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## Detection of Habitat Heterogeneity Changes Using Laser Scanning Data Targeting Birds

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Research dealing with three-dimensional structural data of forests or vegetation is increasing. LiDAR-based research to detect biodiversity (LaRue et al. 2019) is growing, through using structural data such as analyzing heterogeneity, distribution, and height in forest structures (Matsuo et al. 2021) or identifying rugosity (Gough et al. 2020). For example, the technology to detect canopy structures is linked with the GEDI technology, leading to structural diversity mapping on a wide scale and further to  $\beta$ -diversity. (Schneider et al. 2020) Meanwhile, most connectivity studies so far have been conducted on two-dimensional surfaces, and resistance value-based studies on species data, topography and vegetation structure, and habitat quality have been performed. In this study, we try to detect changes in the space distribution pattern of species due to anthropogenic intervention through lidar-based 3D structural data. Through structural heterogeneity, the connectivity at the landscape level is analyzed, and for this purpose, it can be compared with the traditional diversity evaluation method through a verification process based on species data. By detecting the impact on species in advance in the impact assessment stage, this study intends to present a methodology that can function as a forestry and conservation decision-making support tool in combination with ICT-based monitoring technology.