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The island of Marettimo (Italy), important bird area for the autumn migration of raptors

NICOLANTONIO AGOSTINI[1], DANIELA LOGOZZO[2] and MICHELE PANUCCIO[3]

[1]*Via Carlo Alberto 4, 89046 Marina di Gioiosa Jonica (RC), Italy*
[2]*Via Antonio Gramsci 26, 89046 Marina di Gioiosa Jonica (RC), Italy*
[3]*Via Mario Fioretti 18, 00152 Roma, Italy*

Abstract - A survey on the autumn migration of raptors over the island of Marettimo (western Sicily) was carried out from 27 August to 9 September 1997, and from 26 August to 14 September 1998. A total of 3177 and 5227 birds was counted, respectively. Each year, nearly all raptors observed were Black Kites *Milvus migrans* and Honey Buzzards *Pernis apivorus*. These species showed a strong tendency to migrate in large flocks. During 1998 it was possible to age some migrating birds; a notable overlap in the migration periods of adult and juvenile Black Kites occurred, while nearly all Honey Buzzards aged were adults. This study confirms the hypothesis that adult Honey Buzzards cross the central Mediterranean at its narrowest point, using the same route as in spring and showing true navigational abilities. Finally, on the island of Marettimo, occurs the greatest concentration of Black Kites and Egyptian Vultures *Neophron percnopterus* during post-reproductive movements on the central Mediterranean. These results suggest that this site should be included among the Important Bird Areas for the autumn migration of raptors.

Introduction

To date studies on the autumn migration of raptors on the central Mediterranean have been made in southern continental Italy and over the island of Malta (Beaman and Galea 1974, Agostini and Logozzo 1995 a, b,c,1997, 2000). A correspondence between counts made in the two sites occurs only after the first half of September, when mostly Marsh Harriers *Circus aeruginosus* and juvenile Honey Buzzards are observed (Coleiro *et al.* 1996, Agostini and Logozzo 1997, Agostini *et al.* 1999). Hundreds of Black Kites and adult Honey Buzzards migrate earlier, between the end of August and the first 10-days of September, concentrating along the Calabrian Apennines (southern continental Italy) but without moving over Malta (Agostini and Logozzo 1995 b, 1997, Agostini *et al.* 1999).

Although regular observations have not been made, in western Sicily, flocks of birds belonging to these two species were recorded between the end of August and the beginning of September (Suchantke 1960, Galea and Massa 1985, Iapichino and Massa 1989, Agostini and Logozzo 1997). In this study we investigated the autumn migration of raptors in this region of the central Mediterranean between the end of August and the first half of September 1997 and 1998, through observations on the island of Marettimo, where a notable concentration of raptors was already recorded during spring migration (Agostini and Logozzo 1998).

Study area and methods

Marettimo is a mountainous island (12 km^2), oriented in a NNW-SSE direction, about 30 km off western Sicily and 20 km west of the islands of Levanzo and Favignana (Fig. 1). Monte Falcone is its highest relief, reaching 686 m. This island is located at the narrowest point of the central Mediterranean, about 130 km NE of the Cap Bon promontory (Tunisia, Fig. 1).

Observations were made from 27 August to 9 September 1997 and from 26 August to 14 September 1998 using a single observation post at an altitude of about 500 m; from this post it was possible to dominate both the eastern and the western coasts of the island. In 1998, we concentrated on the migration of adults and juveniles of the species commonly observed. Generally, it was possible to determine the age of birds when they were close (<150 m) overhead. Observations were made using 10x50 binoculars.

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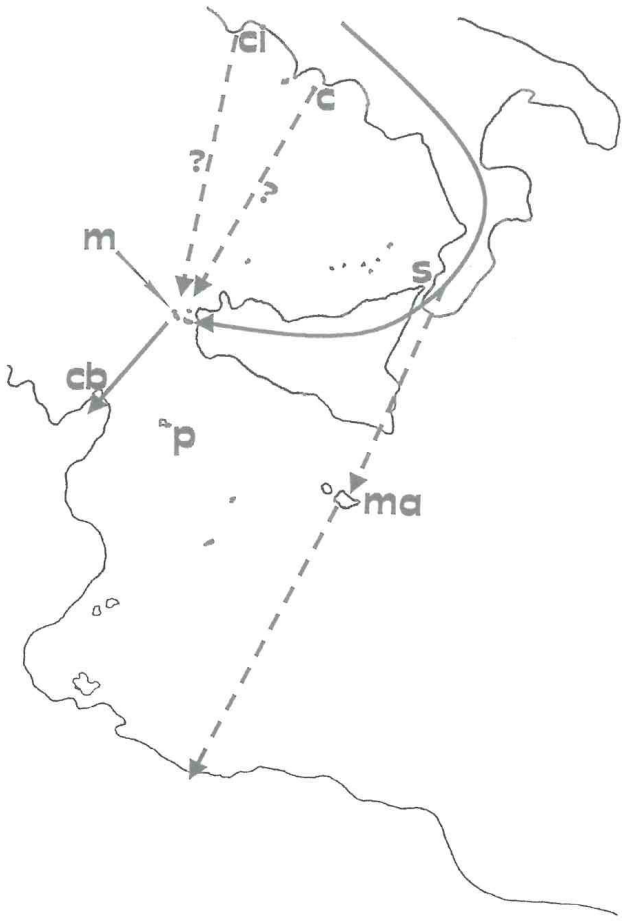

Fig. 1. Routes used by the Honey Buzzard during the autumn migration on the Central Mediterranean (Sketched arrow = mostly juveniles; ? = supposed direction; m = Marettimo; s = Straits of Messina; cb = Cap Bon; ci = Circeo promontory; c = Capri; p = Pantelleria; ma = Malta).

Results

In 1997 we observed 3177 raptors in 86 h (36.9 birds per h); only in three cases it was impossible to identify the species. The most abundant species were the Black Kite (2131, 67.1%) and Honey Buzzard (949, 29.9%). Moreover, we observed 22 Egyptian Vultures (0.7%), 59 Marsh Harriers (1.9%), 5 Montagu's Harriers *Circus pygargus* (0.2%), 7 Booted Eagles *Hieraaetus pennatus* 0.2%) and 1 Short-toed Eagle *Circaetus gallicus* (0.03%). In 1998, a total of 5227 raptors were counted in 160 h (32.7 birds per h), and in 28 cases it was impossible to identify the species. We recorded 3598 Black Kites (68.8%), 1503 Honey Buzzards (28.8%), 70 Egyptian Vultures (1.3%), 38 Marsh Harriers (0.7%), 7 Hobbies *Falco subbuteo* (0.1%), 5 Montagu's Harriers (0.1%), 4 Booted Eagles (0.1%) and 2 Ospreys *Pandion haliaetus* (0.03%).
Raptors reached the eastern coast of the island, generally low to the ground, and used soaring flight along its reliefs, but rarely they continued the sea crossing straight after; in fact, before to migrate towards Tunisia, most of them flew along the island for some hours, sometimes disappearing east over the sea. Only on 27 August and 4 September 1997, it was impossible to follow the movements of raptors because of poor visibility. In those instances we considered, for each species, the largest flock observed to avoid the re-count of the same birds; probably this method caused a difference between estimated and migrating raptors.
In 1997, about 80% of Black Kites were seen on 30 and 31 August (Fig. 2), nearly all in two flocks of 1000 and 650 birds, respectively. In 1998, more than 90% of Black Kites migrated in four days on 27 and 30 August and on 1st and 7th September (Fig. 3), when we observed four large flocks of 1000, 1100, 650, and 420 birds, respectively. During 1998, in 441 cases it was possible to age Black Kites; 64% of them were adults and 36% juveniles. Although birds belonging to the two age groups migrated at the same times, dividing the observation period into two 10-day periods, mostly juveniles were seen between 5 and 14 September (Fig. 4). Moreover, the 420 birds observed

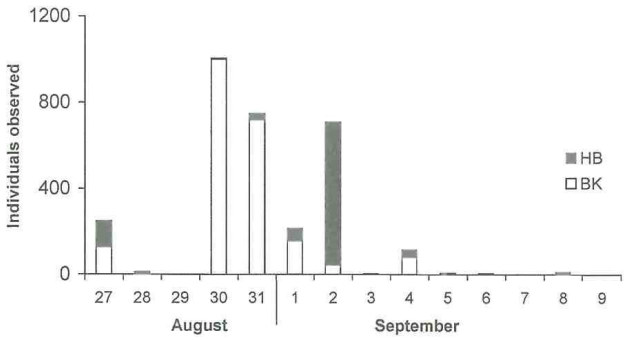

Fig. 2. Seasonal occurrence of migrating Black Kites and Honey Buzzards over the Island of Marettimo in summer 1997.

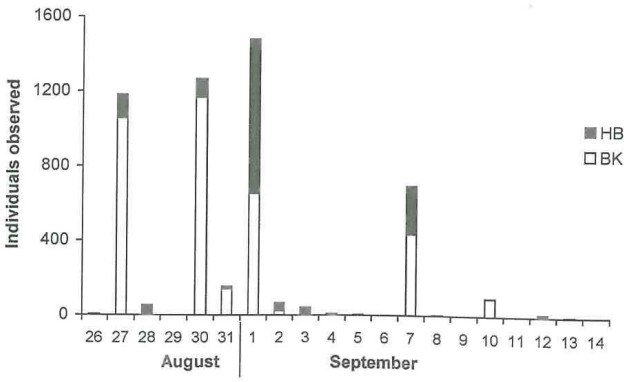

Fig. 3. Seasonal occurrence of migrating Black Kites and Honey Buzzards over the Island of Marettimo in summer 1998.

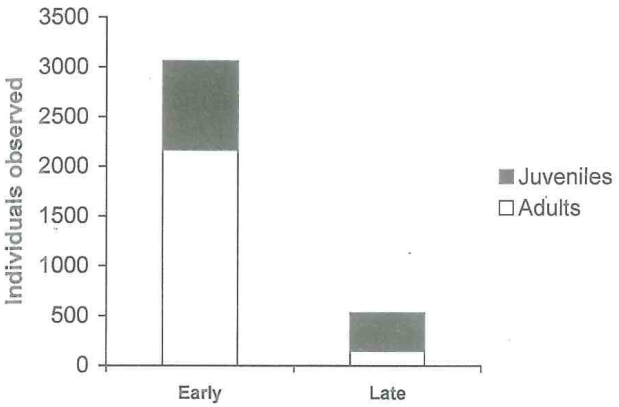

Fig. 4. Estimate of the total number of juvenile and adult Black Kites observed from 26 August and 4 September (Early) and from 5 to 14 September (Late) 1998, according to their proportion among aged individuals in each period.

on 7 September 1998 reached the island apparently following a flock of about 100 Honey Buzzards.

The maximum number of Honey Buzzards was recorded on 1st September 1998, when 832 individuals were counted (Fig. 3); 682 of them were seen together. A flock of 546 Honey Buzzards was also observed on 2nd September 1997, when a total of 666 individuals belonging to this species was counted (Fig. 2). During 1998, in 364 cases it was possible to age Honey Buzzards; 96.4% of them were adults and only 3.6% juveniles. According to their ratio among the identified individuals we estimated a total of 1449 adults and 54 juveniles.

As regards the Egyptian Vulture, a maximum of 9 individuals were seen together. It was possible to age all migrating birds. In 1997 we reported 1 juvenile, 1 immature and 20 adults; in 1998, two juveniles, 1 immature, 8 subadults and 59 adults.

Finally, it is interesting to note that on 28 August 1998, with strong west wind (> 25 km/h at sea level), we observed a flock of 55 Honey Buzzards and 7 Egyptian Vultures very far over the sea, to approach the island using successfully soaring and gliding flight. They passed over the island so high that it was difficult to observe them without binocular.

Discussion

Over Marettimo during autumn migration occurs the greatest concentration of Black Kites of the central Mediterranean. The enormous difference between the counts made on the island and those of previous studies made in the Calabrian Apennines (southern continental Italy: Agostini and Logozzo 1995a, c, 1997) agrees with the hypothesis that many kites migrating in the central Mediterranean area, reach western Sicily undertaking a long powered flight over the sea from the Tyrrhenian coasts of the Italian peninsula (Fig. 5: Agostini and Logozzo 1997). Moreover, our results confirm partially those of the previous study made on the Calabrian Apennines where a complete overlap in the migration periods of juveniles and adults has been observed (Agostini and Logozzo 1997). In fact, although individuals belonging to the two age classes were seen during the whole period, on the island of Marettimo hundreds of juveniles concentrated their migration after that of nearly all adults. During observations made at the island of Pantelleria (Fig. 5), between the end of August and the beginning of September 1978, Galea and Massa (1985) recorded a single flock of about 400 Black Kites on 6th September. Perhaps, on that site occurs a concentration of juvenile migrating later than adults.

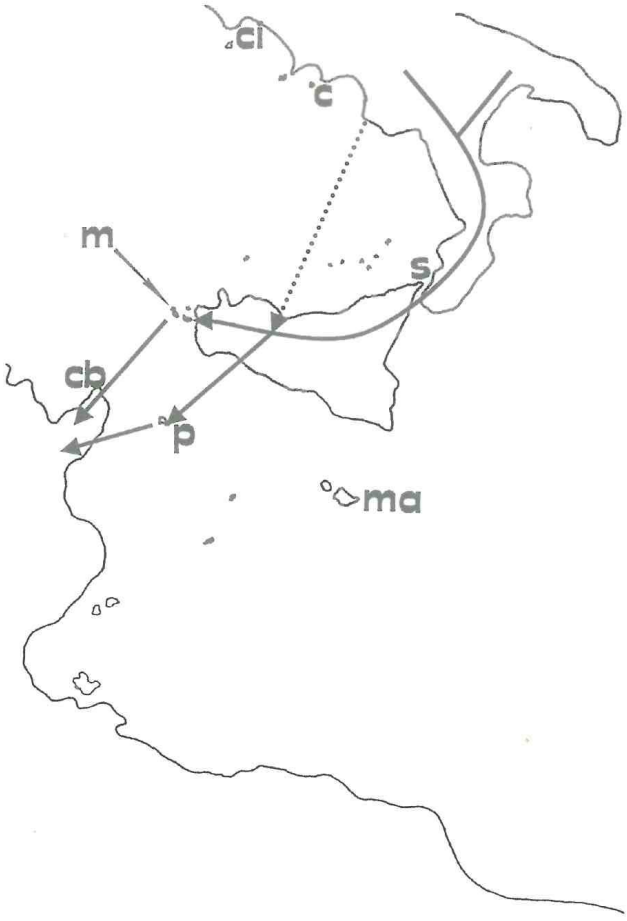

Fig. 5. Black Kites (doted arrow = supposed route). Explanation as in Fig. 1.

Honey Buzzards mostly use soaring and gliding flight during migration over land, concentrating in narrow straits (Cramp and Simmons 1980, Kerlinger 1989). During post-reproductive movements through Italy,

they tend to follow the topographic features of the peninsula, passing along the Calabrian Apennines (Fig. 1: Agostini and Logozzo 1995a, b, c, 1997). Our study confirms the hypothesis that adult Honey Buzzards cross the central Mediterranean at its narrowest point, between Sicily and Tunisia (Agostini & Logozzo 1995b). After the crossing of the Straits of Messina, they deviate westwards (Fig. 1) using the same spring route (Agostini *et al.* 1994b, Agostini and Logozzo 1998) and showing true navigational abilities. Moreover, our results agree with the hypothesis that juvenile Honey Buzzards, during their first migration, are able to learn this route by way of information transmission when migrating in flocks of adults (Agostini *et al.* 1999). On the other hand, juveniles migrating along the Calabrian Apennines later than adults, cross the sea between Sicily and Libya via Malta (Fig.1: Agostini and Logozzo 1995b). Recent studies made at the Circeo promontory and over the island of Capri, showed that large numbers of juvenile Honey Buzzards undertake the crossing of the Tyrrhenian Sea after the first 10-days of September (Fig. 1: Corbi *et al.* 1999, Jonzén and Pettersson 1999). These observations confirm that juvenile Honey Buzzards, moving along a NE-SW axis genetically defined (Agostini and Logozzo 1995b), migrate on a broader front than adults during sea crossing (Agostini and Logozzo 1997). As concerns the islands of the Mediterranean Sea, besides Malta and Capri, a concentration of juveniles belonging to this species has been observed also over Cabrera (Balearic Islands: Rebassa 1995) and, probably, over Cyprus (Agostini and Logozzo 1997).

The very small proportion of juvenile Egyptian Vultures observed in our study should support the hypothesis that mostly non-breeders summering in Italy use this migratory route. As suggested by Finlayson (1992), this hypothesis agrees with observations made during spring migration; in this period, a substantial concentration of birds has been recorded at the Cap Bon promontory in May (Thiollay 1977, Dejonghe 1980), a late time of year for the spring migration of this species (Cramp and Simmons 1980). Thermals are almost absent over sea and raptors are obliged to undertake powered flight during its crossing with a considerable expenditure of energy (Kerlinger 1989). Birds observed to use successfully soaring and gliding flight over water on 28 August, probably exploited lee waves created by the upward deflection of the strong west wind off mountain ridge of the island. A similar flight strategy has been suggested in a study on the migration of raptors across the Strait of Gibraltar (Evans and Lathbury 1973) and, in particular for the Honey Buzzard, during migration over land in southern Israel (Bruderer *et al.* 1994).

Similarly to the Black Kite, during autumn migration on Marettimo occurs the greatest concentration of Egyptian Vultures of the central Mediterranean. In southern continental Italy and over Malta few individuals are observed each year (Beaman and Galea 1974, Agostini and Logozzo 1995a, c, 1997).

Because this species has been included among decreasing species in Europe (Tucker and Heath 1994) and endangered species in Italy (LIPU and WWF 1999), Marettimo has to be considered an Important Bird Area as proposed by Grimmet and Jones (1989). This conclusion is also supported by the fact that on this site occurs during autumn migration the greatest concentration of raptors through Italy (Reteuna 1994, Toffoli *et al.* 1996, Agostini and Logozzo 1997, Mezzavilla *et al.* 1998, Corbi *et al.* 1999, Jonzén and Pettersson 1999). The importance of Marettimo for the protection of raptors migrating across the central Mediterranean area is also evident during spring migration (Agostini and Logozzo 1998). In that period, monitoring on the island could improve the actions against poaching at the Straits of Messina (Agostini 1992, Agostini *et al.* 1994a) being possible to know in advance the variation of the migratory flow.

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Riassunto - Sono state effettuate osservazioni sulla migrazione autunnale dei rapaci sull'isola di Marettimo (Sicilia occidentale) dal 27 agosto al 9 settembre 1997 e dal 26 agosto al 14 settembre 1998. È stato rilevato il passaggio di 3177 e 5227 individui; di essi oltre il 95% erano Nibbi bruni *Milvus migrans* e Falchi pecchiaioli *Pernis apivorus*. Queste specie mostrarono un marcata tendenza a migrare in gruppi numerosi. Durante il 1998 è stato possibile determinare l'età di alcuni uccelli; nel caso del Nibbio bruno, è stata rilevata una notevole sovrapposizione dei periodi di migrazione degli adulti e dei giovani; diversamente, quasi tutti i Falchi pecchiaioli osservati a breve distanza erano adulti. Questo risultato conferma che i Falchi pecchiaioli adulti attraversano il Mediterraneo centrale nel suo punto più stretto, utilizzando la stessa rotta primaverile. Sull'isola di Marettimo si verifica la maggiore concentrazione di Nibbi bruni e Capovaccai *Neophron percnopterus* durante i movimenti post-riproduttivi in Italia. Questi risultati evidenziano l'importanza dell'isola per la migrazione autunnale dei rapaci che, nel caso del Capovaccaio, è anche in relazione alla conservazione di questa specie, la cui popolazione italiana è in forte declino.

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