



Monitoring Woody Vegetation

Introduction

Monitoring the canopy cover of woody vegetation will enable the land manager to determine if the amount and extent of influence of brush is increasing or decreasing, providing information to assess if management objectives are being met. Recording the age class of each plant encountered will provide a measure of the overall “health” of the brush stand. A mixture of seedlings, young and mature plants, with few or no decadent plants, indicates a healthy, reproducing stand. Form class, based on availability and hedging, indicates past use and value of the stand for browsing animals, both of which are often important in evaluating management objectives.

The Line Intercept Method

In the line intercept method described by Canfield (1941) a tape is stretched between two points. Linear measurements are taken of all plants intercepted by a vertical plane running through the tape. The line has one dimension, length. Basal or canopy intercept measurements can be made. The technique is most suitable for measuring cover of shrubs and trees in mountain meadows, chaparral, and hardwood rangeland.

The procedure involves establishing a randomly located transect through a representative part of the range site. Transects are usually 100 feet to 200 feet long. Sampling begins at the zero end of the tape stretched along the transect line. The observer measures canopy from the right side or **downhill** side of the tape. The horizontal linear length of the plant intercepts along the line are recorded in inches

by species. For shrubs and trees, measure the vertical projection of the foliar cover intercepting the tape.

The percent cover of each **plant** species is calculated by totaling the intercept measurements for all individuals of that species along the transect line and converting this total to a percentage by dividing by the total length of the line. Total cover measured on the transect is calculated by adding the cover percentages of all the species. This total could exceed 100 percent if the intercepts of overlapping canopies are recorded. With this method, relative species composition is based on the percent cover of the various species. Relative composition is calculated by dividing the percent cover for each species by the total cover of all plant species.

Extensions of the method involving additional measurements include sampling the degree of grazing use and the forage production. In addition, woody shrubs intercepted along the line can be classified by age and form class. Oak trees intercepted can be measured for volume and rated for mast production.

Drawbacks to the line intercept method are the lengthy amount of time required to conduct sampling; the difficulty in stretching a tape between two points in tall, dense vegetation; and measuring dense stands of single-stem herbaceous species.

The line intercept method is an acceptable technique for monitoring the effects of grazing prescriptions, prescribed burns, and wildlife

habitat projects over time. The method can be used in large and small areas, and can be readily extended to include additional monitoring information for evaluation. A sample data sheet is provided at the end of this report.

Age and form classification

At the same time the line intercept method is being conducted, the age and form classification can be used to evaluate present condition by age structure, availability of browse, degree of past browsing pressure, and abundance of dead plants. The age of browse plants are classified as seedlings, young plants, mature plants, or decadent plants. Factors used to determine the age of browse include size, growth rings, branching, and bark. Simply recording the age and form class of each plant encountered will provide this valuable information.

The age classes of browse plants are characterized as follows:

Seedling. A very young plant, it has become firmly established and yet obviously is a new comer. It is usually distinguished by its relative size, simple branching, and succulent bark.

Young plant. Larger than a seedling with more complex branching and more fibrous bark, it does not show signs of maturity, such as rounding crowns.

Mature plant. Indicated by complex branching, rounded growth form, larger size, heavier and often gnarled stems, and a crown made up of three-quarters of more living wood.

Decadent plant. This shrub or tree is dying from age or other factors. Crown shows one-quarter or more dead wood.

Form classes of browse include a composite rating of both availability of forage and degree of hedging resulting from cropping. When shrubs are not browsed or are only lightly browsed, they will assume their natural growth form or shape. As intensity of browsing increases, the departure from normal shape becomes more striking. Continued heavy browsing year after year results in closely hedged or highlined and dead or partly dead browse plants.

Degree of hedging is classed into (1) little or no hedging, (2) moderately hedged, and (3) heavily hedged. Hedging, a product of past use, should not be confused with current use. The data sheet on the following page includes age and form class recording.

Aerial Photos

Use of aerial photos is another popular means of assessing canopy cover of woody vegetation. By utilizing methodology similar to line intercept or dot grids, canopy cover of brush species present may be estimated. Advantages include the ability to evaluate large areas quickly and, through the use of old photos, to evaluate the stand as it existed in the past. Disadvantages of using aerial photos include the increased chance of identifying species incorrectly, errors caused by camera angle or distortion, difficulty in seeing and identifying small plants such as seedlings, and inability to assess age and form class of plants present.

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