
Cyprus Migrating Bird Census

South Eastern Peninsula

28 August – 29 October 2005



Autumn Bird Migration at the South Eastern Peninsula with Cape Greco, Cyprus

Diurnal Bird Migration and Transect
Counts from 28 August to 29 October
2005

Tobias Roth and Edith Loosli

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Contact address:

Tobias Roth, Im Zimmerhof 7, CH-4054 Basel, e-Mail: tobias.roth@birding.ch

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Cranes (*Grus grus*) by Tobias Roth

Contents

Summary	4
Introduction	5
Aims of this Report.....	5
The South East Peninsula with Cape Greco.....	5
Methods.....	6
Diurnal Bird Counts.....	6
Transect counts	6
Casual bird observations	6
Acknowledgement	7
Species of Conservation Importance	8
Introduction	8
Globally threatened species.....	8
Species threatened at the European Union level	10
Important populations of non-threatened species.....	12
Bottleneck Site	13
Rare Birds of Cyprus	14
Densities and Numbers of Common Migrants.....	19
Introduction	19
Study area.....	19
Densities and Numbers	20
Estimated numbers.....	20
Common Quail (<i>Coturnix coturnix</i>)	20
Redstart (<i>Pheonicurus phoenicurus</i>)	21
Whinchat (<i>Saxicola rubetra</i>) and Stonechat (<i>Saxicola torquata</i>)	21
Wheatears (<i>Oenanthe</i>)	22
Warblers (<i>Sylvidae</i>).....	23
Flycatchers (<i>Muscicapidae</i>)	26
Shrikes (<i>Laniidae</i>)	26
Other Migrants	26
Conclusion	28
Bibliography.....	29
Appendix: Systematic List of Recorded Species	30

Summary

Autumn bird migration was counted at the South Eastern Peninsula with Cape Greco, Cyprus, from 28 August to 29 October 2005. During the study diurnal bird migration was continuously counted and 4 to 5 transect counts were conducted daily to estimate the densities of resting birds.

Six globally threatened species and 56 species threatened at the European Union level were observed.

The total number of migrants of the non-threatened European Bee-eater (*Merops apiaster*) exceeds 1% of the European breeding population. The “C3” criterion of the Important Bird Area criteria system is met.

25 raptor species with a total of 5153 individuals were counted. The “bottleneck site” criterion of the Important Bird Area criteria system is fulfilled. Not only the total numbers but also the species diversity is important.

In total 190 species were recorded. The transect counts prove that many species rest in important numbers on the peninsula. Common Quail (*Coturnix coturnix*) was recorded in high densities which means that several tens of thousands of birds stopped on the south eastern peninsula.

Introduction

Aims of this Report

Millions of migratory birds from Scandinavia, Central and Eastern Europe, Western Russia and Turkey pass through Cyprus in autumn. Birds of prey cross the island on a broad front, but concentrate over and depart from the capes in the south (Flint & Stewart, 1992). Various species of small passerines occur as nocturnal migrants, and millions stop over throughout the island wherever there is cover, but they form dense concentrations in scrub along the southern coast (Flint & Stewart, 1992). Therefore the capes in the south must be of significant importance for migrating birds in autumn.

Despite this, until now the south east peninsula with Cape Greco has received little attention in ornithological literature, usually only in relation to bird catching and shooting. Only scattered observations from autumn bird migration are available. The importance of the peninsula and Cape Greco for birds and the threats from bird shooting and liming has been discussed in Loosli & Schneider (2004). But to prove the importance of the SE peninsula and Cape Greco more data are needed. Very probably the peninsula was not included in the recent list of important bird areas on Cyprus (Iezekiel et al., 2004) because available data were insufficient.

From 28 August to 29 October 2005 diurnal bird migration was continuously counted. Transect counts were conducted daily to estimate the numbers of resting birds. It is the aim of this report to summarize the results of this census and to stress the findings that are most important in terms of bird protection.

The South East Peninsula with Cape Greco

The South Eastern Peninsula consists of extensive inland cliffs and rocky limestone areas covered by a rich vegetation. Extensive scrub of high and low acacias and juniper trees alternate with stubble fields and vast rocky heaths with low dry grass vegetation. Clumps of high trees and dense vegetation along the dry water ditches alternate with low bush land and vegetable plantations or the many conventional crop and wild oats fields.

This is a magnificent habitat with well conserved biodiversity of wild plants and insects: attractive to all kinds of breeders and a great number and variety of birds of passage, funnelled into the south eastern-most peninsula of Cyprus and down into the hinterland of this bottleneck, the last stopover before crossing the Mediterranean Sea.

For a detailed description see "Bird Protection Area of South Eastern Peninsula and Cape Greco" by Loosli et al. (2004).

Methods

Diurnal Bird Counts

Every day from 03.09.2005 to 26.10.2005 migrating birds were counted from a point with good views in all directions. From the outset until 18.09.2005 this point was located on the Phanos, the highest inland hill at 170 meters above sea level. Thereafter the diurnal bird census was performed from the southernmost cliff on the edge of the peninsula (100 meters above sea level). The observation point was changed because some falcons were arriving from the sea from north easterly directions and these distant birds could hardly be seen from the first observation place. One observer (up to three during days with strong migration) continuously scanned the sky with binoculars. Scopes were used to identify and (if possible) to age the birds. Time, number, age and direction were noted for every observation. If a species was too common (resident) to note every single bird, only the total and the time interval was noted.

Transect counts

Compared to the counts of breeding birds, a census of resting migrants faces the problem that the species do not sing and are often hard to detect. Line transect methodology, however, makes it possible to estimate the density of bird species from the recorded data without being constrained by the different species' detectability or habitat differences. The guidelines and study design for line transect sampling are described in Buckland et al. (2001). Samplings were conducted every morning from 05.09.2005 to 29.10.2005 along 4 randomly selected straight lines of 800 to 900 m in length. From 06.10.2005 to 29.10.2005 an additional transect of 500 meters in length was also performed every morning. All samples were done on foot at a constant and very slow pace (less than 1 km per hour) and conducted during early morning hours between 6:30 and 9:30. All the birds seen along the transect line were identified and their distances and angles to the line were measured accurately using a laser range finder (Bushnell Yardage-Pro 500).

Analyses of the transect data were carried out with the program DISTANCE version 4.1 (Thomas et al., 2002). To calculate the detection probability all observation of one species were lumped together. The first step of any analysis included a visual inspection of the histograms of distances. The largest 5% of the observation furthest away from the transect line were discarded ("right truncation"). Four different models were considered (half-normal with cosine or hermite polynomial expansion, and hazard-rate with cosine or simple polynomial expansion) to fit the data, and the most appropriate model was chosen on the basis of their lowest AIC value (Akaike, 1973). The mean densities were calculated for each day using the appropriate model for the data and plotted in the figures with a 95% confidence interval.

Casual bird observations

All casual observations of birds were recorded with estimated numbers and time of the day. At the end of the day the observations of all observers were summarized and summed up. To avoid double counting, the times of the observations were compared and observations of the same individuals were excluded. Some good habitats not covered by the transect were checked sporadically. Observations from these habitats were included in the casual bird observations database.

Acknowledgement

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Species of Conservation Importance

Introduction

The South-Eastern Peninsula is not mentioned in the recent list of Important Bird Areas in Cyprus (Iezekiel et al., 2004). Lack of data may be the most important reason why the area was not selected. The data presented here prove that several of the selection criteria (Waliczky, 2000) are fulfilled for the South Eastern Peninsula and Cape Greco to be considered as an Important Bird Area. The data were collected to support the objective of designation of the South Eastern Peninsula as a bird protection area (for details see Loosli & Schneider, 2004). In this section we discuss the results that are most important in terms of bird conservation.

Globally threatened species

Six globally threatened species were observed during the survey according to the assessments by Bird Life International (BirdLife International, 2005). They include Pallid Harrier, Saker, Lesser Kestrel, Corncrake, Audouin's Gull and Cinereous Bunting. All observations of these species are listed below.

Pallid Harrier (*Circus macrourus*) – Near Threatened

The population of Pallid Harrier is estimated at only 20,000 pairs, having shown a marked decline and range contraction (BirdLife International, 2004b). On their way to the wintering areas in the Afrotropics, some individuals regularly turn up in Cyprus, where it is a scarce to fairly common migrant in September and October, occasional in November (Flint & Stewart, 1992). The numbers of passage individuals in Cyprus also showed signs of decline in recent decades (Flint, 2001). During the survey 15 individuals were identified and listed in Table 1; other individuals (at least 6 individuals) were suspected to be Pallid Harriers but could not be safely discerned from Montagu's Harriers.

Table 1: The 15 records of Pallid Harrier (*Circus macrourus*) during the whole study.

Date	Number	Age and sex
03.09.2005	1	Juvenile
20.09.2005	1	Juvenile
22.09.2005	2	Juvenile and adult male
23.09.2005	1	Juvenile
25.09.2005	2	Males
26.09.2005	2	Juvenile and adult male
27.09.2005	1	Male transitional
28.09.2005	1	Juvenile
30.09.2005	1	Juvenile
01.10.2005	1	Adult male
09.10.2005	1	Juvenile
11.10.2005	1	Adult male

Saker (*Falco cherrug*) - Endangered

This species has been included into the IUCN Red List only recently. It qualifies as endangered because of its very rapid population decline, especially on the Central Asian breeding grounds (BirdLife International, 2005). The European population consists of 360 to 540 pairs (BirdLife International, 2004a). In Cyprus the Saker is a scarce migrant in September and October (Flint, 2001). During the survey we recorded 8 individuals (see Table 2 for details), missing out 5 individuals that were probably Sakers, but could not be identified safely enough.

Table 2: Records of Saker (*Falco cherrug*).

Date	Number Age
07.09.2005	1 Adult
05.10.2005	2 Adult
06.10.2005	1
16.10.2005	2 Juveniles
28.10.2005	1
29.10.2005	1

Lesser Kestrel (*Falco naumanni*) – Vulnerable

Western Palaearctic populations of Lesser Kestrel have undergone serious decline. The western European population has declined by around 95% since 1950, and the species has disappeared from the Ural region of Russia and from northern Kazakhstan. The European and north African population is currently estimated at 17,000 to 21,000 pairs (BirdLife International, 2004b). This species used to breed on Cyprus, but nowadays it occurs only during migration. The reason for its extinction is unknown (Flint & Stewart, 1992). On migration it is more common during spring than autumn passage (Flint, 2001). During the study period we recorded 32 individuals migrating across Cape Greco from mid September to mid October (see Table 3 for the record details). Lesser Kestrel and Common Kestrel are very similar (Forsman, 1999). As the Common Kestrel is a common resident in the study area, many Lesser Kestrels may have been overlooked.

Table 3: The 32 records of Lesser Kestrel (*Falco naumanni*) during the whole study.

Date	Number Age and sex
17.09.2005	1 Adult male
18.09.2005	3 Juvenile
19.09.2005	2 Females or juveniles
22.09.2005	1 Adult male
27.09.2005	1 Juveniles
28.09.2005	3 One male, 2 juveniles
29.09.2005	2 Males
30.09.2005	1 Females or juveniles
03.10.2005	2 Females or juveniles
09.10.2005	3 Juveniles
15.10.2005	1 Adult male
16.10.2005	8 Juveniles or females
18.10.2005	4 Juveniles

Corncrake (*Crex crex*) – Near Threatened

The population of Corncrake in Europe is estimated at 1,138,000 to 1,822,000 singing males. Populations often undergo rapid declines and may do so in response to changes in agricultural practice in eastern Europe (BirdLife International, 2004b). On the way to their Sub-Saharan wintering grounds some birds (a substantial number) also fly across Cyprus. Our results suggest that the species is also a regular passage migrant in autumn, although it is mentioned only as a more or less regular spring migrant (Flint, 2001). During the study we recorded 26 different individuals. Unfortunately, this is a very difficult species to count during migration. The birds sit very inconspicuously on the ground, hiding in the vegetation, and they can be flushed only if an observer is very close. The detection probability for our data was estimated to be 2.4% (0.13% lower and 45% upper limit) on transects with a strip length of 150 meters. Therefore, the total numbers of individuals using the south east peninsula as a stopover place must be much higher, but too few individuals were recorded on the transect to allow a reliable estimation of the densities.

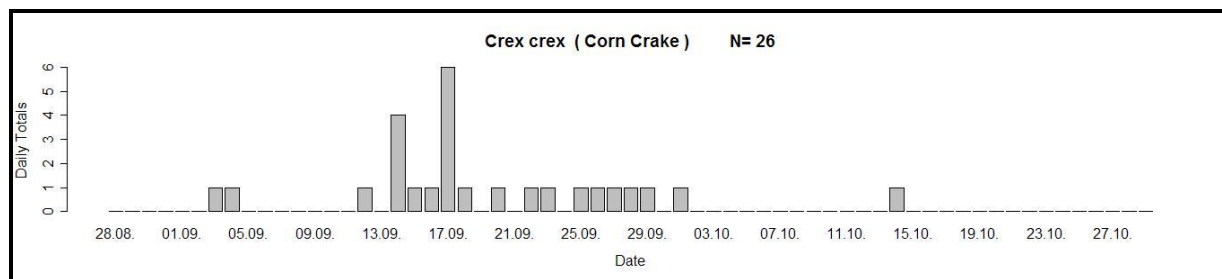


Figure 1: 26 Corncrakes were recorded during the study. The main passage may take place during the second half of September.

Audouin's Gull (*Larus audouinii*) – Near Threatened

The global population has been estimated at 19,200 pairs. The European Population encompasses over 90% of the world population and is stable or increasing throughout its breeding range (BirdLife International, 2004b). The species is a scarce resident in Cyprus (Flint, 2001). We recorded the species almost daily in Konnos Bay (mean: 5.9 individuals), with a maximum of 15 individuals on 21.09.2005. On 29.09.2005 a colour-ringed bird was read (AF7). This individual was born on the Lispi Islands (east of Patmos Island), Greece, and previously recorded from Larnaca Sewage Pond, Cyprus (Flint and Stewart in lit.).

Cinereous Bunting (*Emberiza cineracea*) – Near Threatened

The Cinereous Bunting is a species with a very restricted breeding range (Turkey, some Greek islands, Iran and possibly Iraq). The total population is estimated at only 700-5,350 breeding pairs. Migrating birds are regularly recorded in lowland agricultural land and semi-deserts in Cyprus (BirdLife International, 2004b). In Flint (1992) it is only mentioned as a very scarce (overlooked?) migrant in spring (mainly April). During the census we recorded two different individuals on Cape Greco (09.09.2005 and 12.09.2005) indicating that the species has been overlooked during autumn migration.

Species threatened at the European Union level

During the census 56 species were recorded that are threatened at the European Union level (European Commission, 2004). The six globally threatened species (see above) are not

included in this list. The percentage of days with records and the sum of the daily numbers are given in Table 4. For the few resident birds (e.g. Kingfisher, Cyprus Wheatear and Cyprus Warbler) the sum is not meaningful as it may include the same individuals counted during several days.

Table 4: Recorded species threatened at the European Union level and therefore mentioned in Annex I of the European Union Birds Directive (European Commission, 2004). * indicates species with substantial night migration not included in the numbers.

Species	% days	sum
White Pelican (<i>Pelecanus onocrotalus</i>)	3%	8
Little Bittern (<i>Ixobrychus minutus</i>)	3%	2
Night-Heron (<i>Nycticorax nycticorax</i>)	25%	213*
Squacco Heron (<i>Ardeola ralloides</i>)	2%	5
Little Egret (<i>Egretta garzetta</i>)	32%	58
Great White Egret (<i>Egretta alba</i>)	8%	10
Purple Heron (<i>Ardea purpurea</i>)	25%	83
White Stork (<i>Ciconia ciconia</i>)	5%	6
Black Stork (<i>Ciconia nigra</i>)	11%	25
Glossy Ibis (<i>Plegadis falcinellus</i>)	2%	34
Eurasian Spoonbill (<i>Platalea leucorodia</i>)	2%	4
Greater Flamingo (<i>Phoenicopterus ruber</i>)	6%	159
European Honey-buzzard (<i>Pernis apivorus</i>)	62%	3302
Black Kite (<i>Milvus migrans</i>)	13%	44
Egyptian Vulture (<i>Neophron percnopterus</i>)	2%	1
Short-toed Eagle (<i>Circus gallicus</i>)	3%	2
Marsh Harrier (<i>Circus aeruginosus</i>)	86%	554
Northern Harrier (<i>Circus cyaneus</i>)	10%	6
Montagu's Harrier (<i>Circus pygargus</i>)	43%	96
Levant Sparrowhawk (<i>Accipiter brevipes</i>)	6%	9
Long-legged Buzzard (<i>Buteo rufinus</i>)	24%	16
Lesser Spotted Eagle (<i>Aquila pomarina</i>)	6%	4
Bonelli's Eagle (<i>Hieraaetus fasciatus</i>)	2%	2
Booted Eagle (<i>Hieraaetus pennatus</i>)	8%	7
Osprey (<i>Pandion haliaetus</i>)	32%	23
Merlin (<i>Falco columbarius</i>)	3%	3
Peregrine Falcon (<i>Falco peregrinus</i>)	30%	24
Eleonora's Falcon (<i>Falco eleonora</i>)	32%	29
Red-footed Falcon (<i>Falco vespertinus</i>)	56%	660
Little Crake (<i>Porzana parva</i>)	3%	2
Common Crane (<i>Grus grus</i>)	27%	2412*
Eurasian Thick-knee (<i>Burhinus oedicnemus</i>)	24%	60
Spur-winged Plover (<i>Vanellus spinosus</i>)	2%	1
Ruff (<i>Philomachus pugnax</i>)	5%	5
Wood Sandpiper (<i>Tringa glareola</i>)	5%	9
Short-eared Owl (<i>Asio flammeus</i>)	10%	8
Eurasian Nightjar (<i>Caprimulgus europaeus</i>)	10%	9
Common Kingfisher (<i>Alcedo atthis</i>)	70%	102
European Roller (<i>Coracias garrulus</i>)	11%	8
Calandra Lark (<i>Melanocorypha calandra</i>)	11%	10
Short-toed Lark (<i>Calandrella brachydactyla</i>)	59%	98

Species	% days	sum
Wood Lark (<i>Lullula arborea</i>)	17%	51
Tawny Pipit (<i>Anthus campestris</i>)	70%	464
Cyprus Wheatear (<i>Oenanthe cypriaca</i>)	59%	95
Moustached Warbler (<i>Acrocephalus melanopogon</i>)	3%	2
Olive-tree Warbler (<i>Hippolais olivetorum</i>)	2%	1
Cyprus Warbler (<i>Sylvia melanothorax</i>)	30%	34
Barred Warbler (<i>Sylvia nisoria</i>)	3%	2
Rueppell's Warbler (<i>Sylvia rueppelli</i>)	5%	4
Collared Flycatcher (<i>Ficedula albicollis</i>)	5%	3
Semicollared Flycatcher (<i>Ficedula semitorquata</i>)	2%	1
Red-backed Shrike (<i>Lanius collurio</i>)	100%	803
Lesser Grey Shrike (<i>Lanius minor</i>)	38%	74
Masked Shrike (<i>Lanius nubicus</i>)	52%	75
Cretzschmar's Bunting (<i>Emberiza caesia</i>)	16%	18
Ortolan Bunting (<i>Emberiza hortulana</i>)	38%	251

Important populations of non-threatened species

European Bee-eater (*Merops apiaster*)

The European Bee-eater has a large global breeding range with a big global population, including an estimated 950,000 to 2,000,000 individuals in Europe (BirdLife International, 2004b). On Cyprus the Bee-eater is a very common migrant during both seasons (Flint, 2001). On Cape Greco the passage lasted from the beginning of September to the first half of October, with peaks around the last third of September. The maximum day count was on 18.09.2005 with more than 2000 individuals passing.

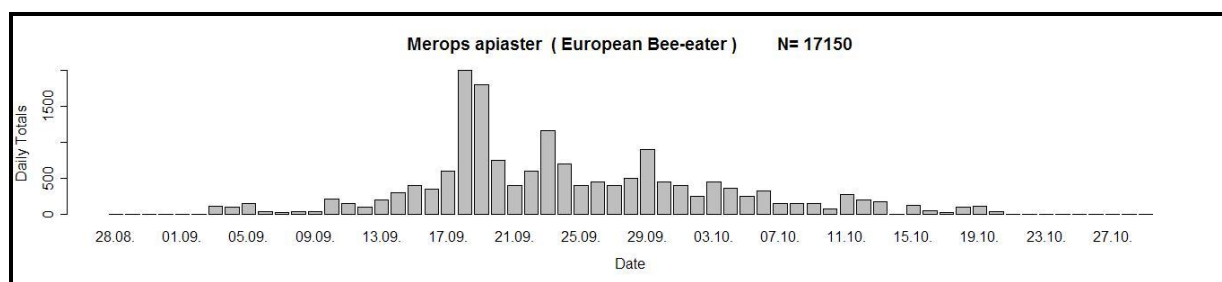


Figure 2: The daily totals of European Bee-eater (*Merops apiaster*).

During September and the first half of October the weather was sunny and hot. The very high migrating birds were extremely difficult to detect in the clear blue sky. Migrating flocks of Bee-eaters were often only heard, but could not be found in the glare of the blue sky and therefore could not be counted. It is realistic to suppose that a number of flocks passed without being discovered at all. Furthermore, flocks of migrating Bee-eaters were heard at night (e.g. 22 to 24 September and 29 to 30 September, some in large flocks). Thus important numbers seem to pass at night. The total of 17,150 individuals counted might therefore be a strong underestimation of the actual number passing along the peninsula.

The actual numbers migrating across the South-Eastern Peninsula must exceed 1% of the European Breeding population. Following the Important Bird Area criteria system (Waliczky, 2000), the “C3” criterion is complied with if “a site is known to regularly hold at least 1% of the flyway of migratory species not considered threatened at the EU level”. In Iezekiel et. al. (2004) the threshold for European Bee-eater to fulfil this criteria is stated as 13,000 individuals. In our case, this threshold is complied with by the number of counted birds alone, even without being complemented with an estimation of the amount of birds overlooked and without those migrating at night.

Bottleneck Site

Following the Important Bird Area criteria system (“C”- EU-level criteria) a “bottleneck” site is where at least 5000 storks (*Ciconiidae*) and/or at least 3000 migratory raptors (*Accipitridae*) or cranes (*Gruidae*) regularly pass on spring or autumn migration (Waliczky, 2000).

Raptors (*Accipitridae*)

This criteria is complied with by the numbers of raptors. Table 4 gives a summary of all raptor species recorded and their total numbers. For species without signs of migration only the maximum day count was used (depicted with bold numbers in the table), for migratory species the daily counts were totalled over the whole season.

Table 5: List of raptors and numbers (N) counted. The bold numbers are the daily maximum if the species is considered as resident, all the other numbers represent the totals of the daily counts. The site fulfils the EU-level “bottleneck”-site criteria (Waliczky, 2000), as the total number of raptors is higher than 3000 individuals.

English name	Scientific name	N
Osprey	<i>Pandion haliaetus</i>	23
European Honey-buzzard	<i>Pernis apivorus</i>	3302
Black Kite	<i>Milvus migrans</i>	44
Egyptian Vulture	<i>Neophron percnopterus</i>	1
Short-toed Snake-Eagle	<i>Circaetus gallicus</i>	2
Western Marsh-Harrier	<i>Circus aeruginosus</i>	554
Northern Harrier	<i>Circus cyaneus</i>	4
Pallid Harrier	<i>Circus macrourus</i>	15
Montagu's Harrier	<i>Circus pygargus</i>	96
Levant Sparrowhawk	<i>Accipiter brevipes</i>	9
Eurasian Sparrowhawk	<i>Accipiter nisus</i>	93
Northern Goshawk	<i>Accipiter gentiles</i>	2
Common Buzzard	<i>Buteo buteo</i>	36
Long-legged Buzzard	<i>Buteo rufinus</i>	2
Lesser Spotted Eagle	<i>Aquila pomarina</i>	3
Bonelli's Eagle	<i>Hieraaetus fasciatus</i>	2
Booted Eagle	<i>Hieraaetus pennatus</i>	3
Lesser Kestrel	<i>Falco naumanni</i>	32
Common Kestrel	<i>Falco tinnunculus</i>	20
Red-footed Falcon	<i>Falco vespertinus</i>	660
Eleonora's Falcon	<i>Falco eleonora</i>	5
Merlin	<i>Falco columbarius</i>	3
Eurasian Hobby	<i>Falco subbuteo</i>	152
Saker Falcon	<i>Falco cherrug</i>	13

Peregrine Falcon	<i>Falco peregrinus</i>	24
Falcon	<i>Falco sp.</i>	53
Total		5153

Not only the total numbers of raptors are important, but also the number of species is worth mentioning. 25 species of raptors prove that this site is indeed an important migration site.

Cranes (*Gruidae*)

The bottleneck criterion ("C 5") is most probably compiled with also by the numbers of cranes. During the study period we counted 2412 individuals during day observations only (see Figure 3). The migration period of cranes lasts during all November, with a peak at the end of October to beginning of November (Flint, 2001). Therefore, significant numbers are expected to have passed after the end of the study.

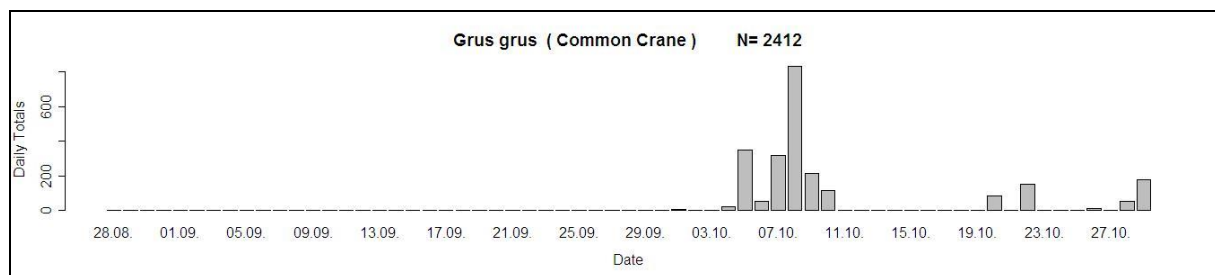


Figure 3: The daily totals of Cranes (*Grus grus*) passing over Cape Greco.

Cranes were heard migrating during night. Witnessed night migrations of cranes (not included in figure 3) were for instance:

26 Oct 19 p.m. A large flock of cranes passed along the coast
 26 and 27 Oct At night we could hear several migrating flocks of cranes

The exceptionally early weather depression of 18 October with rain and extremely strong southeast winds caused a break in crane migration. Migrating birds may have drifted towards the west in these strong winds.

Furthermore, the cranes were more common on the South East Peninsula in former years, exceeding the threshold of 3000 individuals (Loosli and Schneider in lit.) and fulfilling the bottleneck criterion C 5.

Rare Birds of Cyprus

The following list of species concentrates on records worth mentioning as they might be exceptional for Cyprus but not rare on the European or global level.

Northern Goshawk (*Accipiter gentilis*)

The status of the Goshawk in Cyprus is not yet clear; apparently it is a scarce breeder, but there is no satisfactory description of passage birds (Flint & Stewart, 1992). During the study we twice saw a Goshawk on 17.10.2005 and 19.10.2005 without clear sign of migration. It could even be two records of the same individual.

Jack Snipe (*Lymnocyptes minimus*)

The Jack Snipe is considered to be a scarce passage migrant on marshes in October to December (Flint & Stewart, 1992). We had two records, the first on 7.10.2005 and the second on 13.10.2005. The first record was found far away from any water in the middle of dry, bushy habitat. Birds resting in this extensive scrub habitat are extremely hard to discover and migration might be greatly underestimated.

Whimbrel (*Numenius phaeopus*)

Scarce and irregular passage migrant in August to September (Flint & Stewart, 1992). A single bird was heading southwest along the coast on 21.09.2005.

Grey Plover (*Pluvialis squatarola*)

Scarce migrant and winter visitor to wetlands and coasts (Flint & Stewart, 1992). The bird on 27.09.2005 was on its southward migration along the coast.

Northern Lapwing (*Vanellus vanellus*)

The Lapwing is a very common winter visitor from November to February (Flint & Stewart, 1992). During October we recorded several individuals (08.10. 1 ind., 10.10. 1 ind., 15.10.2005 7 ind.), indicating that there might be migration as well.

Common Cuckoo (*Cuculus canorus*)

The Common Cuckoo is a regular migrant in spring, but far fewer records are known from autumn (Flint & Stewart, 1992). We had two records of one bird each, on 17.9.2005 and 04.10.2005.

Bimaculated Lark (*Melanocorypha bimaculata*)

This species remained undiscovered for many years and was almost certainly overlooked as Calandra Lark (*M. calandra*). Up to now the species has proved to be a regular spring migrant (Flint & Stewart, 1992), but is still very irregular on autumn passage (Flint, 2001). Our records of 5 to 8 different individuals (07.10.2005 5 ind., 08.10.2005 1 ind., 14.10.2005 1 ind. and 28.10.2005 1 ind.) indicate that the species is still overlooked during autumn.

Eurasian Crag-Martin (*Hirundo rupestris*)

The Crag Martin is considered to be a locally common breeder and a scarce to fairly common passage migrant in spring (Flint, 2001). Data from autumn migration are mostly lacking. The breeders seem to be residents; at least there are records from the entire year (Flint, 2001). There was substantial migration during late October. The birds were seen at the "View-Point" of Cape Greco in the southernmost corner of the peninsula and most of them were heading towards south. Those birds evidently left Cyprus for more southerly wintering areas. See Figure 4 for more details.

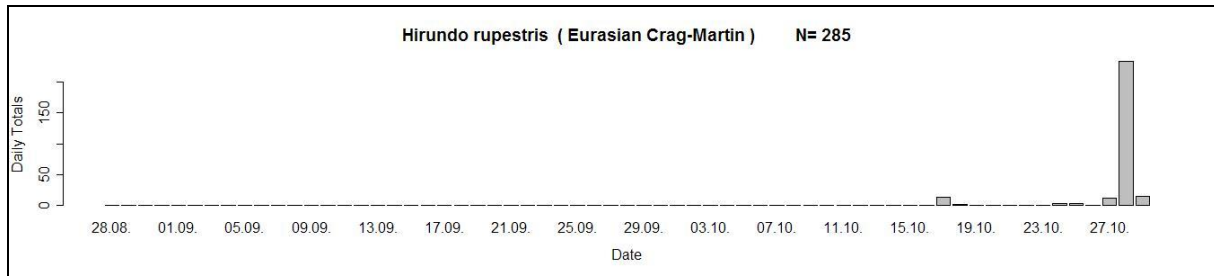


Figure 4: The daily totals of Eurasian Crag-Martin (*Hirundo rupestris*).

Richard's Pipit (*Anthus richardi*)

Scarce passage migrant from mid October to early November (Flint & Stewart, 1992). The observation from 15.10.2005 of 1 individual is in line with this statement.

Citrine Wagtail (*Motacilla citreola*)

On Cyprus it is an occasional migrant in autumn (Flint, 2001). But numbers of records have increased (probably linked to its westward expansion in Russia) in southern Europe in the last two decades (Alström et al., 2003). The increase in numbers is also documented by the recent increase of records in Cyprus (Flint, 2001). Two individuals were observed on 22.09.2005. The subspecies could not be identified.

Dunnock (*Prunella modularis*)

Winter visitor from November to February in variable numbers, probably often overlooked (Flint & Stewart, 1992). There is also indication of scarce passage migration in November. We recorded the first two individuals as early as on 01.10.2005. Another two individuals were recorded on 21.10.2005 and 28.10.2005. It might be possible that the species arrives earlier than usually thought or there might be weak passage migration in October as well.

Rufous-tailed Scrub-Robin (*Cercotrichas galactotes*)

There are two records of Rufous-tailed Scrub-Robins, one on 10.09.2005 and the second on 21.09.2005. This species is considered as a scarce passage migrant from August to early October (Flint & Stewart, 1992).

Finsch's Wheatear (*Oenanthe finschii*)

Finsch's Wheatear is a regular winter visitor in Cyprus. Most of the birds are expected to arrive in November (Flint, 2001). Our data suggests that they arrive already in the middle of October. The sum of the daily totals may overestimate the actual number as many individuals were seen more than (once) on one day. At least 7 different individuals could be distinguished (different sites, sex or age). The sex ratio was 5 males against 2 females, which corresponds with the literature that states males to be much more common than females in Cyprus. The peninsula might be one of the most important wintering areas for this species on Cyprus.

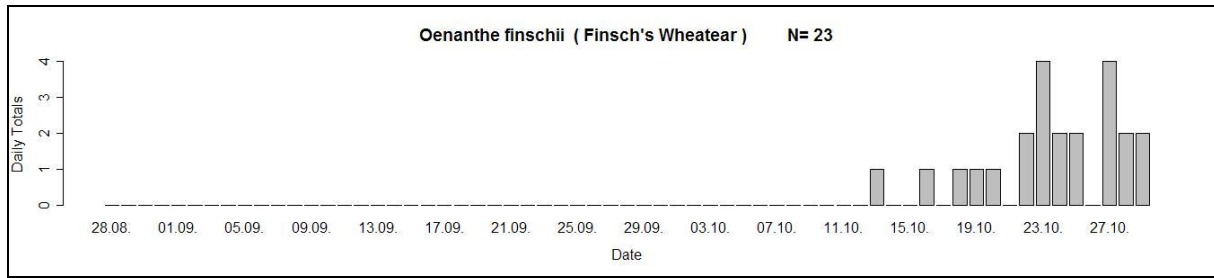


Figure 5: The observations of Finsch's Wheatear (*Oenanthe finschii*).

Rock-Thrush (*Monticola saxatilis*)

There are only very few autumn records (Flint & Stewart, 1992). Our four records of single individual (10.09.2005, 13.09.2005, 22.09.2005 and 06.10.2005) indicate that the species might have been overlooked. During an earlier breeding bird census in the same area the species was suspected to breed but breeding could not be proven (E. Loosli in lit.). In Autumn we observed the species exactly in the same area where it was recorded during the breeding bird census.

Ring Ouzel (*Turdus torquatus*)

Usually a scarce and irregular passage migrant and winter visitor from October to March (Flint & Stewart, 1992). On 19.10.2005 we saw one Ring Ouzel of the subspecies *alpestris*.

River Warbler (*Locustella fluviatilis*)

In autumn 1967 3 birds were trapped during an extensive ringing programme, suggesting that the species may be regular in autumn in very small numbers (Flint & Stewart, 1992). One individual was seen on 14.10.2005 for a short time before it disappeared again in low scrub. This record will require confirmation by the rarity committee of Cyprus.

Icterine Warbler (*Hippolais icterina*)

Scarce passage migrant, most frequent in spring. Passage time in autumn from late August to mid October (Flint & Stewart, 1992). We recorded 3 to 4 different individuals (03.09.2005 2 ind., 04.09.2005 1 ind. and 05.09.2005 1 ind). Therefore the species might be more regular than usually thought.

Subalpine Warbler (*Sylvia cantillans*)

Up to the year 2000 there was only one autumn record of this species (Flint, 2001). Two individuals observed on 19.09.2005 require acceptance by the rarity committee of Cyprus.

European Pied Flycatcher (*Ficedula hypoleuca*)

Common passage migrant in spring but scarce on return passage in September to October. We recorded 4 to 6 individuals (13.09.2005 2 ind., 16.09.2005 1 ind., 19.09.2005 1 ind., 06.10.2005 1 ind. and 08.10.2005 1 ind.).

Eurasian Tree Sparrow (*Passer montanus*)

Scarce (regular?) winter visitor to low ground and lower hills from MidOctober (Flint & Stewart, 1992). The first record of 4 individuals was as early as on 29.08.2005. Probably one of the earliest arrivals. The 2 individuals from 25.10.2005 and the 10 individuals from 28.10.2005 matched the normal arrival date.

Yellowhammer (*Emberiza citrinella*)

Scarce (regular?) winter visitor from December to February (Flint & Stewart, 1992). The flock of 15 individuals observed on 24.10.2005 is an unusually early date.

Black-headed Bunting (*Emberiza melanocephala*)

Two individuals were observed from 17.09. to 22.09.2005. These are rather late observations as this species normally leaves Cyprus mainly during July with only a few records from August to September (Flint & Stewart, 1992).

Densities and Numbers of Common Migrants

Introduction

Mostly long distance migrants are expected to fly across Cyprus. Apart from Swallows most of the Passerines migrate during the night. Among the numerous species that cross Cyprus we find many warblers (*Sylviidae*), the most numerous of which are Willow Warbler and Blackcap (Flint & Stewart, 1992). For these birds safe resting sites are very important, this is especially the case for long distance birds that are about to cross obstacles such as deserts or seas. Safe resting sites in Cyprus might therefore be one of the key points for successful migration for various bird species. Grounded night migrants occur throughout Cyprus, but concentrate behind the southern coast in Autumn wherever there is cover (Flint & Stewart, 1992). The south-eastern peninsula is of crucial importance as a resting site for passerine migrants. But direct measurement of the resting bird population is very difficult to perform, as most of the passerines are inconspicuous during stopover. The bird numbers passing through the peninsula have been estimated mainly by the numbers of birds killed by bird trappers.

Line transect methodology has recently made great improvements (Buckland et al., 2001). The estimation of the detection probability from distance data is nowadays widely accepted. For the estimation of the numbers of resting birds in a stopover area, the estimation of the detection probability is essential. In this study we performed every morning 5 to 6 different transects. The transects were randomly selected. The densities were used to calculate a rough estimate of the resting bird population at the South-Eastern Peninsula.

Study area

The aim of this count was to estimate the number of migrants resting within the area of the South Eastern Peninsula and Cape Greco. To designate the study area (where it was actually possible to perform transect counting) we put a grid with mesh size of 750 meters over the map of the whole area. All squares where it was not possible to perform transects were excluded. The reasons to exclude a square were the following:

- A square covered the parts of the 3 areas which were designated hunting areas for September shooting.
- A part of a square covered the sea area.
- A part of a square covered military areas.
- A part of the square covered the fenced area of the sewage plant.

Of the total 68 squares there remained 43 squares (with a total area of 2107 ha) where it was possible to perform the transect censuses. Out of these 43 squares we randomly selected 6. Within each of these squares a transect line with random direction was designated.

Unfortunately, hunting in September was not restricted to the indicated hunting areas designated by the hunting map 2005 and as a result two of the 6 transects could not be used during September because of the hunters who were present almost every day.

The procedure of selecting the transects randomly secures that they should be a sound sample of the various habitats available. The main density can be used to roughly estimate the numbers of resting birds.

Densities and Numbers

Estimated numbers

The sum of individuals that stopped over in the study area should be estimated. A problem occurs in that some individuals may be present over several days, but it is very difficult to know how long species stay during autumn migration on Cyprus. Flint (1992) states that “retraps of ringed birds, mainly Willow Warbler, at Akrotiri, show that individuals occasionally remain for several days”. If a mean stopover length of a species was known its total number could be estimated using the following formula:

$$N_j = \frac{A}{t_j} \sum_i d_i$$

with the study area surface (A) of 2107 ha, t for the main stopover duration and d the daily density. The indices i and j represent days and species, respectively.

Common Quail (*Coturnix coturnix*)

The status of Common Quail in Cyprus is still obscure. In some autumns there was no obvious passage (Flint & Stewart, 1992), but normally it is a common passage migrant from late August to October (Flint, 2001). Our transect counts suggest that this species is very common on the south eastern peninsula with Cape Greco (see Figure 6). Assuming each individual was resting only during one day the total number in the study area would be estimated at 80,000 individuals.

Apart from the transect observations, birds could be seen in various different places, even near houses and streets. As a matter of fact three individuals were found dead on the street. These observations support the result that huge numbers use the South East Peninsula as a stopover place.

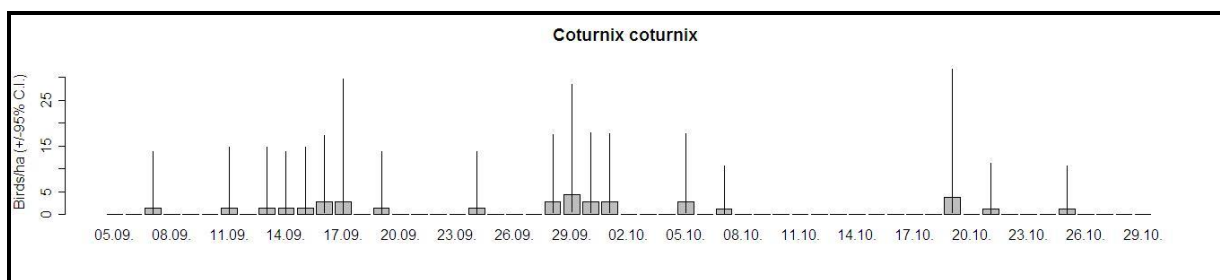


Figure 6: The densities of Common Quail (*Coturnix coturnix*).

Common Quail has an estimated 5,500,000-9,400,000 individuals in Europe (BirdLife International, 2005). The population underwent a large decline from 1970-1990 (BirdLife International, 2004a). Therefore this species is of conservation concern and our result suggests that the number of resting birds on the SE peninsula with Cape Greco are significant.

Redstart (*Phoenicurus phoenicurus*)

The main passage in autumn is from early September to October. The Redstart is one of the long distance migrants that has shown large declines from 1970-1990 in Europe (BirdLife International, 2004a). Recently, efforts have been made to protect this species in Europe. But for these endeavours to be successful the species needs to be protected in its overwintering and stopover places as well. Redstarts are often caught on limesticks. For instance in spring 1968 1134 were limed in Paralimni (Horner & Hubbard, 1982).

The Redstart is a common migrant on the south eastern peninsula with Cape Greco. Birds were present from mid September to end of October without a clear peak. Sometimes there were observations from the same place 2 to 3 days in a row, indicating that some individuals rest longer than just one day.

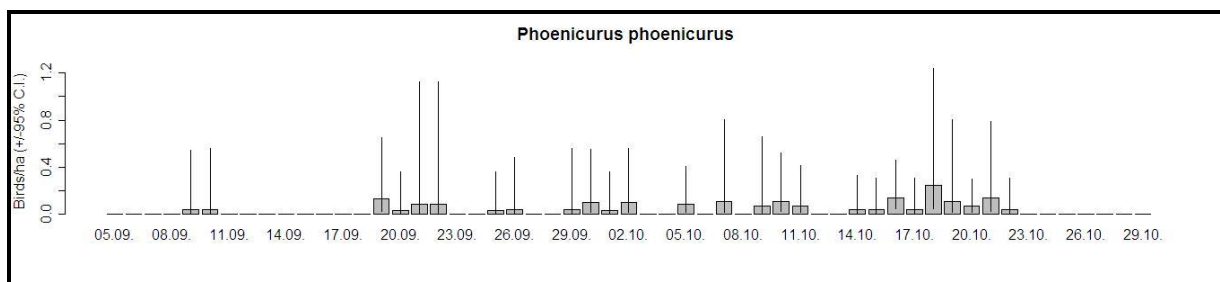


Figure 7: The densities of Redstart (*Phoenicurus phoenicurus*).

Whinchat (*Saxicola rubetra*) and Stonechat (*Saxicola torquata*)

On the peninsula the Whinchat is a common passage migrant from early September to the second half of October. It reached its peak on September 20. On the peak days the total number in the study area is estimated to be several thousands.

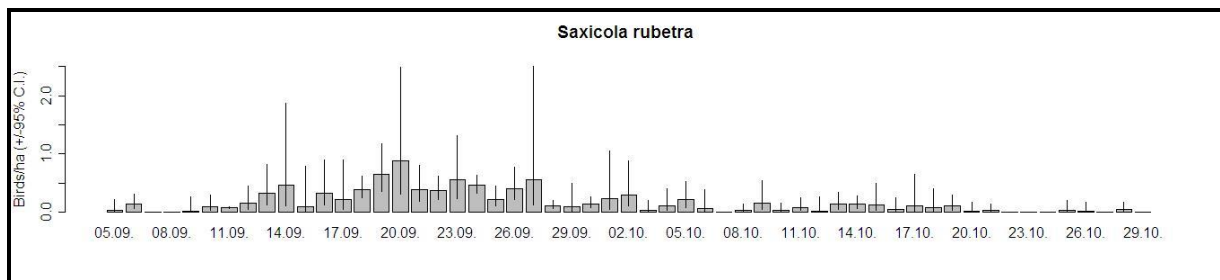


Figure 8: The densities of Whinchat (*Saxicola rubetra*).

The Stonechat is a very common winter visitor (Flint & Stewart, 1992). During arrival time from mid October to beginning of November the species seems to concentrate at Cape Greco (Flint & Stewart, 1992). At the end of October an estimated number of more than 2000 birds were simultaneously present in the study area. Thereafter, birds disperse to take up winter territories, usually in pairs (Flint & Stewart, 1992).

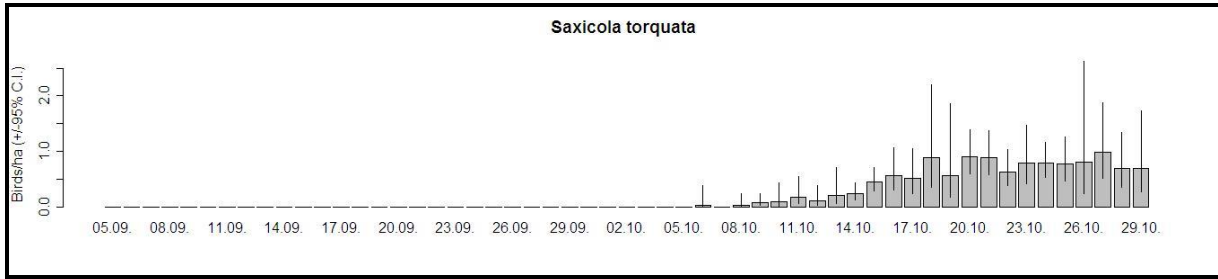


Figure 9: The densities of Stonechat (*Saxicola torquata*).

Wheatears (*Oenanthe*)

5 species of Wheatears were observed on the south eastern peninsula. Black-eared Wheatears are supposed to be very scarce on autumn migration (Flint, 2001). On the south-eastern peninsula it might be more common and probably it is one of the best places for this species on the whole island. The densities (see Figure 10) suggest that several hundred individuals were present in the study area during peak days.

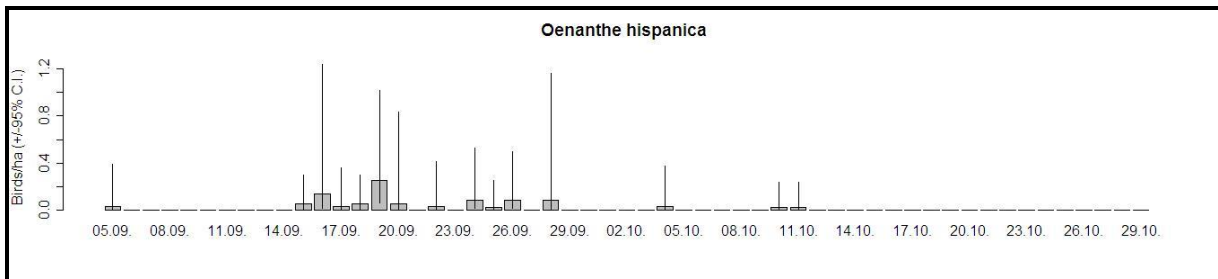


Figure 10: The densities of Black-eared Wheatear (*Oenanthe hispanica*).

Isabelline Wheatear is a common passage migrant, but less common in autumn than in spring (Flint & Stewart, 1992). The main passage on Cape Greco was from late August to early October (see Figure 11).

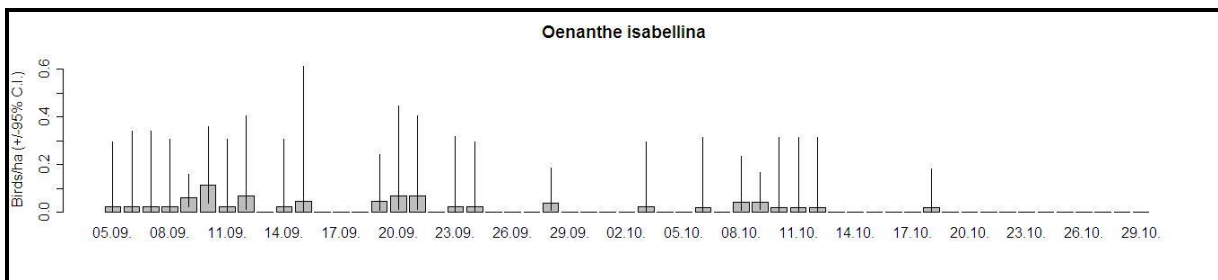


Figure 11: The densities of Isabelline Wheatear (*Oenanthe isabellina*).

The Northern Wheatear is a very common passage migrant on the south eastern peninsula. Probably several thousand individuals were present in the study area during the peak days. During 1990 to 2000 the species suffered from widespread population declines, including the population from Turkey, which is the most important of Europe (BirdLife International, 2004a). It may be assumed that many of the birds observed actually belong to this Turkish population.

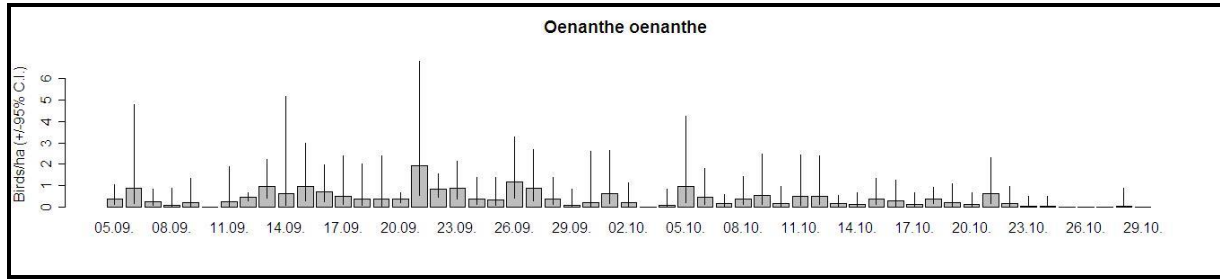


Figure 12: The densities of Northern Wheatear (*Oenanthe oenanthe*).

Warblers (*Sylvidae*)

The Olivaceous Warbler is the most numerous and widespread breeding warbler of Cyprus (Flint & Stewart, 1992). On the south eastern peninsula the breeding population has been estimated at 20 to 30 pairs (Gause in litt.). The transect densities (see Figure 13) suggest that the numbers are much higher in September, notably above thousands on peak days. This might be explained by breeders from other parts of Cyprus concentrating along the southern coast or by passage migrants from abroad.

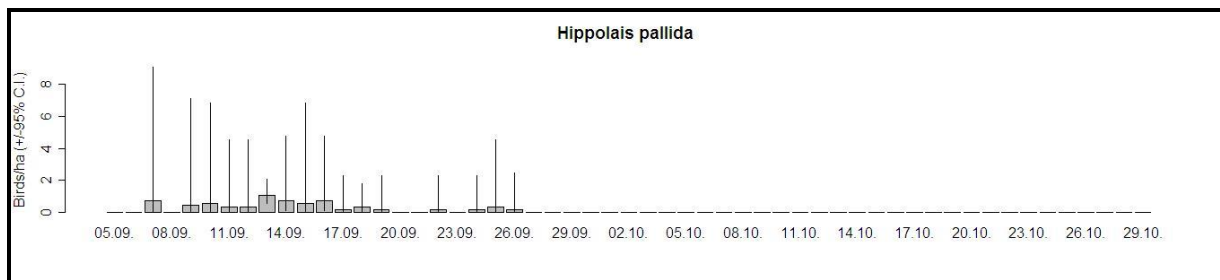


Figure 13: The densities of Olivaceous Warbler (*Hippolais pallida*).

11 *sylvia* warbler species were recorded during the study; except the two vagrants (Desert Warbler *S. nana* and Ménétries's Warbler *S. mystacea*), these are all the *Sylvia* warblers occurring on Cyprus. This indicates the importance of the SE peninsula with Cape Greco for this genus.

In the abundant garrigue and low maquis habitats of the peninsula, the Spectacled Warbler is by far the most common breeding bird (Gause in litt.). It has been described as a passage migrant by Vaurie (1965), but questioned by Flint (1992). Nowadays it is considered as a partial migrant (Shirihai et al., 2001). The densities are shown in Figure 14 with higher main density in October than September. This could be the result of local migrants (from other breeding sites on Cyprus) or of passage migrants from abroad.

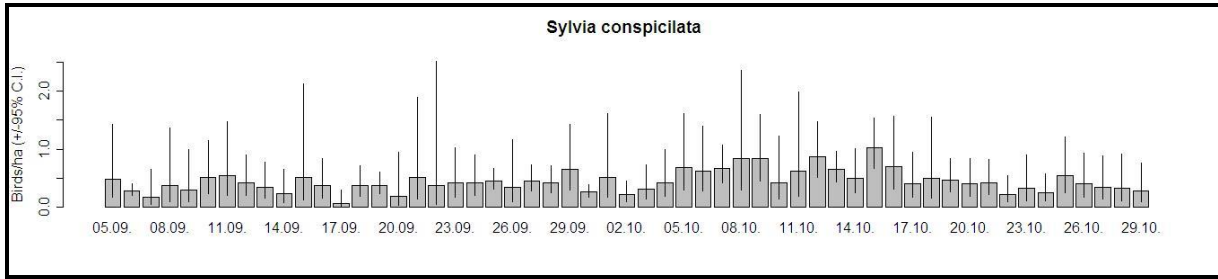


Figure 14: The densities of Spectacled Warbler (*Sylvia conspicillata*).

The Sardinian Warbler is a winter visitor in variable numbers (Flint & Stewart, 1992) and a regular passage migrant from late October to November (Shirihai et al., 2001). The isolated record of a single bird on September 9 is very early (see Figure 15).

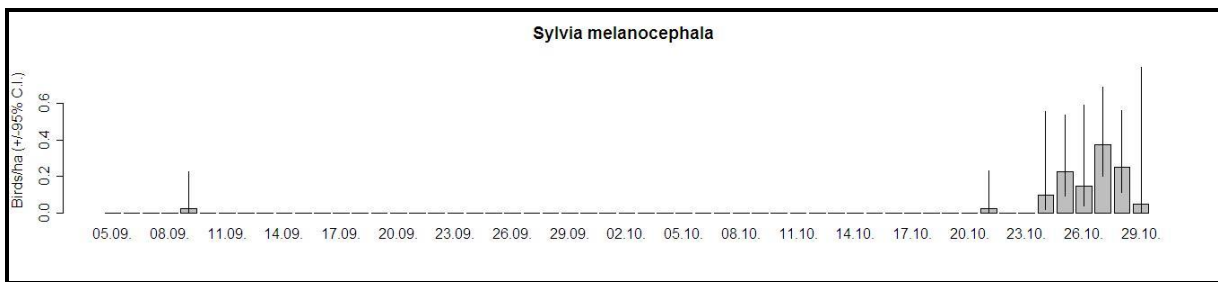


Figure 15: The densities of Sardinian Warbler (*Sylvia melanocephala*).

The Lesser Whitethroat is a common passage migrant and a very common victim of limesticks (Horner & Hubbard, 1982). There were peak days with around a thousand individuals present in the study area. As the passage lasted almost during the whole study period, the total number of Lesser Whitethroat must have been one of the largest of all migrants.

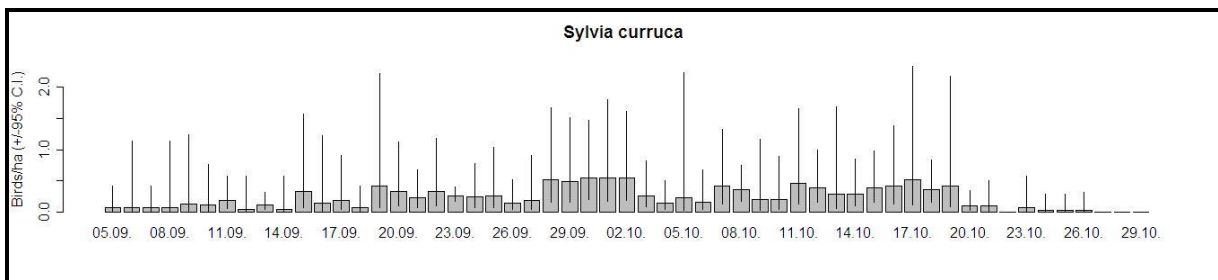


Figure 16: The densities of Lesser Whitethroat (*Sylvia curruca*).

Compared to the former species the Whitethroat was much less common. Main passage is from mid-late August to mid-late October with peak passage in late September to early October (Flint & Stewart, 1992). The phenology of passage at Cape Greco in 2005 differs slightly, since migration almost stopped at the end of September (see Figure 17).

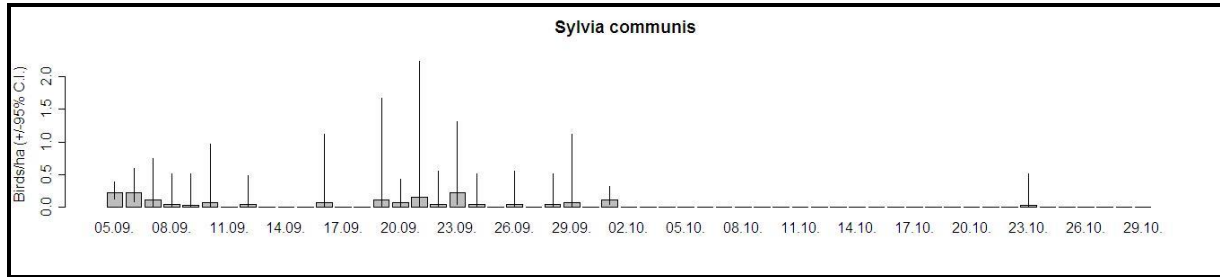


Figure 17: The densities of Whitethroat (*Sylvia communis*).

The Blackcap is an abundant passage migrant and winter visitor (Flint & Stewart, 1992). It is also a very common victim on limesticks (Horner & Hubbard, 1982).

The densities were low during the first half of October. One single abundant passage of Blackcaps was noted after the middle of October, but left within a few days. This weak passage might be very untypical as compared to other years. The species was almost absent during late October, indicating that most of the birds recorded before were migrants.

Out of around 20 limed birds found on limesticks in the study area during the second week of October there were 9 Blackcaps. This may be a hint that this species was more common than suggested by transect counts.

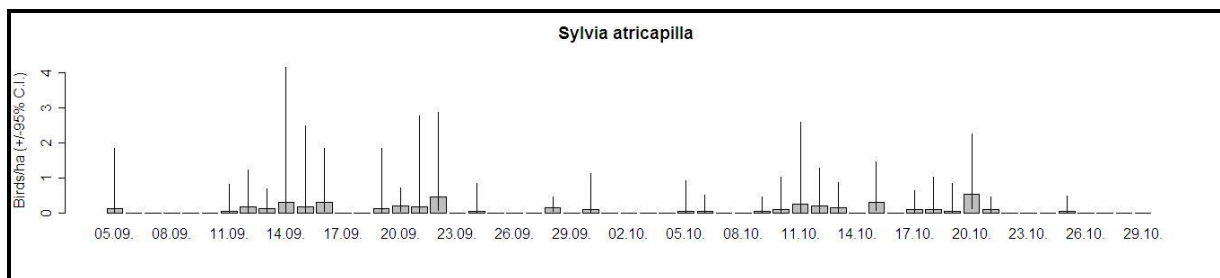


Figure 18: The densities of Blackcap (*Sylvia atricapilla*).

The Chiffchaff is a common passage migrant and winter visitor, with peak numbers in November (Flint & Stewart, 1992).

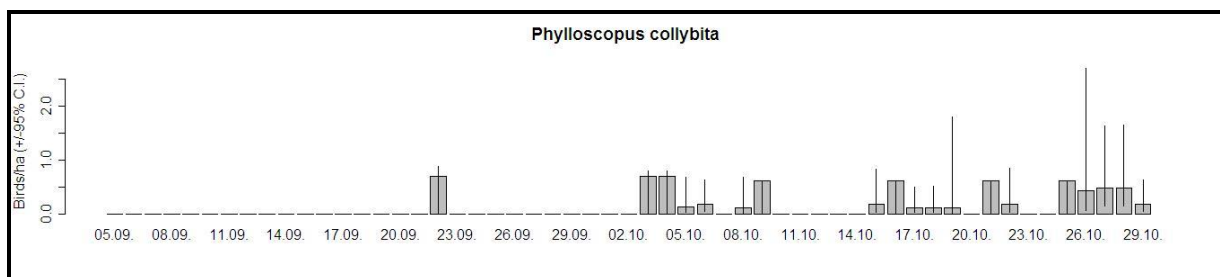


Figure 19: The densities of Chiffchaff (*Phylloscopus collybita*).

The Willow Warbler is the most numerous passage migrant in autumn of all migrants, it is even more common than the Blackcap (Flint & Stewart, 1992). Indeed during peak migration more than 4000 individuals per day are estimated for the study area.

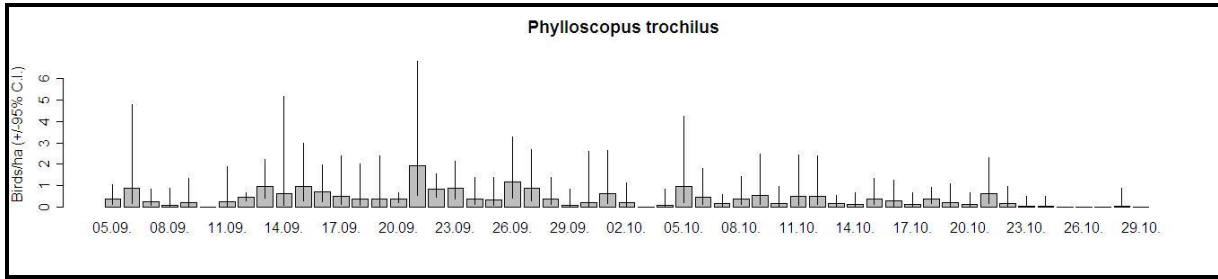


Figure 20: The densities of Willow Warbler (*Phylloscopus trochilus*).

Flycatchers (*Muscicapidae*)

The *ficedula*-Flycatchers are more common in spring than in autumn. The Spotted Flycatcher is the only Flycatcher species that is abundant during autumn, although it is also less common in autumn than in spring (Flint & Stewart, 1992). In our study site around a thousand individuals were present during peak days.

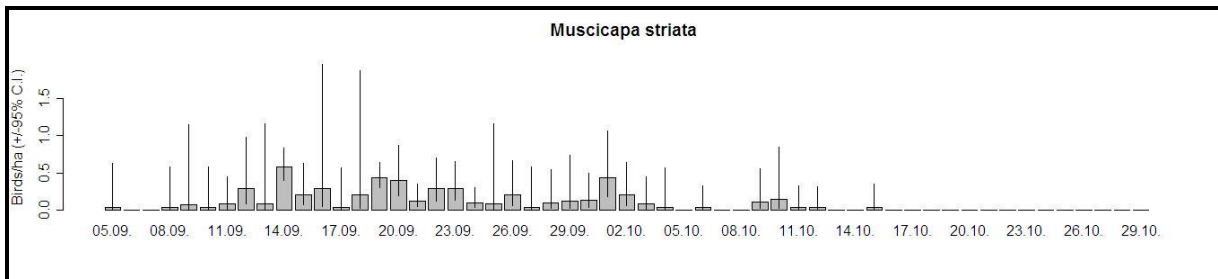


Figure 21: The densities of Spotted Flycatcher (*Muscicapa striata*).

Shrikes (*Laniidae*)

Three species of Shrikes were recorded during the study. The most common was Red-backed Shrike. It is a fairly common migrant from August to October. It is a very rare breeder on Cyprus and no breeding pair could be found on the south eastern peninsula yet (Gause in lit.). Therefore, all the recorded birds may have been migrants.

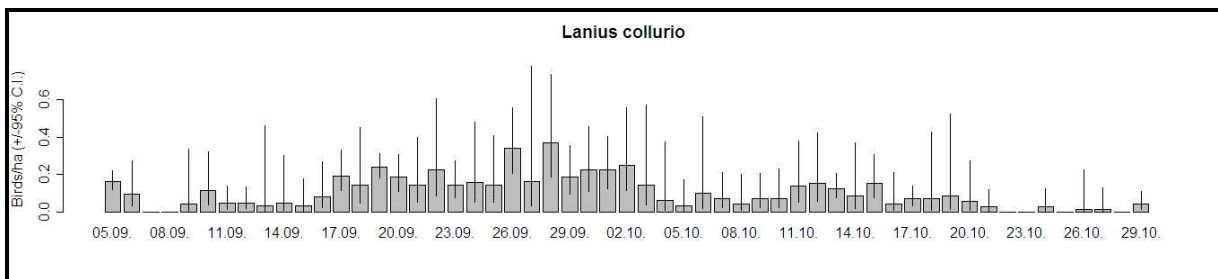


Figure 22: The densities of Red-backed Shrike (*Lanius collurio*).

Other Migrants

It is difficult to apply distance sampling for rare birds. Moreover it is almost impossible to use it for species such as Swallows that fly most of the time. Therefore many species have not so

far been discussed. Notwithstanding this, the south eastern peninsula is an important stopover site for some of these species. Some casual observations should underpin this statement.

During the first light of the day raptors were often seen perched on trees. Most probably they had spent the whole night at the same place. The simultaneous starting of around 120 Honey Buzzards (*Pernis apivorus*) on the morning of 5 September 2005 was a formidable sign. A Lesser Spotted Eagle (*Aquila pomarina*) was perched on a tree in the evening and seen leaving the island at the Cape the subsequent morning. But other raptors such as Harriers (*Circus*), Ospreys (*Pandion haliaetus*) and Red-footed Falcons (*Falco vespertinus*) were also spending the night on the south eastern peninsula.

On several evenings (e.g. 14, 15 and 20 September 2005) European Bee-eaters (*Merops apiaster*) were observed in large flocks of a hundred and more individuals late in the evening. They were seen flying around and settled in a few trees when it was almost dark . On 29 September a flock of around 80 birds were flushed from a small group of trees. It was already dark and obviously the birds had settled to spend the night.

Remarkable numbers of Swallows (*Hirundinidae*) migrate across the south eastern peninsula, but their total numbers can hardly be guessed. Without doubt many perched on wires or trees to spend the night before heading further south the next morning. Night roosts of several hundred individuals were seen in the proximity of the sewage farm.

Conclusion

The results of the census were in many respects surprising and satisfactory. A great diversity of species migrate along the south eastern peninsula and Cape Greco, especially raptors and large-winged soaring birds, and great numbers of long distance passerines. Many endangered species were recorded during the census, some of them in internationally important numbers.

Several criteria are fulfilled for designation of the south eastern peninsula and Cape Greco as an “important bird area”. The area is indeed internationally important for the protection of birds.

Uncontrolled hunting during migration hindered our project considerably due to shooting in transect areas, which caused heavy losses of birds.

The satisfactory outcome of this autumn census encourages the publication of certain interesting results and specialities. We intend to publish an article for “Sandgrouse”, a scientific journal for Ornithology in the Middle East.



Photo: M.Wettstein

Bibliography

- Akaike, H. 1973. Information theory as an extension of the maximum likelihood principle. In: *Second International Symposium on Information Theory* (Ed. by Petrov, B. N. & Csaki, F.), pp. 267-281. Budapest, Hungary.
- Alström, P., Mild, K. & Zetterström, B. 2003. *Pipits & Wagtails of Europe, Asia and North America*. London, U.K.: Christopher Helm.
- BirdLife International. 2004a. *Birds in Europe: population estimates, trends and conservation status*. Cambridge, U.K.: BirdLife International (Conservation Series 12).
- BirdLife International. 2004b. *Threatened birds of the world 2004. CD-ROM*. Cambridge, U.K.: BirdLife International.
- BirdLife International. 2005. Species factsheet. Downloaded from <http://www.birdlife.org> on 24/11/2005. Birdlife International.
- Buckland, S. T., Anderson, D. R., Burnham, K. P., Laake, J. L., Borchers, D. L. & Thomas, L. 2001. *Introduction to Distance Sampling: estimating abundance of biological populations*. Oxford: Oxford UP.
- European Commission. 2004. The Birds Directive (79/409/EEC). Annex I.: http://europa.eu.int/comm/environment/nature/nature_conservation/eu_enlargement/2004/birds/annex_i.pdf.
- Flint, P. 2001. North Cyprus Bird Report 2000. Girne, Turkey: North Cyprus Society for the Protection of Birds and Nature.
- Flint, P. & Stewart, P. 1992. *The Birds of Cyprus: an Annotated Check-list, 2nd ed.* Tring: British Ornithologists' Union.
- Forsman, D. 1999. *The raptors of Europe and the Middle East. A handbook of field identification*. London, U.K.: T&AD Poyser.
- Horner, K. O. & Hubbard, J. P. 1982. An analysis of birds limed in spring at Paralimni, Cyprus. *Cyprus Ornithological Society (1957)*, **Report 7**, 54-104.
- Iezekiel, S., Makris, C. & Antoniou, A. 2004. Important bird areas of European Union importance in Cyprus. Nicosia, Cyprus.: BirdLife Cyprus.
- Loosli, E. & Schneider, E. 2004. Bird protection area south eastern peninsula, Cape Greco project in Cyprus. Securing a vital part of Europe's natural heritage. Thun, Switzerland.
- Shirihai, H., Gargallo, G. & Helbig, A. J. 2001. *Sylvia warblers*. New Jersey: Princeton.
- Thomas, L., Laake, J. L., Strindberg, S., Marques, F. F. C., Buckland, S. T., Borchers, D. L., Anderson, D. R., Burnham, K. P., Hedley, S. L. & Pollard, J. H. 2002. Distance 4.0. Release 2.: Research Unit for Wildlife Population Assessment, University of St. Andrews, UK.
- Vaurie, C. 1965. *The birds of the Palearctic Fauna*. London, U.K.: Witherby.
- Waliczky, Z. 2000. Important bird areas of European Union importance: An explanation of the EU criteria applied in IBA 2000. Brussels: RSPB.

Appendix: Systematic List of Recorded Species

<i>Species</i>	Total of birds	Maximum	Abundance (total/study time)
<i>Podiceps nigricollis</i>	7	3	0.1
<i>Tachybaptus ruficollis</i>	393	85	6.2
<i>Podiceps cristatus</i>	80	80	1.3
<i>Puffinus yelkouan</i>	1	1	0.0
<i>Pelecanus onocrotalus</i>	8	7	0.1
<i>Phalacrocorax carbo</i>	24	10	0.4
<i>Phalacrocorax aristotelis</i>	10	2	0.2
<i>Ixobrychus minutus</i>	2	1	0.0
<i>Nycticorax nycticorax</i>	213	50	3.4
<i>Ardeola ralloides</i>	5	5	0.1
<i>Egretta garzetta</i>	58	21	0.9
<i>Casmerodius albus</i>	10	4	0.2
<i>Ardea cinerea</i>	840	108	13.3
<i>Ardea purpurea</i>	83	19	1.3
<i>Ardea sp.</i>	13	13	0.2
<i>Ciconia nigra</i>	25	9	0.4
<i>Ciconia ciconia</i>	6	3	0.1
<i>Plegadis falcinellus</i>	34	34	0.5
<i>Platalea leucorodia</i>	4	4	0.1
<i>Phoenicopterus ruber</i>	159	70	2.5
<i>Anas platyrhynchos</i>	15	5	0.2
<i>Anas clypeata</i>	1	1	0.0
<i>Anas querquedula</i>	16	13	0.3
<i>Anas crecca</i>	47	23	0.7
<i>Neophron percnopterus</i>	1	1	0.0
<i>Pandion haliaetus</i>	23	2	0.4
<i>Aquila pomarina</i>	4	1	0.1
<i>Circaetus gallicus</i>	2	1	0.0
<i>Hieraaetus pennatus</i>	7	3	0.1
<i>Hieraaetus fasciatus</i>	2	2	0.0
<i>Milvus migrans</i>	44	24	0.7
<i>Circus aeruginosus</i>	552	53	8.8
<i>Circus cyaneus</i>	6	1	0.1
<i>Circus pygargus</i>	96	15	1.5
<i>Circus macrourus</i>	15	2	0.2
<i>Circus sp.</i>	30	13	0.5
<i>Buteo rufinus</i>	16	2	0.3
<i>Buteo buteo</i>	36	9	0.6
<i>Buteo sp.</i>	1	1	0.0
<i>Pernis apivorus</i>	3302	2250	52.4
<i>Accipiter nisus</i>	93	10	1.5
<i>Accipiter brevipes</i>	9	6	0.1
<i>Accipiter gentilis</i>	2	1	0.0
<i>Accipitriformes sp.</i>	9	4	0.1

<i>Species</i>	Total of birds	Maximum	Abundance (total/study time)
<i>Falco tinnunculus</i>	986	20	15.7
<i>Falco naumanni</i>	32	8	0.5
<i>Falco vespertinus</i>	660	223	10.5
<i>Falco subbuteo</i>	152	20	2.4
<i>Falco eleonora</i>	29	5	0.5
<i>Falco peregrinus</i>	24	2	0.4
<i>Falco columbarius</i>	3	2	0.0
<i>Falco cherrug</i>	13	2	0.2
<i>Falco sp.</i>	53	5	0.8
<i>Francolinus francolinus</i>	84	9	1.3
<i>Alectoris chukar</i>	4873	150	77.3
<i>Coturnix coturnix</i>	77	12	1.2
<i>Crex crex</i>	26	6	0.4
<i>Rallus aquaticus</i>	19	3	0.3
<i>Porzana parva</i>	2	1	0.0
<i>Gallinula chloropus</i>	110	15	1.7
<i>Fulica atra</i>	27	4	0.4
<i>Grus grus</i>	2412	833	38.3
<i>Burhinus oedicnemus</i>	60	17	1.0
<i>Charadrius hiaticula</i>	1	1	0.0
<i>Pluvialis squatarola</i>	1	1	0.0
<i>Vanellus vanellus</i>	9	7	0.1
<i>Calidris alpina</i>	15	7	0.2
<i>Calidris minuta</i>	5	3	0.1
<i>Tringa glareola</i>	9	4	0.1
<i>Tringa ochropus</i>	24	4	0.4
<i>Tringa hypoleucos</i>	12	1	0.2
<i>Tringa totanus</i>	8	2	0.1
<i>Tringa nebularia</i>	2	1	0.0
<i>Numenius arquata</i>	3	2	0.0
<i>Numenius phaeopus</i>	1	1	0.0
<i>Gallinago gallinago</i>	4	1	0.1
<i>Lymnocyptes minimus</i>	2	1	0.0
<i>Philomachus pugnax</i>	5	2	0.1
<i>Charadriiformes sp.</i>	5	4	0.1
<i>Larus ridibundus</i>	22	15	0.3
<i>Larus cacchinans</i>	4	2	0.1
<i>Larus michahellis</i>	135	15	2.1
<i>Larus audouinii</i>	179	15	2.8
<i>Larus fuscus</i>	24	9	0.4
<i>Laridae sp.</i>	55	10	0.9
<i>Columba livia</i>	201	200	3.2
<i>Columba livia forma domestica</i>	9460	400	150.2
<i>Columba oenas</i>	13	3	0.2
<i>Columba palumbus</i>	300	60	4.8
<i>Streptopelia decaocto</i>	104	12	1.7
<i>Streptopelia turtur</i>	837	205	13.3
<i>Cuculus canorus</i>	2	1	0.0
<i>Asio otus</i>	3	1	0.0
<i>Asio flammeus</i>	8	2	0.1

<i>Species</i>	Total of birds	Maximum	Abundance (total/study time)
<i>Tyto alba</i>	5	1	0.1
<i>Otus scops</i>	3	1	0.0
<i>Caprimulgus europaeus</i>	9	3	0.1
<i>Apus apus</i>	93	20	1.5
<i>Apus pallidus</i>	21	4	0.3
<i>Tachymarptis melba</i>	75	15	1.2
<i>Apus sp.</i>	248	100	3.9
<i>Upupa epops</i>	24	3	0.4
<i>Alcedo atthis</i>	102	6	1.6
<i>Merops apiaster</i>	17145	2000	272.1
<i>Coracias garrulus</i>	8	2	0.1
<i>Jynx torquilla</i>	3	1	0.0
<i>Alauda arvensis</i>	574	87	9.1
<i>Galerida cristata</i>	3572	100	56.7
<i>Lullula arborea</i>	51	19	0.8
<i>Calandrella brachydactyla</i>	98	9	1.6
<i>Calandrella rufescens</i>	1	1	0.0
<i>Melanocorypha calandra</i>	10	2	0.2
<i>Melanocorypha bimaculata</i>	8	5	0.1
<i>Riparia riparia</i>	2265	200	36.0
<i>Hirundo rupestris</i>	285	233	4.5
<i>Hirundo rustica</i>	38955	4500	618.3
<i>Hirundo daurica</i>	418	50	6.6
<i>Delichon urbica</i>	311	40	4.9
<i>Hirundo sp.</i>	30	30	0.5
<i>Anthus campestris</i>	464	40	7.4
<i>Anthus richardi</i>	1	1	0.0
<i>Anthus spinoletta</i>	5	5	0.1
<i>Anthus pratensis</i>	71	28	1.1
<i>Anthus trivialis</i>	611	45	9.7
<i>Anthus cervinus</i>	505	40	8.0
<i>Anthus sp.</i>	2	2	0.0
<i>Motacilla alba</i>	2142	270	34.0
<i>Motacilla flava</i>	1486	180	23.6
<i>Motacilla citreola</i>	2	2	0.0
<i>Motacilla cinerea</i>	98	10	1.6
<i>Prunella modularis</i>	4	2	0.1
<i>Erithacus rubecula</i>	181	44	2.9
<i>Luscinia megarhynchos</i>	2	2	0.0
<i>Luscinia sp.</i>	1	1	0.0
<i>Cercotrichas galactotes</i>	2	1	0.0
<i>Phoenicurus phoenicurus</i>	112	10	1.8
<i>Phoenicurus ochruros</i>	73	24	1.2
<i>Oenanthe oenanthe</i>	557	70	8.8
<i>Oenanthe isabellina</i>	117	9	1.9
<i>Oenanthe hispanica</i>	88	19	1.4
<i>Oenanthe cyprica</i>	95	8	1.5
<i>Oenanthe finschii</i>	23	4	0.4
<i>Oenanthe sp.</i>	13	8	0.2
<i>Saxicola rubetra</i>	1101	92	17.5
<i>Saxicola torquata</i>	1493	150	23.7

<i>Species</i>	Total of birds	Maximum	Abundance (total/study time)
<i>Monticola solitarius</i>	67	5	1.1
<i>Monticola saxatilis</i>	4	1	0.1
<i>Turdus philomelos</i>	95	18	1.5
<i>Turdus viscivorus</i>	31	12	0.5
<i>Turdus merula</i>	24	7	0.4
<i>Turdus torquatus</i>	1	1	0.0
<i>Sylvia borin</i>	19	3	0.3
<i>Sylvia nisoria</i>	1	1	0.0
<i>Sylvia atricapilla</i>	313	27	5.0
<i>Sylvia hortensis</i>	15	3	0.2
<i>Sylvia curruca</i>	846	45	13.4
<i>Sylvia melanocephala</i>	146	33	2.3
<i>Sylvia melanothorax</i>	34	6	0.5
<i>Sylvia rueppelli</i>	4	2	0.1
<i>Sylvia communis</i>	177	20	2.8
<i>Sylvia conspicillata</i>	2504	85	39.7
<i>Sylvia cantillans</i>	2	2	0.0
<i>Acrocephalus melanopogon</i>	2	1	0.0
<i>Cisticola juncidis</i>	1022	45	16.2
<i>Locustella fluviatilis</i>	1	1	0.0
<i>Cettia cetti</i>	35	4	0.6
<i>Acrocephalus scirpaceus</i>	2	2	0.0
<i>Acrocephalus palustris</i>	1	1	0.0
<i>Acrocephalus sp.</i>	1	1	0.0
<i>Hippolais icterina</i>	4	2	0.1
<i>Hippolais polyglotta</i>	1	1	0.0
<i>Hippolais olivetorum</i>	1	1	0.0
<i>Hippolais pallida</i>	147	14	2.3
<i>Phylloscopus trochilus</i>	1345	80	21.3
<i>Phylloscopus sibilatrix</i>	5	3	0.1
<i>Phylloscopus collybita</i>	177	46	2.8
<i>Muscicapa striata</i>	433	43	6.9
<i>Ficedula hypoleuca</i>	6	2	0.1
<i>Ficedula albicollis</i>	3	1	0.0
<i>Ficedula semitorquata</i>	1	1	0.0
<i>Ficedula sp.</i>	1	1	0.0
<i>Parus major</i>	45	4	0.7
<i>Lanius collurio</i>	799	40	12.7
<i>Lanius nubicus</i>	73	8	1.2
<i>Lanius minor</i>	67	8	1.1
<i>Pica pica</i>	6	1	0.1
<i>Corvus monedula</i>	458	26	7.3
<i>Corvus frugilegus</i>	3	3	0.0
<i>Corvus corone</i>	443	25	7.0
<i>Sturnus vulgaris</i>	2	1	0.0
<i>Oriolus oriolus</i>	28	6	0.4
<i>Passer domesticus</i>	8805	400	139.8
<i>Passer hispaniolensis</i>	1836	180	29.1
<i>Passer montanus</i>	16	10	0.3
<i>Fringilla coelebs</i>	2073	400	32.9
<i>Carduelis cannabina</i>	228	55	3.6

<i>Species</i>	Total of birds	Maximum	Abundance (total/study time)
<i>Carduelis carduelis</i>	5261	170	83.5
<i>Carduelis chloris</i>	2146	130	34.1
<i>Serinus serinus</i>	35	17	0.6
<i>Emberiza hortulana</i>	250	30	4.0
<i>Emberiza caesia</i>	18	4	0.3
<i>Emberiza cineracea</i>	2	1	0.0
<i>Emberiza citrinella</i>	15	15	0.2
<i>Emberiza melanocephala</i>	6	2	0.1
<i>Miliaria calandra</i>	370	66	5.9
<i>Emberiza sp.</i>	3	2	0.0
<i>Passerines sp.</i>	180	180	2.9

Tobias Roth

Ornithological experience

- Sep-Nov 2005 "Autumn Bird Migration Census in Cyprus" in cooperation with E. Loosli, Thun and the *Swiss Ornithological Institute of Sempach*
- Jun-Aug 2005 High alpine breeding bird Census for *Hintermann & Weber AG, Reinach*
- Nov 04/ Apr-Jun05 Scientific research - work at the *Swiss Ornithological Institute, Sempach*
- 2005 / 06 Secretary of the "Society for Field Ornithology and Bird Protection in Central Asia"
- Jan 2004 Winter Survey in the Syrian Wetlands. Project leader: *David Murdoch, London*
- Dec04 - Feb05 Field assistant of the Capercaillie project of the *Swiss Ornithological Institut, Sempach*
- Jan-Mar 2004 Telemetry of the Capercaillies in the Blackforest (for the *Swiss Ornithological Institute*),
- 2000-2005 Advisor for breeding bird census for *Hintermann & Weber AG, Reinach*

Publications

- Aye, R. & Roth, T. 2000. Chevalier Barge (*Tringa cinerea*) hivernant dans le golfe de gabes. *Alauda*, **68**, 235-.
- Aye, R. & Roth, T. 2001. Observation d'un Pluvier fauve *Pluvialis pacificus* dans le Golfe de Gabès. [Pacific Golden Plover in Tunisia]. *Alauda*, **69**, 203-204.
- Aye, R. & Roth, T. 2002. Aussergewöhnliche Winterflucht von Mäusebussarden *Buteo buteo* im November 1999. [Strong hard-weather movements of common buzzard *Buteo buteo*]. *Der Ornithologische Beobachter*, **99**, 117-121.
- Aye, R. & Roth, T. 2003. Unterwegs im südlichen Iran: Die grünen Inseln im Wüstenmeer. *Der Falke*, **50**, 38-43.
- Aye, R. & Roth, T. 2005. Von der Schwierigkeit, Vogelarten zu erkennen: Weiß ein Zilpzalp, dass er ein Zilpzalp ist? *Der Falke*, **52**, 240-246.
- Murdoch, D. A., Vos, R., Abdallah, A., Abdallah, M., Andrews, I., al-Asaad, A., van Beusekom, R., Hofland, R., Roth, T., Saveyn, B., Serra, G. & Wells, C. 2005. A Winter Survey of Syrian Wetlands (Final Report of the Syrian Wetland Expedition, January-February 2004). London, U.K.: Privately published.
- Roth, T. 2004. Phenology and West-East Distribution of Migrating Birds in Mauritania, Western Africa. *Diploma Thesis*. Basel: University of Basel.
- Roth, T. & Aye, R. 2001 Vogelbeobachten in Tunesien: Küsten-, Wüsten- und Bergvögel. *Der Falke*, **48**, 302-308.
- Roth, T. & Aye, R. 2004 Vogelleben und Vogelschutz am Südrand des Kaspischen Meeres. *Der Falke*, **51**, 40-45.
- Roth, T. & Aye, R. 2005. Helfertum und Kooperation bei Vögeln: Selbstlos oder mit Kalkül? *Ornis*.
- Roth, T., Aye, R., Burri, R. & Schweizer, M. 2005. Bird observations from Iran in February-March 2001, including a new species for the Middle East. *Sandgrouse*, **27**, 63-68.
- Roth, T. & Aye, R. 2006. Wer anderen hilft ist selber schuld? *Der Falke*, **52**, 40-46.
- Roth, T. & Jalilova, G. 2004. First confirmed breeding record of Palla's Grasshopper Warbler in Kyrgyzstan. *Sandgrouse*.
- Roth, T., Liechti, F., Jones, P. & Bruderer, B. 2005 (in prep.). Is the passage of passerine migrants in a Saharan oasis modified by difference in the amount of rain?
- Roth, T., & Loosli, E. (2005): Autumn Bird Migration at the South Eastern Peninsula with Cape Greco, Cyprus. Diurnal Bird Migration and Transect Counts from 28 August to 29 October 2005. Privately published. Thun, Switzerland.
- Thiel, D., Ehrenbold, S. & Roth, T. 2005. Grosse Wintergruppen und Winterbalz beim Auerhuhn Tetrao urogallus. [Large winter groups and early displaying behaviour of capercaillie Tetrao urogallus.]. *Der Ornithologische Beobachter*, **102**, 44-46.