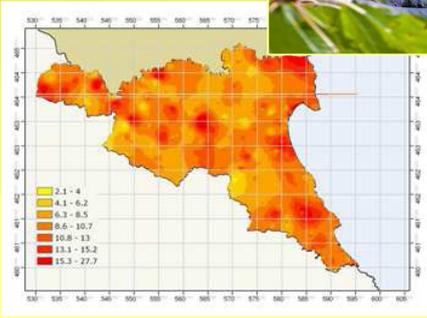




NO.6: DIVERSITY AND DISTRIBUTION OF BIRDS IN THE YILDIZ MOUNTAINS

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April 2010



YILDIZ MOUNTAINS BIOSPHERE PROJECT REPORT SERIES



This document may be cited as:

YMBP (2010). *Diversity and distribution of birds in the Yıldız Mountains*. Report prepared on behalf of AGRER-Agriconsulting-AGRIN by Korhan Özkan for the Ministry of Environment and Forestry, Ankara. **Yıldız Mountains Biosphere Project Report Series No. 6.**

Other documents in this series of reports prepared by the Yıldız Mountains Biosphere Project are as follows:

Land and vegetation cover, habitat and landscape mapping of the Yıldız Mountains, using satellite remote sensing and GIS techniques. A report prepared on behalf of AGRER-Agriconsulting-AGRIN by S. Berberoğlu, C. Dönmez, O. Şatır for the Ministry of Environment and Forestry, Ankara. **Yıldız Mountains Biosphere Project Report Series No. 1.**

Eco-hydrology of Yıldız Mountains. A report prepared on behalf of AGRER-Agriconsulting-AGRIN by Yusuf Serengil for the Ministry of Environment and Forestry, Ankara. **Yıldız Mountains Biosphere Project Report Series No. 2.**

Flora of Yıldız Mountains. A report prepared on behalf of AGRER-Agriconsulting-AGRIN by N. Özhatay, E. Akalın, Y. Yeşil, S. Demirci, N. Güler, and H. Ersoy for the Ministry of Environment and Forestry, Ankara. **Yıldız Mountains Biosphere Project Report Series No. 3.**

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Social profiling of villages in the Yıldız Mountains. A report prepared on behalf of AGRER-Agriconsulting-AGRIN by Dominic Moran and Axel Tarisse for the Ministry of Environment and Forestry, Ankara. **Yıldız Mountains Biosphere Project Report Series No. 10.**

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SUMMARY

An avifauna diversity survey, aimed at supporting planning and management of the proposed Yildiz Mountains Biosphere and providing baseline data for future studies, was conducted between May and August 2009. Breeding birds, the major component of the local avifauna, were the focus of the field surveys. A standardised methodology was employed to survey the local avifauna, breeding bird distribution and abundance, and species composition within different habitats. Other components of the avifauna, namely overwintering and migrating birds, were not surveyed with a standard methodology due to constraints relating to the survey period and limited resources.

The study generated a total of 8,535 records of 177 species in 697 locations during the 88 days of field work. The results show that the Yildiz Mountains harbour 105 certain, seven probable and 16 possible breeding bird species. The breeding evidence of wood warbler¹, yellowhammer and green sandpiper in Yildiz Mountains represent new breeding records for Turkey. Furthermore, the study provides the first evidence of Baillon's crane, stock dove, icterine warbler, garden warbler and common rosefinch breeding in Thrace.

The common chaffinch is the most abundant (numerous) and common (widely distributed) bird species according to survey results. Agricultural lands and open forest patches have the highest diversity of bird species, probably owing to their structural heterogeneity. It was also observed that mature forest stands have higher species richness than younger ones. A comparison between the two dominant tree species revealed that oak stands harbour more bird species than beech stands. Furthermore, the study confirms that swamp forests are an important hotspot for bird species richness.

A thorough review of the literature and available databases indicates that a total of 258 bird species have been reliably recorded from the proposed Yildiz Mountains Biosphere, based on the results of this survey and previous studies. This includes eight species observed for the first time during the present survey.

A number of practical recommendations arising from this study to conserve and enhance the diversity of birds in the Yildiz Mountains include the following:

- The patchiness and structural diversity of agricultural lands and forest clearings should be maintained and enhanced in the Yildiz Mountains because such habitats support most species of those habitats surveyed for birds.
- Detailed studies of agricultural lands should be made in relation to bird species diversity in order to determine the extent to which traditional farming practices should be maintained in the interests of bird (and possibly flora) diversity. This may result in the need to subsidise such practices in future in the interests of biodiversity conservation.
- Mature forest stands with old and decaying trees should be protected and extensified. They are well known to be a critical component of forest biodiversity and, in the Yildiz Mountains, they support a higher diversity of birds than younger, well-managed stands.
- Coastal areas support among the highest diversity of bird species on account of their swamp forests, coastal forests, estuaries, sand dunes, reed beds and meadows. Appropriate measures need to be taken for their protection, especially the sand dunes along the coastline from Mert Lake to the

¹ Only the English bird names are used in the report. Scientific and Turkish names of bird species are provided in Annex 1. Turkish and English names of bird species are taken from *The Birds of Turkey* (Kirwan *et al.*, 2008).

estuary of Bulanık River. These dunes are under significant pressure from tourists and their vehicles in summer.

- Conifer plantations are not natural to the Yıldız Mountains and are characterised by very low bird species richness. This management practice should be abandoned and natural forest should be allowed to regenerate once the timber has been extracted.
- Poplar plantations, with the lowest bird species richness of the surveyed habitats, are replacing open forest patches and agricultural lands, especially in close proximity to streams. Their extent needs to be regulated in relation to the extent of open forest patches and agricultural lands.
- Mert and Erikli lakes and their surrounding swamp forest are under some significant pressures: untreated sewage effluent from İğneada in the case of Erikli Lake; interference with the natural hydrological cycle of Mert Lake by local fisherman, resulting in extremely low water levels in the Lake and drought in the swamp forest during summer; and hunting during the bird migration and overwintering periods. These malpractices within the İğneada Longoz Forest National Park, recently established in 2007, need to be addressed.
- The Yıldız Mountains lie along on one of the main bird migration bottlenecks of the Palaeoartic Region. Thus, the construction of wind farms could have far-reaching negative consequences for avifauna within this entire biogeographic region and should certainly be avoided within the proposed Yıldız Mountains Biosphere, given its strategic location with respect to bird migration.

ADDENDUM

The national biodiversity databases (TRAKUŞ and KUŞBANK) were examined in September 2009, as part of the work involved in compiling an inventory of the avifauna of the proposed Yıldız Mountains Biosphere. During the interim between the Project's official ending in November 2009 and the publication of this report, six new records of bird species in the Project area have been added to these national databases, as indicated in the Table below. All of these species are over-wintering and rare visitors, and their observation during such a short time-span may have been due to the significantly colder winter experienced throughout Europe in 2009-2010. Therefore; it should be noted that the total inventory of the birds of the proposed Yıldız Mountains Biosphere has increased from 258 to 264 species by March 2010.

Table Overwintering species newly recorded in the proposed Yıldız Mountains Biosphere in winter 2009-2010

Genus name	Species name	English name	Turkish name	Source*
<i>Somateria</i>	<i>mollissima</i>	Common eider	Pufla	TRAKUŞ (photo), KUŞBANK
<i>Melanitta</i>	<i>fusca</i>	Velvet scoter	Kadife ördek	TRAKUŞ (photo), KUŞBANK
<i>Buteo</i>	<i>lagopus</i>	Rough-legged buzzard	Paçalı şahin	TRAKUŞ (photo), KUŞBANK
<i>Asio</i>	<i>flammeus</i>	Short-eared owl	Kır baykuşu	TRAKUŞ (photo), KUŞBANK
<i>Remiz</i>	<i>pendulinus</i>	Eurasian penduline tit	Çulhakuşu	TRAKUŞ
<i>Calcarius</i>	<i>lapponicus</i>	Lapland longspur	Mahmuzlu çinte	TRAKUŞ (photo), KUŞBANK

*Records are based on observations and, where indicated in brackets, supported by photographs.

1. INTRODUCTION

The planet Earth supports 9,856 living bird species (BirdLife International, 2008) and they occupy nearly its entire surface and virtually all of its habitats (Figure 1). Birds provide irreplaceable ecosystem services, such as decomposition, pest control, pollination and seed dispersal (Şekercioğlu, 2006). However, 21.5% of living bird species are under imminent threat of extinction (Şekercioğlu, 2006), while 153 bird species have become extinct since 1500 AD. The rate of bird extinctions in this era is estimated to be 1,000 - 10,000 times the natural background rate (BirdLife International, 2008). Reductions in bird abundance and species richness are likely to trigger far-reaching ecological consequences (Şekercioğlu, 2006). Although several conservation initiatives have been implemented in recent decades, such efforts have not prevented further deterioration in the status of world's bird species in the last 20 years. Therefore, identifying and monitoring bird communities at global, regional and local scale are crucial.

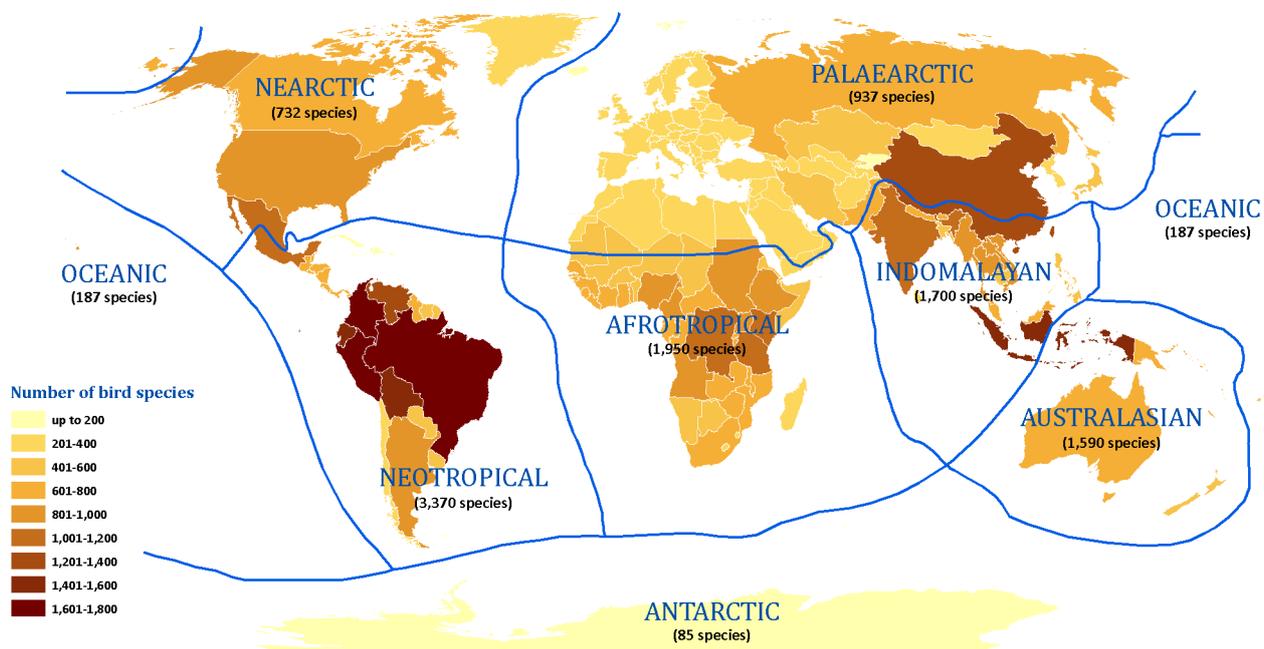


Figure 1 Distribution of bird species diversity by biogeographic realms and countries (BirdLife International, 2008)

Turkey is located in the western part of the Palaeoartic, which is the largest of the eight biogeographic realms of the world², and home to an extensive diversity of life (Figure 1). There are 937 bird species in the Palaeoartic region (Snow and Perrins, 1998, BirdLife International, 2008) and more than 600 species breed regularly (Snow and Perrins, 1998). Turkey, located between the three continents of Africa, Asia and Europe, and having a large gradient in climate and topography, spans three biogeographic provinces within the Palaeoartic Realm: West Anatolian, Mediterranean Sclerophyll and Anatolian-Iranian Desert (Udvardy, 1975). Such variety in Turkey's biogeography is reflected in its diversity of flora and fauna, which is exceptionally high given its temperate location. Turkey's flora comprises more than 9,000 vascular plant species and its fauna includes 1,350 vertebrate species (Kuş Araştırmaları Derneği, 2007), of which 463 species are birds (including 300 regularly breeding species) that have been reliably recorded within its

² The world is divided into eight main biogeographic regions, which have distinct geographic, ecological and biological characteristics. These are: Palaeoartic, Nearctic, Neotropical, Afrotropical, Indomalayan, Oceanic, Australasian and Antarctic. The Palaeoartic includes Europe, northern Asia, North Africa and Middle East (Udvardy, 1975).

borders (Kirwan *et al.*, 2008). There are no endemic bird species to Turkey. However, distributions of some bird species are almost confined to Turkey (none for Thrace), such as, Rüppell's warbler (*Sylvia rueppelli*), cinereous bunting (*Emberiza cineracea*) and Krüper's nuthatch (*Sitta krueperi*).

While some bird species are resident in the Palaearctic, many others are migratory. A large proportion of Palaearctic birds breed in temperate lands, as far north as the Arctic, in summer and then migrate south to Africa, South Asia and even Australia for winter. Africa is the main overwintering ground for the majority of the birds breeding in Eurasia and it is estimated that five billion individuals from more than 200 species take part in this annual cycle of migration (Elphick, 2007). The large soaring birds are strictly connected to land and cannot cross large water bodies, due to physical and biological constraints. Several other smaller birds may also prefer terrestrial habitats, though such preferences are mostly not obligatory. This results in the accumulation of a great number of birds in some main bottlenecks along their journey from Eurasia to Africa. Three of these bottlenecks lie in Turkey (Figure 2) which, strategically, is extremely important for the conservation of migratory bird species.



Figure 2 Turkey lies along three main bird migratory routes. Species migrating from their breeding grounds in Europe and Siberia to their wintering grounds in sub-Saharan Africa are concentrated along the Bosphorus and Caucasus, flying over the Belen Pass in the eastern Mediterranean to avoid the Mediterranean and Black Sea. The other important bottlenecks in Eurasia are the Gibraltar and Sicily passes.

The Yıldız Mountains are located along the south-western shores of the Black Sea, extending beyond Turkey to Bulgaria. The highest point in Thrace lies in the Yıldız Mountains at an altitude of 1,031 m. The seaward side of this mountain range within Turkey is in the process of being nominated as a UNESCO Biosphere Reserve (Figure 3). The Project area is mainly covered with Balkan deciduous forests (Figure 3), dominated by oak (*Quercus sp.*) and beech (*Fagion moesiicum*) and with occasional small coniferous plantations. Nearly all of the forests are managed for timber and, thus, the majority of tree stands are homogeneous in age and

species. The swamp forest, however, is more heterogeneous and designated a national park in view of its nationally important wetland ecosystem.

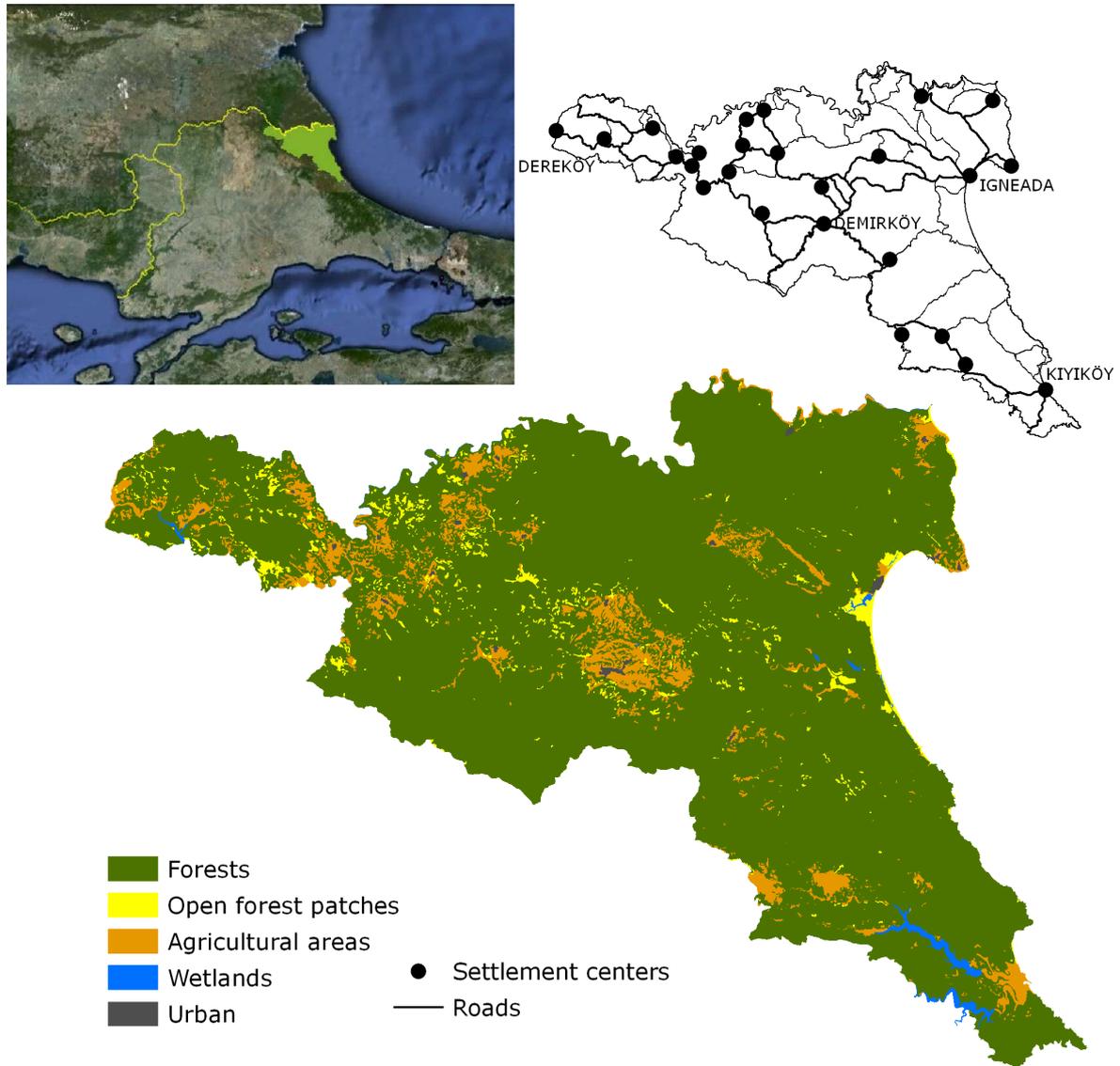


Figure 3 Location, settlements, main roads and main habitat types of the proposed Yıldız Mountains Biosphere. (Spatial data source: Ministry of Environment and Forestry)

The human settlements are mostly rural and not highly populated. The forest cover is fragmented by small patches of forest openings and agricultural lands. Agriculture is neither intensive nor based on monocultures and such land is frequently interspersed with natural vegetation (scattered bushes and trees) and often used for raising grass for grazing. These less-intensive heterogeneous agricultural practices are known to support higher species richness than intensive ones (Kati and Şekercioğlu, 2006).

Wetlands in the region are small and distributed along the coast, with the exception of three dams in the north-west and south-east built for irrigation and drinking water purposes. These wetlands, especially the natural ones, are extremely important resting sites for migratory birds, given their location within one of the most important migration bottlenecks in the region (Figures 2 and 3). The largest natural wetland is Lake Mert with a total area of 400 ha, of which 100 ha is open water. The coasts are largely free from human

impact and consist of sand dunes, coastal grasslands, forests and rocky shores in respective order of coverage (Figure 3). This diversity of habitats and their ecological characteristics make the Yıldız Mountains a very important area for both breeding and migratory species of birds.

The only review on the birds of the Yıldız Mountains was prepared in 2006 (Hasbenli, 2006). This review provides an inventory of 194 bird species from the Yıldız Mountains without any detailed information on breeding status, distribution or abundance of species. The other principal sources of information are the national databases for the birds of Turkey. Observation records of birds in Turkey are held in KUŞBANK, the largest national biodiversity database and probably the most actively used of its kind (KUŞBANK, 2009). It has more than 2,000 registered users and contains over 250,000 records of 422 bird species. The other national database for avian diversity is TRAKUŞ, founded in 2007 as a photographic archive of the birds of Turkey (TRAKUŞ, 2009). More than 15,000 photographs taken in Turkey have already been submitted for 405 species, along with 607 observation records. The existing literature and the information in these databases are reviewed in this report with respect to the results of the present survey.

2. METHODS

2.1. Field Surveys

The scope of the study is two-fold: a review of the existing literature and a field survey, the latter being the major component due to the limited amount of previous work on the avifauna of Yıldız Mountains. The focus of this study was to assess the diversity of species and overall distribution of species within different habitats of the Project area. Thus, a rapid survey method was used in order to cover as much of the survey area as possible within the available time.

Table 1 Summary of the survey effort and number of species recorded for each observation type. S, observations at a survey point within survey time; SO, observations at a survey point but not within the survey time; O, opportunistic observations. The number of bird species not recorded in morning survey time (S-morning) but observed in night survey time (S-night) or opportunistic observations are given in parenthesis. Note that values in parentheses for totals are not necessarily the arithmetic sum of the respective observation types.

Observation type	Number of observations	Number of observation points	Number of days in the field	Number of species observed
S-morning	5,494	443	53	116 (–)
S-night	506	381	55	17 (3)
<i>S-total</i>	<i>6,000</i>	<i>-</i>	<i>57</i>	<i>119 (3)</i>
SO-morning	833	286	52	97 (6)
SO-night	30	24	19	10 (2)
<i>SO-total</i>	<i>863</i>	<i>-</i>	<i>53</i>	<i>101 (7)</i>
<i>S and SO total</i>	<i>6,863</i>	<i>-</i>	<i>57</i>	<i>125 (10)</i>
O	1,672	254	80	167 (57)
TOTAL	8,535	697	88	177 (61)

The breeding bird survey was conducted between April 30th and July 6th, with one team of two surveyors for the first month and two teams of four surveyors for the second month. The field work based on opportunistic observations continued until August 3rd, following the breeding bird survey. A total of 88 days of observation in the field yielded 8,535 records of 177 species at 697 localities (Table 1, Figure 4). The

survey was based on recording birds within circular plots using a methodology modified after Bibby (2004) and Gregory *et al.* (2004).

Morning surveys commenced just before sunrise and lasted for six hours at most. Surveyors entered at least 200 m into the habitat at each survey point to avoid edge effects. Up to three consecutive observations were made from three different survey points along a pre-defined direction with a distance of at least 200 m between each survey point, if sufficient habitat was available. Main habitat characteristics (dominant tree species, canopy cover, stand age and undergrowth), GPS coordinates and weather conditions were recorded at each survey point. Canopy cover and stand age were recorded using forest management standards. Three canopy cover categories were used: 1, 10-40% cover; 2, 40-70% cover; 3, 70-100% cover. Five categories of stand age were adopted: a, 0-8 cm; b, 8-16 cm; c, 16-25 cm; d, 25-50 cm; and e, >50 cm. If the stand had mixed age groups a composite category was used (e.g. ab). The dominant species in the undergrowth were recorded and their cover was estimated using the same categories as for canopy cover.

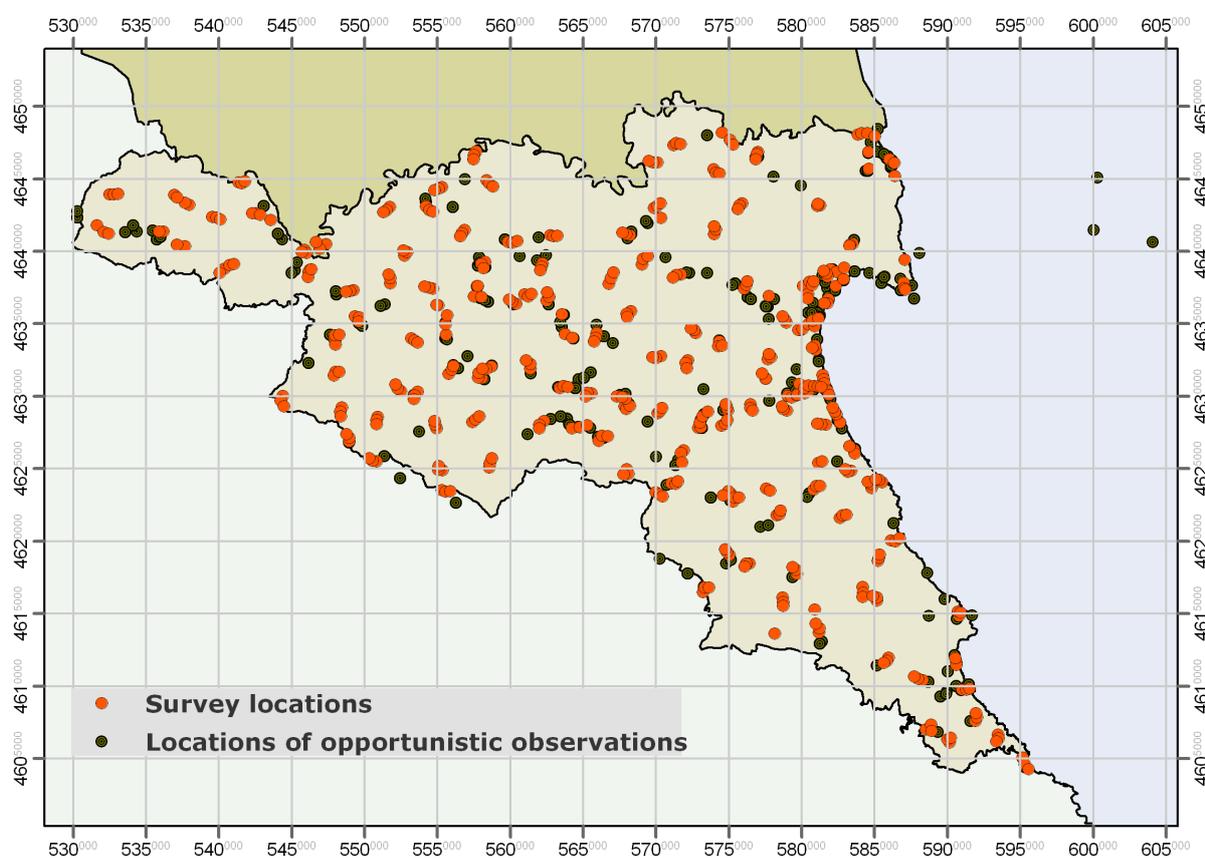


Figure 4 Distribution of survey and opportunistic observation locations in the Project area. The map is overlaid by five km UTM squares.

Surveyors waited at least two minutes for birds to settle prior to recording. They worked in pairs, back-to-back. Any bird identified by sight or sound during each 10 minute sampling period was recorded in accordance to its distance from the observers, using four distance bands (0-10m, 10-20m, 20-100m, and beyond 100m). Unidentified observations and survey points with no observations (encountered rarely in night samples) were also recorded. Mullarney *et al.* (1999) and Snow and Perrins (1998) were the main

references used for identification when needed. The locations of survey points and opportunistic observations are shown in Figure 4.

Each survey point was visited again after 22:00 hours and, where practicable at night with reasonable effort, all sample points were once again surveyed for nocturnal birds using the above-mentioned methodology. If no bird was recorded, owl calls were played from the loud speakers of the vehicle at one of the survey points or the nearest point that the vehicle could reach to verify the presence or absence of nocturnal birds.

Each bird species was assigned a breeding code modified after Hagemeyer and Blair (1997), further details of which are given in Table 2. Any encounter with a new species or a higher breeding code for a recorded species, outside the 10 minute survey time at the survey point, or half-way-through the neighbouring survey point, was recorded for the present survey point with a relevant code (SO). Certain evidence of breeding was not easily available for some bird species due to their breeding behaviour or cryptic nature. Therefore, extra attention was paid throughout and after the survey to maximise opportunities of breeding evidence.

Table 2 Breeding codes assigned to each encounter for both surveys and opportunistic observations (modified after Hagemeyer and Blair (1997)).

Code	Explanation	Breeding status
M	Migration	None
0	Habitat is NOT suitable for breeding	None
1	Adult in SUITABLE HABITAT in breeding season	Possible
2	SINGING MALE	Possible
3	COUPLE in suitable habitat	Probable
4	Bird holding TERRITORY	Probable
5	COURTSHIP display or MATING	Probable
6	Adult visiting PROBABLE NEST-site	Probable
7	AGITATED behaviour	Probable
8	Brood patch in adults	Probable
9	NEST BUILDING	Probable
10	DISTRACTION DISPLAY	Certain
11	OCCUPIED nest or EGG fragments	Certain
12	YOUNG recently fledged or downy	Certain
13	Used NEST	Certain
14	Adult carrying FAECAL SAC or FOOD	Certain
15	EGG in nest	Certain
16	YOUNG in nest	Certain

Unequivocal evidence of breeding was not obtained for a number of common species frequently observed throughout the breeding season and whose regional distribution closely matches the Project area. Such evidence strongly suggests that they certainly do breed in the Yıldız Mountains and, therefore, such species were assigned to certain breeding status, although their breeding codes correspond to probable or possible breeding. The single observation of a juvenile Baillon's crane at the end of July was assigned a code of probable breeder rather than certain breeder due to the likely possibility that this juvenile was an early migrant. Species assigned to breeding statuses other than their corresponding maximum breeding code are listed in Table 3.

This sampling method was complemented with opportunistic observations to provide a better understanding of the local avifauna with respect to micro-habitats, especially rare and cryptic bird species that are prone to being overlooked during routine survey work. Opportunistic observations were recorded

when (i) a new species was observed, (ii) a higher breeding code was confirmed for a previously recorded species, (iii) a cryptic or probably under-estimated species was observed, and (iv) a habitat patch with interesting features or specific potential was encountered. Main habitat characteristics and all of the birds in the available time were recorded when an opportunistic observation was made. Thus, there were three different types of observation: (i) observations from survey points within standard survey times (S), (ii) observations from survey points outside the standard survey time (SO), and (iii) opportunistic observations (O). Photographs were taken opportunistically but not during survey periods because this would have distracted the research effort and consistent application of the method between survey points. Therefore, limited photographic material was obtained.

Table 3 List of species assigned to breeding statuses different than their corresponding maximum breeding code, together with first and last recorded dates, and numbers of records, locations and birds observed. Total number of birds might include some that were double-counted as some locations were visited more than once during the survey.

Species	Maximum breeding code	Assigned breeding status	First date of record	Last date of record	No. records	No. survey locations	No. birds
Baillon's Crake	12	Probable	31-Jul	31-Jul	1	1	1
Black Woodpecker	4	Certain	3-May	5-Jul	29	24	34
Black-headed Bunting	3	Certain	18-May	30-Jun	16	10	19
Booted Eagle	1	Certain	4-May	23-Jul	9	9	9
Common Cuckoo	2	Certain	29-Apr	17-Jun	148	133	171
Common Kingfisher	3	Certain	14-May	28-Jul	27	15	31
Common Linnet	1	Certain	7-Jun	1-Jul	10	8	35
Common Whitethroat	3	Certain	29-Apr	5-Jul	19	11	21
Eurasian Hobby	4	Certain	2-May	17-Jul	19	14	28
Eurasian Hoopoe	3	Certain	29-Apr	17-Jul	60	38	70
Eurasian Wryneck	4	Certain	26-May	20-Jul	5	2	6
European Green Woodpecker	2	Certain	4-May	21-Jul	30	25	31
European Honey Buzzard	5	Certain	3-May	13-Jul	12	10	18
European Nightjar	5	Certain	3-May	13-Jul	55	41	61
European Scops Owl	2	Certain	2-May	16-Jul	23	15	26
Long-eared Owl	2	Certain	5-May	8-May	2	1	2
Ortolan Bunting	2	Certain	2-May	17-Jun	10	5	11
Short-toed Snake Eagle	3	Certain	18-May	1-Aug	15	12	18
White-throated Dipper	1	Certain	14-May	23-Jul	7	5	7
Yellowhammer	5	Certain	22-Jun	2-Jul	38	15	45

Although planned otherwise, it was not possible to adopt a completely stratified-random approach to the selection of survey points due to the lack of a detailed habitat classification of the Project area at the time of the onset of field work. Instead, the forest type data provided by the forestry administration was used to select central locations; and survey points were determined in the field with respect to the general features and size of the habitat, more or less even distribution of survey points and reasonable access by vehicle. Main roads and extremely small habitat patches were avoided to minimise edge effects but this was not always possible in the case of some habitats (e.g. poplar plantations, agricultural lands and open forest patches). While the absence of random sampling is a shortcoming of the present study, the fairly comprehensive coverage of the Project area (Figure 4) is considered to provide a reasonable estimate of breeding bird diversity.

2.2. Habitat Types and Sampling Effort

The sampling strategy during the two-month breeding bird survey was aimed at achieving an even coverage of survey points and adequate sampling of each main habitat type. The distribution of the 443 survey points with respect to nine main habitat types is enumerated in Table 4 and mapped in Figure 5.

Table 4 Total number of survey points for each main habitat type.

Habitat type	Total number of survey points
Forests	279
Open forest patches	38
Urban	23
Wetlands	23
Agricultural lands	22
Riparian zone	21
Coastal areas	20
Pine plantations	9
Poplar plantations	8
Total	443

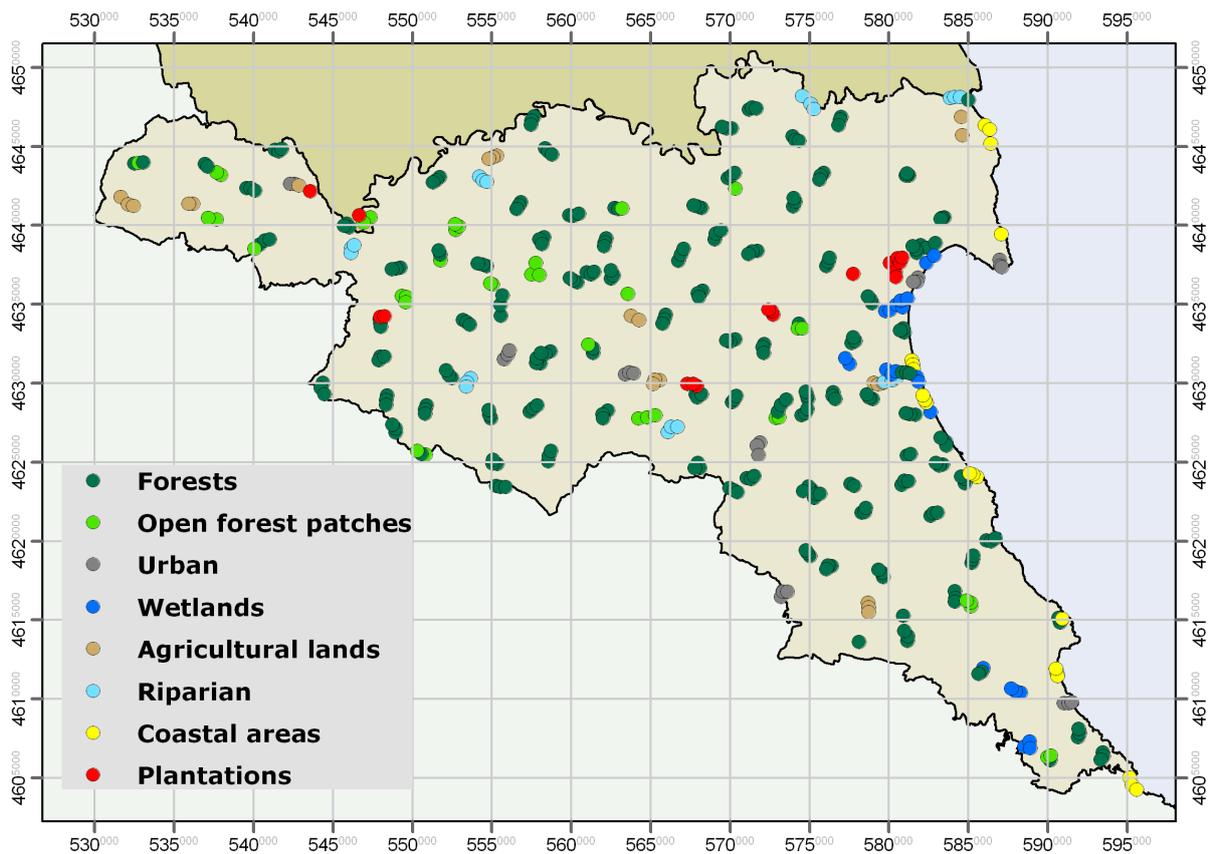


Figure 5 Distribution of 443 survey points, labelled according to main habitat types in the Project area. Pine and poplar plantations were pooled as plantations. The map is overlaid by five km UTM squares.

The majority (279) of survey points were in forest, reflecting the fact that much of the Yıldız Mountains is forested. The large number of forest samples enabled this habitat type to be further classified with respect to dominant tree species, foliage cover and age. Oak and beech were the dominant tree species and the majority of the stands were in the cd age group, as shown in Table 5.

Table 5 Forest survey points classified by dominant tree and age of stand (BDH, breast height diameter)

Dominant tree species	a	ab	b	bc	c	cd	d	de	e	Total
Oak	9	8	5	51	17	68	8	2	1	169
Beech				4	2	50	16	5	7	84
Hornbeam			1	4		3		3		11
Ash				1		7	1	1		10
Alder						1	2			3
Black pine						2				2
Total	9	8	6	60	19	131	27	11	8	279

BHD codes a: 0-8 cm, b: 8-16 cm, c: 16-25 cm, d: 25-50 cm, e: >50 (combined BDH categories denote mixed-age stands)

At least 20 survey points per habitat type were planned at the beginning of the survey. However, it was not possible to achieve this adequacy of sample size for poplar and pine plantations due to the low numbers of locations and small patch sizes. Sampling adequacy was assessed for the whole Project area and for each habitat type using species accumulation curves³ (Figure 6).

The well-established asymptote of the curve for the Project area indicates that the results of the field survey provide an adequate estimate of avifaunal species richness in the Yıldız Mountains. The curve for forest habitat can be interpreted similarly. Species accumulation curves for the remaining habitats, other than plantations, indicate that much though not all of the diversity is accounted for after 20 points have been sampled. Thus, sampling is considered to be reasonably adequate. In the case of pine and poplar plantations, the curves are steeply inclined with no sign of levelling off, so the total species richness may be significantly under-represented for these habitats (Figure 6).

2.3. Constraints

There are a number of constraints with the survey methodology. Ideally, each survey site is located at least 200 m distance from the edge of a habitat patch, and main roads that may fragment habitat are avoided as much as possible. In practice, secondary forest roads were not avoided; in fact, tertiary forest trails were occasionally used in the survey to ease transportation in rough terrain. This was a necessary optimisation of the field work to balance the needs of adequate site selection and efficient use of time and labour. Also learnt from experience was the fact that the risk of penetrating deep into large habitat patches without previous knowledge about the condition of forest roads frequently cost the team a full day's effort without any sampling. This meant the loss of six survey points. However, there are only a few main roads in the Project area and use of secondary forest roads, which are not a main concern for habitat fragmentation, enabled the survey team to reach every 5 km UTM grid in the Project area (Figure 4).

³ A species accumulation curve shows the accumulation of different species with each additional sampling location. In general, fewer species are encountered for the first time and the total number of species increases with each additional location surveyed until eventually the curve reaches a plateau. This indicates that the intensity of sampling is adequate for that particular habitat.

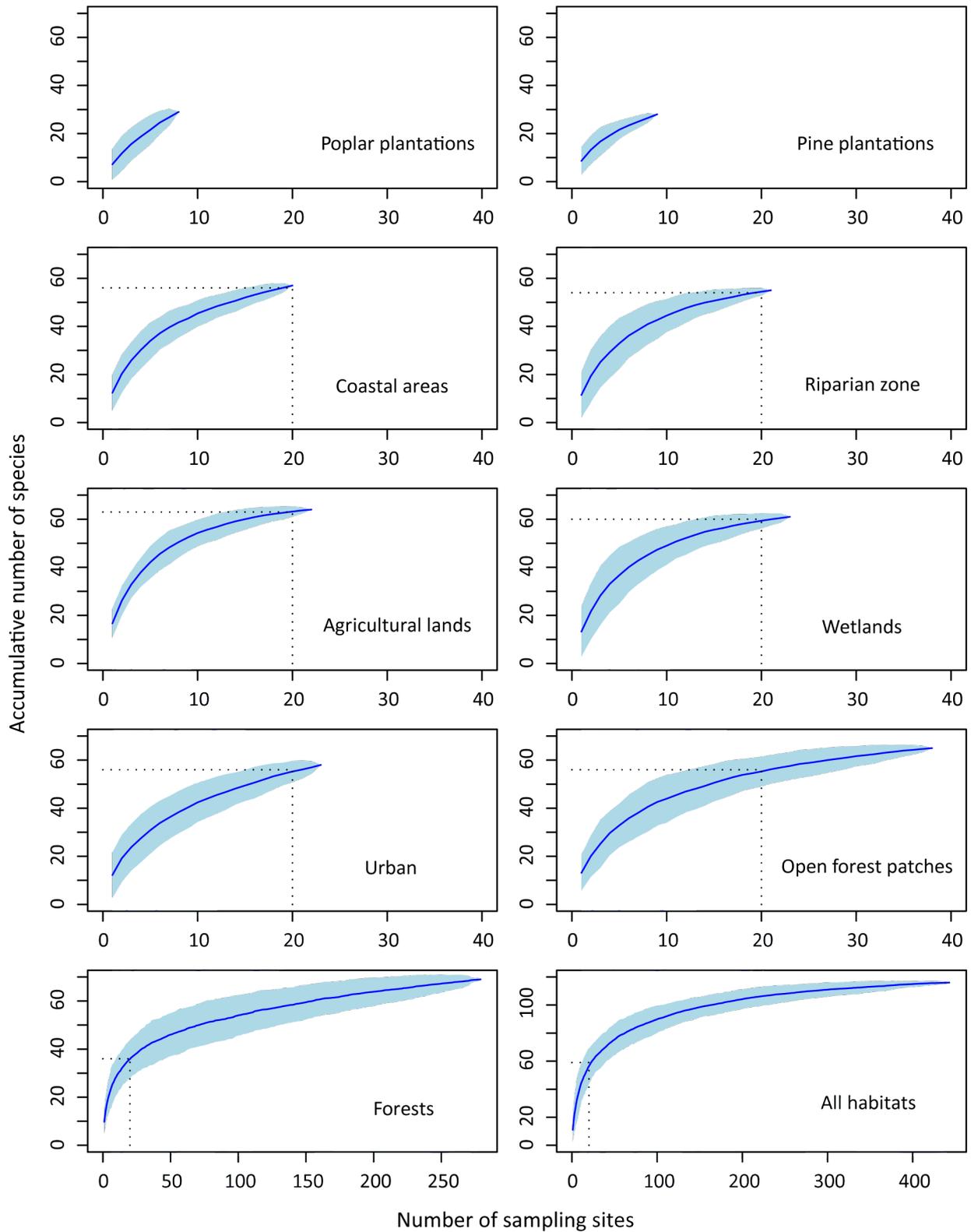


Figure 6 Species accumulation curves for the main habitat types. The solid line denotes the accumulative average number of species and the shaded area is the standard deviation. A guide to sampling adequacy is provided by the dotted line at 20 survey points. Note the different scales for plots of forests and all habitats.

Bird diversity surveys are usually conducted by experienced birdwatchers (Bibby, 2004), as in the case of the present study. The invaluable contribution of birdwatchers may also have shortcomings that can bias

statistical analyses. Analysis of the data and observations in the field showed that surveyors had a reluctance to record unidentified observations. A total of 28 unidentified observations were recorded, when the principal investigator (Korhan Özkan) was present. However, there was only one unidentified record when the principal investigator was absent. Such a shortcoming is inevitable for this kind of survey (Bibby, 2004) and considered a minor flaw compared to the overall efficiency.

It is difficult to estimate distance from sound, which is the main observation method in forests where direct sightings are in the minority. There is some limited bias in the distance estimates made by the team, especially for the first two distance bands (0-10m and 10-20m). This might have resulted in an overestimation of the abundance of birds within the nearest distance bands. This is inevitable in such surveys and knowing these shortcomings enables any post-analysis to take into account such possible bias. Furthermore, such surveys are also prone to underestimation of cryptic and less abundant species (Bibby, 2004). However, observations after 10 minute survey times and between consecutive survey points (SO) generated only an additional seven species (Table 1). This indicates that a 10-minute survey period was sufficient to capture most of the species diversity within a survey location (Table, Figure 6).

2.4. Data Analysis

The statistical analyses of species richness and generation of accumulation curves were made using R statistical software and the vegan community analysis package (R Development Core Team, 2008, Oksanen *et al.*, 2009). Only species observed in the standard survey time (S) were included in species richness analysis; species responding only to the played calls were discarded from this analysis. More detailed analysis of species diversity data demands complex statistics, which is beyond the scope of this study. Thus, the present analysis provides a general overview with descriptive statistics, whose limitations should be taken into account.

The distribution map of bird species richness (Figure 9) was generated by interpolating species richness in each survey point using the ArcGIS (Version 9.3.1) spatial analyst extension (inverse distance weighted interpolation). This method involves assigning richness values to the entire Project area, based on richness values from a scattered set of survey points. Spatial observation data were processed using ArcGIS to generate distribution maps of each species, other than those with migratory behaviour (Annex 2).

The analysis of habitat preference was based on observations from the 443 survey points (Table 4). Measures of **abundance**, in relative terms, are based on the total number of individuals of a species recorded within a given habitat; and measures of **commonness**, in relative terms, are based on the number of locations within which a species is observed in a given habitat. A species was considered to be **characteristic** of a particular habitat if the habitat accounted for more than 80% of records of the species.

3. RESULTS

3.1. Inventory for the Proposed Yıldız Mountains Biosphere

Previous scientific literature and observations on Yıldız Mountains were reviewed to provide a comprehensive overview of its avifaunal diversity. This also enabled gaps in knowledge to be filled for the winter and migratory seasons when no field survey work was undertaken (between the end of summer and late spring). Existing scientific literature on the avifauna of the Yıldız Mountains is limited to a few scientific papers and reports (Hasbenli, 2006, Kaya *et al.*, 1999, Milchev, 1994, Yurtsever and Kurtonur, 2003), and

there is only reference to the Yıldız Mountains in other relevant works (Roselaar, 1995, Kirwan *et al.*, 2008). Online databases, however, hold extensive amounts of data (KUŞBANK, 2009, TRAKUŞ, 2009).

The most recent review on the Yıldız Mountains is a fauna report on İğneada region (Hasbenli, 2006). This report is based on a limited field study and an analysis of two previous studies (Kaya *et al.*, 1999, Yurtsever and Kurtonur, 2003). The report provides an inventory of 194 bird species observed in the İğneada region, of which 180 species are consistent with the findings of the present survey and other observations (Roselaar, 1995, KUŞBANK, 2009, Milchev, 1994, Kirwan *et al.*, 2008, TRAKUŞ, 2009). Nine of the remaining 14 species listed by Hasbenli (2006) are not considered to be based on sufficiently reliable evidence to merit inclusion in the present inventory of birds for the Yıldız Mountains Biosphere. Their inclusion in Hasbenli's 2006 list for İğneada is based on the literature and not direct field observations. The two referenced works were not confined to the Yıldız Mountains, one covering Thrace (Kaya *et al.*, 1999) and the other including the dry-plains behind the Yıldız Mountains (Yurtsever and Kurtonur, 2003). Details of these nine species excluded from the present inventory for Yıldız Mountains Biosphere are given in Table 6.

Table 6 Assessment of species reported from the Project area that are unlikely to be present

Bird species	Reference	Assessment
Lesser kestrel <i>Falco naumanni</i>	Hasbenli (2006), Kaya <i>et al.</i> (1999)	Wrong reference, actually recorded outside the Project area in the original reference.
Barn owl <i>Tyto alba</i>	Hasbenli (2006), Kaya <i>et al.</i> (1999)	Wrong reference, actually recorded outside the Project area in the original reference.
Olive-tree warbler <i>Hippolais olivetorum</i>	Hasbenli (2006), Kaya <i>et al.</i> (1999)	Wrong reference, actually recorded outside the Project area in the original reference.
Great grey shrike <i>Lanius excubitor</i>	Hasbenli (2006), Kaya <i>et al.</i> (1999)	Wrong reference, actually recorded outside the Project area in the original reference.
Willow tit <i>Parus montanus</i>	Hasbenli (2006)	Species is not in the Turkish bird list (Kirwan <i>et al.</i> , 2008), has a distinctly different habitat preference than the Yıldız Mountains (Snow and Perrins, 1998) and lacked necessary detailed description.
Tengmalm's owl <i>Aegolius funereus</i>	Hasbenli (2006), Kaya <i>et al.</i> (1999)	Species has distinctly different habitat preferences (Snow and Perrins, 1998) and is an exceptionally rare, local breeder in Turkey (Kirwan <i>et al.</i> , 2008)
Chukar <i>Alectoris chukar</i>	Hasbenli (2006), Kaya <i>et al.</i> (1999) Yurtsever and Kurtonur (2003)	The species has distinctly different habitat preference and limited distribution in the region (Kirwan <i>et al.</i> , 2008, Snow and Perrins, 1998).
Alpine chough <i>Pyrrhocorax graculus</i>	Hasbenli (2006), Kaya <i>et al.</i> (1999) Yurtsever and Kurtonur (2003)	Species has distinctly different habitat preference and limited distribution in the region (Kirwan <i>et al.</i> , 2008, Snow and Perrins, 1998).
Masked shrike <i>Lanius nubicus</i>	Hasbenli (2006), Kaya <i>et al.</i> (1999) Yurtsever and Kurtonur (2003)	Species has distinctly different habitat preference and limited distribution in the region (Kirwan <i>et al.</i> , 2008, Snow and Perrins, 1998).
Herring gull <i>Larus argentatus</i>	Kaya <i>et al.</i> (1999) Yurtsever and Kurtonur (2003)	Species has an extremely northern distribution and never recorded in Turkey or the region (Kirwan <i>et al.</i> , 2008, Snow and Perrins, 1998). Lack of any record of yellow-legged gull, the commonest gull in the region, in both Yurtsever & Kurtonur (2003) and Kaya <i>et al.</i> (1999) implies a probable confusion between herring and yellow-legged gulls either taxonomy-wise or identification-wise.

The other five of the remaining 14 species not recorded in present survey, namely Egyptian vulture, greater flamingo, Eurasian eagle owl, eastern blacked-eared wheatear and rose-coloured starling, are included in the present inventory of birds of the Yildiz Mountains Biosphere for the following reasons:

- The Egyptian vulture has an active breeding colony in the Bulgarian part of the Yildiz Mountains (Milchev, 1994).
- The record of the greater flamingo was based on actual field observations (Hasbenli, 2006).
- Eurasian eagle owl has several anonymous observations and eastern blacked-eared wheatear and rose-coloured starling have wide distribution in the region with distinct migratory patterns (Snow and Perrins, 1998), all of which support the likelihood of their presence in the Yildiz Mountains.

Eurasian bullfinch and eastern Bonelli's warbler are also included in the inventory on the basis of historical records (Roselaar, 1995), although they were not observed in the present survey nor have they been recorded recently.

In addition to the existing literature, the national avian diversity databases contain invaluable information on the bird diversity of the Yildiz Mountains. KUŞBANK, which is the largest database, contains 2,385 records of 214 species on 22 localities on the Yildiz Mountains. These observations were made by 20 observers between 1996 and 2009. The distribution of the observation locations were given in Figure 7. Review of the data in KUŞBANK revealed an additional 65 species that were not observed in the present survey, mainly due to most of these species being passage migrants or overwintering species that were not around during the survey period. Twelve of these 65 species have not been recorded in other works, namely greater white-fronted goose, greylag goose, common scoter, pallid harrier, Montagu's harrier, little crane, parasitic jaeger, caspian gull, black-legged kittiwake, calandra lark, isabelline wheatear and sedge warbler, all of which are passage migrants or overwintering species with a global distribution that is consistent with their being observed in Yildiz Mountains. Only four of the 2,385 records were discarded due to a high probability of them being erroneous.

The data in KUŞBANK include some exceptional observations. During the autumn, 1,500 common buzzards and 2,500 white storks in 2006 and 1996, respectively, were seen migrating over Sivrilir Village. This verifies the importance of the Project area as lying along a main migration corridor. The data also indicate that Lake Mert is an important wintering site for waterfowl. Great cormorant (1,000), mallard (600), common pochard (600), tufted duck (350), Eurasian coot (2,500), black-headed gull (1,500), common wood pigeon (2,000) and common chaffinch (3,000), as well as several other species, were observed on Lake Mert in winter.

The TRAKUŞ national database holds photographs of 101 species and observations on 157 species in the Yildiz Mountains, recorded by four observers between June 2007 and June 2009. The observations in TRAKUŞ are limited to two coastal locations, İğneada and Kiyıköy, and their surroundings (Figure 7). Records in TRAKUŞ include overwintering birds and passage migrants, including 53 species that were not recorded in the present survey. Six of these 53 species, namely Bewick's swan, common pheasant, European golden plover, whimbrel, collared flycatcher and bearded reedling, are not reported elsewhere in the literature. These rare observations are all supported by photographic evidence, except in the case of bearded reedling, whose overwintering distribution includes the Project area (Snow and Perrins, 1998).

A total of 177 species were recorded during the present breeding bird survey, of which 119 were observed in the standard 10 minute survey time. The remaining 58 species were recorded opportunistically, including a large number of migrating species (Table 1). Eight species, namely black-tailed godwit, little tern, red-

throated pipit, eastern (Siberian) stonechat, moustached warbler, icterine warbler, barred warbler and rock bunting, were recorded for the first time in the Project area during this survey. **Thus, the total number of birds reliably recorded in the Yildiz Mountains Biosphere currently stands at 258 species, based on the results of the present survey and a thorough review of the literature, previous studies and national database holdings.** This inventory of 258 species, provided in Annex 1, includes 73 new species that are additional to those listed by Hasbenli (2006). Distribution maps of bird species (non-migrating) observed in the present survey can be found in Annex 2.

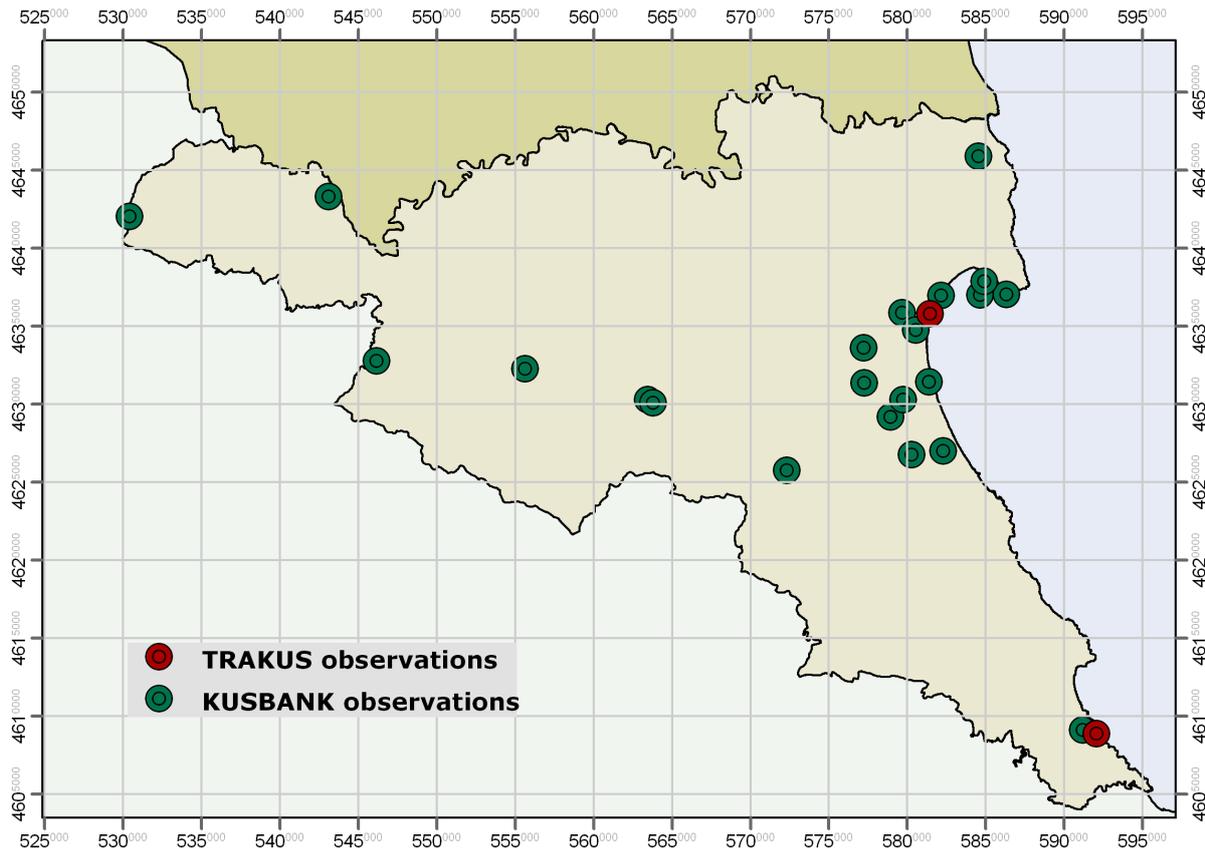


Figure 7 Distribution of the locations of observations held in national databases, KUŞBANK and TRAKUŞ. The map of the Project area is overlaid by five km UTM squares.

3.2. Breeding Birds - Distribution and Habitat Preferences

Observations of breeding behaviour revealed that there are 105 certain, seven probable and 16 possible breeding bird species in the Yildiz Mountains (Annex 1).

All of the main habitat types share a number of species associated with forests, which clearly indicates that forests are the dominant habitat in the Yildiz Mountains both structurally and functionally. The common chaffinch was found to be the most abundant and common species in the Project area, reflecting the extensiveness of its preferred habitat, forest (Table 7). Next most abundant species, in respective order, were common house martin, blue tit, Eurasian nuthatch, barn swallow and common nightingale. Next most common species, in order, were: Eurasian nuthatch, blue tit, European robin, common blackbird and great tit.

Table 7 List of most abundant and most common species for each main habitat type surveyed. The total number of birds and of survey points is given in parentheses for abundant and common species, respectively.

All habitats		Forests	
Most abundant	Most common	Most abundant	Most common
Common Chaffinch (1332) Common House Martin (862) Blue Tit (577) Eurasian Nuthatch (516) Barn Swallow (458) Common Nightingale (420) Great Tit (418) European Robin (383) Common Blackbird (371) Common Chiffchaff (323)	Common Chaffinch (386) Eurasian Nuthatch (245) Blue Tit (241) European Robin (240) Common Blackbird (240) Great Tit (238) Common Chiffchaff (233) Common Nightingale (146) Winter Wren (136) Common Cuckoo (123)	Common Chaffinch (903) Eurasian Nuthatch (403) European Robin (344) Blue Tit (324) Common Chiffchaff (237) Common Blackbird (234) Great Tit (230) Winter Wren (162) Marsh Tit (119) Common Nightingale (113)	Common Chaffinch (269) European Robin (209) Eurasian Nuthatch (186) Common Chiffchaff (166) Blue Tit (162) Common Blackbird (155) Great Tit (141) Winter Wren (111) Great Spotted Woodpecker (88) Common Cuckoo (84)
Open forest patches		Urban	
Most abundant	Most common	Most abundant	Most common
Common Chaffinch (100) Blue Tit (73) Common Nightingale (70) Common House Martin (65) Common Blackbird (47) Eurasian Nuthatch (46) Great Tit (45) Red-backed Shrike (38) Woodlark (38) Common Chiffchaff (34)	Common Chaffinch (35) Great Tit (27) Common Blackbird (26) Common Chiffchaff (25) Blue Tit (23) Red-backed Shrike (21) Tawny Owl (21) Common Nightingale (20) Eurasian Nuthatch (20) European Turtle Dove (19)	Common House Martin (553) House Sparrow (118) Barn Swallow (87) Western Jackdaw (62) Blue Tit (43) Common Nightingale (39) Common Swift (33) European Shag (32) Common Chaffinch (25) Spanish Sparrow (25)	Common House Martin (22) House Sparrow (22) Barn Swallow (16) Common Nightingale (15) Great Tit (13) Eurasian Greenfinch (11) Eurasian Golden Oriole (11) Eurasian Collared Dove (10) Eurasian Goldfinch (10) Common Chaffinch (8)
Wetlands		Agricultural lands	
Most abundant	Most common	Most abundant	Most common
Great Cormorant (159) Barn Swallow (96) Common House Martin (74) Great Reed Warbler (51) Common Starling (44) Common Chaffinch (38) Blue Tit (34) European Reed Warbler (33) Common Nightingale (32) Great Tit (27)	Common Chaffinch (14) Great Tit (13) European Turtle Dove (13) Great Cormorant (11) Great Reed Warbler (11) Blue Tit (11) Common Nightingale (11) Common Chiffchaff (11) Common Blackbird (10) Blackcap (9)	Barn Swallow (167) Common Chaffinch (150) Common Nightingale (82) Common House Martin (53) House Sparrow (52) Spanish Sparrow (37) Eurasian Golden Oriole (32) Great Tit (32) Corn Bunting (30) Common Wood Pigeon (30)	Eurasian Golden Oriole (19) Common Nightingale (18) Corn Bunting (16) Great Tit (15) European Turtle Dove (15) Common Blackbird (15) Common Chaffinch (14) Red-backed Shrike (13) Barn Swallow (12) Eurasian Greenfinch (12)
Riparian zone		Coastal areas	
Most abundant	Most common	Most abundant	Most common
Common House Martin (84) Common Chaffinch (58) Hawfinch (45) Barn Swallow (34) Great Cormorant (32) Blue Tit (27) Common Nightingale (23) Common Blackbird (20) Eurasian Nuthatch (18) Great Tit (18)	Common Chaffinch (20) Common Blackbird (14) Blue Tit (13) Eurasian Nuthatch (11) Winter Wren (11) Hawfinch (9) Great Tit (9) Marsh Tit (9) Blackcap (9) Common Chiffchaff (9)	Great Cormorant (61) Common Nightingale (54) Yellow-legged Gull (50) Blue Tit (47) Common Chaffinch (30) Great Tit (30) Barn Swallow (24) European Shag (19) European Turtle Dove (15) Common Blackbird (13)	Common Nightingale (17) Great Cormorant (12) Yellow-legged Gull (12) Common Chaffinch (12) Great Tit (12) Blue Tit (10) Common Chiffchaff (10) White Wagtail (9) Barn Swallow (8) Common Blackbird (8)
Poplar plantations		Pine plantations	
Most abundant	Most common	Most abundant	Most common
Common Chaffinch (12) Hawfinch (9) Common Nightingale (6) Great Tit (6) Eurasian Jay (4) Common Blackbird (4) Eurasian Golden Oriole (4) Blue Tit (3) Great Spotted Woodpecker (3) Eurasian Goldfinch (3)	Common Chaffinch (6) Great Tit (4) Common Nightingale (4) Eurasian Jay (3) Blue Tit (3) Common Blackbird (2) Eurasian Golden Oriole (2) Great Spotted Woodpecker (2) Woodlark (2) Middle Spotted Woodpecker (2)	Common Chaffinch (16) Common House Martin (10) Great Tit (9) Common Chiffchaff (8) European Nightjar (8) Barn Swallow (8) European Turtle Dove (6) Great Spotted Woodpecker (5) Eurasian Nuthatch (4) Common Cuckoo (4)	Common Chaffinch (8) Common Chiffchaff (6) European Nightjar (6) Great Tit (4) Great Spotted Woodpecker (4) European Turtle Dove (3) Eurasian Nuthatch (3) Common Cuckoo (3) Common Blackbird (3) Eurasian Hoopoe (3)

This underlying pattern is evident in **forest** and **open forest patches**. In the case of open forest patches and **agricultural lands**, species such as red-backed shrike, common nightingale and common blackbird were also abundant and/or common. Eurasian golden oriole, corn bunting and European turtle dove were among the most abundant and/or common species in agricultural lands (Table 7).

Common house martin, barn swallow, house sparrow and western jackdaw (abundant but not commonly distributed due to its colonial breeding habit), all of which are usually associated with human settlements, were most abundant and/or common in **urban** areas, along with the nightingale (Table 7).

Wetlands and **coastal areas** had a different species composition as expected (Table 7). Great cormorant, great reed warbler and European reed warbler were among the most abundant and common species in **wetlands**, together with common chaffinch, barn swallow, great tit and common house martin that were also abundant and/or common in other habitats. Great cormorant and yellow-legged gull were among the most abundant and common species in **coastal areas**, along with such species as common nightingale, great tit, common chaffinch and blue tit that were abundant and/or common in other habitats.

The composition of bird species, with respect to abundant and common species, in **poplar** and **pine plantations** reflects that of the surrounding forests (Table 7). Pine plantations are also favoured by European nightjar, which is known to prefer open lands with bushes and also conifers (Snow and Perrins, 1998).

Analysis of bird communities within each main habitat type shows **wetlands** as having the highest number of characteristic species (Table 8). **Open forest patches** and **agricultural lands** were analysed together as these habitats share common features; moreover, agricultural lands are small and not intensive monocultures. These two habitats harbour the second highest number of characteristic birds, consisting mostly of birds of the open plains and birds of prey (Table 8). The relationship between birds of prey and these two habitats is likely to reflect the ease of locating prey moving in open areas, including birds in flight.

A similar pattern is evident in **urban** areas, the only habitat where eastern imperial eagle and northern goshawk were observed, together with other species commonly associated with humans such as Eurasian collared dove and Eurasian tree sparrow (Table 8).

A number of species are characteristic of **forests**, including black woodpecker, Eurasian treecreeper, stock dove and wood warbler (Table 8). The only species characteristic of the **riparian zone** is white-throated dipper, reflecting its very direct affinity with running freshwater (Table 8).

In addition to European shag, which is a coastal bird, **coastal areas** have a large number of other characteristic species as follows: squacco heron, western marsh harrier and Cetti's warbler, probably due to several small wetlands being located in coastal areas; and Eurasian skylark, tawny pipit and greater short-toed lark, probably due to the presence of coastal grasslands and sand dunes (Table 8).

Plantations have no characteristic bird species, indicating that such non-native habitat is structurally and functionally lower in quality with respect to biodiversity.

No systematic ornithological work had been done in the Yildiz Mountains prior to the present survey, so it is not possible to compare the current status and distribution of species with those of an earlier period. However, a breeding bird atlas survey was carried out at the Bulgarian part of the Yildiz Mountains in 1988-90 (Milchev, 1994). The study concluded that there were 133 certain, eight probable and five possible breeding bird species in the Bulgarian part of the Yildiz Mountains. The results of the present survey are

mostly in accordance with the observations on the Bulgarian side of the mountains. The main differences between the two surveys are as follows:

- Records of breeding populations of chukar, grey partridge (*Perdix perdix*), great spotted cuckoo (*Clamator glandarius*), roller, calandra lark, isabelline wheatear and olive tree warbler on the Bulgarian side, which is likely to reflect the much more extensive patches of agricultural lands.
- A more diverse community of breeding birds of prey in Bulgaria, including black kite (*Milvus migrans*), Egyptian vulture, Montagu's harrier, levant sparrowhawk, golden eagle and common kestrel. This difference could also be due to the large open tracts of lands in the Bulgarian part.

Table 8 Characteristic bird species of the main habitats surveyed. As defined in Section 2.4, characteristic indicates that >80% records of a species relate to a particular habitat. Frequencies of occurrences are given in parentheses. Note that plantations (pine and poplar) are not listed as they had no characteristic species. Open forest patches and agricultural lands were analysed together as they share common habitat features.

Forests	Open forest patches / Agricultural lands	Urban
Black Woodpecker (1) Eurasian Treecreeper (1) Stock Dove (1) Wood Warbler (1) European Robin (0.87) Song Thrush (0.85) Winter Wren (0.82) Marsh Tit (0.81)	Booted Eagle (1) Common Quail (1) European Honey Buzzard (1) Lesser Spotted Eagle (1) Long-eared Owl (1) Sombre Tit (1) Woodchat Shrike (1) Yellowhammer (0.93)	Alpine Swift (1) Eastern Imperial Eagle (1) Feral Pigeon (1) Northern Goshawk (1) Little Owl (0.85) Eurasian Collared Dove (0.83) Eurasian Tree Sparrow (0.80) Common Redstart (0.80)
Wetlands	Riparian zone	Coastal areas
Eurasian Coot (1) European Reed Warbler (1) Garganey (1) Little Egret (1) Little Grebe (1) Mallard (1) Mute Swan (1) Pygmy Cormorant (1) Common Moorhen (0.80) Little Bittern (0.80)	White-throated Dipper (1)	Cetti's Warbler (1) Eurasian Skylark (1) Greater Short-toed Lark (1) Squacco Heron (1) Tawny Pipit (1) Western Marsh Harrier (1) European Shag (0.83)

3.3. Significant Findings

The avifauna survey revealed several new breeding records both for the Yıldız Mountains and Turkey. The wood warbler was not known to breed in Turkey (Kirwan *et al.*, 2008) until the discovery of a nest and several other breeding records over the Project area throughout the present survey (Annex 2). The only previous record was of a singing male in summer 1974 (Roselaar, 1995). Wood warblers are nearly always observed in oak forests with clear undergrowth, occasionally with a slight slope. The nest was discovered near the Bulgarian border in a young oak forest having the above-mentioned characteristics. The doom-shaped nest was built on the ground among short grass and contained at least three chicks. The wide distribution of the wood warbler in the Yıldız Mountains indicates that it regularly breeds in the area and its breeding distribution probably extends in oak forests as far east as İstanbul.

Yellowhammer is another bird that needed proof of breeding in Turkey (Kirwan *et al.*, 2008). Several widely distributed breeding records over the survey area indicated that this species also breeds regularly in open forest patches and agricultural lands of the Yıldız Mountains (Annex 2, Figure 8).

Green sandpiper is another species that lacked any evidence of breeding in Turkey. In fact, its breeding was expected to be distinctly unlikely due to its northern breeding range (Kirwan *et al.*, 2008). However, several individuals were recorded throughout the survey along forested rivers, streams and forested coastal wetlands (Annex 2). Their cryptic breeding behaviour prevented the survey team from improving the breeding evidence, although several offspring were seen at the end of the study period. These offspring could have been early migrants but the observations on probable breeding of green sandpiper are consistent with observations from the Bulgarian side of the Yıldız Mountains, where green sandpiper is recorded as a probable breeder (Milchev, 1994).



Figure 8 Photographs of some important bird observations. **Top left:** Male icterine warbler singing on 14 May. The same individual was observed singing at the same site four days later. **Top right:** Juvenile Baillon's crane (first photograph of this species in Turkey) foraging among reeds at Lake Mert on 31 July. **Bottom left:** One of two offspring of a white-tailed eagle couple that bred in swamp forest, flying over the coast on 13 July. **Bottom right:** Male yellowhammer singing on a perch on 27 June. They are common breeders of the open forest patches on the north-east Yıldız Mountains.

The survey also provided breeding evidence for several other species, namely: icterine warbler, Baillon's crane, stock dove, Eurasian wryneck, red-breasted flycatcher, common rosefinch, white-throated dipper and garden warbler, which needed need further breeding information from the region. However, stock dove, Eurasian wryneck and white-throated dipper have been recorded from the Bulgarian side of the Yıldız Mountains (Milchev, 1994).

Icterine warbler is an irregular, extremely rare breeder in Turkey that had not been recorded previously in Thrace (Kirwan *et al.*, 2008, Roselaar, 1995). Several observations of singing males and a couple indicate that it probably breeds in the Yildiz Mountains. It was nearly always recorded at forest edges adjacent to streams (Figure 8). Baillon's Crake is also an irregular breeder in Turkey (Kirwan *et al.*, 2008) and extremely rarely recorded, probably owing to its cryptic behaviour. An offspring was recorded on July 31st among the reeds of Lake Mert (Figure 8). Although the migration period of Baillon's crake is late autumn (Snow and Perrins, 1998), it might have been an early migrant and, thus, its breeding status was assigned to probable (Table 3). Stock dove is a local resident in well-wooded uplands of Anatolia, however never recorded in Thrace during the breeding period (Kirwan *et al.*, 2008). The observation of an individual in old-growth forest with partial canopy cover during the survey indicates that stock dove probably breeds in the study area but locally and rarely.

Eurasian wryneck and red-breasted flycatcher are rare breeders in Turkey, mostly distributed along the northern forests of Anatolia (Kirwan *et al.*, 2008). Both species were recorded in several locations during the present survey: Eurasian wryneck was assigned to certain breeding due to several-weeks-long territory holding; and red-breasted flycatcher remains as a probable breeder. Common rosefinch more commonly breeds in the northern parts of Turkey at higher altitudes (Kirwan *et al.*, 2008). Interestingly, several individuals including a singing male were seen on 23 June at 650 m. Therefore, they probably breed in Thrace but with a restricted distribution due to limited higher-altitude habitats. White-throated dipper also commonly breeds throughout Anatolia, mostly associated with upland streams and fast-flowing torrents (Kirwan *et al.*, 2008). Their wide distribution among slow-flowing, lowland streams in the Yildiz Mountains (Annex 2) represents an interesting finding. Lastly, the breeding status of the garden warbler in Turkey is unclear, with numerous observations but only one conclusive breeding record in İstanbul in 1972 (Kirwan *et al.*, 2008). The observation of one pair feeding two fledged young confirms their breeding in the study area.

3.4. Avifauna Diversity in the Yildiz Mountains

The Convention on Biological Diversity defines biodiversity as the variability among living organisms from all sources including, among other things, terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are a part. This includes diversity within species, between species and of ecosystems. However, species richness was used as a measure of bird diversity in the different habitats of the Yildiz Mountains in this study.

Table 9 Average bird species richness for the main habitat types in the Yildiz Mountains

Habitat type	Total number of survey points	Total number of bird species	Average species richness
Forests	279	68	8.7
Open forest patches	38	64	12.5
Urban	23	57	11.3
Wetlands	23	60	12.1
Agricultural lands	22	63	15.8
Riparian zone	21	54	11.6
Coastal areas	20	56	12.1
Pine plantations	9	27	7.0
Poplar plantations	8	28	6.1
Total Project area	443	115	9.9

Agricultural lands has the highest average species richness with a value of 15.8, followed by **open forest patches** with a value of 12.5 (Table 9). The high bird species richness observed in these two habitats is

probably related to their heterogeneity (Kati and Şekerciöğlü, 2006). Much of these lands are mosaics of hedgerows, scattered trees and tree lines, and frequently in close proximity to forest edges or streams. This structural and functional diversity of the habitats probably enhances bird species richness. Species richness is lowest in **plantations** (Table 9), indicating that pine and poplar plantations result in diminished avifaunal diversity compared with the natural forests and open forest patches, respectively, that they replace.

The distribution of bird species richness across the proposed Yıldız Mountains Biosphere is shown in Figure 9. Hotspots of high species richness occur in the swamp forests along the coast, as well as in a number of locations represented by agricultural lands and open forest patches.

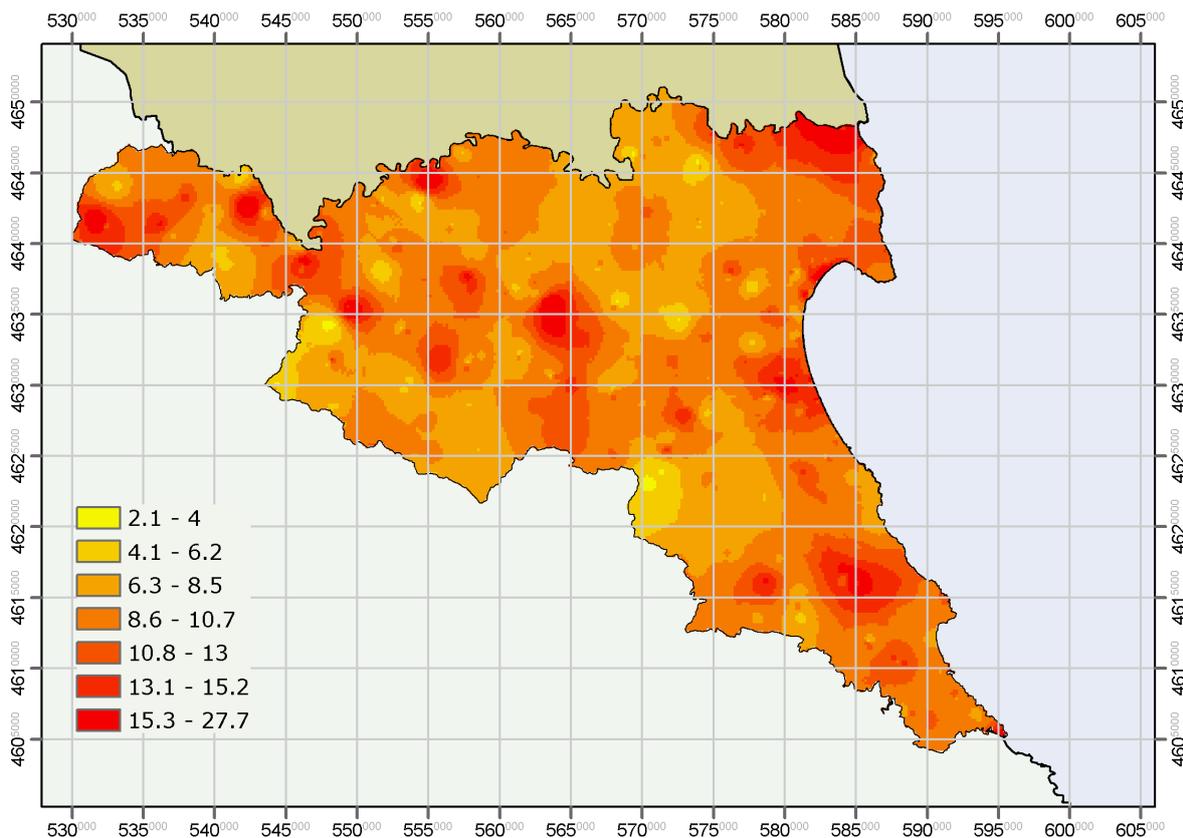


Figure 9 Distribution of bird species richness across the proposed Yıldız Mountains Biosphere

Forests cover the majority of the Yıldız Mountains and, therefore, are a main determinant of local bird diversity. The sample size for forest habitat is sufficiently large to merit further examination of different forest types with respect to stand age and dominant tree species (Table 10). A number of patterns emerge from such an analysis as follows:

- Bird species richness differs between the dominant tree species.
 - Ash and hornbeam, which are representative of swamp forest, have the highest bird species richness.
 - Comparison of the two most dominant forest types (oak and beech) shows that oak-dominated stands tend to have more bird species than beech-dominated forests. The rough bark of oak,

with its cracks and crevices, is likely to provide more nesting and foraging opportunities for birds compared with the smooth, uniform bark of beech.

- Alder and black pine, which is an introduced species in the Project area, harbour the lowest bird species richness but this comparison is based on low sample sizes and statistically is not robust.
- Bird species richness differs between stand age categories.
 - Average bird species richness increases with the age of the stand when dominant tree species are pooled. The progressively positive effect of increasing stand age on bird species richness is clearly evident for oak and hornbeam dominated stands. This effect is partially observed in beech and ash dominated stands but there are some confounding effects: middle-aged beech and old-aged ash stands are least rich in bird species. Explanation of such effects would require more detailed field study and analysis.

The above findings are supported by preliminary statistical analysis (unpaired *t* test) of the data. For example, ash stands have significantly higher bird species richness compared to all other dominant tree species [\sim oak, $t(9)=3.4$, $P<0.01$; \sim beech, $t(9)=3.7$, $P<0.01$; \sim hornbeam, $t(11)=2.9$, $P=0.02$]. However, pair-wise comparison of oak and beech stands shows that the higher species richness of oak stands is statistically insignificant [$t(186)=1.6$, $P=0.11$]⁴. Pair-wise comparison of pooled stand age groups shows that old stands harbour significantly higher bird species richness than middle-age [$t(86)=2.2$, $P=0.03$] and young stands [$t(95)=2.5$, $P=0.01$].

Table 10 Average bird species richness according to dominant tree species and age of stand (young, middle, old)

Dominant tree species	Young (0-16 cm BHD)	Middle (16-25 cm BHD)	Old (>25 cm BHD)	All samples
Oak	8.3	8.7	9.6	8.6
Beech	8.5	7.4	9.3	8.1
Hornbeam	8.0	9.3	11.0	9.2
Ash	12.0	15.3	12.5	14.4
Alder		6.0	7.5	7.0
Black pine		7.5		7.5
Total samples	8.3	8.5	9.6	8.6

Thus, the importance of mature forests for forest biodiversity (Ülgen and Zeydanlı, 2008) is confirmed by the above analyses of the survey data. Survival of several bird species in the Project area is directly related to the survival of old forests, as they need old and decaying trees for nesting and foraging (Figure 10). Although mature forests in the Project area are subject to active management practices, the relatively wide distribution of several bird species that prefer mature forests (black stork, white-tailed eagle, woodpeckers, semi-collared flycatcher, Eurasian treecreeper, marsh tit) indicates that some mature forests continue to function in the Yıldız Mountains (Annex 2). However, any further deterioration of these mature forests would probably risk the survival of several bird species in the Project area.

⁴ Oak stands have significantly higher bird species richness than beech stands when the confined to the middle-age class [$t(113)=3.3$, $P<0.01$].



Figure 10 Some birds live in old forests with decaying trees. Eurasian treecreeper (**left**) nests underneath the loose bark of dead trees. Semi-collared flycatcher (**middle**, photo courtesy of Kadir Söğüt), which is globally threatened (IUCN, near threatened, for details see section 3.5) prefers mature forests as breeding habitat. Marsh tit (**right**) nests in holes in trees and thus needs dead and decaying trees.

3.5. Conservation Status of Birds in the Yıldız Mountains

The status of the avifauna of the Yıldız Mountains was assessed with respect to relevant international and national legal and other instruments concerned with biodiversity conservation, specifically:

- Bern Convention 1982 (Convention on the Conservation of European Wildlife and Natural Habitats), ratified by Turkey in 1984.
- European Union Birds Directive, under which the provisions of the Bern Convention are applied. Note that while assessments have been made at European level and for each member state, there is no specific assessment for Turkey due to its candidacy to the European Union still being in progress.
- IUCN (International Union for the Conservation of Nature and Natural Resources) Red List of threatened species (IUCN, 2009).
- BirdLife's *Birds in the European Union status assessment* (BirdLife International, 2004).
- At the national level, the Law of Land Hunting 4915 (2003) is the main instrument providing protection to specific species. Species listed under the different annexes are assessed annually by the Central Commission for Hunting, based essentially on the provisions of the Bern Convention.

The various annexes and categories arising from these instruments are defined in Table 11. The results of this assessment are summarised in Table 12, based on the data collated for individual species in Annex 1. Many species are listed under the Bern Convention and all but eight species are protected to varying extents (Table 12).

Nearly half of the bird species recorded from the Yıldız Mountains have a breeding code, while the remaining half comprise migratory species, overwintering or passage migrants (Annex 1). According to the latest IUCN Red List, three species in the Yıldız Mountains are globally threatened and a further seven species are at significant risk of becoming threatened. Eight of these ten species are migratory species (Mediterranean (Yelkouan) shearwater, ferruginous duck, Egyptian vulture, pallid harrier, greater spotted eagle, black-tailed godwit, Eurasian curlew and European roller); the other two species being the eastern imperial eagle and

semi-collared flycatcher, which are possible and certain breeders, respectively. The wide distribution of the semi-collared flycatcher across the Yıldız Mountains (Annex2) is a locally important conservation feature.

Table 11 Conservation annexes and categories defined under international and national legislation and other instruments. Note that only those annexes and categories relevant to the present study are included.

Instrument	Latest assessment	Annex / Category	Explanation
Bern Convention (1982)	1993	Annex 2	List of strictly protected fauna species.
		Annex 3	List of protected fauna species that may be hunted or otherwise exploited in exceptional instances.
EU Birds Directive (1979)	2007	Annex 1	List of species subject to special conservation measures concerning their habitat to ensure their survival and reproduction.
		Annex 2	List of species that may be hunted under national legislation, with care not to jeopardize conservation efforts within their distribution area.
		Annex 3	List of species that may be subject to trade under national legislation.
IUCN Red List	2009	EN	Endangered
		VU	Vulnerable
		NT	Near threatened
		LC	Least concern
BirdLife International	2004	SPEC 1	Species of global conservation concern, i.e. classified as globally threatened, near threatened or data deficient in the IUCN Red List.
		SPEC 2	Species concentrated in Europe and with an unfavourable conservation status.
		SPEC 3	Species not concentrated in Europe but with an unfavourable conservation status.
		Non-SPEC	Favourable conservation status
Law of Land Hunting 4915 (2003)	2009	Annex 1	List of species permanently protected
		Annex 2	List of hunted species that are temporarily protected.
		Annex 3	List of species that can be hunted within limits of time, place and quantity.

Table 12 Summary of international and national conservation status of the 258 species of birds in the proposed Yıldız Mountains Biosphere, based on Bern Convention, EU Birds Directive, IUCN Red List, BirdLife International and national legislation. The total number of species is given for each category. NI denotes the number of species not included in an assessment. For further details concerning individual species refer to Annex 1.

Breeding Status		Bern Convention		EU Birds Directive		IUCN Red List		BirdLife International		National Legislation	
C	105	Annex 2	180	Annex 1	84	EN	1	SPEC 1	6	Annex 1	183
Pr	7	Annex 3	70	Annex 2	13	VU	2	SPEC 2	30	Annex 2	47
Po	16	NI	8	Annex 3	3	NT	7	SPEC 3	70	Annex 3	27
NB	130			NI	158	LC	248	Non-SPEC	151	NI	1
								NI	1		

According to the BirdLife International (2004) assessment, six species are of global conservation concern (SPEC1). Two of these species (pygmy cormorant and white-tailed eagle) are no longer considered to be globally threatened (2008 IUCN Red List) due to more recent increases in their population. Nonetheless, they should be considered species of potential conservation concern, given their historical declines. Thus, the breeding couple of white-tailed eagles and one or two breeding couples of pygmy cormorants are of conservation importance to the Project area (Annex 2). Also of conservation importance in the Yıldız Mountains are the 47 breeding and 51 non-breeding species classified as SPEC2 or SPEC3 (Annex 1). Included among these species are black stork, European nightjar, common kingfisher, European hoopoe, grey-headed

and green woodpecker, wood warbler, spotted flycatcher, marsh tit, red-backed and woodchat shrikes, all of which breed over a wide distribution in the Yildiz Mountains (Annexes 1 and 2).

Most bird species are protected nationally from hunting under the Law of Land Hunting 4915 (2003), of which the species listed in the annexes are assessed annually by the Central Commission for Hunting, Ministry of Environment and Forestry. Of the 27 bird species classified as open to hunting (Table 12, Annex 1), 20 are protected under the Bern Convention, 13 certainly or possibly breed in the Yildiz Mountains, and 11 species are of unfavourable conservation status in Europe (SPEC2) or outside Europe (SPEC 3). A large number of species that may be hunted are waterfowl and waders, which tend to be passage migrants.

4. IMPORTANCE OF THE YILDIZ MOUNTAINS FOR BIRD-WATCHING

Bird-watching is a pursuit that brings many people, young and old, into closer contact with nature, perhaps not least because birds are ubiquitous and readily seen at home, in the countryside and especially in areas conserved for their wildlife. It is an important component of fast-growing eco-tourism.

The Yildiz Mountains, with its diverse composition of habitats and rich avifauna, is an important destination for birdwatchers. Among the great diversity of birds in the region, woodpeckers are the ultimate speciality of the Yildiz Mountains (Figure 11). All of Turkey's nine woodpecker species are commonly found in the Yildiz Mountains and in great abundance, with the exception of the Syrian woodpecker which does not breed in the Project area. This species has been observed in autumn and winter, probably due to its post-breeding dispersal from the surrounding habitats. It is possible for a birdwatcher to enjoy this great diversity of woodpeckers in a single visit.

Other interesting species for the birdwatcher include the white-tailed eagle (Figure 8), a rare breeder in Turkey and definitely a spectacular bird to observe. The resident couple in the swamp forest enhances the importance of the site as a bird-watching destination. Furthermore, breeding of the icterine and wood warblers is an important attribute of the local avifauna. The possibility of encountering both white-throated dipper and semi-collared flycatcher in a forest visit (probably the only place in Thrace) can provide further enjoyment.

The diversity of breeding and resident birds provides a wide range of opportunities for bird-watching in the Yildiz Mountains. The wetlands and coastal areas are particularly spectacular in the migration periods and during winter. Although the wetlands are small, they harbour an impressive diversity of egrets, waterfowl and shore birds, as well as birds of prey through the spring and autumn migration, probably because these small wetlands are an important stop-over location along a main migration corridor of the western Palaeoartic. Winter, on the other hand, provides a great opportunity for keen birders to observe some of the region's rare specialities, such as loons, all three swan species together, greater scaup, long-tailed duck, common scoter, red-breasted merganser, smew and black-legged kittiwake. In addition to bird-watching opportunities in wetlands and the sea, the extensive coastal dunes provide habitat to some rare song birds, such as snow bunting, in winter.



Figure 11 Yildiz Mountains harbours a great diversity of woodpeckers. White-backed woodpecker (**top left**) is the rarest woodpecker in Turkey, a favourite for bird-watchers. Grey-headed woodpecker (**top middle**) has a limited distribution in Turkey, mostly confined to north-west. Great spotted woodpecker (**top right**) is common in forests but also easily adapts to rural development. Eurasian wryneck (**bottom left**) has a scattered breeding distribution in Turkey. Middle spotted woodpecker (**bottom middle**) is a common breeder in Turkey but avoids inland Anatolia. Black woodpecker (**bottom right**, photo courtesy of Soner Bekir) is the largest and the most spectacular woodpecker in the region and probably the favourite woodpecker among birdwatchers.

5. DISCUSSION AND RECOMMENDATIONS

The analysis of the results and observations in the field are discussed below and practical management recommendations arising from them to conserve and enhance bird diversity in the Yildiz Mountains are highlighted in bold text.

While the total number of bird species recorded in forests (68 species) is higher than for any other of the main habitats sampled, the highest average species richness was recorded in agricultural lands (15.8 species), followed by open forest patches (12.5) and then wetlands and coastal areas, for which values of 12.1 species were recorded for both habitats (Table 9). The high heterogeneity, structural diversity and rural

mosaics in the less-intensively managed agricultural lands of the Yıldız Mountains probably favour this markedly higher average bird species richness (Kati and Şekercioğlu, 2006).

- **Thus, the patchiness and structural diversity in agricultural habitats and associated low intensity farming practices should be maintained in the Yıldız Mountains.**
- **Detailed studies of these farming practices should be made in relation to bird species diversity in order to determine the extent to which traditional farming practices should be maintained in the interests of bird (and possibly flora) diversity.** This may result in the need for government to subsidise such practices in future in the interests of biodiversity conservation.

The markedly low average bird species richness in forests compared with most other habitat types (Table 9) is likely to reflect past management regimes, resulting in low structural diversity including the absence of a shrub layer in some stands. This is supported by an analysis of average bird species richness in relation to the age of forest stands dominated by different tree species. In all cases, except for forests dominated by ash and beech, average species richness increases with stand age (Table 10). It is well known that mature forests are key elements in forest biodiversity conservation that have suffered from forest management practices world-wide (Ülgen and Zeydanlı, 2008). Yıldız Forests are no exception, the majority of the forest stands being fairly uniform in composition and age due to being managed for timber production over many decades. The recent change in the Forest Policy for less intensive production is an important improvement but needs to be enhanced by specific measures to protect stands of old growth forest, of which several remain in the Project area. This will build on the fairly recent initiative to protect swamp forest through the establishment of the İğneada Longoz Forest National Park.

It is also noted from field survey results that forest management policies probably favour beech over oak trees. This is based on the fact that old beech trees were encountered more often than old oak trees in the managed forests, despite oak being the predominant tree type (Table 5). The data show, however, that average bird species richness is higher in oak than beech stands (Table 10). Therefore, appropriate measures should be taken to reduce the production stress over the oak forests by:

- **Protection of the several remaining stands of old oak forest, ensuring that old trees are left to die, fall and rot on the ground to benefit biodiversity in general and birds in particular.**
- **Continuing management of forests for timber production does not favour earlier (in terms of BHD class) selective removal of oak over other species, such as beech.**

Coastal areas are of great importance for conserving the bird diversity in the Yıldız Mountains. The protected parts of the coastline include swamp forests, coastal forests, estuaries, sand dunes and coastal meadows. The diversity of coastal habitats is probably responsible for the accumulation of several hot-spots of high bird species richness along the coastline (Figure 9). A number of protection measures are necessary as follows:

- **The long-term protection of the swamp forest along the Mutlu River should be ensured.** Its high bird species richness is attributed to its location within the restricted military zone adjacent to the international border. Any future relaxation in military restrictions should be matched by greater conservation protection measures.
- **The sand dunes along the coastline from Lake Mert to the estuary of Bulanık River should be protected from vehicular use and excessive recreational activities should be regulated.** The white-tailed eagle, one of the rarest birds of prey in Turkey, nests along this stretch of coast because it is largely free from human disturbance. This is the only confirmed breeding location of this species in

the region (Annex 2). Currently, the beach is used extensively by tourists in summer and even a vehicle track has been established adjacent to the dunes. An adequate portion of the bay, stretching from Limanköy to İğneada, is already dedicated to recreational activities and there is no specific need for such activities to spill over towards the swamp forest that lies in the national park.

There are several conifer plantations in the Project area that were planted and maintained by the forestry administration. They are not natural to the Yıldız Mountains and include several introduced species. Introduced species are one of the main drivers of global biodiversity loss (BirdLife International, 2008). The results of the present survey indicate that these conifer plantations are characterised by very low bird species richness (Table 9). **This management practice should be abandoned and, once the timber has been extracted, the land should be allowed to revert to natural forest.**

The establishment of poplar plantations should be regulated, with maximum limits established in proportion to the available open land at each location. Similar to conifer plantations, their avifaunal species diversity is very low (Table 9). They are rapidly replacing open forest patches and agricultural lands, especially along river terraces, and this practice is also changing the landscape.

The water level and hydrological cycle of Mert Lake and the surrounding swamp forest are regulated by a small channel that connects with the Black Sea. This channel is blocked by accumulated sand from the sea and opened by the pressure of freshwater water during rainy seasons in a natural, annual cycle. This natural cycle sustains the ecological functioning of the wetland. It was observed during the field study and in previous years that the blocked channel is opened by local fisherman to allow fish to enter the lake, which is then used as a fishing lagoon. Such practice drains the lake and swamp forest much earlier than in the annual cycle, resulting in extremely low water levels in Mert Lake and drought conditions in the swamp forest during summer. **Such malpractices reflect badly on the lack of effective management of the İğneada Longoz Forest National Park and must be stopped to conserve the ecological structure and functioning of Mert Lake, its surrounding swamp forest and the local avifauna.** The road crossing Lake Mert is another significant problem as it fragments the wetland, decreases the habitat quality, and interferes with the hydrology. **This road should be closed and the surrounding wetlands and Lake Mert should be reconnected by digging several channels, if it is not practicable to remove the entire length road.**

Lake Mert and Lake Erikli receive the total sewage effluent of İğneada, which results in eutrophication⁵ in both lakes (Özkan and Beklioğlu, 2007). Eutrophication is a main factor that deteriorates diversity in each group of wetland species (Jeppesen, 1998). **The sewage effluent should be processed in an environmentally appropriate way and diverted to the sea.**

Hunting in the wetlands is another significant issue. It is well known and previously observed that birds are hunted at Mert and Erikli lakes during the migratory and winter seasons. These small wetlands are crucial for migrating and overwintering birds as the Yıldız Mountains lie in one of the main migration bottlenecks of the Palaeoarctic region (Figure 2). Hunting activities not only result in direct bird mortality but disrupt the function of these small wetlands as resting and feeding habitat by disturbing the entire bird community. **Hunting should be prohibited from all such wetlands within the proposed Yıldız Mountains Biosphere and effectively warded.**

⁵ Eutrophication is the destruction of the food-web and biodiversity in wetlands due to excessive nutrient enrichment of freshwater, often due to agricultural fertilizers and sewage effluents and evident from algal blooms and fish kills.

Licensing of the construction of wind farms in the Project area is a recent issue that potentially threatens bird migration and avian diversity. The negative impact of wind farms on local breeding birds due to the resultant deterioration of habitat quality and, more importantly, on migrating birds due to direct mortality is well known (Langston and Pullan, 2003). Given that the Yıldız Mountains are located strategically on one of the major migration bottlenecks of the entire Palaeoarctic Region, the construction of wind farms could have far-reaching negative consequences extending way beyond Turkey's international borders. The military radar station at the peak of Mahya Mountain leads to direct mortality of hundreds of quails in each migration (personal communication). The significant effect of this limited-sized-structure is a good indication of the probable consequences of large scale wind farms in such an important migration bottleneck. Thus, **the construction of wind farms should be avoided within the proposed Yıldız Mountains Biosphere, given its strategic location with respect to bird migration.**

ACKNOWLEDGEMENTS

I should like to thank Michael Green for his helpful suggestions, cooperation and editing of the text; Türker Altan, Refik Çölaşan, Selim Cesur, Frank Feys, Mustafa İşçiođlu, Volkan Göç, Adil Akyol, Ömer Şen and Ziya Babat for their cooperation; Keziban Kaynar and Emre Öztürk for their help in the field; Kerem Ali Boyla, Asaf Ertan, Şahika Ertan, Okan Can, Özge Keşaplı Can, Mustafa Sözen, Ahmet Karataş and Ömer Necipođlu for their suggestions on methodology and local avifauna; Soner Bekir and Kadir Söğüt for supplying photographs; and Josephine Green for editorial assistance. The technical assistance provided by Murat Bozdođan, Cemil Gezgin and Ergün Bacak throughout the field survey is also acknowledged. All the photographs used in the report were taken by Korhan Özkan, except where otherwise indicated.

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ANNEX 1. LIST OF BIRDS IN THE YILDIZ MOUNTAINS

A complete list of bird species observed in the Yildiz Mountains is given below with, in respective order, their families, scientific names (genus and species names), English & Turkish names, occurrence status, breeding status, maximum breeding codes observed through the field survey, conservation status with respect to IUCN, Bern, EU Birds Directive, BirdLife International SPEC categories, national status, source of information and number of observations recorded during the field survey.

Key to Annex 1:

Occurrence status: R, resident; S, summer visitor; W, overwintering; P, passage migrant; V, vagrant.

Breeding status: C, certain breeder; Pr: probable breeder; Po: possible breeder; NB: no evidence of breeding.

Breeding codes: for details see Table 2.

IUCN threatened species categories: LC, least concern; VU, vulnerable; NT, near threatened; EN: endangered.

Bern Convention: B2, species in Annex 2; B3, species in Annex 3; NP, not protected by Bern Convention.

EU Birds Directive: 1, species in Annex 1; 2, species in Annex 2; 3, species in Annex 3.

BirdLife International Species of European Conservation Concern (SPEC): for details see Table 11.

National Legislation (Law of Land Hunting 4915): N1, species in Annex 1; N2, species in Annex 2; N3, species in Annex 3.

Source of information: S, observed in field survey; K, in KUŞBANK database; T, in TRAKUŞ database (fo, photographic record; o, observation); L, literature (1, (Hasbenli, 2006, Kaya *et al.*, 1999, Yurtsever and Kurtonur, 2003); 2, (Roselaar, 1995)); A, anonymous information.

Main habitat types, with number of sample sites below: FOR, forests; OFP, open forest patches; URB, urban; WET, wetlands; AGR, agricultural lands; RIP, riparian zones; COA, coastal areas; PLA, plantations (pine and poplar); TOT, total number of sample sites for the survey.

	Family	Genus	Species	English	Turkish	Occur. status	Breed. status
1	Gaviidae	Gavia	stellata	Red-throated Loon	Kızıl Gerdanlı Dalgıç	WP	NB
2	Gaviidae	Gavia	arctica	Black-throated Loon	Kara Gerdanlı Dalgıç	W	NB
3	Podicipedidae	Tachybaptus	ruficollis	Little Grebe	Küçük Batağan	RP	C
4	Podicipedidae	Podiceps	cristatus	Great Crested Grebe	Bahri	WP	NB
5	Podicipedidae	Podiceps	grisegena	Red-necked Grebe	Kızıl Boyunlu Batağan	WP	NB
6	Podicipedidae	Podiceps	nigricollis	Black-necked (eared) Grebe	Kara Boyunlu Batağan	WP	NB
7	Procellariidae	Puffinus	yelkouan	Mediterranean (Yelkouan) Shearwater	Yelkovan	W	NB
8	Phalacrocoracidae	Phalacrocorax	carbo	Great Cormorant	Karabatak	RP	C
9	Phalacrocoracidae	Phalacrocorax	aristotelis	European Shag	Tepeli Karabatak	RP	C
10	Phalacrocoracidae	Phalacrocorax	pygmeus	Pygmy Cormorant	Küçük Karabatak	RP	C
11	Pelecanidae	Pelecanus	onocrotalus	Great White Pelican	Ak Pelikan	P	NB
12	Ardeidae	Botaurus	stellaris	Great Bittern	Balaban	WP	NB
13	Ardeidae	Ixobrychus	minutus	Little Bittern	Küçük Balaban	SP	C
14	Ardeidae	Nycticorax	nycticorax	Black-crowned Night Heron	Gece Balıkçılı	P	NB
15	Ardeidae	Ardeola	ralloides	Squacco Heron	Alaca Balıkçıl	SP	Po
16	Ardeidae	Egretta	garzetta	Little Egret	Küçük Ak Balıkçıl	SP	Po
17	Ardeidae	Casmerodius	albus	Great White Egret	Büyük Ak Balıkçıl	WP	NB
18	Ardeidae	Ardea	cinerea	Grey Heron	Gri Balıkçıl	RP	C
19	Ardeidae	Ardea	purpurea	Purple Heron	Erguvani Balıkçıl	P	NB
20	Ciconiidae	Ciconia	nigra	Black Stork	Kara Leylek	SP	C
21	Ciconiidae	Ciconia	ciconia	White Stork	Leylek	SP	C
22	Threskiornithidae	Plegadis	falcinellus	Glossy Ibis	Çeltikçi	P	NB
23	Threskiornithidae	Platalea	leucorodia	Eurasian Spoonbill	Kaşıkcı	P	NB
24	Phoenicopteridae	Phoenicopterus	ruber	Greater Flamingo	Flamingo	PV	NB
25	Anatidae	Cygnus	olor	Mute Swan	Sessiz Kuğu	RWP	NB
26	Anatidae	Cygnus	columbianus	Bewick's Swan	Küçük Kuğu	WP	NB
27	Anatidae	Cygnus	cygnus	Whooper Swan	Ötücü Kuğu	WP	NB
28	Anatidae	Anser	albifrons	Greater White-fronted Goose	Sakarca	WP	NB
29	Anatidae	Anser	anser	Greylag Goose	Boz Kaz	WP	NB
30	Anatidae	Tadorna	ferruginea	Ruddy Shelduck	Angit	P	NB
31	Anatidae	Tadorna	tadorna	Common Shelduck	Suna	WP	NB
32	Anatidae	Anas	penelope	Eurasian Wigeon	Fiyu	WP	NB
33	Anatidae	Anas	strepera	Gadwall	Boz Ördek	WP	NB
34	Anatidae	Anas	crecca	Eurasian (Common) Teal	Çamurcun	WP	NB
35	Anatidae	Anas	platyrhynchos	Mallard	Yeşilbaş	RP	C
36	Anatidae	Anas	acuta	Northern Pintail	Kılkuyruk	WP	NB
37	Anatidae	Anas	querquedula	Garganey	Çikrikçin	SP	C
38	Anatidae	Anas	clypeata	Northern Shoveler	Kaşıkgaga	WP	NB
39	Anatidae	Netta	rufina	Red-crested Pochard	Macar Ördeği	WP	NB
40	Anatidae	Aythya	ferina	Common Pochard	Elmabaş Patka	WP	NB
41	Anatidae	Aythya	nyroca	Ferruginous Duck	Pasbaş Patka	WP	NB
42	Anatidae	Aythya	fuligula	Tufted Duck	Tepeli Patka	WP	NB
43	Anatidae	Aythya	marila	Greater Scaup	Karabaş Patka	WP	NB
44	Anatidae	Clangula	hyemalis	Long-tailed Duck	Telkuyruk	WP	NB
45	Anatidae	Melanitta	nigra	Common Scoter	Kara Ördek	WP	NB
46	Anatidae	Bucephala	clangula	Common Goldeneye	Altıngöz	WP	NB
47	Anatidae	Mergellus	albellus	Smew	Sütlabi	WP	NB
48	Anatidae	Mergus	serrator	Red-breasted Merganser	Tarakdiş	WP	NB
49	Accipitridae	Pernis	apivorus	European Honey Buzzard	Arı Şahini	SP	C
50	Accipitridae	Milvus	migrans	Black Kite	Kara Çaylak	P	NB
51	Accipitridae	Haliaeetus	albicilla	White-tailed Eagle	Ak Kuyruklu Kartal	RP	C
52	Accipitridae	Neophron	percnopterus	Egyptian Vulture	Küçük Akbaba	P	NB
53	Accipitridae	Circaetus	gallicus	Short-toed Snake Eagle	Yılan Kartalı	SP	C
54	Accipitridae	Circus	aeruginosus	Western Marsh Harrier	Saz Delicesi	SP	Po
55	Accipitridae	Circus	cyaneus	Hen Harrier	Gökçe Delice	WP	NB
56	Accipitridae	Circus	macrourus	Pallid Harrier	Bozkır Delicesi	P	NB
57	Accipitridae	Circus	pygargus	Montagu's Harrier	Çayır Delicesi	P	NB
58	Accipitridae	Accipiter	gentilis	Northern Goshawk	Çakır	R	Po

Breeding code	IUCN	Bern	EU Birds directive	SPEC category	National status	Source of information	FOR 279	OPF 38	URB 23	WET 23	AGR 22	RIP 21	COA 20	PLA 17	TOT 443
-	LC	B2	1	SPEC 3	N2	A									1
M	LC	B2	1	SPEC 3	N2	S,K,T(fo),L(2)									2
12	LC	B2	-	Non-SPEC	N1	S,K,T(fo),L(2)	-	-	-	3	-	-	-	-	3
-	LC	B3	-	Non-SPEC	N1	K,T(fo),L(2)									4
-	LC	B2	-	Non-SPEC	N1	K,T(fo),L(2)									5
0	LC	B2	-	Non-SPEC	N1	S,K,T(fo),L(2)									6
0	NT	B2	1	Non-SPECE	N1	S,K,L(2)									7
13	LC	B3	-	Non-SPEC	N2	S,K,T(fo),L(2)	2	-	2	11	2	3	12	-	32
13	LC	B2	1	Non-SPECE	N1	S,K,L(2)	-	-	1	-	-	-	5	-	6
12	LC	B2	1	SPEC 1	N1	S,K,T(o),L(2)	-	-	-	2	-	-	-	-	2
0	LC	B2	1	SPEC 3	N1	S,K,T(fo),L(2)									11
-	LC	B2	1	SPEC 3	N1	K,T(o),L(2),A									12
12	LC	B2	1	SPEC 3	N1	S,K,T(fo),L(2)	-	-	-	4	-	-	1	-	5
0	LC	B2	1	SPEC 3	N1	S,K,L(2)									14
1	LC	B2	1	SPEC 3	N1	S,K,T(fo),L(2)	-	-	-	-	-	-	1	-	1
1	LC	B2	1	Non-SPEC	N1	S,K,T(fo),L(2)	-	-	-	1	-	-	-	-	1
0	LC	B2	1	Non-SPEC	N1	S,K,T(fo),L(2)									17
12	LC	B3	-	Non-SPEC	N2	S,K,T(o),L(2)	-	-	-	1	-	1	1	-	3
0	LC	B2	1	SPEC 3	N1	S,K,T(fo),L(2)									19
12	LC	B2	1	SPEC 2	N1	S,K,T(o),L(2)	-	1	1	2	1	-	-	-	5
16	LC	B2	1	SPEC 2	N1	S,K,T(o),L(2)	-	-	1	1	-	-	-	-	2
0	LC	B2	1	SPEC 3	N1	S,K,T(f),L(2)									22
0	LC	B2	1	SPEC 2	N1	S,K,T(o),L(2)									23
-	LC	B2	1	SPEC 3	N1	L(2)									24
0	LC	B3	-	Non-SPECE	N1	S,K,T(fo),L(2)	-	-	-	3	-	-	-	-	3
-	LC	B2	1	SPEC 3W	N1	T(fo)									26
-	LC	B2	1	Non-SPECEW	N1	K,T(fo),L(2)									27
-	LC	B3	-	Non-SPEC	N3	K									28
-	LC	B3	2	Non-SPEC	N2	K									29
-	LC	B2	1	SPEC 3	N1	K,T(o)									30
0	LC	B2	-	Non-SPEC	N1	S,K,T(o),L(2)									31
-	LC	B3	2	Non-SPECEW	N3	K,T(fo),L(2)									32
-	LC	B3	2	SPEC 3	N3	K,T(o),L(2)									33
-	LC	B3	2	Non-SPEC	N3	K,T(fo),L(2)									34
12	LC	B3	2-3	Non-SPEC	N3	S,K,T(f),L(2)	-	-	-	3	-	-	-	-	3
-	LC	B3	2	SPEC 3	N3	K,T(o),L(2)									36
12	LC	B3	2	SPEC 3	N3	S,K,T(o),L(2)	-	-	-	1	-	-	-	-	1
-	LC	B3	2	SPEC 3	N2	K,T(o),L(2)									38
-	LC	B3	-	Non-SPEC	N3	K,T(o),L(2)									39
0	LC	B3	2	SPEC 2	N3	S,K,T(fo),L(2)									40
-	NT	B3	1	SPEC 1	N1	K,T(o)									41
-	LC	B3	2	SPEC 3	N3	K,T(o),L(2)									42
-	LC	B3	-	SPEC 3W	N3	K,T(o)									43
-	LC	B3	-	Non-SPEC	N2	K,T(fo)									44
-	LC	B3	-	Non-SPEC	N3	K									45
-	LC	B3	-	Non-SPEC	N3	K,T(fo)									46
-	LC	B2	1	SPEC 3	N1	K,T(o)									47
0	LC	B3	-	Non-SPEC	N2	S,K,T(fo),L(2)									48
5	LC	B2	1	Non-SPECE	N1	S,K,T(fo)	-	1	-	-	2	-	-	-	3
-	LC	B2	1	SPEC 3	N1	K,T(o),L(2)									50
12	LC	B2	1	SPEC 1	N1	S,K,T(fo),L(2)									51
-	EN	B2	1	SPEC 3	N1	L(2)									52
3	LC	B2	1	SPEC 3	N1	S,K,T(fo)	1	1	-	-	1	-	-	-	3
1	LC	B2	1	Non-SPEC	N1	S,K,T(o),L(2)	-	-	-	-	-	-	1	-	1
-	LC	B2	1	SPEC 3	N1	K,T(fo),L(2)									55
-	NT	B2	1	SPEC 1	N1	K									56
-	LC	B2	1	Non-SPECE	N1	K									57
1	LC	B2	-	Non-SPEC	N1	S,K,L(2)	-	-	1	-	-	-	-	-	1

	Family	Genus	Species	English	Turkish	Occur. status	Breed. status
59	Accipitridae	Accipiter	<i>nisus</i>	Eurasian Sparrowhawk	Atmaca	RP	C
60	Accipitridae	Accipiter	<i>brevipes</i>	Levant Sparrowhawk	Yaz Atmacası	P	NB
61	Accipitridae	Buteo	<i>buteo</i>	Common Buzzard	Şahin	RP	C
62	Accipitridae	Buteo	<i>rufinus</i>	Long-legged Buzzard	Kızıl Şahin	PV	NB
63	Accipitridae	Aquila	<i>ponarina</i>	Lesser Spotted Eagle	Küçük Orman Kartalı	SP	Po
64	Accipitridae	Aquila	<i>clanga</i>	Greater Spotted Eagle	Büyük Orman Kartalı	WP	NB
65	Accipitridae	Aquila	<i>heliaca</i>	Eastern Imperial Eagle	Şah Kartal	SP	Po
66	Accipitridae	Hieraaetus	<i>pennatus</i>	Booted Eagle	Küçük Kartal	SP	C
67	Pandionidae	Pandion	<i>haliaetus</i>	Osprey	Balık Kartalı	P	NB
68	Falconidae	Falco	<i>tinnunculus</i>	Common Kestrel	Kerkenez	WP	NB
69	Falconidae	Falco	<i>columbarius</i>	Merlin	Boz Doğan	WP	NB
70	Falconidae	Falco	<i>subbuteo</i>	Eurasian Hobby	Delice Doğan	SP	C
71	Falconidae	Falco	<i>peregrinus</i>	Peregrine Falcon	Gök Doğan	RP	NB
72	Phasianidae	Coturnix	<i>coturnix</i>	Common Quail	Bıldırın	SP	Po
73	Phasianidae	Phasianus	<i>colchicus</i>	Common Pheasant	Sülün	R	NB
74	Rallidae	Rallus	<i>aquaticus</i>	Water Rail	Sukılavuzu	RP	C
75	Rallidae	Porzana	<i>parva</i>	Little Crake	Bataklık Suyelvesi	P	NB
76	Rallidae	Porzana	<i>pusilla</i>	Baillon's Crake	Küçük Suyelvesi	SP	Pr
77	Rallidae	Gallinula	<i>chloropus</i>	Common Moorhen	Sutavuğu	RP	C
78	Rallidae	Fulica	<i>atra</i>	Eurasian Coot	Sakarmeke	RP	C
79	Gruidae	Grus	<i>grus</i>	Common Crane	Turna	P	NB
80	Haematopodidae	Haematopus	<i>ostralegus</i>	Eurasian Oystercatcher	Poyrazkuşu	WP	NB
81	Recurvirostridae	Himantopus	<i>himantopus</i>	Black-winged Stilt	Uzunbacak	RP	NB
82	Recurvirostridae	Recurvirostra	<i>avosetta</i>	Pied Avocet	Kılıçgaga	P	NB
83	Burhinidae	Burhinus	<i>oedincnemus</i>	Stone-curlew	Kocagöz	RP	Po
84	Glareolidae	Glareola	<i>pratinctola</i>	Collared Pranticole	Bataklıklırlangıcı	P	NB
85	Charadriidae	Charadrius	<i>dubius</i>	Little Ringed Plover	Halkalı Küçük Cılıbit	SP	C
86	Charadriidae	Charadrius	<i>hiaticula</i>	Common Ringed Plover	Halkalı Cılıbit	P	NB
87	Charadriidae	Charadrius	<i>alexandrinus</i>	Kentish Plover	Akça Cılıbit	P	NB
88	Charadriidae	Pluvialis	<i>apricaria</i>	European Golden Plover	Altın Yağmurcun	P	NB
89	Charadriidae	Pluvialis	<i>squatarola</i>	Grey Plover	Gümüş Yağmurcun	WP	NB
90	Charadriidae	Vanellus	<i>vanellus</i>	Northern Lapwing	Kızkuşu	WP	NB
91	Scolopacidae	Calidris	<i>alba</i>	Sanderling	Ak Kumkuşu	WP	NB
92	Scolopacidae	Calidris	<i>minuta</i>	Little Stint	Küçük Kumkuşu	P	NB
93	Scolopacidae	Calidris	<i>temminckii</i>	Temminck's Stint	Sarı Bacaklı Kumkuşu	P	NB
94	Scolopacidae	Calidris	<i>ferruginea</i>	Curlew Sandpiper	Kızıl Kumkuşu	P	NB
95	Scolopacidae	Calidris	<i>alpina</i>	Dunlin	Kara Karınlı Kumkuşu	WP	NB
96	Scolopacidae	Philomachus	<i>pugnax</i>	Ruff	Döğüşkenkuş	P	NB
97	Scolopacidae	Gallinago	<i>gallinago</i>	Common Snipe	Suçulluğu	WP	NB
98	Scolopacidae	Scolopax	<i>rusticola</i>	Eurasian Woodcock	Çulluk	WP	NB
99	Scolopacidae	Limosa	<i>limosa</i>	Black-tailed Godwit	Çamurçulluğu	P	NB
100	Scolopacidae	Numenius	<i>phaeopus</i>	Whimbrel	Sürekli Kervançulluğu	P	NB
101	Scolopacidae	Numenius	<i>arquata</i>	Eurasian Curlew	Kervançulluğu	WP	NB
102	Scolopacidae	Tringa	<i>erythropus</i>	Spotted Redshank	Kara Kızılbacak	P	NB
103	Scolopacidae	Tringa	<i>totanus</i>	Common Redshank	Kızılbacak	SP	Po
104	Scolopacidae	Tringa	<i>stagnatilis</i>	Marsh Sandpiper	Bataklık Düdükçünü	P	NB
105	Scolopacidae	Tringa	<i>nebularia</i>	Common Greenshank	Yeşilbacak	WP	NB
106	Scolopacidae	Tringa	<i>ochropus</i>	Green Sandpiper	Yeşil Düdükçün	RP	Pr
107	Scolopacidae	Tringa	<i>glareola</i>	Wood Sandpiper	Orman Düdükçünü	P	NB
108	Scolopacidae	Xenus	<i>cinereus</i>	Terek Sandpiper	Terek Düdükçünü	P	NB
109	Scolopacidae	Actitis	<i>hypoleucos</i>	Common Sandpiper	Dere Düdükçünü	SP	Po
110	Scolopacidae	Arenaria	<i>interpres</i>	Ruddy Turnstone	Taşçeviren	P	NB
111	Stercorariidae	Stercorarius	<i>parasiticus</i>	Parasitic Jaeger	Korsanmartı	WP	NB
112	Laridae	Larus	<i>melanocephalus</i>	Mediterranean Gull	Akdeniz Martısı	WP	NB
113	Laridae	Larus	<i>minutus</i>	Little Gull	Küçük Martı	WP	NB
114	Laridae	Larus	<i>ridibundus</i>	Black-headed Gull	Karabaş Martı	RP	NB
115	Laridae	Larus	<i>genei</i>	Slender-billed Gull	İnce Gagalı Martı	P	NB
116	Laridae	Larus	<i>canus</i>	Mew (Common) Gull	Küçük Gümüş Martı	WP	NB
117	Laridae	Larus	<i>michahellis</i>	Yellow-legged Gull	Gümüş Martı	RP	Po
118	Laridae	Larus	<i>cachinnans</i>	Caspian Gull	Hazar Martısı	RP	NB
119	Laridae	Larus	<i>tridactylus</i>	Black-legged Kittiwake	Kara Ayaklı Martı	WP	NB

Breeding code	IUCN	Bern	EU Birds directive	SPEC category	National status	Source of information	FOR 279	OPF 38	URB 23	WET 23	AGR 22	RIP 21	COA 20	PLA 17	TOT 443	
12	LC	B2	-	Non-SPEC	N1	S,K,T(o),L(2)	1	1	-	1	1	1	-	-	5	59
0	LC	B2	1	SPEC 2	N1	S,K,L(2)										60
13	LC	B2	-	Non-SPEC	N1	S,K,T(fo),L(2)	20	10	1	1	6	3	-	2	43	61
-	LC	B2	1	SPEC 3	N1	T(o),L(2)										62
1	LC	B2	1	SPEC 2	N1	S,K,L(2)	-	1	-	-	-	-	-	-	1	63
-	VU	B2	1	SPEC 1	N1	K,T(o)										64
1	VU	B2	1	SPEC 1	N1	S,K	-	-	1	-	-	-	-	-	1	65
1	LC	B2	1	SPEC 3	N1	S,K	-	-	-	-	2	-	-	-	2	66
-	LC	B2	1	SPEC 3	N1	K,T(f),L(2)										67
-	LC	B2	-	SPEC 3	N1	K,T(o),L(2)										68
-	LC	B2	1	Non-SPEC	N1	K,T(o)										69
4	LC	B2	-	Non-SPEC	N1	S,T(o),L(2)	1	-	-	1	-	1	1	-	4	70
0	LC	B2	1	Non-SPEC	N1	S,K,L(2)										71
2	LC	B3	-	SPEC 3	N3	S,L(2)	-	-	-	-	2	-	-	-	2	72
-	LC	B3	2-3	Non-SPEC	N2	T(fo)										73
12	LC	B3	-	Non-SPEC	N2	S,K,T(o),L(2)										74
-	LC	B2	1	Non-SPECE	N1	K										75
12	LC	B2	1	SPEC 3	N1	S,T(f)										76
12	LC	B3	-	Non-SPEC	N2	S,K,T(fo),L(2)	1	-	-	8	-	-	1	-	10	77
12	LC	B3	2	Non-SPEC	N3	S,K,T(fo),L(2)	-	-	-	2	-	-	-	-	2	78
-	LC	B3	1	SPEC 2	N1	K,L(2)										79
0	LC	B3	-	Non-SPECE	N2	S,K,T(o),L(2)										80
0	LC	B2	1	Non-SPEC	N1	S,K										81
0	LC	B2	1	Non-SPEC	N1	S,K,T(o)										82
1	LC	B2	1	SPEC 3	N1	S,K,T(o)										83
0	LC	B2	1	SPEC 3	N1	S,K,T(f)										84
12	LC	B2	-	Non-SPEC	N1	S,K,T(fo),L(2)	1	-	-	3	-	1	8	-	13	85
-	LC	B2	-	Non-SPECE	N1	K,T(fo)										86
-	LC	B2	1	SPEC 3	N1	K,T(o)										87
-	LC	B3	1	Non-SPECE	N2	T(f)										88
-	LC	B3	-	Non-SPEC	N2	K,T(fo)										89
-	LC	B3	-	SPEC 2	N2	K,T(o)										90
-	LC	B2	-	Non-SPEC	N1	K,T(f)										91
0	LC	B2	-	Non-SPEC	N1	S,K,T(o),L(2)										92
m	LC	B2	-	Non-SPEC	N1	S,K,T(fo)										93
0	LC	B2	-	-	N1	S,K,T(f),L(2)										94
0	LC	B2	-	SPEC 3	N1	S,K,T(fo)										95
0	LC	B3	1	SPEC 2	N2	S,K										96
-	LC	B3	2	SPEC 3	N3	K,T(fo),L(2)										97
-	LC	B3	2	SPEC 3	N3	K,T(o),L(2)										98
0	NT	B3	-	SPEC 2	N2	S										99
-	LC	B3	-	Non-SPECE	N2	T(fo)										100
0	NT	B3	-	SPEC 2	N2	S,K										101
0	LC	B3	-	SPEC 3	N2	S,K,L(2)										102
1	LC	B3	-	SPEC 2	N2	S,K,L(2)										103
0	LC	B2	-	Non-SPEC	N1	S,K										104
0	LC	B3	-	Non-SPEC	N2	S,K,T(o)										105
12	LC	B2	-	Non-SPEC	N1	S,K,T(o)	-	-	-	1	-	3	-	-	4	106
0	LC	B2	1	SPEC 3	N1	S,K,T(o)										107
0	LC	B2	1	Non-SPEC	-	S,T(f)										108
1	LC	B2	-	SPEC 3	N1	S,T(fo),L(2)										109
0	LC	B2	-	Non-SPEC	N1	S,K,T(f)										110
-	LC	B3	-	Non-SPEC	N2	K										111
0	LC	B2	1	Non-SPECE	N1	S,K,T(fo)										112
-	LC	B2	1	SPEC 3	N1	K,T(o),L(2)										113
0	LC	B3	-	Non-SPECE	N2	S,K,T(fo),L(2)										114
0	LC	B2	1	SPEC 3	N1	S,K,T(o)										115
-	LC	B3	-	SPEC 2	N2	K,T(fo)										116
1	LC	B3	-	Non-SPECE	N2	S,K,T(fo),L(2)	1	-	3	3	-	-	12	-	19	117
-	LC	B3	-	Non-SPECE	N2	K										118
-	LC	B3	-	Non-SPEC	N2	K										119

	Family	Genus	Species	English	Turkish	Occur. status	Breed. status
120	Sternidae	<i>Gelochelidon</i>	<i>nilotica</i>	Gull-billed Tern	Gülen Sumru	P	NB
121	Sternidae	<i>Hydroprogne</i>	<i>caspia</i>	Caspian Tern	Hazar Sumrusu	P	NB
122	Sternidae	<i>Sterna</i>	<i>sandvicensis</i>	Sandwich Tern	Kara Gagalı Sumru	WP	NB
123	Sternidae	<i>Sterna</i>	<i>hirundo</i>	Common Tern	Sumru	P	NB
124	Sternidae	<i>Sternula</i>	<i>albifrons</i>	Little Tern	Küçük Sumru	P	NB
125	Sternidae	<i>Chlidonias</i>	<i>hybrida</i>	Whiskered Tern	Bıyıklı Sumru	P	NB
126	Sternidae	<i>Chlidonias</i>	<i>niger</i>	Black Tern	Kara Sumru	P	NB
127	Sternidae	<i>Chlidonias</i>	<i>leucopterus</i>	White-winged Tern	Ak Kanatlı Sumru	P	NB
128	Columbidae	<i>Columba</i>	<i>livia (domest.)</i>	Feral Pigeon	Şehir Güvercini	R	C
129	Columbidae	<i>Columba</i>	<i>oenas</i>	Stock Dove	Gökçe Güvercin	RP	Po
130	Columbidae	<i>Columba</i>	<i>palumbus</i>	Common Wood Pigeon	Tahtalı	RP	C
131	Columbidae	<i>Streptopelia</i>	<i>decaocto</i>	Eurasian Collared Dove	Kumru	R	C
132	Columbidae	<i>Streptopelia</i>	<i>turtur</i>	European Turtle Dove	Üveyik	SP	C
133	Cuculidae	<i>Cuculus</i>	<i>canorus</i>	Common Cuckoo	Guguk	SP	C
134	Strigidae	<i>Otus</i>	<i>scops</i>	European Scops Owl	İshakkuşu	SP	C
135	Strigidae	<i>Bubo</i>	<i>bubo</i>	Eurasian Eagle Owl	Puhu	R	NB
136	Strigidae	<i>Athene</i>	<i>noctua</i>	Little Owl	Kukumav	R	C
137	Strigidae	<i>Strix</i>	<i>aluco</i>	Tawny Owl	Alaca Baykuş	R	C
138	Strigidae	<i>Asio</i>	<i>otus</i>	Long-eared Owl	Kulaklı Orman Baykuşu	RP	C
139	Caprimulgidae	<i>Caprimulgus</i>	<i>europaeus</i>	European Nightjar	Çobanaldatan	SP	C
140	Apodidae	<i>Apus</i>	<i>apus</i>	Common Swift	Ebabil	SP	C
141	Apodidae	<i>Apus</i>	<i>melba</i>	Alpine Swift	Ak Karınlı Ebabil	SP	Pr
142	Alcedinidae	<i>Alcedo</i>	<i>atthis</i>	Common Kingfisher	Yalıçapkını	RP	C
143	Meropidae	<i>Merops</i>	<i>apiaster</i>	European Bee-eater	Arikuşu	SP	C
144	Coraciidae	<i>Coracias</i>	<i>garrulus</i>	European Roller	Gökkuşgun	P	NB
145	Upupidae	<i>Upupa</i>	<i>epops</i>	Eurasian Hoopoe	İbibik	SP	C
146	Picidae	<i>Jynx</i>	<i>torquilla</i>	Eurasian Wryneck	Boyunçeviren	SP	C
147	Picidae	<i>Picus</i>	<i>canus</i>	Grey-headed Woodpecker	Küçük Yeşil Ağaçkakan	R	C
148	Picidae	<i>Picus</i>	<i>viridis</i>	European Green Woodpecker	Yeşil Ağaçkakan	R	C
149	Picidae	<i>Dryocopus</i>	<i>martius</i>	Black Woodpecker	Kara Ağaçkakan	R	C
150	Picidae	<i>Dendrocopos</i>	<i>major</i>	Great Spotted Woodpecker	Orman Ağaçkakanı	R	C
151	Picidae	<i>Dendrocopos</i>	<i>syriacus</i>	Syrian Woodpecker	Alaca Ağaçkakan	W	NB
152	Picidae	<i>Dendrocopos</i>	<i>medius</i>	Middle Spotted Woodpecker	Ortanca Ağaçkakan	R	C
153	Picidae	<i>Dendrocopos</i>	<i>leucotos</i>	White-backed Woodpecker	Ak Sırtlı Ağaçkakan	R	C
154	Picidae	<i>Dendrocopos</i>	<i>minor</i>	Lesser Spotted Woodpecker	Küçük Ağaçkakan	R	C
155	Alaudidae	<i>Melanocorypha</i>	<i>calandra</i>	Calandra Lark	Boğmaklı Toygar	P	NB
156	Alaudidae	<i>Calandrella</i>	<i>brachydactyla</i>	Greater Short-toed Lark	Bozkır Toygarı	P	NB
157	Alaudidae	<i>Galerida</i>	<i>cristata</i>	Crested Lark	Tepeli Toygar	R	Po
158	Alaudidae	<i>Lullula</i>	<i>arborea</i>	Woodlark	Orman Toygarı	SP	C
159	Alaudidae	<i>Alauda</i>	<i>arvensis</i>	Eurasian Skylark	Tarlakuşu	RP	C
160	Hirundinidae	<i>Riparia</i>	<i>riparia</i>	Sand Martin	Kum Kırlangıcı	P	NB
161	Hirundinidae	<i>Hirundo</i>	<i>rustica</i>	Barn Swallow	Kır Kırlangıcı	SP	C
162	Hirundinidae	<i>Cecropis</i>	<i>daurica</i>	Red-rumped Swallow	Kızıl Kırlangıç	SP	C
163	Hirundinidae	<i>Delichon</i>	<i>urbicum</i>	Common House Martin	Ev Kırlangıcı	SP	C
164	Motacillidae	<i>Anthus</i>	<i>campestris</i>	Tawny Pipit	Kır İncirkuşu	SP	Pr
165	Motacillidae	<i>Anthus</i>	<i>trivialis</i>	Tree Pipit	Ağaç İncirkuşu	P	NB
166	Motacillidae	<i>Anthus</i>	<i>pratensis</i>	Meadow Pipit	Çayır İncirkuşu	WP	NB
167	Motacillidae	<i>Anthus</i>	<i>cervinus</i>	Red-thorated Pipit	Kızıl Gerdanlı İncirkuşu	P	NB
168	Motacillidae	<i>Anthus</i>	<i>spinoletta</i>	Water Pipit	Dağ İncirkuşu	WP	NB
169	Motacillidae	<i>Motacilla</i>	<i>flava</i>	(Western) Yellow Wagtail	Sarı Kuyruksallayan	SP	C
170	Motacillidae	<i>Motacilla</i>	<i>cinerea</i>	Grey Wagtail	Dağ Kuyruksallayanı	RP	C
171	Motacillidae	<i>Motacilla</i>	<i>alba</i>	White Wagtail	Ak Kuyruksallayan	RP	C
172	Cinclidae	<i>Cinclus</i>	<i>cinclus</i>	White-throated Dipper	Derekuşu	R	C
173	Troglodytidae	<i>Troglodytes</i>	<i>troglodytes</i>	Winter Wren	Çitkuşu	RP	C
174	Prunellidae	<i>Prunella</i>	<i>modularis</i>	Dunnock	Dağbülbülü	P	NB

Breeding code	IUCN	Bern	EU Birds directive	SPEC category	National status	Source of information	FOR 279	OPF 38	URB 23	WET 23	AGR 22	RIP 21	COA 20	PLA 17	TOT 443	
0	LC	B2	1	SPEC 3	N1	S,K										120
-	LC	B2	1	SPEC 3	N1	K,L(2)										121
0	LC	B2	1	SPEC 2	N1	S,K,T(f)										122
0	LC	B2	1	Non-SPEC	N1	S,K,L(2)										123
0	LC	B2	1	SPEC 3	N1	S										124
0	LC	B2	1	SPEC 3	N1	S,K,T(fo),L(2)										125
0	LC	B2	1	SPEC 3	N1	S,T(f),L(2)										126
0	LC	B2	-	Non-SPEC	N1	S,K,L(2)										127
13	LC	B3	2	Non-SPEC	N3	S,K,T(o),L(2)	-	-	8	-	-	-	-	-	8	128
2	LC	B3	-	Non-SPECE	N2	S,L(2)	1	-	-	-	-	-	-	-	1	129
12	LC	NP	2-3	Non-SPECE	N3	S,K,T(o),L(2)	52	12	-	3	8	3	-	1	79	130
12	LC	B3	-	Non-SPEC	N2	S,K,T(o),L(2)	-	-	10	-	2	-	-	-	12	131
12	LC	B3	-	SPEC 3	N3	S,K,T(o),L(2)	38	19	5	13	15	7	8	4	109	132
2	LC	B3	-	Non-SPEC	N1	S,K,T(fo),L(2)	84	12	3	6	7	4	3	4	123	133
2	LC	B2	-	SPEC 2	N1	S,K	9	1	3	-	2	-	-	-	15	134
-	LC	B2	1	SPEC 3	N1	L(2),A										135
12	LC	B2	-	SPEC 3	N1	S,K,L(2)	-	1	6	-	-	-	-	-	7	136
12	LC	B2	-	Non-SPECE	N1	S,K,T(f),L(2)	62	21	1	-	3	2	-	2	91	137
2	LC	B2	-	Non-SPEC	N1	S,L(2)	-	-	-	-	3	-	-	-	3	138
5	LC	B2	1	SPEC 2	N1	S,K,T(o),L(2)	19	9	1	-	-	-	1	7	37	139
13	LC	B3	-	Non-SPEC	N1	S,K,L(2)	-	-	5	-	-	3	1	-	9	140
6	LC	B2	-	Non-SPEC	N1	S,K,L(2)	-	-	2	-	-	-	-	-	2	141
3	LC	B2	1	SPEC 3	N1	S,K,T(o),L(2)	3	-	-	3	-	6	-	-	12	142
14	LC	B2	-	SPEC 3	N1	S,K,L(2)	23	3	1	3	4	2	2	-	38	143
0	NT	B2	1	SPEC 2	N1	S,L(2)										144
3	LC	B2	-	SPEC 3	N1	S,K,T(fo),L(2)	12	3	1	4	3	3	-	3	29	145
4	LC	B2	-	SPEC 3	N1	S,L(2)										146
13	LC	B2	1	SPEC 3	N1	S,K,T(fo),L(2)	19	5	1	-	2	4	1	1	33	147
2	LC	B2	-	SPEC 2	N1	S,K,T(o),L(2)	8	3	-	-	3	1	-	-	15	148
4	LC	B2	1	Non-SPEC	N1	S,K,T(fo),L(2)	14	-	-	-	-	-	-	-	14	149
16	LC	B2	-	Non-SPEC	N1	S,K,T(fo),L(2)	88	7	4	4	7	3	2	6	121	150
-	LC	B2	1	Non-SPECE	N1	K,L(2)										151
16	LC	B2	1	Non-SPECE	N1	S,K,T(o),L(2)	45	10	1	2	4	2	-	3	67	152
12	LC	B2	1	Non-SPEC	N1	S,K,T(fo),L(2)	1	-	-	-	-	-	1	-	2	153
14	LC	B2	-	Non-SPEC	N1	S,K,T(fo),L(2)	14	2	-	4	5	5	3	2	35	154
-	LC	B2	1	SPEC 3	N1	K										155
0	LC	B2	1	SPEC 3	N1	S,K,T(o),L(12)	-	-	-	-	-	-	2	-	2	156
1	LC	B3	-	SPEC 3	N2	S,K,T(o),L(12)										157
14	LC	B3	1	SPEC 2	N2	S,K,T(o),L(12)	7	19	1	-	8	-	-	2	37	158
12	LC	B3	-	SPEC 3	N2	S,K,T(fo),L(2)	-	-	-	-	-	-	1	-	1	159
M	LC	B2	-	SPEC 3	N1	S,K,L(2)										160
16	LC	B2	-	SPEC 3	N1	S,K,T(o),L(2)	7	8	16	8	12	4	8	1	64	161
13	LC	B2	-	Non-SPEC	N1	S,K	2	2	2	1	3	-	2	-	12	162
16	LC	B2	-	SPEC 3	N1	S,K,T(o),L(2)	2	3	22	5	5	5	5	2	49	164
5	LC	B2	1	SPEC 3	N1	S,K	-	-	-	-	-	-	1	-	1	165
-	LC	B2	-	Non-SPEC	N1	K,L(2)										166
-	LC	B2	-	Non-SPECE	N1	K,T(o),L(2)										167
M	LC	B2	-	Non-SPEC	N1	S										168
-	LC	B2	-	Non-SPEC	N1	K,T(fo),L(2)										169
12	LC	B2	-	Non-SPEC	N1	S,K,T(fo),L(12)	-	-	-	5	1	-	1	-	7	170
13	LC	B2	-	Non-SPEC	N1	S,K,T(fo),L(12)	2	-	-	-	-	3	-	-	5	171
14	LC	B2	-	Non-SPEC	N1	S,K,T(o),L(12)	1	1	6	4	5	2	9	1	29	172
1	LC	B2	-	Non-SPEC	N1	S,L(2)	-	-	-	-	-	2	-	-	2	173
12	LC	B2	-	Non-SPEC	N1	S,K,T(fo),L(12)	111	3	1	4	2	11	3	1	136	174
-	LC	B2	-	Non-SPECE	N1	K,T(o),L(2)										174

	Family	Genus	Species	English	Turkish	Occur. status	Breed. status
175	Turdidae	<i>Erithacus</i>	<i>rubecula</i>	European Robin	Kızılgerdan	RP	C
176	Turdidae	<i>Luscinia</i>	<i>luscinia</i>	Thrush Nightingale	Benekli Bülbül	P	NB
177	Turdidae	<i>Luscinia</i>	<i>megarhynchos</i>	Common Nightingale	Bülbül	SP	C
178	Turdidae	<i>Phoenicurus</i>	<i>ochruros</i>	Black Redstart	Kara Kızılkuyruk	WP	NB
179	Turdidae	<i>Phoenicurus</i>	<i>phoenicurus</i>	Common Redstart	Kızılkuyruk	SP	C
180	Turdidae	<i>Saxicola</i>	<i>rubetra</i>	Whinchat	Çayır Taşkuşu	P	NB
181	Turdidae	<i>Saxicola</i>	<i>rubicola</i>	European Stonechat	Taşkuşu	RP	C
182	Turdidae	<i>Saxicola</i>	<i>(maurus) armenicus</i>	Eastern (Siberian) Stonechat	Sibirya Taşkuşu	P	NB
183	Turdidae	<i>Oenanthe</i>	<i>isabellina</i>	Isabelline Wheatear	Boz Kuyrukkakan	P	NB
184	Turdidae	<i>Oenanthe</i>	<i>oenanthe</i>	Northern Wheatear	Kuyrukkakan	SP	C
185	Turdidae	<i>Oenanthe</i>	<i>melanoleuca</i>	Eastern Blacked-eared Wheatear	Karakulaklı Kuyrukkakan	P	NB
186	Turdidae	<i>Turdus</i>	<i>toquatus</i>	Ring Ouzel	Boğmaklı Ardiç	P	NB
187	Turdidae	<i>Turdus</i>	<i>merula</i>	Common Blackbird	Karatavuk	RP	C
188	Turdidae	<i>Turdus</i>	<i>pilaris</i>	Fieldfare	Tarla Ardıcı	WP	NB
189	Turdidae	<i>Turdus</i>	<i>philomelos</i>	Song Thrush	Öter Ardiç	RP	C
190	Turdidae	<i>Turdus</i>	<i>iliacus</i>	Redwing	Kızıl Ardiç	WP	NB
191	Turdidae	<i>Turdus</i>	<i>viscivorus</i>	Mistle Thrush	Ökse Ardıcı	RP	C
192	Sylviidae	<i>Cettia</i>	<i>cetti</i>	Cetti's Warbler	Kamışbülbulü	R	Po
193	Sylviidae	<i>Acrocephalus</i>	<i>melanopogon</i>	Moustached Warbler	Bıyıklı Kamışçın	SP	Po
194	Sylviidae	<i>Acrocephalus</i>	<i>schoenobaenus</i>	Sedge Warbler	Kindıra Kamışçını	P	NB
195	Sylviidae	<i>Acrocephalus</i>	<i>scirpaceus</i>	European Reed Warbler	Saz Kamışçını	SP	C
196	Sylviidae	<i>Acrocephalus</i>	<i>arundinaceus</i>	Great Reed Warbler	Büyük Kamışçın	SP	C
197	Sylviidae	<i>Hippolais</i>	<i>pallida</i>	Eastern Olivaceous Warbler	Ak Mukallit	SP	C
198	Sylviidae	<i>Hippolais</i>	<i>icterina</i>	Icterine Warbler	Sarı Mukallit	SP	Pr
199	Sylviidae	<i>Sylvia</i>	<i>melanocephala</i>	Sardinian Warbler	Maskeli Ötleğen	SP	C
200	Sylviidae	<i>Sylvia</i>	<i>nisoria</i>	Barred Warbler	Çizgili Ötleğen	SP	C
201	Sylviidae	<i>Sylvia</i>	<i>curruca</i>	Lesser Whitethroat	Küçük Ak Gerdanlı Ötleğen	SP	C
202	Sylviidae	<i>Sylvia</i>	<i>communis</i>	Common Whitethroat	Ak Gerdanlı Ötleğen	SP	C
203	Sylviidae	<i>Sylvia</i>	<i>borin</i>	Garden Warbler	Boz Ötleğen	SP	C
204	Sylviidae	<i>Sylvia</i>	<i>atricapilla</i>	Blackcap	Kara Başlı Ötleğen	RP	C
205	Sylviidae	<i>Phylloscopus</i>	<i>orientalis</i>	Eastern Bonelli's Warbler	Boz Çıvgın	SP	NB
206	Sylviidae	<i>Phylloscopus</i>	<i>sibilatrix</i>	Wood Warbler	Orman Çıvgını	SP	C
207	Sylviidae	<i>Phylloscopus</i>	<i>collybita</i>	Common Chiffchaff	Çıvgın	RP	C
208	Sylviidae	<i>Phylloscopus</i>	<i>trochilus</i>	Willow Warbler	Söğütbülbulü	P	NB
209	Sylviidae	<i>Regulus</i>	<i>regulus</i>	Goldcrest	Çalikuşu	WP	NB
210	Sylviidae	<i>Regulus</i>	<i>ignicapilla</i>	Firecrest	Sürmeli Çalikuşu	WP	NB
211	Muscicapidae	<i>Muscicapa</i>	<i>striata</i>	Spotted Flycatcher	Benekli Sinekkapan	SP	C
212	Muscicapidae	<i>Ficedula</i>	<i>parva</i>	Red-breasted Flycatcher	Küçük Sinekkapan	SP	Pr
213	Muscicapidae	<i>Ficedula</i>	<i>semitorquata</i>	Semi-collared Flycatcher	Alaca Sinekkapan	SP	C
214	Muscicapidae	<i>Ficedula</i>	<i>albicollis</i>	Collared Flycatcher	Halkalı Sinekkapan	SP	NB
215	Muscicapidae	<i>Ficedula</i>	<i>hypoleuca</i>	European Pied Flycatcher	Kara Sinekkapan	P	NB
216	Timaliidae	<i>Panurus</i>	<i>biarmicus</i>	Bearded Reedling	Bıyıklı Baştankara	W	NB
217	Aegithalidae	<i>Aegithalos</i>	<i>caudatus</i>	Long-tailed Tit	Uzun Kuyruklu Baştankara	R	C
218	Paridae	<i>Parus</i>	<i>palustris</i>	Marsh Tit	Kayın Baştankarası	R	C
219	Paridae	<i>Parus</i>	<i>lugubris</i>	Sombre Tit	Ak Yanaklı Baştankara	R	C
220	Paridae	<i>Periparus</i>	<i>ater</i>	Coal Tit	Çam Baştankarası	W	NB
221	Paridae	<i>Cyanistes</i>	<i>caeruleus</i>	Blue Tit	Mavi Baştankara	R	C
222	Paridae	<i>Parus</i>	<i>major</i>	Great Tit	Büyük Baştankara	R	C
223	Sittidae	<i>Sitta</i>	<i>europaea</i>	Eurasian Nuthatch	Sivacıkusu	R	C
224	Certhiidae	<i>Certhia</i>	<i>familiaris</i>	Eurasian Treecreeper	Orman Tırmaşıkkuşu	R	C
225	Certhiidae	<i>Certhia</i>	<i>brachydactyla</i>	Short-toed Treecreeper	Bahçe Tırmaşıkkuşu	R	C
226	Oriolidae	<i>Oriolus</i>	<i>oriolus</i>	Eurasian Golden Oriole	Sarıasma	SP	C
227	Laniidae	<i>Lanius</i>	<i>collurio</i>	Red-backed Shrike	Kızıl Sırtlı Örümcekkuşu	SP	C
228	Laniidae	<i>Lanius</i>	<i>minor</i>	Lesser Grey Shrike	Kara Alınlı Örümcekkuşu	SP	Po

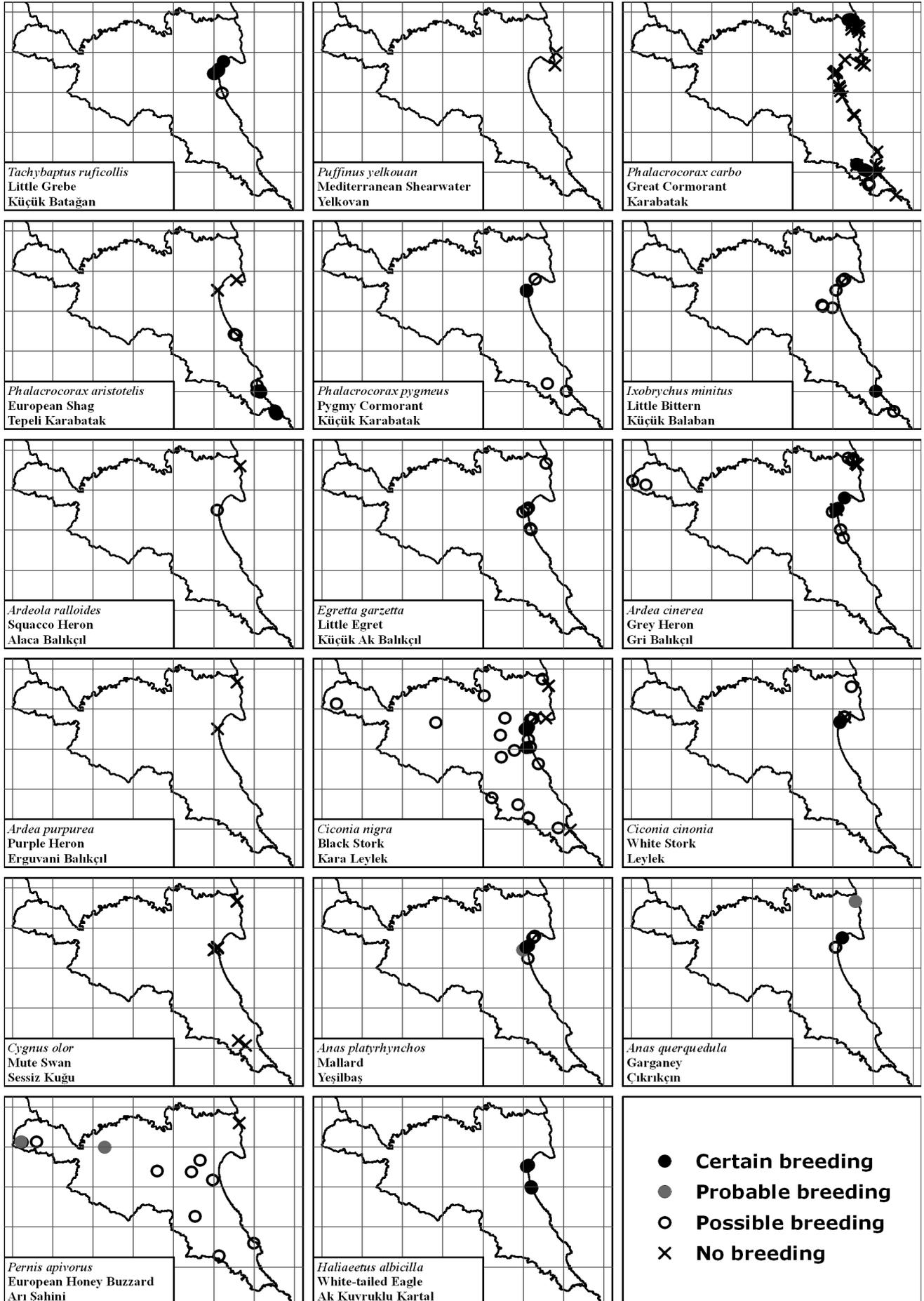
Breeding code	IUCN	Bern	EU Birds directive	SPEC category	National status	Source of information	FOR 279	OPF 38	URB 23	WET 23	AGR 22	RIP 21	COA 20	PLA 17	TOT 443	
14	LC	B2	-	Non-SPECE	N1	S,K,T(fo),L(12)	209	11	-	5	2	8	3	2	240	175
-	LC	B2	-	Non-SPECE	N1	T(f),L(2)										176
14	LC	B2	-	Non-SPECE	N1	S,K,T(fo),L(2)	52	20	15	11	18	8	17	5	146	177
-	LC	B2	-	Non-SPEC	N1	K,T(o),L(2)										178
14	LC	B2	-	SPEC 2	N1	S,K,T(f),L(12)	1	-	4	-	-	-	-	-	5	179
M	LC	B2	-	Non-SPECE	N1	S,K,T(f),L(2)										180
12	LC	B2	-	Non-SPEC	N1	S,K,T(fo),L(12)										181
0	LC	B2	-	Non-SPEC	N1	S										182
-	LC	B2	-	Non-SPEC	N1	K										183
12	LC	B2	-	SPEC 3	N1	S,K,T(fo),L(2)	-	1	-	-	-	-	1	-	2	184
-	LC	B2	-	SPEC 2	N1	L(2)										185
-	LC	B2	-	Non-SPECE	N1	K,L(2)										186
14	LC	B3	-	Non-SPECE	N3	S,K,T(o),L(12)	155	26	7	10	15	14	8	5	240	187
-	LC	B3	-	Non-SPECEW	N2	K,T(fo),L(2)										188
14	LC	B3	-	Non-SPECE	N2	S,K,T(o),L(12)	76	4	-	1	1	3	3	1	89	189
-	LC	B3	-	Non-SPECEW	N2	K,T(o),L(2)										190
14	LC	B3	-	Non-SPECE	N2	S,K,T(o),L(12)	8	6	2	-	2	-	-	-	18	191
2	LC	B2	-	Non-SPEC	N1	S,K,T(o)	-	-	-	-	-	-	1	-	1	192
1	LC	B2	1	Non-SPEC	N1	S										193
-	LC	B2	-	Non-SPECE	N1	K										194
12	LC	B2	-	Non-SPECE	N1	S,K,T(fo),L(2)	-	-	-	6	-	-	-	-	6	195
14	LC	B2	-	Non-SPEC	N1	S,K,T(o),L(12)	-	-	-	11	-	-	3	-	14	196
14	LC	B2	-	SPEC 3	N1	S,K,T(f),L(2)	2	-	2	2	3	1	-	-	10	197
4	LC	B2	-	Non-SPECE	N1	S	-	2	-	-	-	1	-	1	4	198
10	LC	B2	-	Non-SPECE	N1	S,K,L(2)	3	2	-	2	-	-	7	-	14	199
12	LC	B2	1	Non-SPECE	N1	S										200
14	LC	B2	-	Non-SPEC	N1	S,K,T(f),L(2)	3	3	-	-	-	-	-	-	6	201
3	LC	B2	-	Non-SPECE	N1	S,T(f),L(12)	1	1	1	-	3	-	1	-	7	202
12	LC	B2	-	Non-SPECE	N1	S,L(12)										203
14	LC	B2	-	Non-SPECE	N1	S,K,T(fo),L(12)	72	4	1	9	4	9	5	-	104	204
-	LC	B2	-	SPEC 2	N1	L(1)										205
16	LC	B2	-	SPEC 2	N1	S,L(12)	15	-	-	-	-	-	-	-	15	206
14	LC	B2	-	Non-SPEC	N1	S,K,T(o),L(12)	166	25	-	11	5	9	10	7	233	207
-	LC	B2	-	Non-SPEC	N1	K,T(o),L(2)										208
-	LC	B2	-	Non-SPECE	N1	K,T(o),L(2)										209
-	LC	B2	-	Non-SPECE	N1	K,L(2)										210
12	LC	B2	-	SPEC 3	N1	S,K,T(f),L(12)	5	2	-	-	-	3	-	2	12	211
3	LC	B2	1	Non-SPEC	N1	S,T(f),L(2)	1	1	-	-	-	-	-	-	2	212
14	NT	B2	1	SPEC 2	N1	S,L(12)	7	-	-	-	-	2	-	1	10	213
-	LC	B2	1	Non-SPECE	N1	T(f)										214
-	LC	B2	-	Non-SPECE	N1	K,T(f),L(2)										215
-	LC	B2	-	Non-SPEC	N1	T(o)										216
12	LC	B3	-	Non-SPEC	N2	S,K,T(o),L(12)	8	1	-	-	-	2	-	1	12	217
12	LC	B2	-	SPEC 3	N1	S,K,T(fo),L(12)	67	4	-	-	2	9	-	1	83	218
14	LC	B2	-	Non-SPECE	N1	S,L(12)	-	3	-	-	4	-	-	-	7	219
-	LC	B2	-	Non-SPEC	N1	K,T(o),L(2)										220
14	LC	B2	-	Non-SPECE	N1	S,K,T(fo),L(12)	162	23	7	11	11	13	10	4	241	221
14	LC	B2	-	Non-SPEC	N1	S,K,T(fo),L(2)	141	27	13	13	15	9	12	8	238	222
14	LC	B2	-	Non-SPEC	N1	S,K,T(o),L(12)	186	20	4	7	8	11	6	3	245	223
13	LC	B2	-	Non-SPEC	N1	S,K,T(fo),L(12)	25	-	-	-	-	1	-	-	26	224
14	LC	B2	-	Non-SPECE	N1	S,K,L(12)	30	3	1	2	-	2	-	1	39	225
12	LC	B2	-	Non-SPEC	N1	S,K,T(fo),L(12)	20	13	11	5	19	8	3	2	81	226
14	LC	B2	1	SPEC 3	N1	S,K,T(fo),L(1)	-	21	2	2	13	1	6	-	45	227
1	LC	B2	1	SPEC 2	N1	S,K,T(o),L(12)										228

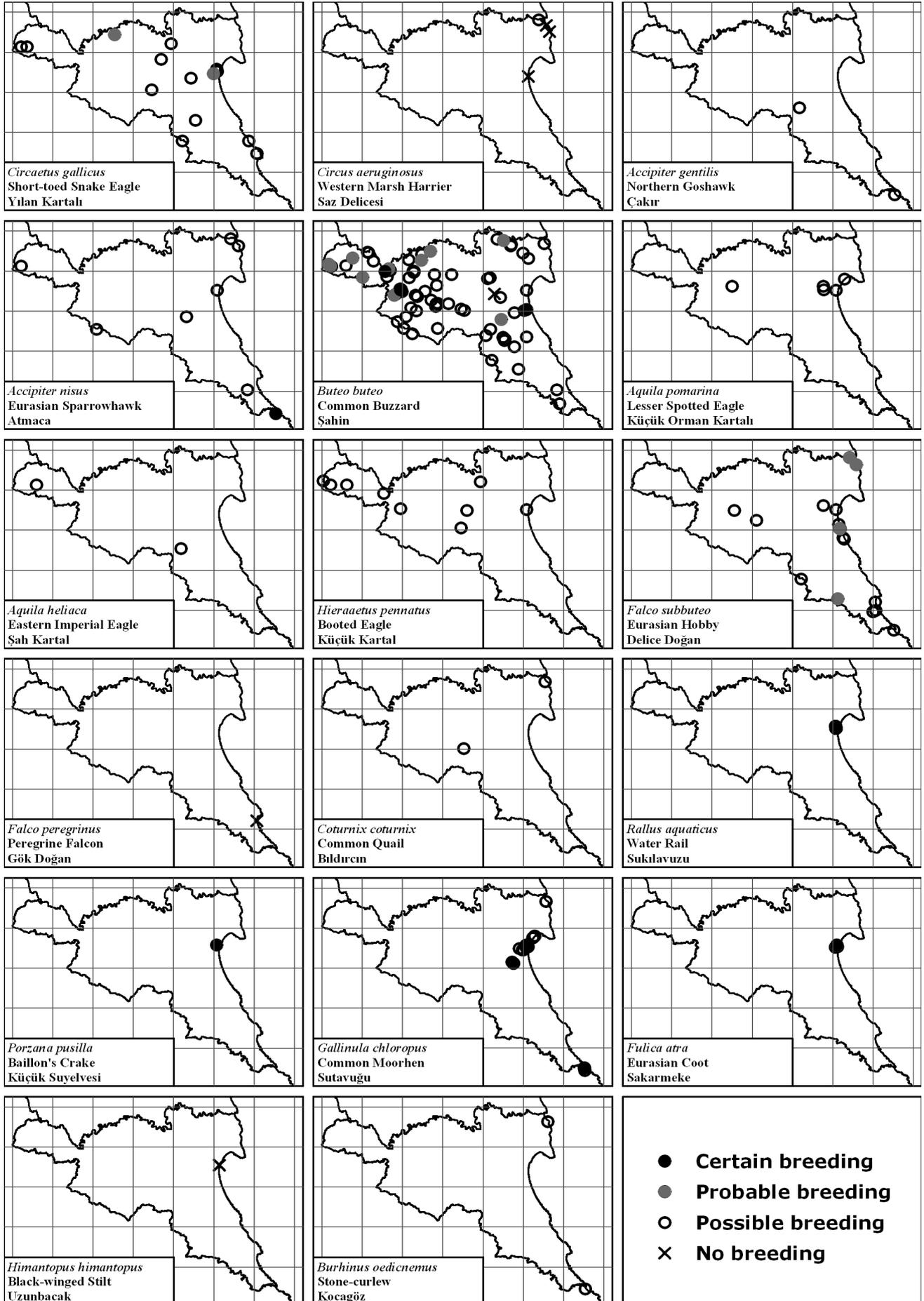
	Family	Genus	Species	English	Turkish	Occur. status	Breed. status
229	Laniidae	Lanius	senator	Woodchat Shrike	Kızıl Başlı Örümcekuşu	SP	C
230	Corvidae	Garrulus	glandarius	Eurasian Jay	Alakarga	R	C
231	Corvidae	Pica	pica	Common Magpie	Saksağan	R	C
232	Corvidae	Corvus	monedula	Western Jackdaw	Küçük Karga	R	C
233	Corvidae	Corvus	frugilegus	Rook	Ekin Kargası	WP	NB
234	Corvidae	Corvus	cornix	Hooded Crow	Leş Kargası	R	C
235	Corvidae	Corvus	corax	Common Raven	Kuzgun	R	C
236	Sturnidae	Sturnus	vulgaris	Common Starling	Siğircık	RP	C
237	Sturnidae	Sturnus	roseus	Rose-coloured Starling	Pembe Siğircık	P	NB
238	Passeridae	Passer	domesticus	House Sparrow	Serçe	R	C
239	Passeridae	Passer	hispaniolensis	Spanish Sparrow	Söğüt Serçesi	SP	C
240	Passeridae	Passer	montanus	Eurasian Tree Sparrow	Ağaç Serçesi	R	C
241	Fringillidae	Fringilla	coelebs	Common Chaffinch	İspinoz	RP	C
242	Fringillidae	Fringilla	montifringilla	Brambling	Dağ İspinozu	WP	NB
243	Fringillidae	Serinus	serinus	Eurasian Serin	Küçük İskete	WP	NB
244	Fringillidae	Carduelis	chloris	Eurasian Greenfinch	Florya	RP	C
245	Fringillidae	Carduelis	carduelis	Eurasian Goldfinch	Saka	RP	C
246	Fringillidae	Carduelis	spinus	Eurasian Siskin	Kara Başlı İskete	WP	NB
247	Fringillidae	Carduelis	cannabina	Common Linnet	Ketenkuşu	RP	C
248	Fringillidae	Carpodacus	erythrinus	Common Rosefinch	Çütre	SP	Pr
249	Fringillidae	Pyrrhula	pyrrhula	Eurasian Bullfinch	Şakrak	WP	NB
250	Fringillidae	Coccothraustes	coccothraustes	Hawfinch	Kocabaş	RP	C
251	Emberizidae	Plectrophenax	nivalis	Snow Bunting	Alaca Çinte	WP	NB
252	Emberizidae	Emberiza	citrinella	Yellowhammer	Sarı Çinte	RP	C
253	Emberizidae	Emberiza	cirlus	Cirl Bunting	Bahçe Çintesi	R	C
254	Emberizidae	Emberiza	cia	Rock Bunting	Kaya Çintesi	RP	C
255	Emberizidae	Emberiza	hortulana	Ortolan Bunting	Kirazkuşu	SP	C
256	Emberizidae	Emberiza	schoeniclus	Common Reed Bunting	Bataklık Çintesi	WP	NB
257	Emberizidae	Emberiza	melanocephala	Black-headed Bunting	Kara Başlı Çinte	SP	C
258	Emberizidae	Miliaria	calandra	Corn Bunting	Tarla Çintesi	RP	C

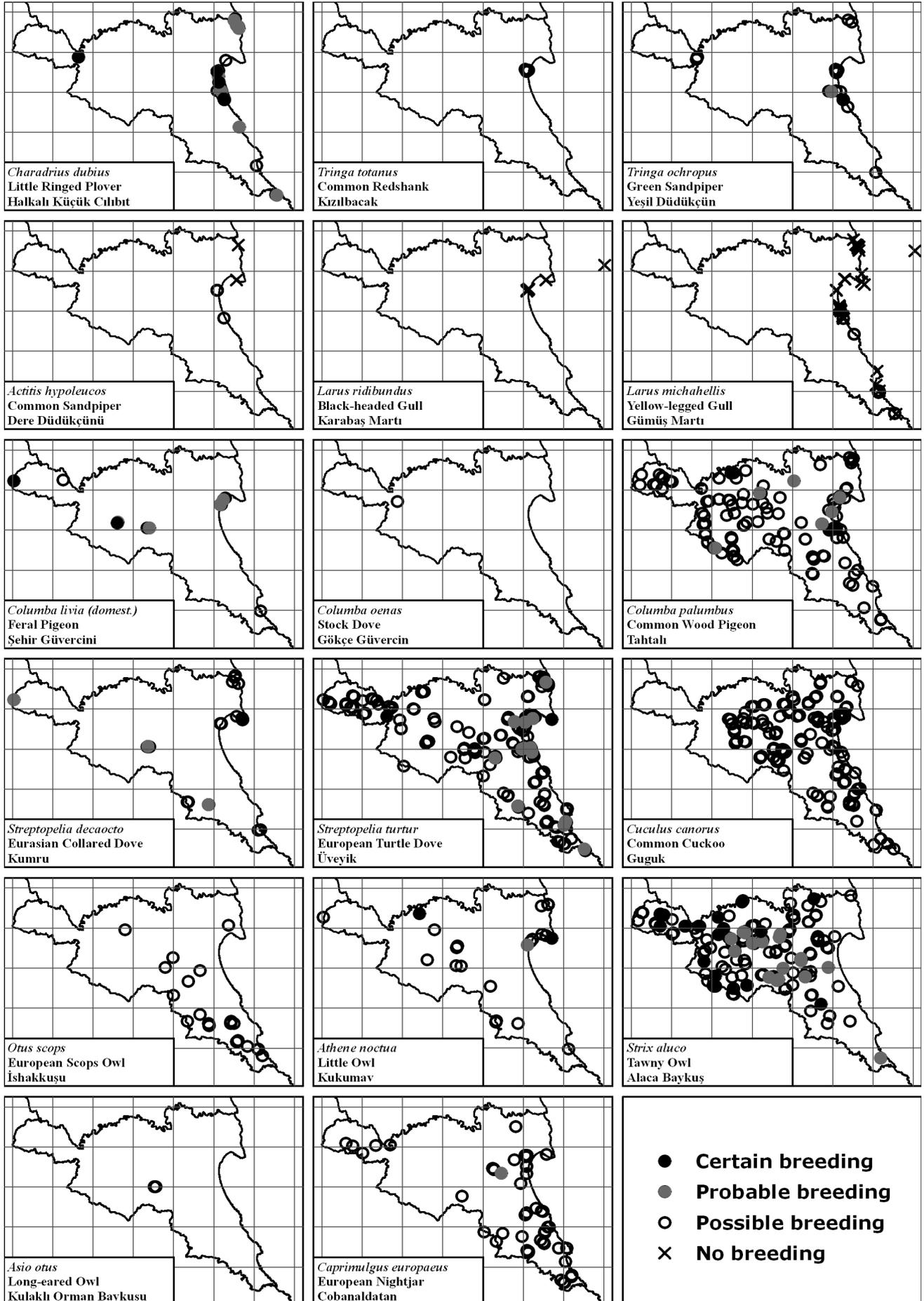
Breeding code	IUCN	Bern	EU Birds directive	SPEC category	National status	Source of information	FOR 279	OFP 38	URB 23	WET 23	AGR 22	RIP 21	COA 20	PLA 17	TOT 443	
12	LC	B2	-	SPEC 2	N1	S,L(12)	-	-	-	-	4	-	-	-	4	229
12	LC	NP	-	Non-SPEC	N3	S,K,T(o),L(2)	21	6	1	4	4	3	1	5	45	230
12	LC	NP	-	Non-SPEC	N3	S,K,T(o),L(12)	-	-	1	-	1	-	-	-	2	231
14	LC	NP	-	Non-SPECE	N3	S,K,T(o),L(12)	-	-	7	-	3	-	-	-	10	232
0	LC	NP	-	Non-SPEC	N3	S,K,T(o),L(2)										233
14	LC	NP	-	Non-SPEC	N3	S,K,T(o),L(2)	7	2	4	9	6	1	7	-	36	234
12	LC	B3	-	Non-SPEC	N2	S,K,T(o),L(12)	7	9	-	-	3	2	2	-	23	235
14	LC	NP	-	SPEC 3	N2	S,K,T(fo),L(2)	2	2	1	3	5	1	3	1	18	236
-	LC	B2	-	Non-SPEC	N1	L(2)										237
16	LC	NP	-	SPEC 3	N3	S,K,T(fo),L(12)	-	1	22	-	7	-	-	-	30	238
16	LC	B3	-	Non-SPEC	N2	S,K,T(o),L(12)	1	-	1	2	2	-	-	-	6	239
12	LC	B3	-	SPEC 3	N2	S,K,T(fo),L(2)	-	-	4	-	1	-	-	-	5	240
14	LC	B3	-	Non-SPECE	N2	S,K,T(fo),L(12)	269	35	8	14	14	20	12	14	386	241
-	LC	B3	-	Non-SPEC	N2	K,T(fo),L(2)										242
-	LC	B2	-	Non-SPECE	N1	K,,L(2)										243
12	LC	B2	-	Non-SPECE	N1	S,K,T(fo),L(2)	2	8	11	4	12	3	6	1	47	244
12	LC	B2	-	Non-SPEC	N1	S,K,T(o),L(12)	1	2	10	5	7	5	3	3	36	245
-	LC	B2	-	Non-SPECE	N1	K,T(fo),L(2)										246
1	LC	B2	-	SPEC 2	N1	S,K,T(o),L(12)	-	1	1	-	-	-	2	-	4	247
3	LC	B2	-	Non-SPEC	N1	S,L(2)										248
-	LC	B3	-	Non-SPEC	N2	L(1)										249
12	LC	B2	-	Non-SPEC	N1	S,K,T(fo),L(12)	31	6	4	3	5	9	1	2	61	250
-	LC	B2	-	Non-SPEC	N1	K,T(f)										251
5	LC	B2	-	Non-SPECE	N1	S,K,T(fo),L(2)	-	8	-	-	6	1	-	-	15	252
14	LC	B2	-	Non-SPECE	N1	S,K,T(o),L(12)	1	2	-	1	1	-	6	-	11	253
12	LC	B2	-	SPEC 3	N1	S										254
2	LC	B3	1	SPEC 2	N2	S,L(12)	1	3	-	-	-	-	-	-	4	255
-	LC	B2	-	Non-SPEC	N1	K,T(fo),L(2)										256
3	LC	B2	-	SPEC 2	N1	S,K,L(2)	-	1	2	-	4	-	1	-	8	257
14	LC	B3	-	SPEC 2	N2	S,K,T(o),L(2)	3	7	3	5	16	-	4	-	38	258

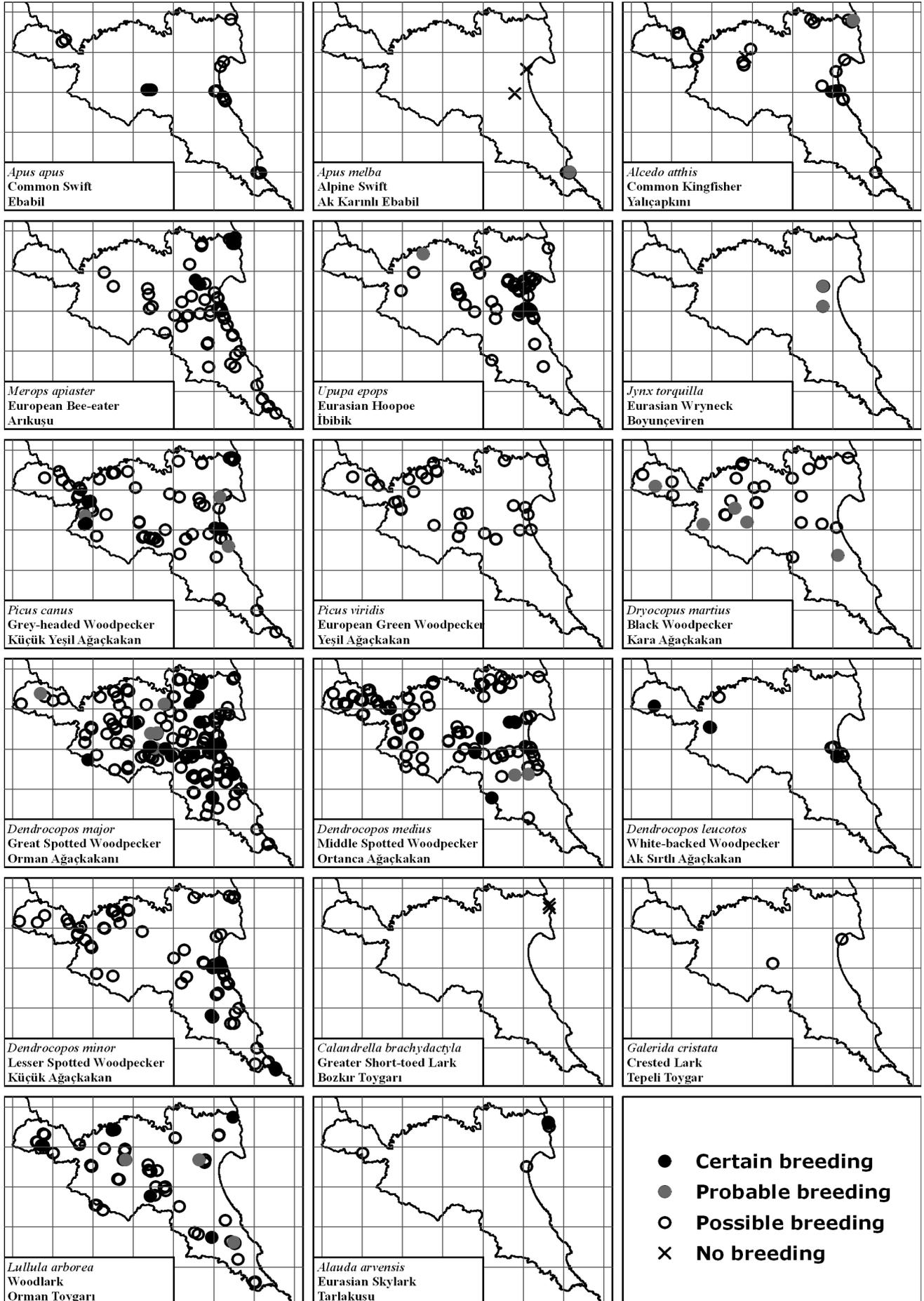
ANNEX 2. DISTRIBUTION MAPS OF SPECIES OBSERVED IN THE SURVEY

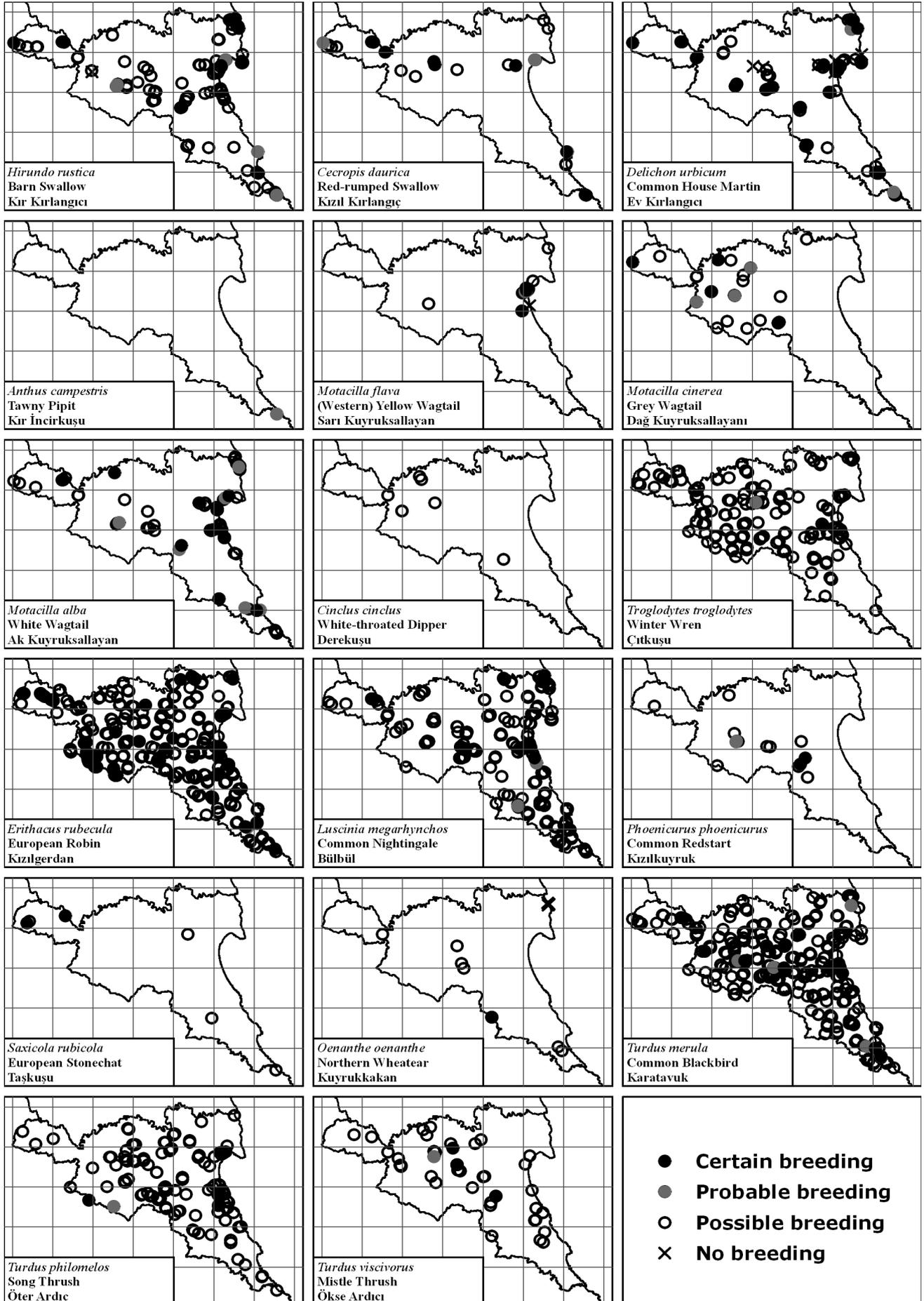
Migratory species are excluded from the distribution maps. The maps are overlaid by 10 km UTM grids. The first (left-most) graticule for easting is 530,000 m and the first (lowest) graticule for northing is 4,610,000 m. For breeding evidence criteria see Table 2.

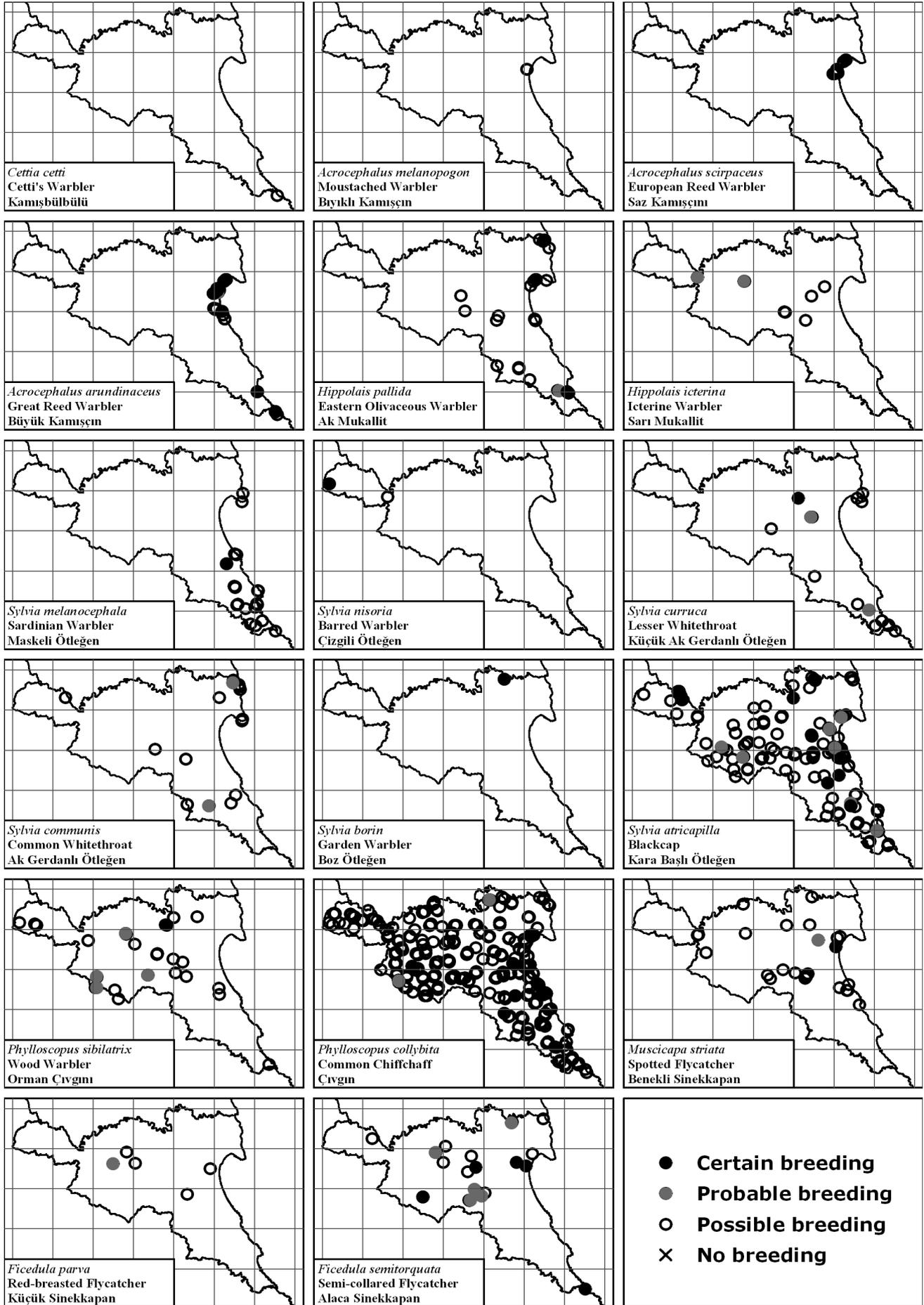


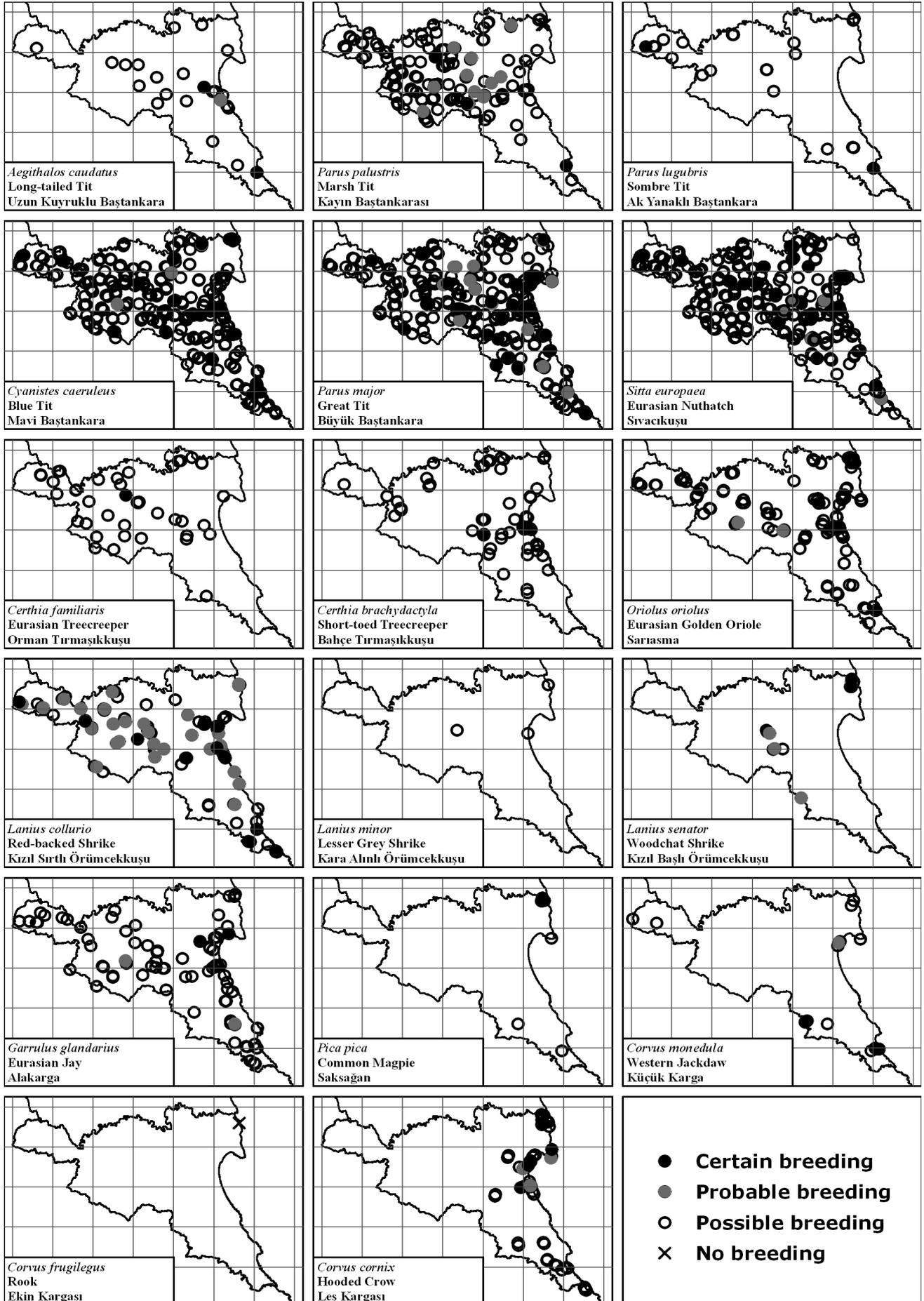


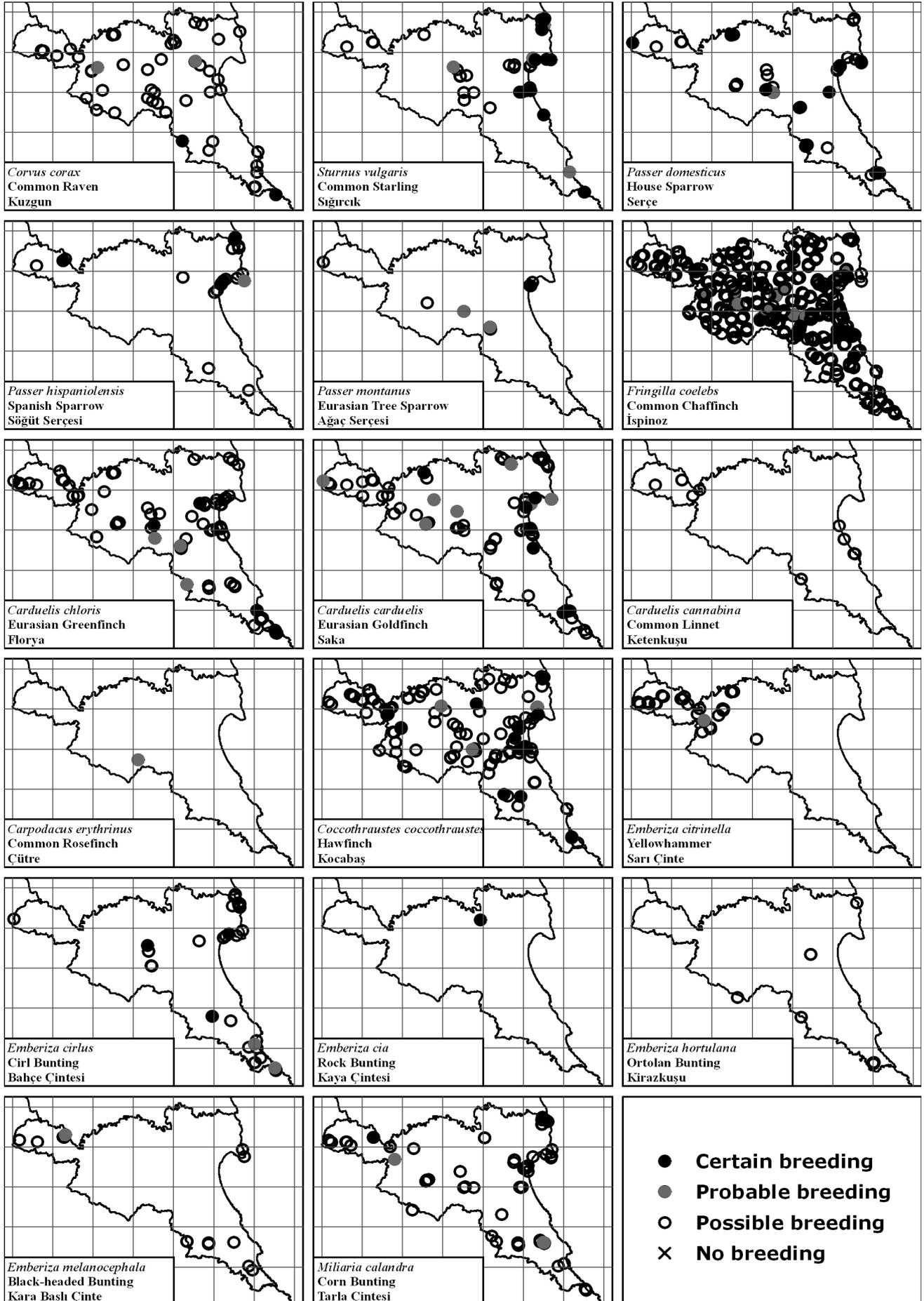












ANNEX 4. NIGHT SURVEY FORM

Point			E			N			Altitude	
Date		Start		End		Rain-wind:			Surveyor	
Species		1	2	3	4	5	6	7	8	9
Point			E			N			Altitude	
Date		Start		End		Rain-wind:			Surveyor	
Species		1	2	3	4	5	6	7	8	9
Point			E			N			Altitude	
Date		Start		End		Rain-wind:			Surveyor	
Species		1	2	3	4	5	6	7	8	9
Point			E			N			Altitude	
Date		Start		End		Rain-wind:			Surveyor	
Species		1	2	3	4	5	6	7	8	9
<p>code,distance,count distance: 1: 0-10 m; 2: 10-20m; 3: 20-100m; 4: >100m; V: "answer to call" FO: "flying over"; F: "flushed"; M: "migration"</p>										

YILDIZ MOUNTAINS BIOSPHERE PROJECT REPORT SERIES



No.6: Diversity and distribution of birds in the Yıldız Mountains

