Chapter 6
Case Study 2. Birds as Indicators of HNV: Case Study in Portuguese Cork Oak *Montados*

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Abstract

- Country: Portugal
- Years of study: 2011–2012
- Dominant environment in study area: cork oak *montados*
- Ecoregion: Mediterranean (South and North)
- Climate: temperate
- Target indicator: ecological bird guilds based on habitat preference
- Main statistical tools: mixed models, information theoretical approach, data dredging
- Some useful R packages: MuMIn [1] and nlme [2]

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Case Summary Study No. 2

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Montados form a heterogeneous landscape of wooded matrix dominated by cork and/or holm oak with open areas characterized by fuzzy boundaries [3]. *Montados* support high biological diversity associated with low-intensity management and landscape diversity provided by a continuous gradient of land cover [4–7]. Among other features this permits the classification of *montados* as a High Nature Value (HNV) system. We assessed the role of birds as HNV indicators for *montados* and tested several bird groups—farmland, edge, forest generalist and forest specialist species; and some universal indicators such as species conservation status, the Shannon diversity index and species richness [8–10]. Our study areas covered the North–South distribution of cork oak in Portugal, and we surveyed breeding bird communities across 117 sampling sites. In addition to variables related to management and sanitary status, we considered variables that characterize the landscape heterogeneity within the *montados*—trees and shrub density and richness of woody vegetation. Our results suggest that specific bird guilds can be used as HNV indicators of particular typologies of *montado*, and highlight the need to develop an indicator that could be transversally applied to all types of *montado*.

6.1 Methodology

6.1.1 Study Area

We sampled four areas covering the main distribution range of cork oak in Portugal (Fig. 6.1): the site of community importance (SCI) of Romeu (hereafter referred to as Romeu) with several private owners (7° 1′ to 7° 6′ W and 41° 33′ to 41° 28′ N), Companhia das Lezírias S.A. (Lezírias), a public ownership farm (8° 48′ W and 38° 50′ N), SCI Serra de Monfurado (Monfurado) (7° 40′ to 8° 16′ W and 38° 27′ to 38° 41′ N) and Serra de Grândola (Grândola) (8° 34′ to 8° 38′ W and 38° 9′ to 38° 8′ N), both with several private owners. These areas reflect the most common typologies of *montados*—half of the national distribution of cork oak has a tree coverage between 10% and 30%, a quarter between 30% and 50% and a quarter superior to 50% [11]. Our sampling sites represent these three categories in a similar