

Distribution and habitat of the Dartford Warbler *Sylvia undata* in the Eastern Tuscany

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Abstract - The distribution of the Dartford Warbler in Eastern Tuscany was investigated visiting all types of potentially inhabited shrubland. The species seems to be rather well distributed in the study area, but only on sufficiently extensive (>5 ha) *Erica scoparia* heathlands. In this habitat it reaches high densities (12.7 singing males/10 ha) in good years, but, after cold spells, the population crashes dramatically. These heathlands are disappearing, so this important part of the species' Tuscan population is vulnerable.

Introduction

The Dartford Warbler is one of the scarcest European *Sylvia* species, having a relatively small range (Campos and Isenmann 1997), in which it occupies a small spectrum of habitats (Bibby and Tubbs 1975; Cody and Walter 1976), thus being generally scarce and localized. Recent European trends show a large decline, owing to habitat loss, and the species is considered vulnerable (Campos 1994), so it is important to define the distribution and habitat of the Italian populations, which form an important part of the global stock of the species (Campos and Isenmann 1997).

The presence of the Dartford Warbler in the Tuscan Apennines was well known in the past (Giglioli 1889). More recent works, on the contrary, have defined the species as absent or very scattered in this area (Lambertini and Meschini 1984; Bricchetti 1985).

Following some sporadic data collected during Atlas work (N. Baccetti pers. comm.), we have investigated the presence, distribution and habitat requirements of the Dartford Warbler population in a large area comprising almost all Eastern Tuscany.

Study area and methods

The study area includes the Thyrranian slope of Eastern Tuscany, around the city of Arezzo. In this area shrubland is well represented. According to dominant species, 5 types are recognizable: i) *Spartium junceum* scrubs; ii) *Cytisus scoparius*

scrubs; iii) *Juniperus communis* and *J. oxycedrus* thickets; iv) Mediterranean scrub (*Arbutus unedo*; *Quercus ilex*); and v) *Erica scoparia* heathlands.

Initially, the survey was conducted in the whole spectrum of shrublands present. In the light of the preliminary results obtained, we focussed only on those heathlands dominated by *Erica scoparia*, having a surface of at least 5 ha (58 sites). From 1987 to 1990 each of these sites was visited at least once during the breeding season (April-June) and once during the winter (December-January). During the 1991 breeding season we revisited 10 sites, attempting to assess the effects of the 1990-1991 cold spell. Six of these control sites were of small extension (5-10 ha); the remaining four were chosen among the widest heathlands (at least 20 ha).

Because the Dartford Warbler has a low detectability (Moore 1983), we used, in all the surveys, play-back recordings (Roché 1991), including calls and typical male song. Play-back stimuli lasted for at least 5 minutes per visit. All visits were conducted in good weather conditions: absence of precipitations, mild temperature and slow wind.

During the 1990 breeding season, we censused the Dartford Warbler singing males in a 7.9 ha heathland, using the mapping method (Williams 1936; IBCC 1969).

The structure and composition of the vegetation was collected in 10 sites, chosen according to elevation and geographical distribution. In these areas, for each woody species the mean height and the percentage of cover (expressed as the projection of the foliage) were estimated.

Results

Fig. 1 indicates the 58 sites in which we found, both in the breeding season and during winter (1987-1990), at least one Dartford Warbler individual. These sites correspond exactly with all the *Erica scoparia* heathlands (>5 ha) known for the study area. The only exception is site 10, a *Ulex europaeus* thicket. Outside these sites we found only three times, between August and December, single Dartford Warbler individuals in other shrubland types.

During the 1991 breeding season, following the 1990/1991 cold spell, the Dartford Warbler was totally absent from the 6 small (5-10 ha) control sites,

whereas it was still present in the wider ones (>20 ha), but apparently with much lower densities in comparison with previous years.

The density in the mapped area (site 5 in Fig. 1), during the 1990 breeding season was of 10 singing males/7.9 ha, corresponding to 12.7 singing males/10 ha. In this site, which was also one of the 1991 small control sites, the Dartford Warbler was completely absent after the cold spell.

Fig. 2 shows the elevation of the 58 sites, expressed as site frequency at different intervals. Tab. 1 plots the foliage covers of the wooden species present in the 10 sample sites (see Fig. 1). Fig. 3 shows the total foliage cover for each vegetation layer, still referring to the same 10 sample sites.

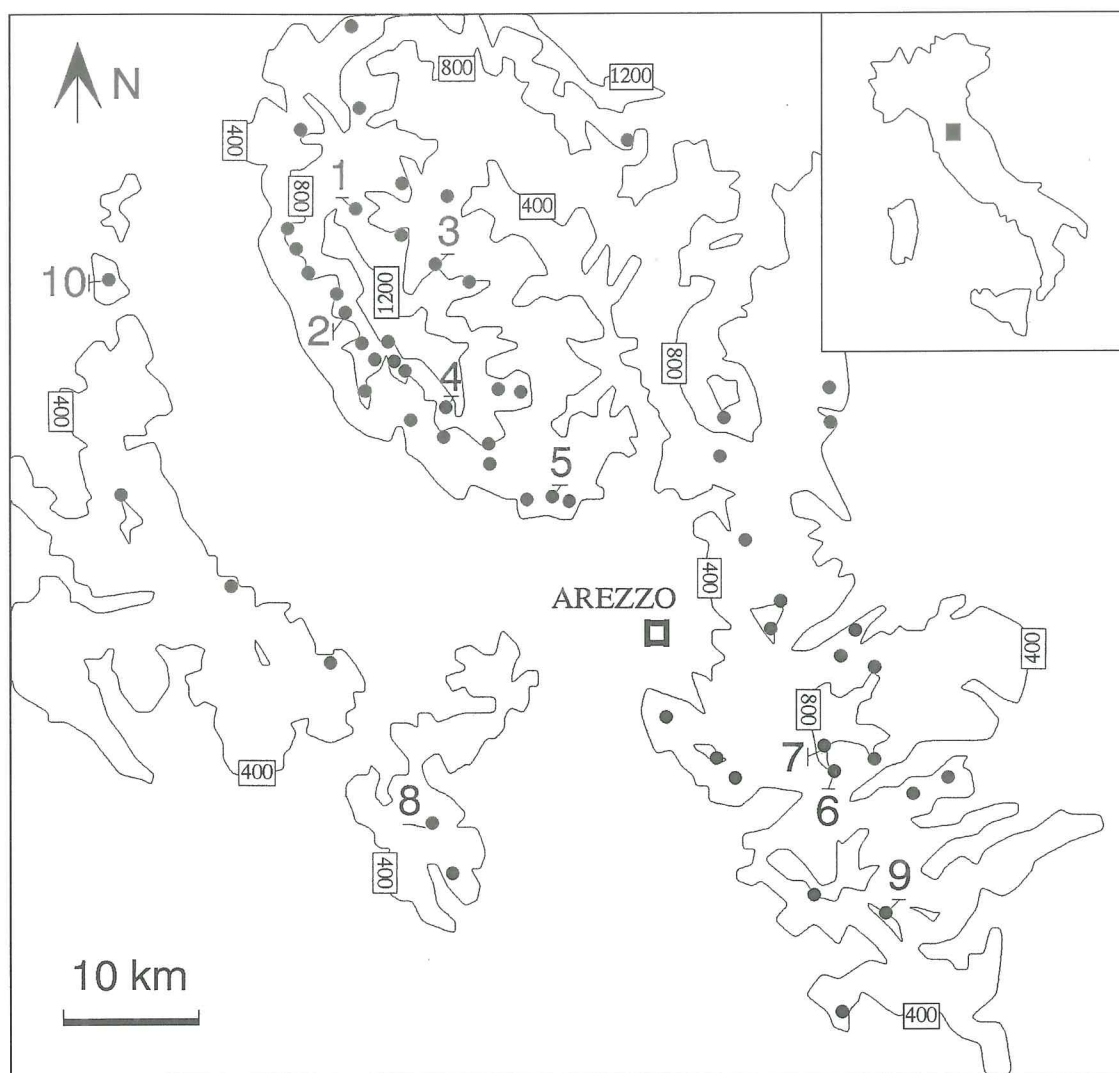


Figure 1. Schematic map of the study area. Black dots show the 58 Dartford Warbler breeding/wintering sites. Numbers (1-10) indicate the sites where vegetation was collected (see Tab. 1). The map shows also the 400, 800 and 1200 m a.s.l. contour lines.

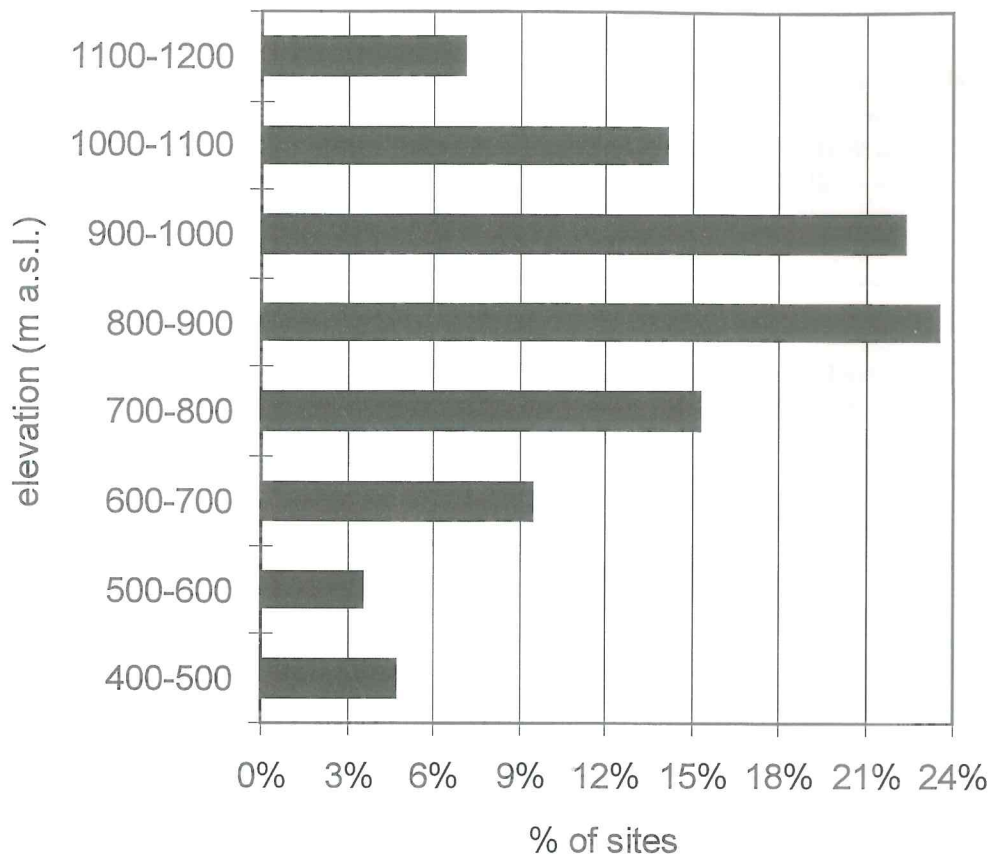


Figure 2. Elevation of the 58 Dartford Warbler sites, expressed as relative frequency.

Table 1. Foliage covers of wooden plant species, as estimated in the 10 sample sites. Exposure and elevation extremes of each site are also indicated.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | mean 1-9 | 10 |
|-----------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------------|-----------|
| <i>Erica scoparia</i> | 85 | 60 | 75 | 75 | 40 | 50 | 80 | 60 | 70 | 66,1 | 3 |
| <i>Cytisus scoparius</i> | 2 | 20 | 5 | 10 | 5 | 10 | 8 | 5 | + | 7,2 | + |
| <i>Spartium junceum</i> | | + | | | 10 | 30 | | 7 | | 5,2 | |
| <i>Erica arborea</i> | | | | | 30 | | | 7 | 5 | 4,7 | + |
| <i>Calluna vulgaris</i> | 8 | 4 | 3 | | | 2 | + | 3 | 9 | 3,2 | |
| <i>Quercus</i> sp. | | | | | 5 | + | + | + | 4 | 1,0 | + |
| <i>Ulex europaeus</i> | | + | | | | | | | | 0,0 | 95 |
| <i>Rubus</i> sp. | | + | 5 | + | + | + | + | + | 2 | 0,8 | + |
| <i>Cistus</i> sp. | | + | | | 5 | | | 2 | | 0,8 | + |
| <i>Juniperus</i> sp. | 1 | | + | + | | + | 2 | | 2 | 0,6 | |
| <i>Crataegus</i> sp. | + | + | 1 | 2 | + | | + | + | 1 | 0,4 | + |
| <i>Rosa</i> sp. | + | + | 1 | | + | + | + | 2 | 1 | 0,4 | + |
| <i>Helichrysum italicum</i> | + | + | 1 | 2 | + | + | | | + | 0,3 | |
| <i>Castanea sativa</i> | + | 1 | 1 | | | | | | | 0,2 | |
| total foliage cover | 96 | 85 | 92 | 89 | 95 | 92 | 90 | 86 | 94 | 91,0 | 98 |
| exposure | SW | SW | S-SW | S-SW | SW | W-SW | W | W-SW | W | | SW-S |
| min elevation | 1000 | 800 | 700 | 900 | 400 | 600 | 750 | 550 | 720 | | 450 |
| max elevation | 1050 | 1100 | 800 | 1150 | 450 | 670 | 900 | 600 | 950 | | 700 |

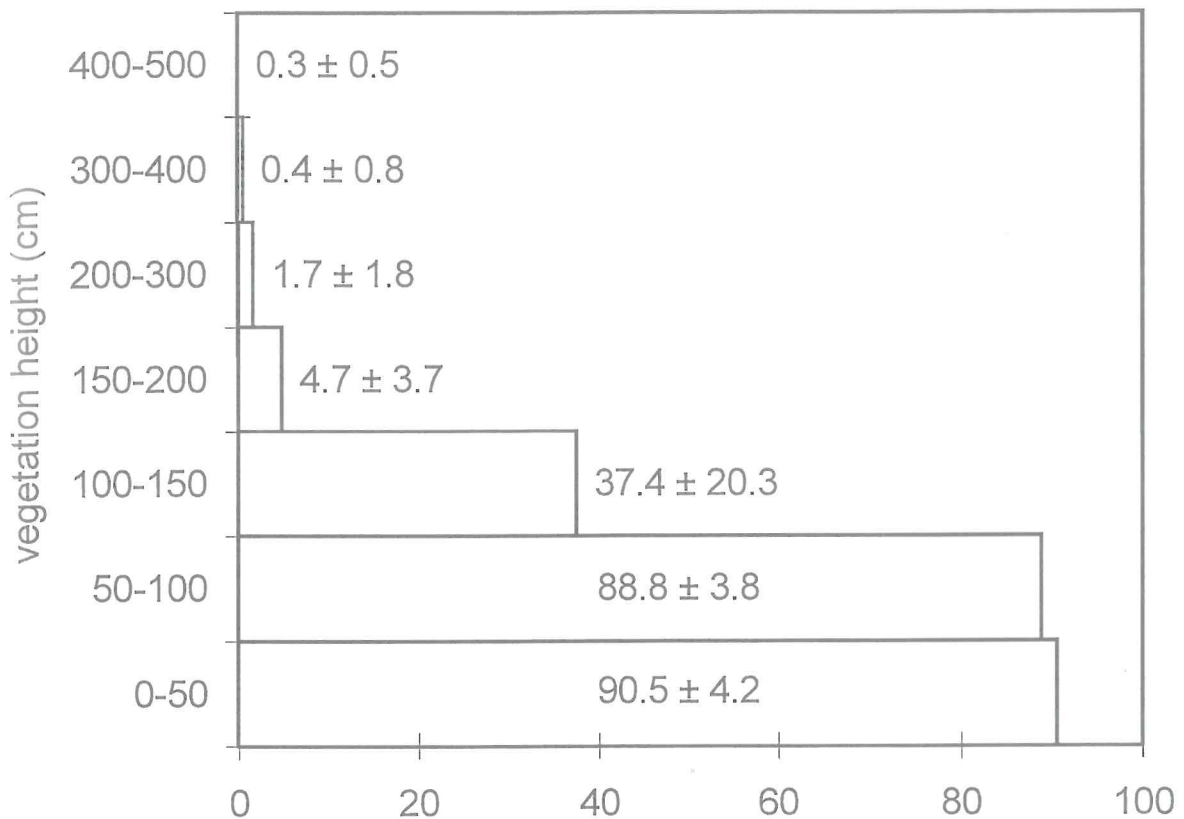


Figure 3. Total foliage cover of wooden plant species at different layers, as estimated in the 10 sample sites (1-10 in Fig. 1). The figures show mean \pm s.d. for each layer.

Discussion

The Dartford Warbler is present and rather well distributed in the study area, confirming historical data (Giglioli 1889; Martorelli 1906). The presence of this 'mountain population', mainly linked with the presence of *Erica scoparia* heathlands, seems to be almost continuous along the Northern Apennines, from Piedmont to Umbria (Silvano 1988; Tellini Florenzano 1997; Velatta 1997).

Dartford Warbler distribution in the study area exactly corresponds with that of the *Erica scoparia*, which are sufficiently extensive (>5 ha). Geographical and elevational distribution of the bird therefore depends only on that of the heathlands, the only exception being a *Ulex europaeus* thicket. Heathlands distribution seems concentrated in mountain slopes facing south or south-west or on tophills of moderate elevation (<1000 m).

In Eastern Tuscany the Dartford Warbler is therefore linked with an Atlantic type vegetation, in which Mediterranean sclerophyllic species are almost absent. Similar vegetations are characteristic of the Atlantic part of the species' range, from Portugal to

England (Constant and Maheo 1970; Bibby and Tubbs 1975). In the southern part of this Atlantic range, the Dartford Warbler is often found even in heathlands with *Erica scoparia* (Boutet and Petit 1987; Matos in Glutz von Blotzheim and Bauer 1991). In other parts of Italy too, the species is also linked with *Erica* dominated vegetation (Tellini 1993).

From a structural point of view, height and foliage cover of the vegetation correspond well with those known for the whole species' range (Bibby and Tubbs 1975; Cody and Walter 1976; Cody 1985). It is worth remarking, however, that shrubs with similar structure but different composition (mainly *Cytisus scoparius* and *Spartium junceum*), also well represented in our study area, completely lack the Dartford Warbler. The species' niche breadth, therefore, is very narrow, being strikingly limited by the composition of the vegetation.

In these heathlands the species' density may reach very high values: our value (12.7 singing males/10 ha) is one of the highest known for the Dartford Warbler (Campos and Isenmann 1997).

These high density values are reached only in 'good' years; after cold spells the population numbers seem

to crash, but the species can recover quickly. For example, also in January 1985 there was a strong cold spell, but in subsequent years the Dartford Warbler population was present in all the suitable sites, as shown by our surveys. Similar strong fluctuations are known for other parts of the species' range, markedly at its extremes (Bibby 1993).

The winter presence of the species seems to demonstrate that an important part of the population is resident. It is however possible that a migratory stock exists, as shown elsewhere (for England see Bibby 1979), comprising the Tyrrhenian islands of Tuscany (Roselli and Sposimo 1994).

Erica scoparia heathlands of Eastern Tuscany are an important bird habitat, not only for the presence of Dartford Warblers (Faralli 1994; Faralli 1995). Nowadays this habitat is vanishing, owing to natural and artificial afforestation, linked with the decline of utilization of heathers for the production of brooms. The Dartford Warbler is therefore included in the Tuscan Red List (Sposimo and Tellini 1995) as a vulnerable species because no protection is accorded to its main inland habitat.

Riassunto - Sulla scorta di informazioni storiche e di alcune sporadiche segnalazioni recenti abbiamo indagato sulla distribuzione e sull'habitat della Magnanina nella Toscana Orientale. Nell'area di studio sono presenti numerose tipologie di arbusteti e macchie. In base ai risultati di alcune indagini preliminari, la ricerca della specie ha riguardato soprattutto le brughiere a *Erica scoparia*. La Magnanina è risultata abbastanza ben diffusa in tutta l'area indagata, però la sua presenza è strettamente legata alle brughiere a *Erica scoparia* sufficientemente estese (> 5ha). In tutte le situazioni di questo tipo la specie è risultata invariabilmente presente, sia come nidificante sia come svernante, mentre è totalmente assente in altri ambienti. In queste brughiere la Magnanina raggiunge, nelle annate migliori, alte densità (12.7 maschi cantori/ha in un'area campione), ma la popolazione crolla drammaticamente a seguito di inverni freddi. Le brughiere a *Erica scoparia*, la cui importanza ornitologica non si limita alla presenza della sola Magnanina, stanno oggi scomparendo, per cui quest'importante parte della popolazione toscana della specie risulta minacciata.

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