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Vegetation patterns in natural and cultural landscapes

Abstract books

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Bacaro G.

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Effects of spatial scales and vegetation types on Observer bias: practical implications for long term monitoring programs

Session: Habitat monitoring and conservation assessment

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Global changes mainly due to habitat fragmentation and climate variation, are rapidly influencing terrestrial and aquatic ecosystems. Long-term monitoring programs based on periodic reliefs represent important tools to understand ecosystem changes in time and in space. Under this perspective, it is crucial to understand the amount of variation in species inventories due to the observer: in long-term monitoring programs, it is often impossible to maintain the same teams of observers over the years and this variation through years can result in a major impact on the data quality and consistency; biased data can result into changes in time due to systematic differences among observers instead of true variations. Non-sampling errors (both within and between observer) can be classified in: 1) overlooking errors, when a species is not recorded when it is present; 2) misidentification errors, occurring when the species is not correctly identified; 3) estimation errors, when species abundances are not accurately estimated. This work aims to: i) investigate the role of observer subjectivity in sampling vegetation in forest monitoring plots in relation to different parameters such as vegetation complexity, observer expertise and the spatial scale of observation and ii) suggest ideas to reduce the observer bias for reliable and repeatable monitoring programs over long periods. We analyzed the observers' influence on vegetation records using data collected in six forest areas in Tuscany (Central Italy): 10 nested multi-scale plots (three plot measures: 1 m², 10 m² and 100 m²) were sampled in spring/summer 2009 by three different teams of botanists

with different level of knowledge of the vegetation in the areas. We analyzed the observers' influence on vegetation data using different analytic methods such as comparisons among field notebooks and permutation analysis of variance (PERMANOVA). We observed that most of the divergence in species records are related with different characteristics of the sampled area, therefore ecologically and structurally complex sites increase observer bias due to the difficulty in species detection. Furthermore, we highlighted the importance of training for new observers to level off their experience with the other more-trained members of the monitoring team.