TECHNICAL NOTES

Modified Step-point System for Botanical Composition and Basal Cover Estimates

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Highlight: *Instructions for use and assembly are presented for a modified step-point sampler. Modifications were made to eliminate bias and to increase ease of use.*

Basal-hit, single-point sampling in botanical census has been shown to be effective and efficient (Goodall, 1952). Evans and Love (1957), describing the step-point method of sampling, concluded that the method's accuracy and objectivity made it suitable for valid analysis of field research plots.

Step-point sampling uses a single pin lowered perpendicularly to the soil surface through a notch in the toe of the sampler's boot at a 30° angle to the ground. Basal or foliage hits may be recorded. Nonplant hits are recorded as misses and the species nearest to the point in a forward, 180° arc is recorded. Information is obtained for basal or foliage cover of individual species, their collective total, and for percentage composition. An estimated frequency may be obtained by grouping points.

Subconscious selection of plants that affects pin placement is a serious defect (Cain and Castro, 1959; Goodall, 1952), which random selection of a single pin from a point frame with several pins would alleviate (Goodall, 1952). Using a single pin instead of groups of pins reduces the number of points needed for comparable accuracy (Blackman, 1935; Goodall, 1952; Greig-Smith, 1957). Single pin measurements require one-third as many points as groups of pins do for comparable accuracy (Goodall, 1952), and time required is reduced to one-sixth or one-eighth that required for the point-frame method (Evans and Love, 1957).

The point-frame modification presented here seeks to eliminate subconscious bias in point placement and to make single-point sampling easier.

Point-frame Design

The basic design of the point frame is shown in Figure 1. The sampling point (a) is offset from the initial ground contact (b) to alleviate subconscious placement by the sampler. The distance it is offset varies with the angle the point rod makes with the horizontal. The inset shows the

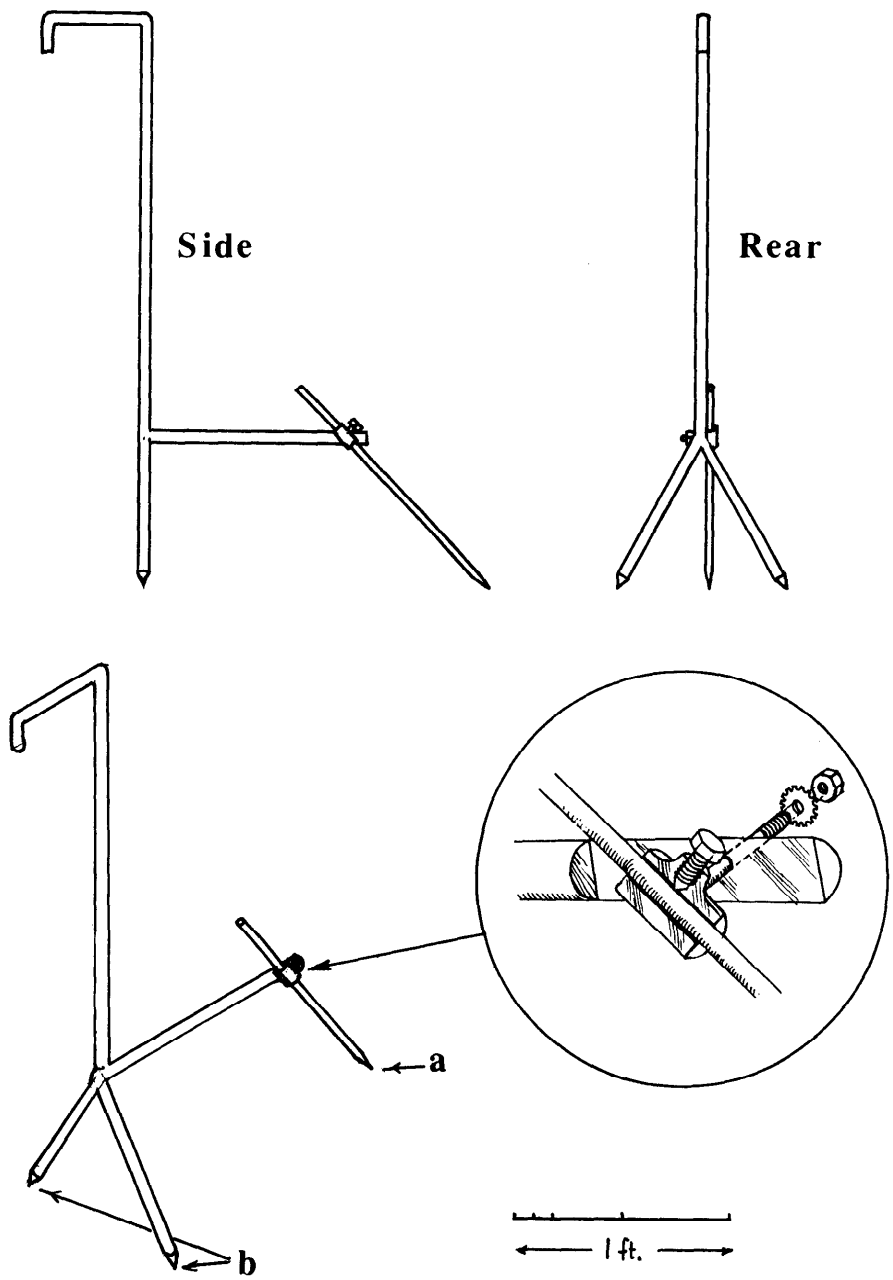

Fig. 1. *Diagram of the modified step-point sampler (a–sample point, b–initial contact points).*

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pivot point mechanism, which adjusts horizontal angle and sample rod length. That enables the sampler to vary sample rod angle and length for sampling different vegetative types. Tinney et al. (1937) indicated better accuracy with an inclined point. Two legs sharpened at the tip (b) are used to eliminate side movement of the sample rod as it moves through the vegetation. Construction is of steel rod or tubular steel with the sample rod being hardened steel with a long-tapered, fine point.

Procedure

The sampler follows a designated line through the plot area. One leg of the point frame is placed at the end of the sampler's boot each time his right (or left) foot hits the ground. The point frame is leaned back towards the sampler on initial ground contact and is leaned forward until point contact is made with a plant crown or bare soil. That enables the sampler to watch its progress much the same as with a point frame. Species recorded are those whose bases are contacted by the point. If no basal hit occurs, the species nearest the point forward (180° arc) is recorded. Basal hit or miss information is also recorded for basal cover estimates. Species and basal cover information are coded by number for ease in computer analysis.

Preliminary use of the device showed it to be easily used with two samplers and a recorder. The two samplers read from opposite feet with one moving while the other was reading the sample point. That permitted the samplers to read 3,000 to 4,000 points per 7-hour day, which covered about 60 acres in the experimental area. Monotony reduced the number taken. To remain alert and avoid inaccurate work, frequent rest breaks are recommended. An average of 2,500 to 3,000 points per day, we think, is realistic.

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