Dynamics						distance
	II	5	5	10	- 20	between bushes
	III	10	2	50	- 62	is 15' +/- 3'
		17	17	62		

A hypothetical frequency record has been put in Figure 1. Note that 1:III and 2:I; and 2:III and 3:I are pairs indicating opposite trend and tend to cancel one another with respect to dynamics trends.

Analysis of data for this hypothetical range indicates that most willows have passed into tree form, with almost 65 percent in this form class. Future prospects are no brighter. There is little retrogression from tree form. Some basal form plants are progressing to shrub, but equal numbers of shrubs are retrogressing. The range has passed its maximum production 65 percent; only 18 percent of plants are at maximum as shrubs. The only dynamics of importance is the continuing growth of trees. From the standpoint of moose, conditions are now remaining static. Abundance of bushes is above average.

Discussion

Analysis of date is limited only by our knowledge of what form and dynamics mean.

In some cases, it will be desirable to record in the field those factors responsible for trends or dynamics observed. Code letters may be given to those factors, such as:
D: normal undisturbed development
M: moose browsing
F: fire
C: competition or plant succession
L: logging
H: horse browsing, etc.
Thus, I L is retrogression due to logging, while III L is progression induced by logging, as from removing competition.

Data may be gathered as shown in Figure 2 and summarized as in Figure 3. In theory, the field tally sheet could become confusingly complicated, but in practice it will usually be found that few causative factors influence any one range sample, at least to the extent that they have an influence severe enough to be recognized quickly. And it is those factors important enough to be rapidly recognized which will be of concern.

It is evident from Figure 2 that the method here outlined provide a flexible but rapid means of collecting data. This figure also shows that the data is in a form to be readily analyzed from a number of aspects.

The average distance between bushes may be left as a linear figure, or converted to number of bushes per acre or square mile. If measurements give an average interval between bushes - D. then the area of land per bush is 22/7 x D/2. This needs a field check. Simple calculation will give a figure in bushes per unit area. Perhaps we should accept a standard requirement of “bushes per acres”. It would be an easy step to calculate “available bushes per acre”, which with the addition of form and dynamics data, will give a comprehensive picture of range.

This, then, is the proposed method. The unit for appraisal is the plant. Recorded are (1) form, (2) dynamics, (3) reason for dynamics, and (4) spacing. The method should be rapid in the field. Possibilities an analysis are broad. The only real weakness possible is inaccuracy in “reasons for dynamics” when assessed by inexperienced or misguided personnel. But this is the aspect of the method which gives reasons for the picture recorded by the other three assessments. While reasons are important and sometime essential information, the sole purpose of obtaining the picture may, in some cases, be the only information desired.

Techniques under study, using aerial photographs, may eventually serve to calculate the areas of range samples.

This paper does two things. It points out a need, then attempts to fill the need. Improvement of the latter may be necessary after thorough field trials anticipated for 1956. Ideas are invited.

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Figure 2

Figure 3