From Satellite Data to Ground Level: An Evaluation of Skogsmonitor's Reliability in Identifying High Conservation Value Bryophyte Flora

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The conservation of biodiversity in forests is a major challenge globally. Efficient methods for identifying high biodiversity forests are needed to preserve threatened species. This study evaluated how effectively the digital tool called "Skogsmonitor", which uses satellite data and algorithms to identify forests with high conservation values, locates forests with a rich bryophyte flora. Field studies were conducted across four areas in Karlstad, Sweden. Within each area, three sites were studied: 1) production forest, 2) confirmed key habitat and 3) potential continuity forest identified by Skogsmonitor. The study focused on bryophytes, particularly threatened and indicator species, growing on deciduous trees, boulders and dead wood. The results showed that areas identified by Skogsmonitor generally hosted a higher richness of bryophytes compared to production forests. Although the Mann-Whitney U-test showed no statistical significance ($p = 0,057$ for bryophytes on dead wood and $p = 0,14$ for bryophytes overall), possibly attributed to the low sample size ($n=4$), a strong biological trend was observed. The threatened liverwort Fuscocephaloziopsis affinis classified as Vulnerable (VU) in the Swedish National Red List 2020, was found in three out of four Skogsmonitor sites. The biodiversity in the Skogsmonitor areas was often similar to the confirmed key habitats. The conclusion is that Skogsmonitor appears to serve as a reliable coarse filter and an effective tool for prioritizing field inventories to locate forests with a rich bryophyte flora. While more sites are needed to fully validate these trends, implementing similar, cost-effective technology could help the global effort to preserve forest biodiversity.

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