METHOD OF MEASURING VEGETATION AND SOIL CONDITIONS ON LINE TRANSECTS

Harvey Valley Experimental Range

1. Laying out the line transect

A 100-foot long line transect is laid out between two guide points as follows:

(a) Drive a 5-foot steel fence post with spade up 2 feet into the ground. This is the guide post of the line.

(b) Determine orientation of the line.

(c) At 25 feet from head post drive a stake (5/8 inch x 1 foot reinforcing rod) to within 1 inch of the soil surface. This marks the beginning of line transect.

(d) At 24.6 feet and 59.6 feet drive similar stakes marking control corners of two 24-inch square quadrats.

(e) At 100.6 feet drive end stake of transect.

(f) At 125.0 drive 5-foot steel fence post 2 feet into the ground, spade down.

This is the line transect tail end guide post.

2. Colors of posts and stakes

   Head guide post including spade -- orange

   Tail guide post -- yellow

   Line stakes -- orange top

   Transect number is stencilled in black on head guide post spade

3. Quadrats on line

   Lay a frame (24 inches square metal frame) on the line at the 24.6 foot and 59.6 foot stake so the quadrat lies to the right and toward the head end of the transect when viewed from the head end of the transect.

   Set 8 stakes in addition to one already on the line to mark two quadrats A and B (see diagram following).
4. Diagram of transect layout

(X) : : : : : : : :
A B C D E F

A = Head line transect guide post
B = Beginning transect stake (25 feet from A) and 4'6"x6'0" quadrat
C = Quadrat A control-corner stake (24.6 feet from B) and 24-inch square quadrat
D = Quadrat B control-corner stake (59.6 feet from B) and 24-inch square quadrat
E = End transect stake (100.5 feet from B)
F = Tail end transect guide post (25 feet from E)

Lay out the third quadrat (4'6"x6'0") astride the line at the head end of the transect as follows:

Set stakes at right angles and on both sides of the transect line 2 feet, 3 inches out from the line at the beginning line stake and out from a point 6 feet along the line from the beginning line stake.

5. Orientation of the line

In order to obtain the vertical photos of the 24-inch quadrats from a height of 6 feet and avoid having the shadows of the tripod legs cross the quadrat, orient the transect line so as to have the sun rays cross the line at right angles. Record the date and time of day of establishment of each transect to permit repeat photos to be taken under the same conditions. The 24-inch quadrat photos are thus taken facing the sun with the head end of the transect located to the left. The shadows in the oblique photos along the line fall at right angles to the direction the photos are taken.

6. Photographs

(a) Quadrats A and B
Vertical from 6 feet

(b) Quadrat 4'6"x6'0" at head end of transect
Slight oblique from height of 11 feet. Camera on line between A and E about 22 feet from A

(c) Long oblique of line transect
Taken from position in (b) above to take in foreground between points B and C and the rest of the line to F and beyond
Vegetation and soil measurements

(See Form CFRES-257 and article, "Getting Better Records of Vegetation Changes with the Line Interception Method", by A. L. Horsay)

Vegetation and soil measurements are made at foot intervals along the line transect starting at the 1 foot mark and ending on the 100 foot mark.

At each point an estimate is made of the percentage area within a 2-inch square frame covered by vegetation and soil criteria. The basis for judging the area covered by individual plant species is outlined in the article cited above. The area influenced by the average bud in a plant crown must be set up for each species by sites. This permits determining the limits of the edges of plant crowns and what can be considered crown area. Thus the normal area influenced by an average bud on Festuca idahoensis may be 1/8-inch square, Carex spp. 1/4-inch square, and Hyethia mollis 1-inch square. The sum of the percentages obtained for plant species and soil criteria should add up to 100.

All seedlings of desirable forage species in the first year of growth found within the frame are counted by species. The species for which seedlings are counted are determined ahead of time on each transect. They usually are limited to the important grasses but may cover sedges, rushes, forbs, and shrubs.

Some standard definitions that will be applicable in all records follow:

(a) A hole in the crown of a shrub is an area 4 square inches or larger. A hole that permits the recording frame to drop through.

(b) Soil - rock particles (and organic matter) less than 1/8 inch in diameter.

(c) Erosion pavement - rock particles 1/8 inch to 2 inches in diameter.

(d) Rock - rock fragments 2 inches and larger in diameter.

(e) Litter - all dead plant residue lying on the soil surface whether detached from the living plant or not but can still be recognized as a plant tissue. All animal products.
Area and percent equivalents in 2-inch square frame

<table>
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<th>Size of area</th>
<th>Percent of 2-inch square frame</th>
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<tr>
<td>1/8&quot; square</td>
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8. Where measurements are taken

Looking along the transect from the head and all measurements are made on the left side of the line. One side of the measuring frame is held parallel and along side of a vertical plane through the transect line.

9. What is measured

Vegetation

The most important (abundant) perennial species; live and dead portions separately.

Percent density values covering portions of live plants that are not available to grazing are enclosed in a circle.

Annual plants, perennial seedlings and unimportant established perennials are lumped into one estimate under the heading "others."

Soil

Estimates are made separately for erosion, pavement, rock, soil and litter.

Supplementary notes are made of the depth and extent of erosion and the location of seedlings on and about the transect.