

A RESUME OF RAPTOR MIGRATION IN EUROPE AND THE MIDDLE EAST

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ABSTRACT

The migration of raptors which concentrate at narrow sea crossings and other strategic points in Europe and the Middle East is quantified. The purpose of counting migrating raptors is discussed, as well as the limitation in using these counts for population monitoring purposes. Suggestions are made for future study.

INTRODUCTION

The 50 species of birds of prey that have been recorded in Europe, North Africa and the Middle East (essentially the Western Palearctic) fall into several categories according to their migratory habits:

- Resident, or largely so—14 species.
- Vagrants—8 species.
- Partial migrants, or mostly so—11 species.
- Full migrants (narrow-winged raptors)—8 species. These move over a broad front and are able to make the long sea crossing over the Mediterranean.
- Full migrants (broad-winged raptors)—9 species. These move over narrow fronts at the 'land bridges'. They do not appear able to make the long sea crossings easily and rely on the 'thermalling' technique, permitting great distances to be covered with little energy expended.

Table 1 gives brief details of the migratory status of those species that breed in the Western Palearctic. Spasmodic observations on migrating raptors have been made in Europe since the 1880s, but it was not until recently that counts were made over entire seasons in either spring or autumn at the 'land bridges' or other strategic localities where streams of raptors, notably the broad-winged species, are concentrated (viz. 1950s Falsterbo, Sweden; 1960s and 1970s Bosphorus, Turkey; 1970s Eilat, Israel). The localities where regular observations have been made are given in *Table 2*, together with the highest total of all raptors recorded in any one spring or autumn (see also *Figure 1*). The main species comprising the movement and the highest number recorded during any one season (spring or autumn) at each locality are given in *Table 3*.

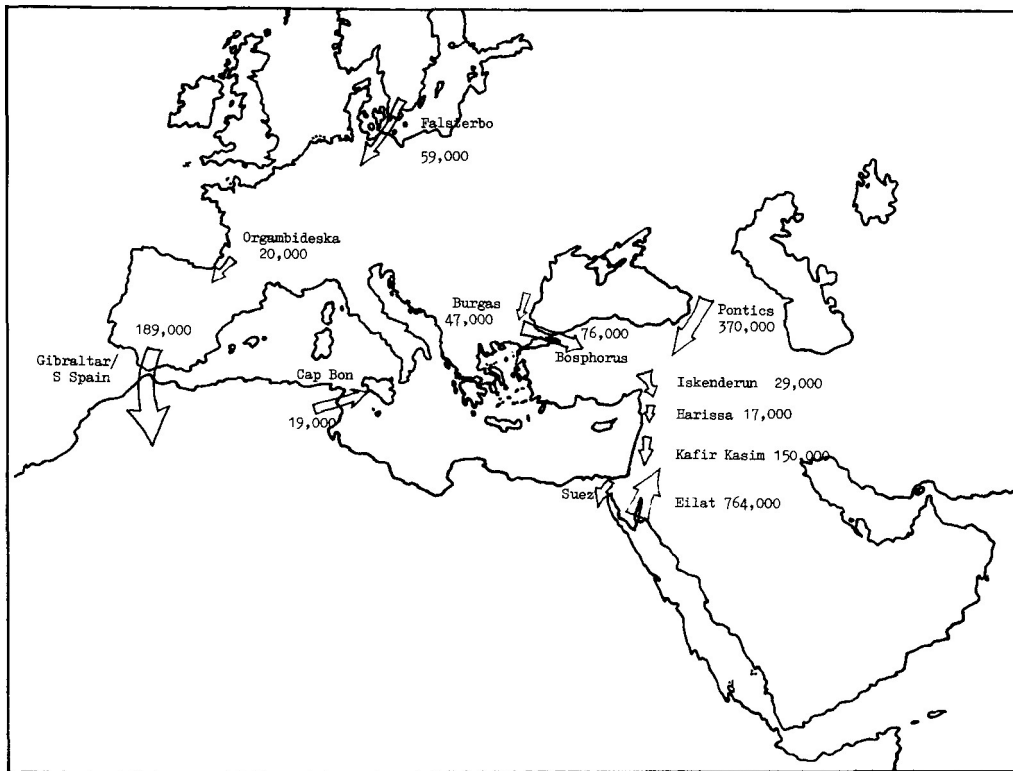


Figure 1: Europe, North Africa and the Middle East; showing localities where raptor migration has been studied. Figures are the highest total of all raptors recorded in any one spring or autumn.

Table 1: Migratory status of breeding raptors in Europe, North Africa and the Middle East (Western Palearctic).

Resident or mainly resident

Black-winged Kite (*Elanus caeruleus*)
 White-tailed Eagle (*Haliaeetus albicilla*) (but migrates in north of range)
 Lammergeier (*Gypaetus barbatus*)
 Griffon Vulture (*Gyps fulvus*)
 Lappet-faced Vulture (*Torgos tracheliotus*)
 Black Vulture (*Aegypius monachus*)
 Long-legged Buzzard (*Buteo rufinus*)
 Tawny Eagle (*Aquila rapax*)
 Golden Eagle (*Aquila chrysaetos*)
 Verreaux's Eagle (*Aquila verreauxii*)
 Bonelli's Eagle (*Hieraetus fasciatus*)
 Gyrfalcon (*Falco rusticolus*)
 Peregrine Falcon (*Falco peregrinus*)
 Barbary Falcon (*Falco pelegrinoides*)

Partial migrants or mostly so

Red Kite (*Milvus milvus*)
 Marsh Harrier (*Circus aeruginosus*)
 Hen Harrier (*Circus cyaneus*)
 Goshawk (*Accipiter gentilis*)
 Sparrowhawk (*Accipiter nisus*)
 Spotted Eagle (*Aquila clanga*)
 Imperial Eagle (*Aquila heliaca*)
 Kestrel (*Falco tinnunculus*)
 Merlin (*Falco columbarius*)
 Lanner (*Falco biarmicus*)
 Saker (*Falco cherrug*)

Full migrants which move over a broad front

Pallid Harrier (*Circus macrourus*)
 Montagu's Harrier (*Circus pygargus*)
 Rough-legged Buzzard (*Buteo lagopus*) (but over a narrow front in S. Sweden)
 Osprey (*Pandion haliaetus*)
 Lesser Kestrel (*Falco naumanni*)
 Red-footed Falcon (*Falco vespertinus*)
 Eleonora's Falcon (*Falco eleonora*)
 Sooty Falcon (*Falco concolor*)

Full migrants which concentrate at 'land bridges'

Honey Buzzard (*Pernis apivorus*)
 Black Kite (*Milvus migrans*)
 Egyptian Vulture (*Neophron percnopterus*)
 Short-toed Eagle (*Circaetus gallicus*)
 Levant Sparrowhawk (*Accipiter brevipes*)
 Buzzard (*Buteo buteo*) (but partial migrant only in west of range)
 Lesser Spotted Eagle (*Aquila pomarina*)
 Steppe Eagle (*Aquila nipalensis*)
 Booted Eagle (*Hieraetus pennatus*)

Table 2: Localities and highest counts of raptors in Europe and the Middle East, 1950-1981.

Locality	Highest number in a spring or autumn	Comments
Falsterbo (Sweden)	59,000 (autumn)	Observations largely made in autumn in 1950s (Rosen 1966).
Gibraltar/S. Spain	189,000 (autumn)	Counts made in early 1970s (Bernis 1975).
Cap Bon (Tunisia)	19,000 (spring)	No counts over an entire spring, so total figure probably much higher (Thiollay 1975; Dejonghe 1980).
Bosphorus (Turkey)	76,000 (autumn)	Regular observations made 1966-75, but concentrated mostly at S. end of Bosphorus. No regular observations for Marmara region or Dardanelles over which some birds are known to pass (Beaman <i>et al.</i> in prep; Porter & Willis 1968).
E. Pontics (Turkey)	370,000 (autumn)	1976 counts which covered entire autumn (OST 1977).
Gulf of Iskendum (Turkey)	29,000 (autumn)	Incomplete counts in mid-60s and 1976 (Cameron <i>et al.</i> 1976; Sutherland & Brooks 1981).
Harissa (Lebanon)	17,000 (autumn)	An amalgam of incomplete counts in 1968 and 1969 (Nielsen & Christensen 1970).
Kafir Kassem (Israel)	approx. 150,000 (autumn)	Counts started in late 1970s. Actual routes over area still being identified; results yet to be published (co-ordinated by E. Dovrat, pers. comm.).
Eilat (Israel)	764,000 (spring)	Most complete count in 1977, but that stopped during Honey Buzzard passage (mid-May), so total figure probably much higher (Christensen <i>et al.</i> 1982).
Suez (Egypt)	?	No complete spring or autumn counts yet made, but planned for 1982 (Bruun, pers. comm.). Could be one of the most important areas for counting raptors.

Note: Since this paper was written, the results of counts at Suez in autumn (4 Sept. to 5 Nov. 1981) have been published. The total number of raptors counted was 134,870 (Bijlsma 1982).

Table 3: Raptors which concentrate at narrow sea crossings and other strategic points in the Mediterranean region showing, for selected localities, the highest total recorded during any one season (all records since 1969).

	Gibraltar/ S. Spain Autumn	Cap Bon (Tunisia) Spring	Bosphorus (Turkey) Autumn	E. Pontics (Turkey) Autumn	Eilat (Israel) Spring
Honey Buzzard (<i>Pernis apivorus</i>) ¹	114,000	10,000	25,700	138,000	226,000
Black Kite (<i>Milvus migrans</i>)	39,000	600	2,700	5,800	26,800
Egyptian Vulture (<i>Neophron percnopterus</i>)	4,000	160	550	2	80
Short-toed Eagle (<i>Circaetus gallicus</i>)	9,000	50	2,300	250	220
Levant Sparrowhawk (<i>Accipiter brevipes</i>)	—	—	5,700	300	6,000
Buzzard (<i>Buteo buteo</i>) ¹	2,900	1,200	32,900	204,800	315,800
Lesser Spotted Eagle (<i>Aquila pomarina</i>)	—	20	19,000	730	Nil ²
Steppe Eagle (<i>Aquila nipalensis</i>)	—	2	2	270	19,300
Booted Eagle (<i>Hieraetus pennatus</i>)	15,200	250	550	—	170

Observer references: Bernis 1975; Thiollay 1975; Beaman *et al.* in prep.; Christensen *et al.* 1982; Dejonghe 1970; Porter & Willis 1968; Ost 1977.

Notes: 1. Maximum autumn counts at Falsterbo, Sweden, are *Pernis apivorus* 20,900 and *Buteo buteo* 36,700 (Rosen 1966).

2. But apparently large numbers pass over Ein Gedi to the north of Eilat.

NEW PLACES AND FUTURE COUNTS AT EXISTING ONES

It is likely that some places where raptors pass in large concentrations are yet to be discovered or studied in detail, and the 1980s are likely to see the completion of the map in respect of several countries. For example, the southwest and southeast Caspian Sea should produce large concentrations of birds of prey in spring or autumn. The northern end of the Persian Gulf, especially in the region of Kuwait, would also repay further study, as brief incomplete counts made so far indicate a fair movement there. The southern tip of the Arabian Peninsula in the Yemen may provide the exodus for many birds, particularly of a more eastern origin. Preliminary observations in the spring (Cornwallis & Porter 1982) and autumn (Phillips 1982) suggest that this area is not important in spring but may be so in autumn. In Israel, counts currently being undertaken at Kafir Kassem (E. Dovrat, pers. comm.) and elsewhere (Y. Leshem, pers. comm.) are likely to yield useful information; Ein Gedi on the edge of the Dead Sea depression, for example, could provide a focal point for many species which do not pass over Eilat. Finally, there is the Suez Canal, where several scattered observations have been made in the past and where systematic counts are currently being co-ordinated under the auspices of Dr B. Bruun; this may prove to be the largest concentration of all.

THE PURPOSE OF COUNTING MIGRATING RAPTORS

The study of those raptors that migrate over a broad front and which therefore do not concentrate at 'land bridges' (and other strategic points) is extremely difficult. Other than details of migration periods, little useful information has been gathered on most species. The same situation also applies to the partial migrants. Attempts to compare seasonal counts either within or between localities would probably be pointless; the numbers are too low and in many cases are likely to be the subject of chance occurrence.

Thus only the nine species of raptors which concentrate at strategic points (see *Table 1*) offer potential for fruitful study—primarily in the following areas: (a) determining migration patterns and periods; (b) determining relative abundance; (c) determining flock sizes and species associations; (d) population monitoring; (e) establishing breeding success in those species in which it is possible to distinguish adults, immatures and juveniles (e.g. *Neophron percnopterus* and *Aquila nipalensis*). In addition there is the educational value, both in terms of identification and appreciation. The spectacle of raptors migrating can do much to foster an interest by local people and may well provide a tourist attraction, with commercial implications.

These seemingly straightforward objectives may in reality be subject to some severe limitations:

- Identification: raptors are notoriously difficult to identify in flight and many mistakes have been made (e.g. until 1966 all Buzzards on passage in Turkey were misidentified as Honey Buzzards; in Israel until the early 1970s all Steppe Eagles had been misidentified as Spotted/Lesser Spotted Eagles).
- Weather conditions, particularly wind, can cause raptor streams to change their positions; thus a flight path can quickly move or may be missed.
- Observer bias: inconsistency between observers can make for difficulties in comparing counts both within and between localities.
- Over-counting: where observers are spaced out in an attempt to count a

broad-fronted movement, duplication can easily occur, as the distances over which raptors are visible tend to be underestimated.

- Around mid-day, especially in the south of the region, raptors may migrate at heights which make them invisible to the naked eye. If this is so, then an unknown proportion of raptors is missed during counts.
- The breeding area of the different species of raptors is not fully known. In attempting to use the figures as some form of population index, it is useful to know the catchment area for the birds. In most cases this can only be guessed.

CONCLUSIONS AND FINAL COMMENTS

We would suggest that most effort should now be spent in establishing the actual migration routes: both the main ones and their inter-linking flyways. Such studies would help to identify any threats, such as shooting or trapping of migrants. This could lead to protection or conservation measures being set up in the future. Future watching may help to determine whether birds feed en route, and if so, where and how. Again, this could be of conservation significance if large numbers of birds descend and feed in areas where pesticides are used. It is suspected that broad-winged raptors feed very infrequently on migration, but this has yet to be established.

In addition to determining the routes, systematic counts should continue at selected localities over several years to see if there is any degree of conformity in the figures from year to year. This might indicate their worth in determining population changes.

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