

THE ROLE OF BIRDS AS INDICATORS OF SUSTAINABLE MANAGEMENT IN OLIVE ORCHARDS OF CENTRAL GREECE

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Birds are considered good indicators of wider ecosystem health and therefore have the potential to serve as indicators of good farming practices. This study aimed at determining the differences in breeding bird species richness, density and alpha diversity indices (Shannon-Wiener, Fisher's alpha and evenness index) among olive orchards managed with different methods (organic, conventional and abandoned) and maquis. Also, it was examined which of the following variables: Heteroptera, Hymenoptera, Hemiptera, Coleoptera and Isopoda densities, woody plant density and cover, altitude, slope and manure, pesticide, inorganic fertilizer N and K application, would be best correlated with breeding bird species richness in the above farming systems. The bird, arthropod and woody plant surveys were carried out using the point count, pitfall trap and sampling plot methods respectively. The data revealed significantly higher values of breeding bird species richness ($F=9.96$, $P<0.001$), density ($F=8.81$, $P<0.001$), diversity and evenness ($P<0.05$) in the organic and abandoned olive groves and maquis than in the conventional ones. According to Principal Component Analysis, breeding bird species richness was positively correlated with manure application in the organic olive groves and Heteroptera, Hymenoptera, Hemiptera, Coleoptera and Isopoda densities, and woody plant density and cover in the organic olive groves and maquis, whereas it was negatively correlated with the pesticide and inorganic fertilizer application in the conventional ones. These results suggest a difference in bird communities as a result of different management schemes, and thus birds might serve as indicators of overall olive orchard health.