TECHNICAL NOTES

A Modified 100-Point Frame for Vegetation Inventory

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Abstract

A modified point frame was developed for vegetation sampling on a short-grass prairie ecosystem in eastern Wyoming. This sampling device facilitates the recording of 100 point hits within a 30 × 60 cm quadrat at a given sampling location. This technique provides quantitative data very sensitive to general ground cover or vegetative changes over time within each quadrat.

Different modifications of the point frame, originally developed by Levy and Madden (1933), have enabled many investigators to use it for their particular situations. Of importance are those modifications made by such authors as Hanson (1934), Tinney et al. (1937), Winkworth (1955), Heady and Rader (1958), Heady and Van Dyne (1963), Long et al. (1972), Shaver and Fisser (1972), and Owensby (1973). These modifications have demonstrated a need for many sample points and the great amount of time often required to obtain adequate sample numbers. This report describes a point frame which has proven helpful in obtaining adequate sample numbers. With steel plot location pins driven into the soil, readings from the same permanent quadrats have been obtained over a number of years (Cox 1977). The frame and pins can be relocated with no more than 2–3 mm change in position. This device has been tested on a short-grass prairie ecosystem in eastern Wyoming where the vegetation basal and foliar cover is readily quantified with point data because of the low strata of most species.

The sampling device is made of two major components, the point frame and the quadrat base. Construction precision is based on standard American machine shop measures. The frame shown in Figure 1 is made from aluminum angle 1″ × 1″ × 1/8″ (2.5cm × 2.5cm × 0.3cm). It is painted aluminum to prevent sum glare (Heady and Rader 1958). The height of the frame is 12 3/4″ (32cm), width 25 3/4″ (65cm), and the lower cross bar is positioned 9″ (23cm) from the top of the frame. Twenty pins of steel welding rods 36″ (91cm) long and 3/32″ (0.2cm) in diameter, sharpened to a needle point with a long bevel, are spaced 7.6″ (3cm) apart in the frame as shown. Brass pipe fittings with 1/8″ (0.3cm) diameter holes are attached through 7/16″ (1.1cm) diameter holes drilled in the crossbar. These fittings, with rubber O rings for tension adjustment, hold the pins in any desired position but allow smooth downward movement for recording data. Removal of these pins is not needed for travel between plots. The pins are easily bent so care is required when using them.

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The quadrat base shown in Figure 2 measures 30 × 60 and 35 × 65 cm for interior and exterior dimensions, respectively. It is also made from aluminum angle. At one end, 5 steel support tubes, 1″ (2.5cm) inside diameter and 2/3″ (6.3cm) long, are installed. A similar number of tubes are installed at the other end, but with a reduced length of 3/4″ (1.9cm). The tubes are placed 6 cm apart with the first one being 3 cm from the inside quadrat corner. A bubble level is attached to a side and an end of the base to ensure a horizontal placement. The base is supported by 4 legs that can be shortened or lengthened, depending upon vegetation height and topographic configuration at each sampling area.

The two steel tube legs of the point frame are 12″ (30cm) long with 26/32″ (2.0cm) outside diameter. They fit inside 2 movable sleeves that are placed into the steel support tubes on the quadrat base. Each sleeve is 8 1/2″ (21.6cm) long. The outside of the lower 2 1/4″ (5.7cm) of the sleeve has been reduced to 31/32″ (2.4cm) diameter for access into the quadrat base support tubes. The upper portion of the sleeve with an outside diameter of 1 1/6″ (2.7cm) has an inside diameter of 27/32″ (2.1cm) to accept the point frame steel tube legs. A set screw is positioned 1″ (2.5cm) from the top of the sleeve to enable positioning the point frame at increased heights. Markings at 1″ (2.5cm) intervals are inscribed on the point frame steel tubes to allow for measurement of point frame heights.

Once sampling location is identified, the point frame is placed into the quadrat (Fig. 3). Each pin is lowered separately and the pin hit recorded. When the 20 pin hits are completed, the frame is moved to the next position on the quadrat base. When all 5 positions have been observed, a total of 100 points have been

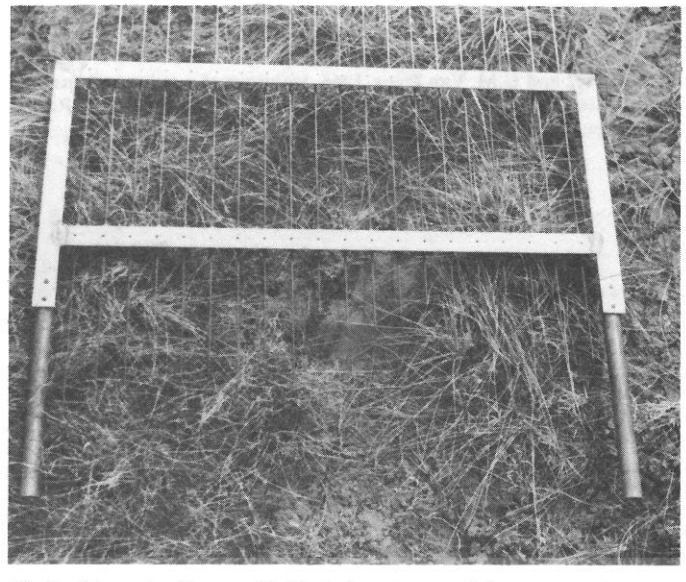

Fig. 1. *The point frame with 20 pin locations and the inner steel tubes.*

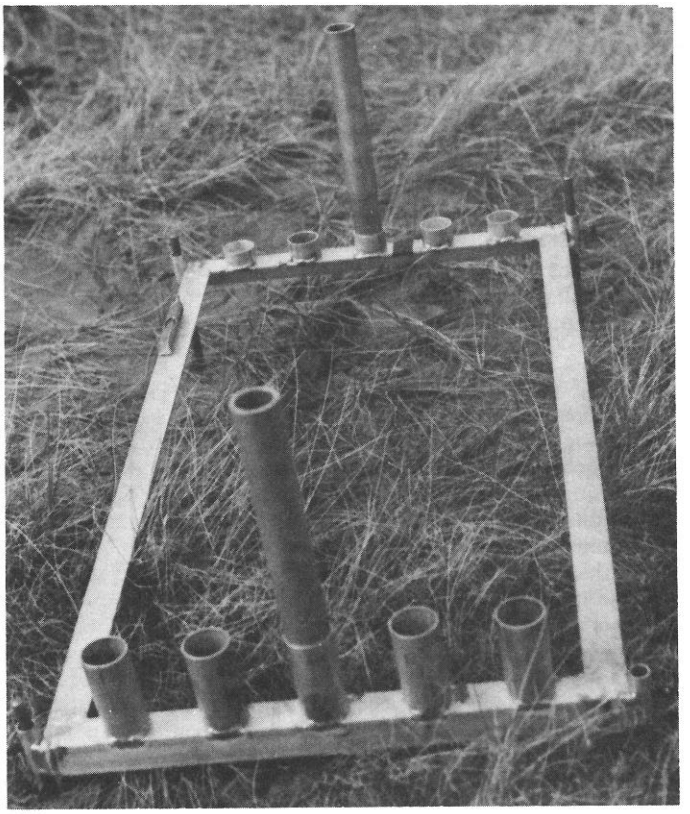

Fig. 2. *The quadrat base with 5 steel support tubes and the 2 movable sleeves.*

recorded from a single 30 × 60 cm quadrat sample. Thus, the technique provides great advantages in obtaining adequate sampling for vegetation in general and enhances in particular, the ability to approach sample adequacy for minor species.

Field experience has demonstrated that the point frame is easily used with two crew members, one to read the pin hits and the other to record the information. Once the field crew were familiar with the technique, they were able to record 7500–8000 points per 8-hour day. Vegetation inventory was conducted on a range-ecosystem that covered 3100 ha and was comprised mainly of rough breaks, level upland sagebrush-grass ephemeral clay lake bottoms, and moist stream channel areas.

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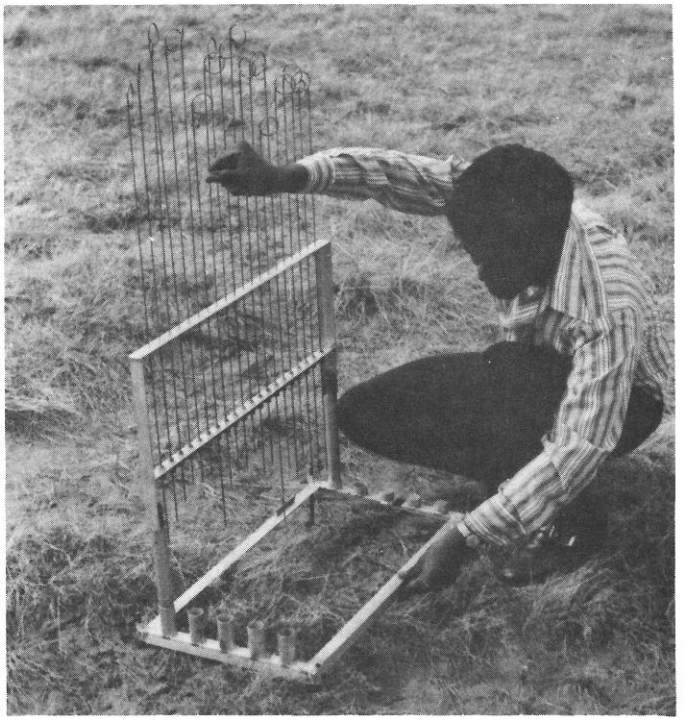

Fig. 3. *Assembled mechanism in position for data recording.*

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