

# An avifaunal survey of the Istranca mountains, Turkish Thrace: novel breeding bird records including the first breeding record of Wood Warbler *Phylloscopus sibilatrix* in Turkey

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A breeding bird survey in the Istranca (Yıldız) mountains of Turkish Thrace seawards to the Black sea was conducted May–August 2009. Eighty-eight days of field work in 697 locations generated novel breeding evidence for several species. The survey provided the first certain evidence of Wood Warbler *Phylloscopus sibilatrix* breeding in Turkey. Strong evidence for breeding of Yellowhammer *Emberiza citrinella*, with a relatively widespread distribution, was also gathered. The survey suggested that Green Sandpiper *Tringa ochropus*, which was not considered to be a breeding bird in Turkey, probably breeds in the study area. Moreover, breeding evidence was gathered for Garden Warbler *Sylvia borin*, Baillon's Crake *Porzana pusilla*, Stock Dove *Columba oenas*, Icterine Warbler *Hippolais icterina* and Common Rosefinch *Carpodacus erythrinus* for the first time in Turkish Thrace. Furthermore, the survey provided some breeding evidence for Great Cormorant *Phalacrocorax carbo*, European Shag *P. aristotelis*, Pygmy Cormorant *P. pygmeus*, Garganey *Anas querquedula*, Common Redshank *Tringa totanus*, Alpine Swift *Apus melba*, Eurasian Wryneck *Jynx torquilla*, Red-rumped Swallow *Cecropis daurica*, White-throated Dipper *Cinclus cinclus*, Sardinian Warbler *Sylvia melanocephala*, Barred Warbler *Sylvia nisoria* and Red-breasted Flycatcher *Ficedula parva*, which require further research on their breeding distributions in the study area.

## INTRODUCTION

A number of bird population censuses and atlas studies have been conducted in Turkey (eg Balkız *et al* 2007, Çağlayan *et al* 2005, Per *et al* 2002) though none have covered Turkish Thrace (European Turkey). A few field studies have been conducted in the Istranca (Yıldız) mountains of Turkish Thrace (Kaya *et al* 1999, Yurtsever & Kurtonur 2003), however, they did not use standard sampling procedures and are difficult to replicate or use comparatively. A breeding bird atlas of the Bulgarian part of the Istranca mountains (Strandja mountains) presented an inventory of 146 breeding bird species (Milchev 1994). To reveal breeding bird distribution, abundance and species composition within different habitats in the Istranca mountains, Turkish Thrace, a breeding bird survey was conducted. The survey resulted in novel breeding evidence for several species, which is discussed here in some detail.

## STUDY AREA

The Istranca mountains are located southwest of the Black sea and extend beyond Turkey into Bulgaria. The non-international border of the study area (Figure 1) is mostly the crests of the mountains and includes the highest point at an altitude of 1031 m. The study area is not a homogeneous administrative unit. It is mainly covered by Balkan deciduous forests (Plate 1) dominated by oak (*Quercus* spp) and beech (*Fagus* spp). Nearly all of the forests are managed for timber, and thus the majority of tree stands are homogeneous in age and species composition. The forest cover is fragmented by small openings and agricultural lands. The agriculture in the area is neither intensive nor based on monocultures, is often used for grazing, and such land is frequently interspersed with natural vegetation (scattered bushes and trees). Human settlements are mostly rural and not highly populated. Wetlands in the region are small and distributed along the coast, with the exception of three dams, in the northwest and southeast. Lake Mert, located near İğneada



**Plate 1.** Young oak stands, typical vegetation covering Istranca mountains, Turkish Thrace. Wood Warblers *Phylloscopus sibilatrix* appear to breed mostly in young oak stands in the survey area. © Korhan Özkan

(Plate 2, Figure 1), is the largest natural wetland with a 100 ha open water area. All the natural wetlands are an integral part of the coastal swamp forest ecosystem, which is an important component of the local biodiversity and under protection as a national park. The coasts are partly free from anthropogenic pressure and consist of sand dunes, coastal grasslands, forests, rocky shores and wetlands.

## METHODS

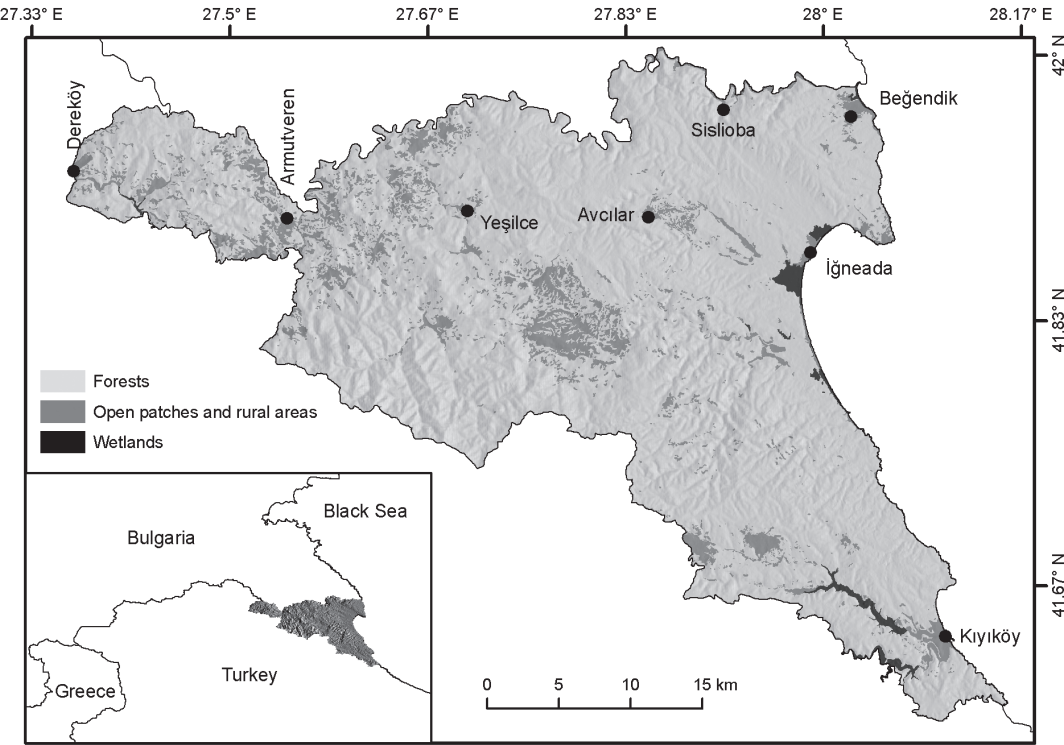
The breeding bird survey, with day and night observations, was conducted 30 April–6 July 2009. Field work based on opportunistic observations continued until 3 August to gather further breeding evidence for species that are cryptic in behaviour and could otherwise avoid detection. The study area was classified into main habitat types (forests, open forest patches, urban places, wetlands, agricultural lands, riparian zone, coastal areas and pine and poplar plantations) by using the forestry administration's land-use data. At least eight sampling points were randomly chosen for each main habitat type. Morning samplings commenced just before dawn and lasted for six hours at most. When practicable with reasonable effort, each sampling location was visited again after 22.00 h for nocturnal birds. In total 433 points were sampled and 381 points were also visited for nocturnal birds. Each 5 km UTM square was sampled with at least three points.

The sampling points were treated as circular plots and methodology was modified from Bibby (2004). Each habitat was penetrated at least 200 m to avoid edge effects. The surveyors waited two minutes for birds to settle and conducted 10 min observations, where all birds identified by sight or sound were noted. Observations were carried out in four distance bands (0–10, 10–20, 20–100, > 100 m) and breeding behaviour was recorded for each bird (Hagemeijer & Blair 1997). Breeding status (possible, probable and certain) of each bird was determined according to certainty of breeding evidence (Hagemeijer





**Plate 2.** Aerial photograph of lake Mert, the largest natural wetland in the study area, Turkish Thrace. It is part of a larger coastal swamp forest ecosystem. © Aykut Ince



**Figure 1.** Map of the survey area, Turkish Thrace. Only the villages mentioned in the text were plotted. The hill-shade effect represents terrain and coordinates are in decimal degrees.

& Blair 1997). Relevant habitat characteristics were recorded at each sampling point (dominant tree species, stand age, canopy cover, undergrowth, surrounding habitats *etc.*). Opportunistic observations were made whenever new breeding evidence was gathered in both the survey period and subsequently.

## RESULTS AND DISCUSSION

The study generated 8535 records of 177 species in 697 locations during 88 days of field work and comprehensive results were reported elsewhere (Özkan 2009). The results show that the Turkish portion of the Istranca mountains harbours 104 certain, eight probable and 16 possible breeding bird species (Özkan 2009). Novel breeding evidence is reported in the present paper based on a comparison between the results of the present survey and the breeding distributions provided in Kirwan *et al* (2008). Details of the observations are summarized in Table 1 and Figure 2, and distribution maps are given in Figure 3. The survey provided breeding evidence for Wood Warbler, Yellowhammer and Green Sandpiper, which previously had only weak breeding evidence in Turkey, *eg* scattered observations of singing males during passage periods. Details of the observations of those three species follow, the species listed in order of strength of breeding evidence.

**Wood Warbler** *Phylloscopus sibilatrix*. Numerous singing males and several pairs were observed throughout the survey at more than 30 sites. They were well distributed over the study area and almost always found in young oak stands with herbaceous undergrowth, generally on slight slopes. An occupied nest with more than three chicks was found on 26 May near Avcılar village, close to the Bulgarian border. Wood Warbler is a common passage migrant in Turkey. Although Birdlife International (2004) suggested breeding of Wood Warblers in Turkey is likely and a survey in the Bulgarian part of the mountains found a breeding population (Milchev 1994), the only previous breeding evidence in Turkey was a singing male on 27 July in Dereköy within the study area (Beaman 1986). The abundance and distribution of observations indicate that Wood Warblers breed throughout the Istranca forests.

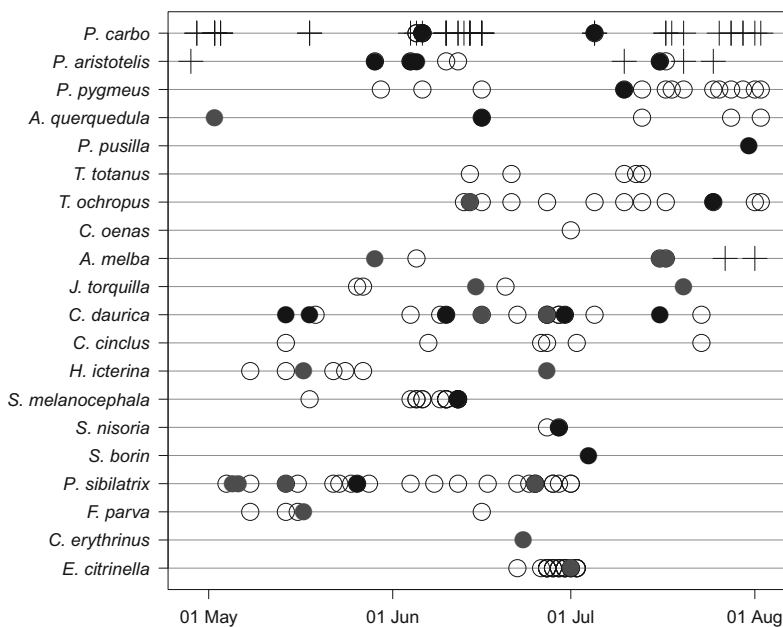
**Yellowhammer** *Emberiza citrinella*. Several singing males and pairs, and also courtship display, were observed 22 June–2 July in 29 different sites. They were mostly confined to the northwest part of the study area, where the forest cover is frequently fragmented by open patches and agricultural land. A number of singing male Yellowhammers had been recorded previously in Turkish Thrace May–June though it was not possible to exclude the possibility of passage migrants and thus the observations were not conclusive (Kirwan *et al* 2008, Roselaar 1995). However, both Kirwan *et al* (2008) and Roselaar (1995) predicted Yellowhammer breeding in Turkish Thrace. Yellowhammer is a common breeding bird in the Bulgarian part of the mountains (Milchev 1994). In the present survey, 45 birds were seen in 15 locations (when nearby occupied sites are omitted) between the end of June and beginning of July, during which period migration is exceptionally unlikely. The results show that the Yellowhammer prefers the northwest part of the survey area, which consists of open forests as well as arable fields and pastures surrounded by bushes and scattered trees, which accords with its published habitat preferences (Snow & Perrins 1998). The circumstantial evidence, such as observation period, abundance of observations and suitability of the habitat, is overwhelming and there is little doubt that the Yellowhammer is a breeding bird in the study area. This population in the study area connects with the larger breeding population of the Bulgarian part of the mountains (Milchev 1994).

**Green Sandpiper** *Tringa ochropus*. Numerous birds were observed 13 June–2 August. All the observations before 17 July (25 birds in 16 different sites) were of solitary birds in suit-

**Table 1.** Breeding status and summary of observations. Only the most conclusive breeding behaviour is given under breeding evidence. Species without breeding evidence are excluded. Nearby occupied sites are omitted in total number of locations. Total number of birds might include some that were double-counted as some locations were visited more than once during the survey.

Species	Breeding status	Breeding evidence	Previous status	Number of observations	Number of locations	Total number of birds	First observation date	Last observation date
Great Cormorant	Certain	Nest in use	Needed further evidence	17	4	195	5 Jun	5 Jul
European Shag	Certain	Nest in use	Needed further evidence	16	3	140	29 May	17 Jul
Pygmy Cormorant	Probable	Juvenile	Needed further evidence	16	4	66	30 May	2 Aug
Garganey	Certain	Juvenile-recently fledged	Needed further evidence	6	3	68	2 May	2 Aug
Baillon's Crake	Probable	Juvenile	Not breeding in Thrace	1	1	1	31 Jul	31 Jul
Common Redshank	Possible	Adult in suitable habitat	Needed further evidence	5	1	16	14 Jun	13 Jul
Green Sandpiper	Probable	Juvenile	Not breeding in Turkey	21	7	41	13 Jun	2 Aug
Stock Dove	Possible	Singing in suitable habitat	Not breeding in Thrace	1	1	1	1 Jul	1 Jul
Alpine Swift	Probable	Visit to a probable nest site	Needed further evidence	7	1	42	29 May	17 Jul
Eurasian Wryneck	Certain	Territory holding	Needed further evidence	5	2	6	26 May	20 Jul
Red-rumped Swallow	Certain	Nest in use	Needed further evidence	26	17	65	14 May	23 Jul
White-throated Dipper	Certain	Adult in suitable habitat	Needed further evidence	7	7	7	14 May	23 Jul
Icterine Warbler	Probable	Territory holding	Not breeding in Thrace	8	6	9	8 May	27 Jun
Sardinian Warbler	Certain	Distraction display	Needed further evidence	24	13	28	18 May	12 Jun
Barred Warbler	Certain	Juvenile-recently fledged	Needed further evidence	3	2	5	27 Jun	29 Jun
Garden Warbler	Certain	Juvenile-recently fledged	Not breeding in Thrace	2	1	4	4 Jul	4 Jul
Wood Warbler	Certain	Young in nest	Not breeding in Turkey	32	21	37	4 May	1 Jul
Red-breasted Flycatcher	Probable	Couple in suitable habitat	Needed further evidence	5	5	6	8 May	16 Jun
Common Rosefinch	Probable	Couple in suitable habitat	Not breeding in Thrace	1	1	2	23 Jun	23 Jun
Yellowhammer	Probable (almost certain)	Courtship or mating	Not breeding in Turkey	38	15	45	22 Jun	2 Jul

able breeding habitat. They were always associated with forested water courses and nearby glades, and sometimes near small coastal wetlands. Small groups around lakes (migration groups) appeared after 25 July. Although their regular breeding range is further north and Kirwan *et al* (2008) assessed their breeding in Turkey as distinctly unlikely, limited breed-



**Figure 2.** Temporal distribution of observations. Birds showing evidence of migratory behaviour were excluded. Black, grey and empty circles denote certain, probable and possible breeding evidence respectively. Birds not showing breeding behaviour and in unsuitable habitat are indicated with a cross/vertical line.

ing evidence in Romania and Bulgaria (Snow & Perrins 1998, Milchev 1994) suggests the possibility of breeding in Thrace. Although a large number of observations were made, it was not possible to confirm the breeding of Green Sandpiper during the survey. Extremely cryptic breeding behaviour of the Green Sandpiper makes it very difficult to gather conclusive breeding evidence. Furthermore, Green Sandpipers migrate in small groups or as solitary birds within a period that also includes the breeding period, which makes it very difficult to distinguish probable breeding from migration. Considering that their main passage is July–August (Snow & Perrins 1998), the observations made of solitary birds in suitable breeding habitats before 17 July without any indication of migration indicate that the Green Sandpiper probably breeds in the Istranca mountains of Turkey.

The survey also provided breeding evidence for Garden Warbler, Baillon's Crake, Stock Dove, Icterine Warbler and Common Rosefinch, which previously had not been recorded breeding in Turkish Thrace. Details of the observations of these five species follow.

**Garden Warbler** *Sylvia borin*. One pair was feeding two fledged young 4 July near Sislioba village by the Bulgarian border. They were observed along the Rezve (Mutlu) river, where small poplar plantations and agricultural lands are surrounded by forests. Garden Warbler is another species that has an unclear breeding status in Turkey, with numerous observations of the species but only one previous conclusive breeding record, in İstanbul in August 1972 (Kirwan *et al* 2008). The breeding population in the study area is likely to be small and scattered as the species was only observed once in the survey and there is no breeding information from the Bulgarian part of the mountains (Milchev 1994).

**Baillon's Crake** *Porzana pusilla*. Only one observation was made during the survey. The bird was a juvenile and it was foraging among the marshes of lake Mert on 31 July. Baillon's Crakes are perhaps irregular and extremely scarce breeders in Turkey, and breeding has not previously been suspected in Turkish Thrace (Kirwan *et al* 2008). It is possible, though,

that the juvenile observed at lake Mert was an early migrant, as the observation was made late in the species' breeding season (early May–early August, Snow & Perrins 1998) and the bird was capable of flight. The only confirmed breeding record in Turkey was 9 August 1967 at lake Manyas (Beaudoin 1967) with a used nest containing three well-incubated eggs and four tiny chicks (considered a second brood), which further shows that the observation was made within the breeding season of Baillon's Crake in Turkey.

**Stock Dove** *Columba oenas*. One bird was heard singing in the vicinity of Armutveren village 1 July. The observation was made in old-growth forest with partially closed canopy. Stock Dove is a local resident in well-wooded uplands of Anatolia (Asian Turkey), but has never been recorded in Turkish Thrace in the breeding period (Kirwan *et al* 2008). The observation is in accordance with its reported habitat preferences (Kirwan *et al* 2008). The species breeds in the Bulgarian part of the mountains (Milchev 1994) and probably is a local and rare breeder in the study area.

**Icterine Warbler** *Hippolais icterina*. Several pairs and singing males were observed during the survey in May and June. They almost always preferred the forest edge in open forest patches and in close proximity to watercourses. A singing male was observed to hold the same territory near Yeşilce village in two successive visits within four days (14–17 May). A pair was recorded near Armutveren village 27 June. There is only one confirmed breeding record of Icterine Warbler in Turkey (Kirwan *et al* 2008) though breeding was confirmed in the Bulgarian part of the Istranca mountains (Milchev 1994). Icterine Warbler probably breeds in the study area.

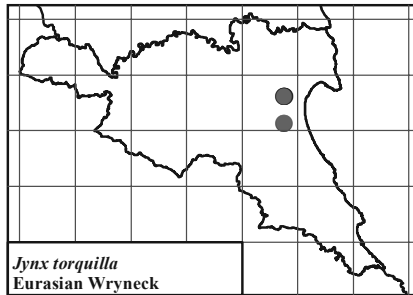
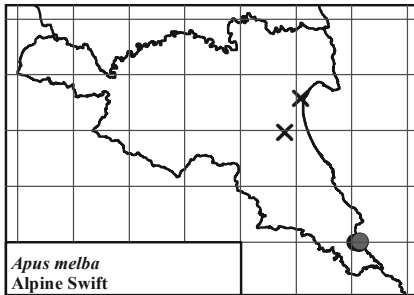
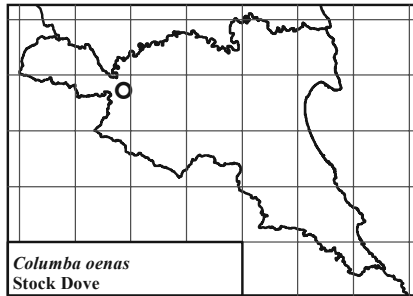
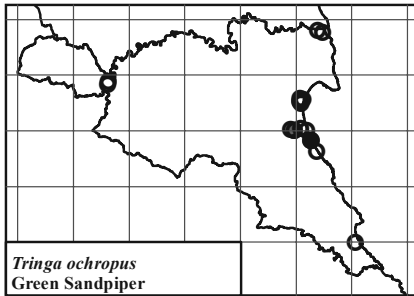
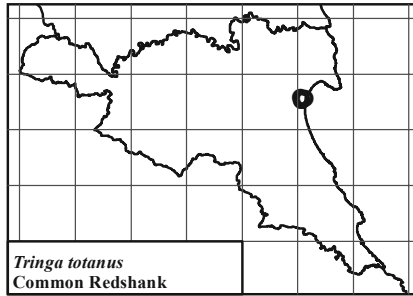
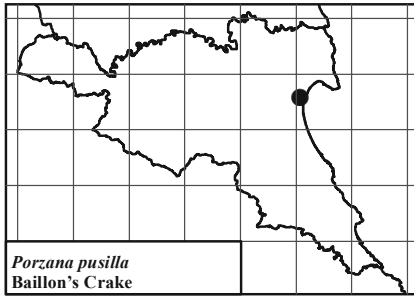
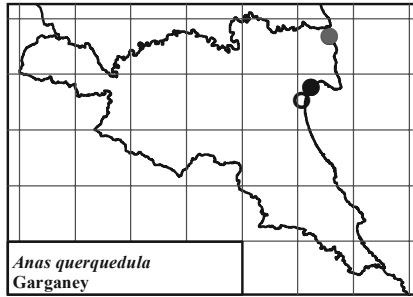
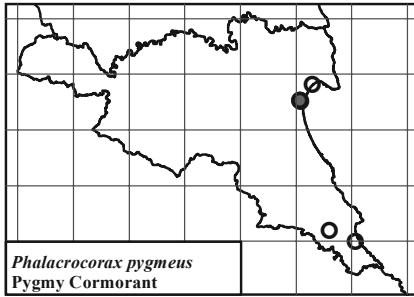
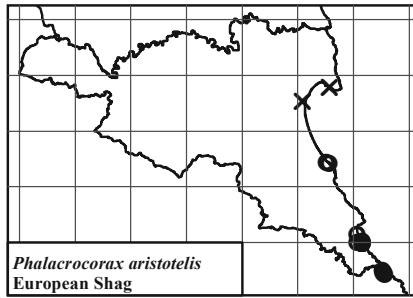
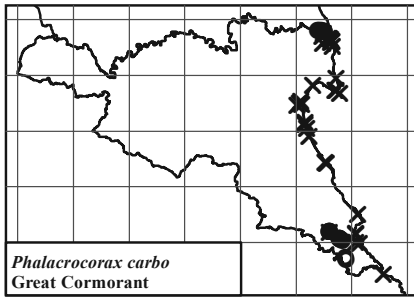
**Common Rosefinch** *Carpodacus erythrinus*. A pair including a singing male was observed in a forest opening surrounded by beech stands on Mahya mountain at an altitude of 650 m on 23 June. Common Rosefinch breeds throughout northern Turkey though breeding evidence in Turkish Thrace is very limited (Kirwan *et al* 2008). There may well be a small breeding population in the highest parts of the Istranca mountains (Mahya mountain), probably the only breeding population in Turkish Thrace (Snow & Perrins 1998, Kirwan *et al* 2008).

The survey also provided breeding evidence for a number of species previously recorded breeding in the study area or elsewhere in Turkish Thrace, presenting further information on their breeding distribution. Details of the observations of those species are given below. The species sequence below and in Table 1 and Figures 2 and 3, follows Snow & Perrins (1998).

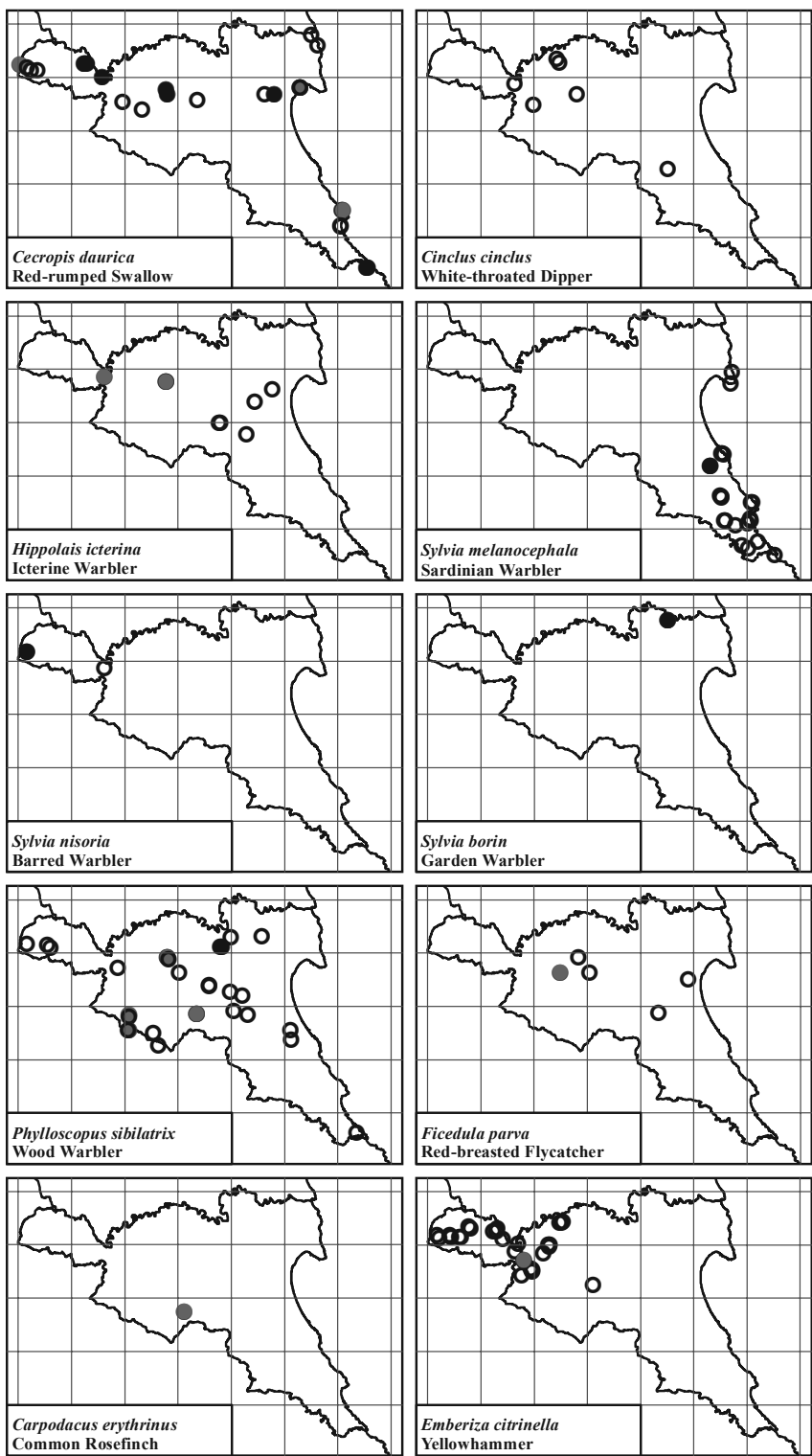
**Great Cormorant** *Phalacrocorax carbo*. A colony dispersed among large trees inundated by a reservoir was discovered near Kıyıköy. The nests were not in use as the observation was made late in the breeding season, however, juveniles and adults were still roosting in the colony. The number of nests indicated that the colony was at least 100 strong. Regular roosting flights of Great Cormorants were noted along the Rezve river suggesting a colony there.

**European Shag** *Phalacrocorax aristotelis*. A colony of c30 nests was found on the cliffs along the sea coast in Kıyıköy. The colony was first discovered on 29 May and the nests were still in use 17 July.

**Pygmy Cormorant** *Phalacrocorax pygmeus*. A few birds were seen occasionally on lake Mert in June and July. Four adults with two juveniles were seen there 10 July. A few individuals were seen around a reservoir near Kıyıköy 6 June. The species might have bred at both sites.







**Figure 3.** Species distribution maps. Black, grey and empty circles denote certain, probable and possible breeding evidence respectively. Birds not showing breeding behaviour and in unsuitable habitat are given with a cross.

**Garganey** *Anas querquedula*. They were seen on small coastal wetlands around İğneada and Beğendik village. Several recently-fledged juveniles were seen foraging with adults on lake Erikli 16 June. Garganey breeds locally and in small numbers in marshy wetlands in Turkey (Kirwan *et al* 2008).

**Common Redshank** *Tringa totanus*. Several lone birds or small groups were observed near lake Mert 14 June–13 July. Larger groups, which indicate migration, appeared only after 13 July. Although the habitat appears suitable for breeding, it was not possible to distinguish whether the observations were of possible breeding birds, non-breeders or groups on migration. Common Redshank is a common breeding bird in wetlands of central and eastern Anatolia, and a regular passage migrant over much of Turkey (Kirwan *et al* 2008); however breeding information from Thrace is limited.

**Alpine Swift** *Apus melba*. A small group of c15 birds was seen flying around an isolated coastal cliff near Kiyıköy on four successive visits 29 May–17 July. It was not possible to search for nests due to the inaccessible nature of the cliffs. Alpine Swift has a fairly widespread breeding range over Turkey; however, only limited information is available from the study area (Kirwan *et al* 2008). The small group of Alpine Swifts observed in Kiyıköy suggests a probable breeding population.

**Eurasian Wryneck** *Jynx torquilla*. A pair was observed in İğneada at the forest edge in a large forest opening. Successive visits to this site May–July showed they occupied the same territory throughout the breeding season. A pair, where both male and female were singing, was seen near lake Pedina 15 June. Eurasian Wryneck is a very local and uncommon breeding bird in northern Turkey (Kirwan *et al* 2008). They breed in the Bulgarian part of the Istranca mountains (Milchev 1994) and Kirwan *et al* (2008) predicted widespread occurrence of breeding Eurasian Wrynecks across northern Turkish Thrace.

**Red-rumped Swallow** *Cecropis daurica*. Seven nests were found at more than 20 probable nesting sites over the study area. All the nests were built on man-made structures, mostly small bridges and culverts. Red-rumped Swallow was predicted as a widespread breeder throughout southern Turkish Thrace (Kirwan *et al* 2008) although they have not been recorded breeding in the study area previously (Roselaar 1995, Kirwan *et al* 2008). They breed in the Bulgarian part of the Istranca mountains (Milchev 1994).

**White-throated Dipper** *Cinclus cinclus*. Several birds were recorded mid May–late July on almost all streams (145–370 m asl) of the Istranca mountains. White-throated Dippers are nearly always associated with fast-flowing upland streams in Turkey (Kirwan *et al* 2008). Although no certain evidence could be gathered, their abundance and distribution clearly suggests they are common breeders in the study area, as predicted by Kirwan *et al* (2008). They were also found to be common breeders in the Bulgarian part of the mountains (Milchev 1994).

**Sardinian Warbler** *Sylvia melanocephala*. Numerous observations were made 18 May–12 June, frequently in coastal pseudo-maquis but also in bushes in forest openings. One pair performed a distraction display against a foraging Eurasian Jay *Garrulus glandarius* around a probable nest site 12 June. Sardinian Warbler is a fairly common breeder in coastal parts of Anatolia and Kirwan *et al* (2008) predicted their breeding in southern and eastern parts of Turkish Thrace. However, they have not been recorded breeding in northern Thrace, including both the Turkish and Bulgarian parts of the Istranca mountains (Kirwan *et al* 2008, Milchev 1994). The present survey suggests that Sardinian Warbler is a common breeder in coastal parts of the study area.

**Barred Warbler** *Sylvia nisoria*. A pair and a juvenile were seen foraging among bushes in agricultural land in the vicinity of a stream near Dereköy 29 June. Another pair was observed near Armutveren village, along the Velika (Balaban) river, 27 June. The species is apparently confined to the northwest part of the study area, where forest cover is frequently fragmented by open patches and agricultural land. Barred Warbler breeds both in Anatolia and Turkish Thrace but definitive breeding data does not exist for the study area (Kirwan *et al* 2008, Roselaar 1995). The species breeds in the Bulgarian section of the mountains (Milchev 1994).

**Red-breasted Flycatcher** *Ficedula parva*. A pair (17 May) and several singing males were observed 8 May–16 June, mostly in oak forests. The Red-breasted Flycatcher was recorded breeding in very small numbers along the coast of the Black sea in Turkey and Kirwan *et al* (2008) predicted that breeding is possible throughout northern Turkish Thrace. However, no evidence of breeding of Red-breasted Flycatcher was gathered in Thrace, including the Bulgarian part of the mountains (Kirwan *et al* 2008, Milchev 1994). The Red-breasted Flycatcher probably breeds in the study area.

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### REFERENCES

- Balkız, Ö, U Özesmi, R Pradel, C Germain, M Siki, JA Amat, M Rendón-Martos & NB Béchet. 2007. Range of the Greater Flamingo, *Phoenicopterus roseus*, metapopulation in the Mediterranean: new insights from Turkey. *Journal of Ornithology* 148: 347–355.
- Beaman, M. 1986. Turkey bird report 1976–81. *Sandgrouse* 8: 1–41.
- Beaudoin, J-C. 1967. La marouette de Baillon *Porzana pusilla* nicheuse en Turquie. *Alauda* 35: 151–152.
- Bibby, CJ. 2004. Bird Diversity Survey Methods. In: Sutherland, WJ, I Newton & R Green (eds). *Bird Ecology and Conservation: a Handbook of Techniques*. Oxford University Press, UK, pp1–15.
- Birdlife International 2004. *Birds in Europe: population estimates, trends and conservation status*. BirdLife International, Cambridge, UK.
- Çağlayan, E, DT Kılıç, E Per & E Gem. 2005. *Türkiye kış ortası su kuşu sayımları*. Doğa Derneği, Ankara.
- Hagemeijer, WJM & MJ Blair. 1997. *The EBCC Atlas of European breeding birds: their distribution and abundance*. T & A D Poyser, London.
- Kaya, M, S Yurtsever & C Kurtonur. 1999. Trakya ornito-faunası üzerine araştırmalar I. *Turkish Journal of Zoology* 23: 781–790.
- Kirwan, G, K Boyla, P Castell, B Demirci, M Özen, H Welch & T Marlow. 2008. *The Birds of Turkey*. Christopher Helm, London.
- Milchev, B. 1994. Breeding bird atlas of the Strandja mountains, south-east Bulgaria. *Sandgrouse* 16: 2–27.
- Özkan, K. 2009. *Istranca mountains Avifauna Diversity Report*. Ministry of Environment and Forestry, Kırklareli, Turkey.
- Per, E, A Yasar, SL Özesmi & U Özesmi. 2002. Turkish breeding bird atlas pilot project 2001: Erciyes Mountain and Kayseri region. *Bird Census News* 15: 2–21.
- Roselaar, CS. 1995. *Taxonomy, morphology, and distribution of the songbirds of Turkey: an atlas of biodiversity of Turkish passerine birds*. Pica Press, Robertsbridge, UK.
- Snow, DW & CM Perrins. 1998. *The Birds of the Western Palearctic*. Concise edn. Oxford University Press, UK.
- Yurtsever, S & C Kurtonur. 2003. A preliminary study on the birds of the Istranca Mountains, Turkey. *Acta Zoologica Cracoviensia* 46: 19–28.

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