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Evaluation of two non-destructive methods for estimating biomass in a prairie

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ABSTRACT

The estimation of aboveground biomass is important in managing natural resources, like assessing habitat conditions. Direct, destructive measurements by clipping, drying, and weighing plant matter is time consuming and labor intensive. It is of interest to develop non-invasive methods to complement or replace direct vegetation harvest. Two non-invasive methods were evaluated, light penetration and visual obstruction, in the Purdue Wildlife Area prairie. Light penetration in the grassland plots were measured using a Decagon light stick (LP-80), 5cm from the ground and above the plants. Estimation of visual obstruction was done using a Robel pole, which focuses on the height and density of the vegetation. Plots were also clipped to provide direct measurements. The relationship between clipped and estimated biomass was significant for both non-invasive methods. However, visual obstruction had higher correlation ($R^2 = 0.74$) than light penetration ($R^2 = 0.41$). This could provide a basis for future interest in predicting biomass using the Robel pole method as a complement to direct clipping of vegetation. Robel pole is easy and cheap to make, allowing research to track the growth and changes of natural resources throughout the growing season.

KEYWORDS

Non-invasive methods, non-destructive, methods biomass, robel pole, visual obstruction, light penetration, decagon, prairie