The Aammiq Bird Census Report
(Oct. 99- Aug. 2002)

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Introduction

Beginning in the autumn of 1999, A Rocha Lebanon set up a long-term census count to monitor the birds found in and around the Aammiq wetlands. Prior to this count there had been a few seasonal surveys and records from general observations of the area, but nothing ongoing. It was clear that for a wetland of such national and international importance, a systematic and year-round survey was needed to gain a more comprehensive understanding of all species of bird using the marsh. Although data from long-term surveys becomes more and more valuable as the years progress, much useful information has already been gained from the data as reflected in this report.

Aims

The aims of the survey were as follows:

- to monitor individual species populations
- to gain an understanding of seasonal variation (ie when individual species come and go, when they reach their peak migration through the area, etc.)
- to gain a better understanding of habitat selection
- to guide conservation efforts through obtained data.

Method and Materials

The method of the Aammiq bird census changed in August of 2002; the reasons for this change are explained within the discussion. All data recorded in this initial report will reflect the original census method as described below.

Two 1km east to west transects were established. The Reedbed Tansect paralleled a dyke along the northern border of the main body of reedbed. The Avenue Transect ran along the avenue of trees just south of the wetland proper. Each transect was divided into four point counts (R1, R2, R3, R4, and A1, A2, A3, A4), roughly 250m apart. Between each point, a transect was walked (At1, At2, At3, and Rt1, Rt2, Rt3) at a moderate pace.

Each point was counted for 10 minutes. All birds heard and seen were recorded and designated a habitat. No habitat was recorded for the transects. The habitats for the points were as follows.

For all avenue points (A1-A4):
Tree- avenue of mostly manna ash trees running along both sides of the transect
Farm- farmers fields on both sides of transects, predominantly winter wheat fields but with some vegetable plots of cabbage and tomato
Vegetation- referred to the banks of the Riachi, a drainage canal, heavily vegetated with bramble, reeds and other herbaceous plants.
Birds in flight- referred to all birds flying except for a bird displaying over a territory (e.g. calandra lark *Melanocorypha calandra*)

For reedbed point 1 (R1):
Reed- beds of Phragmites
Field- referred mostly to the uncultivated rough grazing fields surrounding the beds of Phragmites, but also included some farm fields of mostly winter wheat
Etc.- area including the short avenue of trees, the springs, and the hill above the road
Birds in flight- referred to all birds flying except for a bird displaying over a territory (e.g. calandra lark *Melanocorypha calandra*)

For remaining reedbed points (R2, R3 ,R4)
Reed- as above
Field- as above
Dyke- blocked drainage ditch running along the transect with raised dirt banks in some areas and lined with Phragmites and other vegetation
Other- as above

Individual birds seen from one point and then from another point were intentionally double counted. Between each point, a transect was walked while recording all birds heard and seen, including any bird seen from the previous point.

Binoculars and a scope were used. At each point the distant surrounding area was quickly scanned with a scope. Binoculars were used for nearby birds. For any distant bird along the transects, we stopped briefly to identify the bird with a scope. Typically one person scanned and one person recorded but the recorder identified birds as well.

The count was carried out twice a week from Oct 1999 to mid-May 2000, then reduced to once a week from the middle of May 2000 onwards.

For each individual count, all weather conditions were recorded including cloud cover, wind speed and direction, temperature, and precipitation. Typically, all counts started at sunrise. Time was recorded at the beginning of each count.

Results

Table 1 (below) indicates the number of sightings and number of species recorded at each point and transect for all counts. Totals sightings and a mean number of species are shown for the Avenue Transect and Reedbed Transect.

(Table 1) Total sightings/species recorded between points and transects

All years	**A1**	**A2**	**A3**	**A4**	**At1**	**At2**	**At3**	**Total**	**Mean species**
# of sightings	13,072	9,952	12,195	13,310	11,083	10,137	9,587	**79,336**	
# of species	109	105	110	100	114	108	108		**108**
All years	**R1**	**R2**	**R3**	**R4**	**Rt1**	**Rt2**	**Rt3**	**Total**	**Mean species**
# of sightings	26,782	21,433	18,273	20,143	20,199	20,360	11,220	**138,410**	
# of species	125	104	114	111	120	115	102		**113**

Total number of sightings for both transects: 217,746

Table 2 (below) indicates habitat selection by sightings for the Avenue and Reedbed Transects for all counts. Total sightings by habitat are shown.

(Table 2) Habitat selection by sightings

	Avenue Transect					**Reed Transect**				
	Tree	**Farm**	**Veg'n.**	**Flying**		**Reed**	**Field**	**Etc.**	**Dyke**	**Flying**
A1	990	5135	351	6596	**R1**	8,620	7,543	4,191		6,428
A2	722	4318	529	4383	**R2**	4,195	9,446		18	7,774
A3	934	5554	575	5132	**R3**	2,122	11,516		41	4,584
A4	899	4846	441	7124	**R4**	1,298	12,692		67	6,086
Total	**3,545**	**19,853**	**1,896**	**23,235**	**Total**	**16,235**	**41,197**	**4,191**	**126**	**24,882**

Table 3 (Appendix) indicates the number of counts done by month for each year. The higher numbers for Oct/Nov 1999, and Feb/Mar 2000 represent two counts per week.

Table 4 (Appendix) shows the distribution of sightings and species over the months of the year. Means were calculated by halving the numbers for Oct/Nov 1999, Feb/Mar 2000 and doubling the number for Aug 2002, in order to level the count variation between

months. The mean results, although not entirely accurate, give a rough indication of sightings distribution by month.

Fig. 1 (Appendix) shows the distribution of species by months over all years.

Fig's. 2-5 (Appendix) shows four reed bed species and their distribution by ten-day periods over the spring and summer months.

Discussion

A number of general conclusions and recommendations for management and further study can be made from the results thus far.

Table 1 (results), compares total numbers of sightings recorded between the Avenue transect and the Reedbed transect. It is interesting to note that the Reedbed transect recorded nearly double the number of sightings as did the avenue of trees. The reedbeds and immediate surrounding fields obviously support a much greater density of birds than a similar transect roughly 500m away from the reedbeds. These numbers indicate the importance of the marsh habitat in terms of density of birds.

Table 1 also shows the total number of species counted within each point and transect. Again the reedbed shows a higher diversity of species but the difference is not as marked as with total individuals. Reedbed point 1 shows the highest total sightings and the highest diversity of species for all points and transects. This is probably due mostly to edge effect. The point sits just above the marsh and at the beginning of the reedbeds. It overlooks the largest body of water in the marsh, and sits adjacent to the short avenue of trees. It is also the closest in proximity to the hillside and species like rock nuthatch *Sitta neumayer*, and black-eared wheatear *Oenanthe hispanica* were occasionally recorded from this point.

The species and sighting density at Reedbed point 1 raises an important issue with respect to how the area around this point should be managed. There has been a lot of discussion about developing a picnic site, boardwalks, and either a bird hide or tower in and around the short avenue of trees. Any development in the area must be extremely sensitive to the fact that species diversity and bird density appears to be greatest in this area when compared to the rest of the marsh. Great effort must be made to ensure picnickers are not allowed on the short avenue of trees. It is also essential that public access to this area is strictly monitored. Any bird hide or tower should be placed in a way that allows easy access and causes the least amount of disturbance.

With respect to a boardwalk, any benefits of a structure like this in the largest area of open water in the marsh must be carefully weighed against the negative impact this might have, especially on breeding birds (such as Coot *Fulica atra*, Moorhen *Gallinula chloropus,* Little Grebe *Tachybaptus ruficollis,* Gargeney *Anas querquedula,* and the

reedbed warblers) which use this area of the marsh. Building a boardwalk, which would allow human access to a very sensitive part of the marsh, is not recommended.

Table 2 (results) compares habitats with total sightings recorded in each. Habitats field, farm and reedbed recorded the highest density of birds. Species such as skylark *Alauda arvensis*, callandra lark *Melanocorypha calandra*, white stork *Ciconia ciconia*, and lapwing *Vanellus vanellus*, which congregate in large numbers are largely responsible for these high densities. An important point to note is how much more productive the field habitat was compared with farm. Fields surrounding the marsh appear to hold a much higher density of birds than adjacent farmland. The implications of this are fairly obvious in that any farmland returned to unfarmed fields in the future will likely benefit bird density.

Table 3 (appendix) shows the distribution of counts per month. It is important to remember that the count was set up to run twice a week from Oct 1999 to May 2000. Thus October and November 1999, and February, and March 2000 will have higher numbers simply because there were more count days per month. December 1999 and January 2000 had lower count days due to weather. With that in mind there are some interesting points to make with respect to *Table 4, and Fig 1* (Appendix).

If species diversity for March and April is compared with December and January (*Fig 1)*, it is obvious that the two spring months are much higher. However, if these same months are compared by the mean total sightings *(Table 4)*, March is much lower and the other three months quite similar. What this appears to suggest is that although species diversity is higher during the spring months due to migration, the density of birds is as high or higher during the winter months. A general conclusion that can be drawn from this is that the Ammiq wetlands are not only important as a stopover site during spring migration, but also important as a site for wintering birds.

An interesting observation has to do with the low density of birds during the months of June, July, August and September. Obviously, density will be lower in the summer months because there is little migration. However, it is likely that much of this has to do with the typical drying out of the marsh during the months of June and July. It is quite likely that if water remained in the marsh year-round (as it used to only three decades ago), we would find much higher densities and diversity during these months. In *fig 1,* there were 11 more species recorded in August 2001 compared with August 2000, despite the fact that there were two more counts during August 2000. This is almost certainly due to the fact that there was an unusually large amount of water in the marsh during 2002 and pools of water remained until the end of September. The basic conclusion that can be drawn from this is that birds leave the marsh when the water dries up, and bird densities are also low during the early autumn migration months due to a lack of water.

The more specific figures of individual reed bed species (*2,3,and 4 in appendix*) appear to support this basic conclusion that birds leave the marsh when the water in the marsh dries up. *Fig 2* shows that reed warblers *Acrocephalus scirpaceus* begin decreasing around period 19 (end of June) and are almost completely absent by period 22 (end of July).

Great reed warblers *Acrocephalus arundinaceus* (*Fig 3*) show a very similar pattern to reed warblers. Savis warblers *Locustella luscinioides* (*Fig 4*) begin decreasing around period 17 (mid June) and are almost completely gone by period 19 (end of June). What seems to be happening is a premature dispersal as the marsh dries up. One would expect the breeding birds to stay around into August before they migrate. One would also expect to see a steady flow of northern migrants of the same species through September and October. But it appears that a lack of water significantly affects when reedbed breeding birds leave the marsh, and the overall density of birds in the summer and early autumn months.

Combining all this information suggests that the drying up of the marsh has a significant impact on bird diversity and density. From a strictly avifauna perspective, efforts made to keep water in the marsh year-round would have a significant positive effect on bird numbers in the area.

A reedbed species of interest is the moustached warbler *Acrocephalus melanopogon.* (*fig 5*). They are the earliest reedbed species to arrive (mid February) and by period 11 (mid April), all but a few appear to have left the marsh. This species is not a long distance migrant, and those that breed at the marsh do not travel far between their wintering and breeding grounds. Perhaps this species arrives, sets up territory, breeds, and leaves early in order to avoid competition with the later-arriving reedbed species.

Apart from continuing on with the census count, it is recommended that further studies be done on how water levels affect bird numbers, specifically during the summer and early autumn months. Close attention should be paid to years when water remains in the marsh into the autumn. With respect to conservation, efforts to retain water in the marsh for as long as possible would be beneficial to bird populations in the Aammiq area.

Another area worth studying is winter populations and in particular, bird of prey densities. High numbers of long-legged buzzard *Buteo rufinus*, steppe buzzard *Buteo buteo*, and kestrel *Falco tinnunculus* are recorded in the winter months. On a national level the area of Aammiq is extremely important for these species.

To conclude this discussion, it is important to note how the data has been used thus far. The most important work has been "The Birds of Aammiq" booklet produced in 2001. A second edition with colored plates followed in 2003. The booklet includes a description of each bird found at the marsh with details on arrival, peak and departure dates, habitats, and a general indication of abundance. A seasonal variation chart has also been produced from the data to go along with this report (see appendix). This chart gives an indication of when one would expect to find each species in the area of Aammiq. Work has also begun to analyze individual species and this should continue.

Finally, it is important to discuss what changes have been made to the method of the census count. In the autumn of 2002, a new method was incorporated. Although not ideal, it was necessary to make this change for two main reasons:

1) Accurate estimates of relative densities could not be obtained due to double counting and not recording individuals in distance boxes.
2) Point counts were coupled with transect walks which meant that all approaches to points caused birds to flush. This resulted in inaccurate data for point counts.

In the new method, only transects are used. For each transect, species are recorded in distance boxes. This allows for a much more accurate estimate of relative densities. A full description of the new method can be accessed from the office computer, which includes a description of the newly developed habitat analysis for the census count.

Conclusion

The data obtained thus far from the Aammiq bird census has been valuable in a number of ways. First of all it has provided the A Rocha team with the information needed to produce "The Birds of Aammiq" booklet. Secondly, much useful data has been gained on where and when bird densities and diversity are greatest. From this information one can begin to make recommendations on how the marsh should be maintained in order to ensure healthy populations of birds. The value of the data will increase as the years of the census progress and ideally this census will carry on for many years to come.

Acknowledgements

Much thanks to Andy Pratt for his extensive help with the data analysis in this report and for his work on analyzing data for individual species from the census count.

References

Jaradi G.R., Jaradi M.R. (1999) An updated checklist of the birds of Lebanon. *Sandgrouse* 21: 132-170

Macfarlane A.M. (1978) Field notes on the birds of Lebanon and Syria. *Army Bird-watching Society* Periodic #3.

Appendix

(Table 3) Count days per month

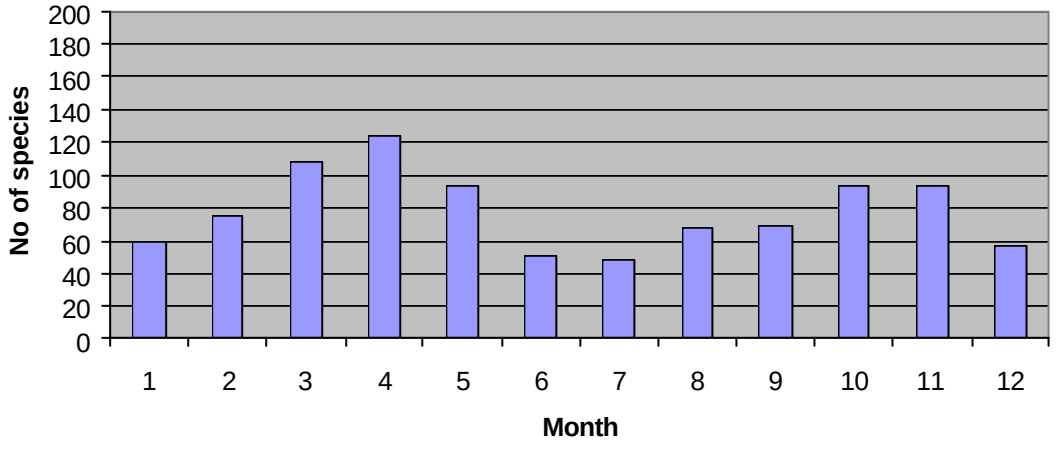
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1999										**7**	**8**	**4**
2000	**5**	**9**	**9**	**5**	**5**	**4**	**4**	**5**	**3**	**4**	**4**	**3**
2001	**5**	**3**	**4**	**4**	**5**	**3**	**4**	**4**	**4**	**3**	**4**	**4**
2002	**5**	**3**	**4**	**5**				**2**				

(Table 4) Sightings by month

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1999										8,629	26,709	10,286
2000	13,366	18,145	8,464	6,062	4,326	2,444	1,884	2,314	1,951	4,441	9,854	11,474
2001	11,400	5,958	4,293	4,218	2,777	1,680	1,518	1,632	1,744	3,092	8,993	5,157
2002	3,716	3,708	5,854	19,148				1,536				
TOTAL	**28,482**	**27,811**	**18,611**	**29,428**	**7,103**	**4,124**	**3,402**	**4,124**	**3,695**	**16,162**	**45,556**	**27,917**
MEAN	**9,494**	**6,246**	**4,793**	**9,809**	**3,552**	**2,062**	**1,701**	**2,339**	**1,848**	**3,949**	**10,733**	**9,306**

Note: Means are calculated with totals for Oct. and Nov. 99, and Feb and March 2000 halved due to higher count days, and August 2002 doubled.

(Fig. 1) Number of species recorded by month - all years

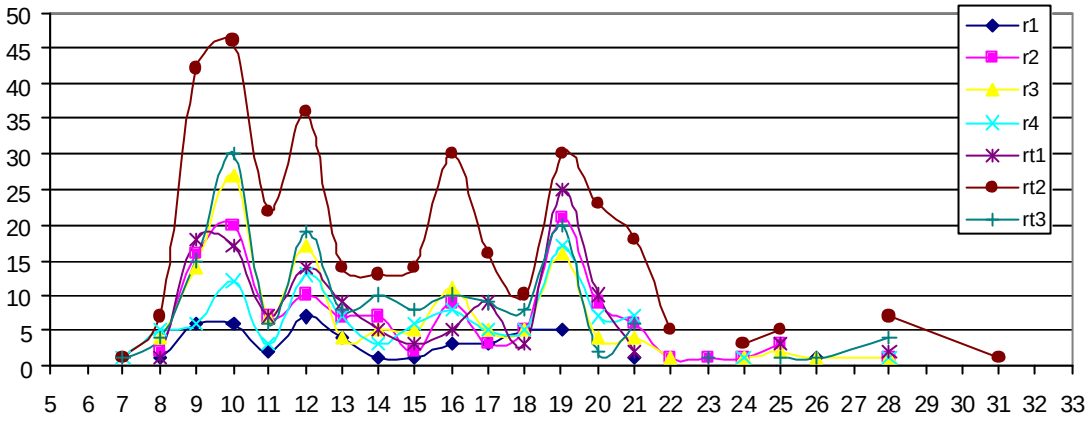


For the *Figures 2,3,4,and 5* (below), the x-axis is divided into 10-day sections as follows:

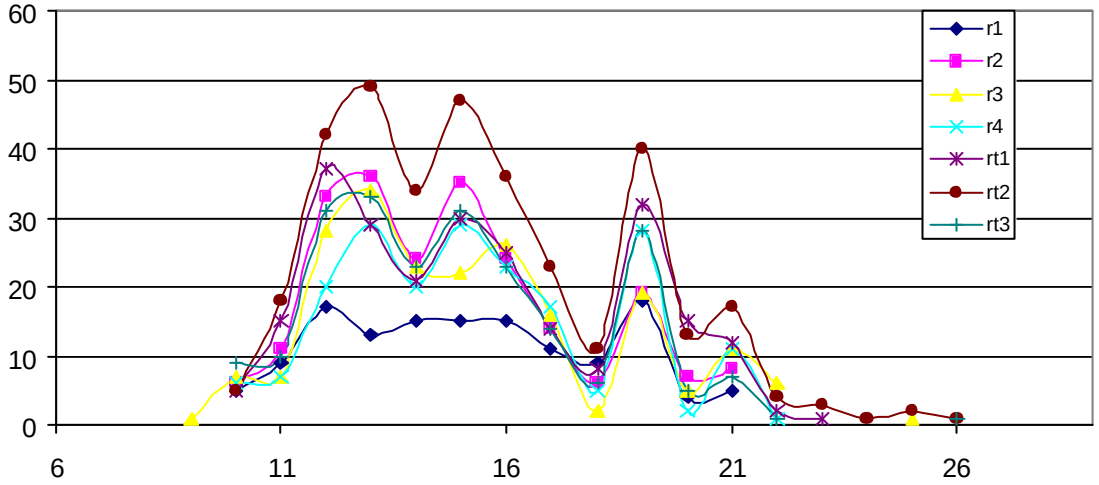
Table 5: Ten day sections

1 = JAN 1-9	9 = MAR 20-29	17 = JUN 8-17	25 = AUG 27-6 SEP	33 = NOV 15-24
2 = JAN 10-19	10 = MAR 30-8 APR	18 = JUN 18-27	26 = SEP 7-15	34 = NOV 25-4 DEC
3 = JAN 20-29	11 = APR 9-18	19 = JUN 28-7 JUL	27 = SEP 16-25	35 = DEC 5-14
4 = JAN 30-8 FEB	12 = APR 19-28	20 = JUL 8-17	28 = SEP 26-5 OCT	36 = DEC 15-24
5 = FEB 9-18	13 = APR 29-8 MAY	21 = JUL 18-27	29 = OCT 6-15	37 = DEC 25-30
6 = FEB 19-28	14 = MAY 9-18	22 = JUL 28-6 AUG	30 = OCT 16-25	
7 = FEB 29-9 MAR	15 = MAY 19-28	23 = AUG 7-16	31 = OCT 26-4 NOV	
8 = MAR 10-19	16 = MAY 29-7 JUN	24 = AUG 17-26	32 = NOV 5-14	

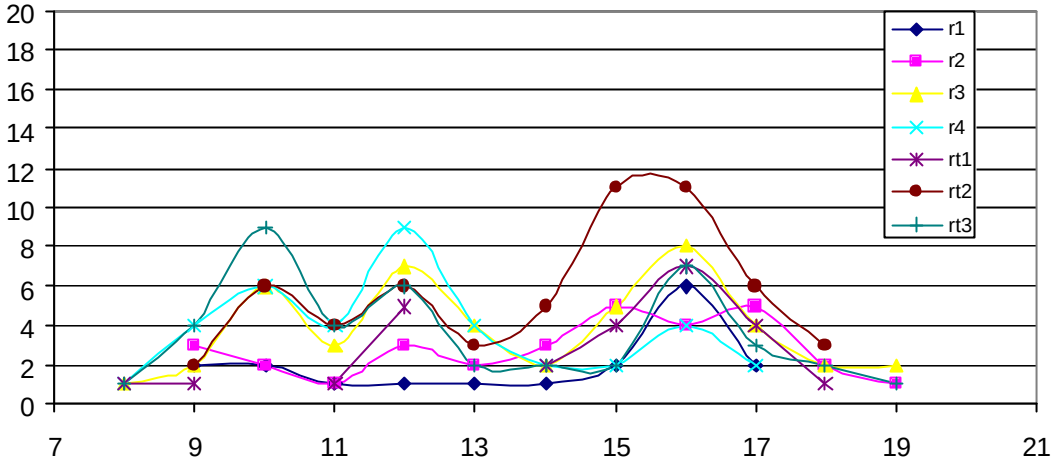
(Fig. 2) Reed warbler *Acrocephalus scirpaceus* in reedbed 2001 and 2002



(Fig. 3) Great reed warbler *Acrocephalus arundinaceus* in reedbed 2001, and 2002



(Fig. 4) Savi's warbler *Locustella luscinioides* in reedbed 2001, and 2002



(Fig. 5) Moustached warbler *Acrocephalus melanopogon* in reedbed- all years

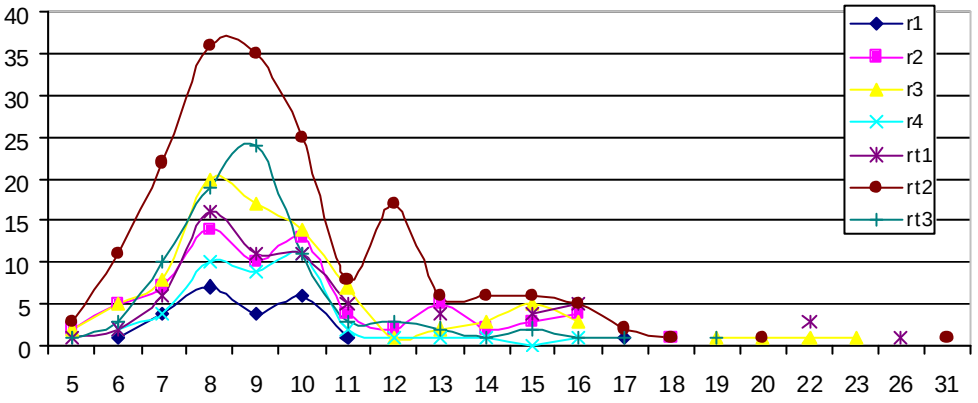


Table 6: Seasonal Variation for Birds of the Aammiq Marsh

Note: this chart only reflects data from the Aammiq bird census and is therefore not fully representative of birds in the surrounding area.

SPECIES	WINTER VISITOR	SPRING PASSAGE	MIGRANT BREEDER	AUTUMN PASSAGE	RESIDENT	VAGRANT
Little Grebe		*	*			
Black-necked Grebe		*				
Cormorant		*		*		
White Pelican		*		*		
Bittern	*	*				
Little Bittern		*	*			
Night Heron		*				
Squacco Heron		*				
Cattle Egret		*				
Little Egret		*				
Great White Egret		*				
Grey Heron		*				
Purple Heron		*				
Black Stork		*		*		
White Stork		*		*		
Glossy Ibis		*				
Greylag Goose						*
Shelduck						*
Gadwall		*				
Teal	*	*				
Mallard	*	*				
Pintail		*				
Garganey		*	*			
Shoveler	*	*				
Tufted Duck						*
Honey Buzzard		*		*		
Black Kite	*	*		*		
Short-toed Eagle		*	*	*		
Marsh Harrier	*	*		*		
Hen Harrier	*	*		*		
Pallid Harrier		*		*		
Montagu's Harrier		*		*		
Sparrowhawk		*		*		
Levant Sparrowhawk		*				
Steppe Buzzard	*	*		*		
Long-legged Buzzard	*	*		*		
Lesser Spotted Eagle		*		*		
Spotted Eagle		*		*		
Steppe Eagle		*				
Booted Eagle		*				

SPECIES	WINTER VISITOR	SPRING PASSAGE	MIGRANT BREEDER	AUTUMN PASSAGE	RESIDENT	VAGRANT
Kestrel	*	*		*		
Red-footed Falcon		*		*		
Merlin				*		
Hobby		*				
Peregrine		*				
Quail	*	*		*		
Water Rail	*	*	*	*		
Spotted Crake		*				
Little Crake		*				
Baillon's Crake		*				
Corncrake		*				
Moorhen	*	*	*	*	*	
Coot	*	*	*	*	*	
Crane	*	*		*		
Black-winged Stilt		*				
Collared Pratincole		*				
Golden Plover	*	*				
Spur-winged Plover		*	*			
Lapwing	*	*		*		
Ruff		*				
Jack Snipe		*				
Snipe	*	*		*		
Great Snipe		*				
Woodcock	*					
Redshank		*				
Marsh Sandpiper		*				
Greenshank		*				
Green Sandpiper		*		*		
Wood Sandpiper		*				
Common Sandpiper		*				
Black-headed Gull	*					
Turtle Dove	*	*		*		
Great Spotted Cuckoo		*				
Cuckoo		*		*		
Collared Dove		*		*		
Stock Dove	*	*		*		
Barn Owl					*	
Swift		*		*		

SPECIES	WINTER VISITOR	SPRING PASSAGE	MIGRANT BREEDER	AUTUMN PASSAGE	RESIDENT	VAGRANT
Pallid Swift						*
Alpine Swift				*		
European Kingfisher	*	*	Possible	*		
Bee-eater		*		*		
Roller		*		*		
Hoopoe		*		*		
Wryneck		*				
Calandra Lark	*	*	*	*	*	
Short-toed Lark		*	*	*		
Woodlark						*
Skylark	*	*		*		
Crested Lark	*	*	*	*	*	
Sand Martin		*		*		
Crag Martin						*
Swallow		*		*		
Red-rumped Swallow		*				
House Martin		*		*		
Tawny Pipit				*		
Tree Pipit		*		*		
Meadow Pipit	*	*		*		
Red-throated Pipit						
Water Pipit	*	*		*		
Yellow Wagtail	*	*	*	*		
Citrine Wagtail						*
Grey Wagtail						*
White Wagtail		*		*		
Wren					*	
Dunnock	*	*		*		
Robin	*	*		*		
Thrush Nightingale		*				
Nightingale		*				
Bluethroat	*	*		*		
Redstart				*		
Black Redstart	*	*		*		
Whinchat		*		*		
Stonechat	*	*		*		
Isabelline Wheatear				*		
Northern Wheatear				*		
Black-eared Wheatear		*	*	*		
Blue Rock Thrush	*					
Blackbird					*	
Song Thrush	*	*		*		

SPECIES	WINTER VISITOR	SPRING PASSAGE	MIGRANT BREEDER	AUTUMN PASSAGE	RESIDENT	VAGRANT
Redwing	*					
Cetti's Warbler					*	
Fan-tailed Warbler	*	*	*	*	*	
Graceful Prinia					*	
Savi's Warbler		*	*	*		
Moustached Warbler		*	*			
Sedge Warbler		*				
Marsh Warbler		*		*		
Reed Warbler		*	*	*		
Great Reed Warbler		*	*	*		
Olivaceous Warbler		*	*	*		
Upcher's Warbler						*
Menetries' Warbler						*
Sardinian Warbler		*				
Orphean Warbler		*		*		
Barred Warbler		*				
Lesser Whitethroat		*	*	*		
Whitethroat		*	*	*		
Garden Warbler		*		*		
Blackcap		*	*	*		
Bonelli's Warbler		*		*		
Wood Warbler		*				
Willow Warbler		*		*		
Chiffchaff	*	*		*		
Spotted Flycatcher						
Semi-collared Flycatcher		*	*	*		
Collared Flycatcher		*				
Pied Flycatcher		*				
Great Tit					*	
Rock Nuthatch					*	
Penduline Tit	*	*		*		
Golden Oriole		*		*		

SPECIES	WINTER VISITOR	SPRING PASSAGE	MIGRANT BREEDER	AUTUMN PASSAGE	RESIDENT	VAGRANT
Red-backed Shrike		*		*		
Isabelline Shrike						*
Lesser Grey Shrike		*		*		
Woodchat Shrike		*	*	*		
Masked Shrike		*	*	*		
Jackdaw				*		
Hooded Crow					*	
Starling	*	*		*		
House Sparrow					*	
Spanish Sparrow	*	*	*	*	*	
Pale Rock Sparrow			*			
Chaffinch	*	*		*		
Brambling	*	*		*		
Serin	*	*		*		
Greenfinch	*	*	*	*		
Goldfinch	*	*	*	*		
Siskin	*	*				
Linnet	*	*		*		
Hawfinch						*
Rustic Bunting						*
Reed Bunting	*	*		*		
Yellowhammer	*	*		*		
Ortolan Bunting		*		*		
Cretzschmar's Bunting				*		
Black-headed Bunting		*	*			
Corn Bunting	*	*	*	*	*	