Comparison of Ground and Aerial Survey Methods on the Grand River National Grasslands

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Ground-based monitoring methods provide a detailed description of ecological systems, but have only a limited area to which they can be practically applied and thus suffer from inaccuracies due to inadequate sample size and distribution. Because of the extended time required to obtain data on the ground, significant phenological changes will have occurred between the beginning and the end of the field season. Therefore, our objectives were to evaluate digital imagery with resolutions of 1mm used to estimate species composition, canopy and basal cover, structure, and production, and develop correlations to traditional on-the-ground rangeland monitoring techniques. In this study, we used a lightweight aircraft flying at 72 km/h and an altitude of 100 m above ground level to obtain 1,516 images on the Grand River National Grasslands located in northwestern South Dakota. The images were analyzed for canopy composition, bare ground, and litter cover using SamplePoint. On-the-ground macroplots (150 m x 150 m) were located along the flightlines and within dominant ecological sites. Species composition, canopy and basal cover, structure, production measurements and range health evaluations were completed for each macroplot. The aerial data were collected from 17 to 23 July 2007; the ground data were collected from 19 June to 23 August 2007. A model for linear regression analysis in SAS will use ground measurements as the dependent variable and aerial image measurements as the independent variable to determine an adjusted R^2 and assess the agreement between aerial and ground methods.

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