The role of detectability on bird population trend estimates in an open farmland landscape

Monitoring programs are key to determine bird population trends and to assess environmental policies, and therefore are central to conservation biology. The European approach commonly used to estimate bird population trends (TRends and Indices for Monitoring data, hereafter TRIM) has proved useful to fulfil this task, yet it fails to account for imperfect detection and assumes constant detectability across years. We tested the role of detectability for population trend estimation in an open Mediterranean farmland context, which is a dynamic landscape likely to undergo yearly changes in detectability, by using data of 30 bird species over a nine-year study period. We evaluated species-specific population trends under the TRIM approach and hierarchical distance sampling models (hereafter HDS) that estimate true abundance by accounting for imperfect detection. When comparing both methods, 13 species presented differences in population trend estimates between TRIM and HDS models. Moreover, detectability was not constant across the bird community: observer and year affected detection, and these effects varied among species. Our study highlights the importance of accounting for imperfect detection in bird monitoring programs to ensure reliable trend estimates, providing a first insight for an open farmland bird community. Aside from trend estimates, our HDS model may prove useful as a tool to obtain site-specific abundance estimates (for instance, within Special Protection Areas) and trend probabilities of bird populations.