

Foraging habitat requirements of European Turtle Dove *Streptopelia turtur* in a Mediterranean forest landscape

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Abstract. Land use changes occurring in Europe in recent decades are generating important changes in the forest landscape characteristics and are having important effects on avian species richness and abundance. This is particularly important for some bird species of particular conservation concern that require heterogenous landscapes where breeding habitats are proximal to foraging habitats. Among these birds, the European Turtle Dove *Streptopelia turtur* is particularly important because of its marked population decline. In southern Europe, forest landscapes have been considered important breeding areas for Turtle Doves. We assessed the influence of the foraging area characteristics — distance to cereal crops and wild seed species abundance — and water availability on Turtle Dove breeding habitat suitability in a Mediterranean forest landscape in southern Spain. Forty-six point locations were surveyed during the spring of 2014 and 2015 on two nearby farms of a forest protected area. The average local abundance of Turtle Doves found at each point location was 1.25 ± 1.31 males, and it was significantly higher at the point locations closest to cereal crops, as well as at nesting sites where the wild seed species included in its local diet were abundant, especially *Echium plantagineum*. Distance to water in the studied range (average distance 475 m) did not show a significant effect on Turtle Dove local abundance, although the high availability of water in the study area could have a positive influence on the overall Turtle Dove breeding habitat suitability. To benefit Turtle Dove breeding habitat suitability, cultivated areas with cereals/legumes near those forest areas where Turtle Doves reproduce should be promoted. Likewise, the promotion of those herbaceous species that are locally important in the Turtle Dove diet, available, for example, through specific grazing management, should be taken into account when nesting habitat restoration is designed in forest areas, regardless of whether the distances to food resources are long.

Key words: Trans-Saharan migrants, forest management, granivorous birds, grazing management, habitat restoration, weed seeds, *Echium plantagineum*

INTRODUCTION

Land use changes that have occurred in Europe in recent decades are generating important changes in forest landscape characteristics (Rudel et al. 2005, Cervera et al. 2016) and are having important effects on avian species richness and abundance (Donald et al. 1998, Gil-Tena et al. 2009). Overall, European forest landscapes are becoming more homogeneous (MacDonald et al. 2000), in part, because traditional management practices are being abandoned for more intensive forms of farming and agriculture (García-Ruiz et al. 1996, Poyatos et al. 2003). This is especially important for some bird species of particular conservation concern that require heterogenous landscapes where the breeding habitats are in close proximity

to the foraging habitats (Burfield & van Bommel 2004, Barbaro et al. 2008). In some cases, most of the food is taken outside the strict nesting habitat (McCollin 1998), and species need to find vital resources in the landscape mosaic to complete their breeding cycle successfully (Dunning et al. 1992).

The European Turtle Dove *Streptopelia turtur* has suffered a strong decline in Europe over the last few decades (Voříšek et al. 2010, BirdLife International 2016), mainly due to changes in the features of their foraging areas (Browne & Aebischer 2003, Dunn & Morris 2012). Intensive farming has been suggested as the main cause of the foraging habitat loss or degradation affecting farmland birds, including Turtle Dove (Chamberlain et al. 2000, Vickery et al. 2004, Butler