

LETTERS

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ARE EARLIER ESTIMATES OF ACCIPITRIFORMES CROSSING THE CHANNEL OF SICILY (CENTRAL MEDITERRANEAN) DURING SPRING MIGRATION ACCURATE?

Each spring thousands of raptors cross the Channel of Sicily, between the Cap Bon Peninsula and western Sicily, during northward migration. The Cap Bon Peninsula in northeastern Tunisia is a 25-km-wide plain dominated in the north by a promontory that reaches a height of 392 m (Fig. 1). At this promontory, Thiollay (1975, *Nos Oiseaux* 33: 109–121; 1977, *Alauda* 43:115–121) made counts of migrants between 26 March–14 April 1974 and between 2–18 May 1975 to estimate the migratory flow of raptors using this route (Table 1). Thiollay divided the period 22 March–20 May into six 10-d periods and extrapolated numbers of migrants in the periods for which observations were lacking. Three decades later these counts and estimates are still quoted in publications (Ferguson-Lees and Christie 2001, *Raptors of the world*, Helm Edition, London, U.K.; Bricchetti and Fracasso 2003, *Ornitologia Italiana*, Perdisa Editore, Bologna, Italy; Sarà 2003, *J. Raptor Res.* 37:167–172). However, subsequent studies carried out at the Cap Bon Promontory, at the Strait of Messina and over the islands of Marettimo and Ustica (Fig. 1) were not consistent with these earlier data (Giordano 1991, *Birds Prey Bull.* 4:239–249; Agostini and Duchi 1994, *Bird Behav.* 10:45–48; Agostini et al. 1994a, *Avocetta* 18:73–76; Agostini et al. 1994b, *Atti VI Conv. Ital. Ornitol.* 451–452; Agostini and Malara 1997, *Riv. Ital. Ornitol.* 66:174–176; Agostini and Logozzo 1998, *Riv. Ital. Ornitol.* 68:153–157; Agostini 2001, *Buteo* 12:99–102; Corso 2001, *Br. Birds* 94:196–202; Panuccio et al. 2004, *Br. Birds* 97:400–403).

At the Cap Bon Promontory, several collaborators and I collected data focusing on the flight behavior of raptors on the coastline in the spring of 1990 and 1992 (Agostini and Duchi 1994, Agostini et al. 1994a, 1994b). During these observations, upon reaching the coast near the promontory, most raptors hesitated at the water barrier; they often stopped migrating and exhibited an unexpected series of movements, first disappearing across the sea, then returning to the coast, and then flying back inland. During our observations, my colleagues and I recognized individuals or entire flocks circling over the promontory, sometimes repeatedly over several days. Because of this behavior, it was impossible to avoid recounting migrating raptors and we concluded that the Tunisian promontory was unsuitable for assessing numbers of passing raptors. Factors probably influencing a hawk's decision whether or not to cross the Mediterranean included the morphology and age of the hawk, weather, and in the case of Honey-buzzards (*Pernis apivorus*) and Black Kites (*Milvus migrans*), flock size. Was the hesitation to cross this water barrier not conspicuous when Thiollay made his observations? Was it possible to avoid recounting migrants during spring 1974 and 1975? The Channel of Sicily is ca. 150 km wide, implying that long, powered flight, with a considerable expenditure of energy, is necessary to make landfall. Because thermals are mostly absent over water, raptors cannot alternate soaring with gliding during the crossing, as they do over land (Kerlinger 1989, *Flight strategies of migrating hawks*, Univ. Chicago Press, Chicago, IL U.S.A.) and this could explain their hesitation at the Cap Bon Promontory when faced with a substantial water crossing. In particular, counts made at the Strait of Messina (Table 1) and over the islands of Marettimo and Ustica (Giordano 1991, Agostini 2001, Agostini and Logozzo 1998, Corso 2001, Panuccio et al. 2004, *Br. Birds* 97:400–403), showed that few broad-winged raptors, such as Common Buzzards (*Buteo buteo*), Booted Eagles (*Hieraetus pennatus*), Short-toed Eagles (*Circus gallicus*), and Egyptian Vultures (*Neophron percnopterus*) cross the Channel of Sicily. However, Thiollay (1977) estimated the total passage of more than 2800, 450, 400, and 620 birds, respectively (Table 1). Moreover, at the Strait of Messina, the Long-legged Buzzard (*Buteo rufinus*) and the Lesser Spotted Eagle (*Aquila pomarina*) were irregular migrants (Table 1; see also Zalles and Bildstein 2000, *Raptor watch: a global directory of raptor migration sites*, BirdLife International, Cambridge, U.K. and Hawk Mountain Sanctuary, Kempton, PA U.S.A.). Whereas, Thiollay estimated a regular passage of more than 200 and 150 individuals of these species. Undoubtedly, our counts missed some proportion of the birds that passed overhead; however, difference between data recorded in southern Italy since 1980s and the estimate made by Thiollay in the 1970s was substantial. Moreover, the few broad-winged raptors recorded in southern Italy was consistent with the notion that species with a lower-aspect ratio (shorter) wings are not suited to undertake crossings of large bodies of water. Such wings increase the induced drag, and thus, the energy needed for powered flight (Kerlinger 1985, *Wilson Bull.* 97: 109–113).

I suggest that the earlier estimates offered by Thiollay in the 1970s were too high probably because, during his survey, the author recounted birds returning after they abandoned the water crossing attempt. Other explanations

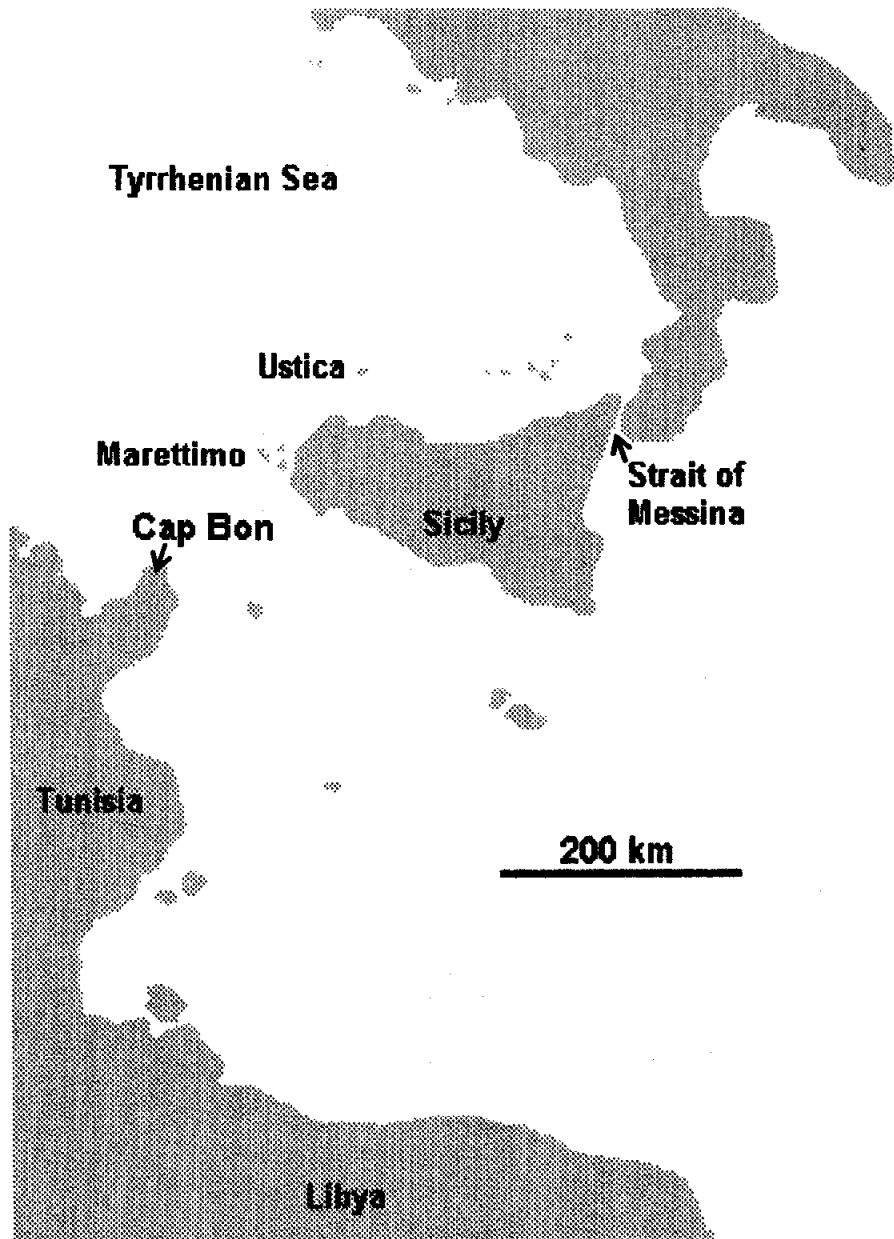


Figure 1. The Channel of Sicily in the central Mediterranean area.

for differences between the 1970s and the more recent data include: (1) numbers of broad-winged raptors (eagles, buteos, vultures), and of Black Kites, may have measurably declined in recent years and (2) a climatic shift may have occurred possibly making water crossings more difficult. However, when comparing counts made at the Strait of Messina between 1986–90 and 1996–2000 (Table 1), I noted a substantial increase in the case of Honey Buzzards, Marsh Harriers (*Circus aeruginosus*), and Black Kites. This comparison suggests, for at least these species, that water crossings have not become more difficult in recent years.

Counts involving Short-toed Eagles made at the Cap Bon Promontory by Thiollay were recently cited by Ferguson-

Table 1. Counts and estimates of raptors crossing the Channel of Sicily in the central Mediterranean area during three decades.

	THIOLLAY'S ESTIMATES 1970s ^a	STRAIT OF MESSINA COUNTS 1986-90 (MIN-MAX) ^b	STRAIT OF MESSINA COUNTS 1996-2000 (MIN-MAX) ^c
European Honey-buzzard (<i>Pernis apivorus</i>)	>16.000	6.032-8.516	16.700-27.297
Black Kite (<i>Milvus migrans</i>)	>15.000	155-397	546-1.008
Western Marsh Harrier (<i>Circus aeruginosus</i>)	>700	125-978	1.621-3.074
Montagu's Harrier (<i>C. pygargus</i>)	>220	5-273	155-866
Pallid Harrier (<i>C. macrourus</i>)	>50	4-15	25-83
Montagu's/Pallid Harrier (<i>C. pygargus</i> × <i>macrourus</i>)	—	0-29	33-159
Northern Harrier (<i>C. cyaneus</i>)	>15	11-59	3-84
Common Buzzard (<i>Buteo buteo</i>)	>2.800	15-42	30-103
Long-legged Buzzard (<i>B. rufinus</i>)	>200	0-4	6-12
Short-toed Eagle (<i>Circus gallicus</i>)	>400	0-3	1-4
Egyptian Vulture (<i>Neophron percnopterus</i>)	>620	4-8	3-12
Booted Eagle (<i>Hieraaetus pennatus</i>)	>450	5-22	5-19
Lesser Spotted Eagle (<i>Aquila pomarina</i>)	>150	0-5	0-4
Eurasian Sparrowhawk (<i>Accipiter nisus</i>)	>70	0-7	2-14
Osprey (<i>Pandion haliaetus</i>)	>20	2-20	10-25

^a Thiollay (1975, *Nos Oiseaux* 33: 109-121; 1977, *Alauda* 43: 115-121).

^b Giordano (1991, *Birds Prey Bull.* 4:239-249).

^c Corso (2001, *Br. Birds* 94: 196-202).

Lees and Christie (2001, *Raptors of the world*, Helm Edition, London): "Italian population (380-415 pairs) presumably crosses by Sicilian Channel to and from Tunisia's Cap Bon, whence total of ca. 200 travelled northward on spring migration during 2-18 May 1975." However, recent studies in Italy showed that nearly all the Italian population of this species crosses the Mediterranean Sea at the Strait of Gibraltar (14 km wide), with hundreds of birds breeding in central Italy using a circuitous migratory route both during spring and autumn migration (Agostini et al. 2002a, *J. Raptor Res.* 36:111-114; Agostini et al. 2002b, *Ardeola* 49:287-291; Agostini et al. 2004, *Avocetta* 28:37-40; Baghino 2003, *Avocetta* 27:67; Premuda 2004, *Riv. Ital. Ornitol.* 74:119-124). The number recorded at Cap Bon by Thiollay during the first half of May was relatively late for the spring migration of this species (Cramp and Simmons 1980, *The birds of the western Palearctic*, Vol. 2, Oxford Univ. Press, Oxford, U.K.). I suggest that perhaps the relatively large number of Short-toed Eagles reported by Thiollay was the result of recounting immature birds in northern Tunisia. In agreement with this conclusion, recent observations by some colleagues and I made over Marettimo showed a late autumn passage of juvenile Short-toed Eagles across the Sicilian Channel (Agostini et al. 2004, *Avocetta* 28:37-40).

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GROUND NESTING BY EGYPTIAN VULTURES (*NEOPHRON PERCNOPTERUS*) IN THE CANARY ISLANDS

Ground nesting is a relatively rare occurrence in raptors, except for areas lacking any elevated nesting substrates (e.g., tundra habitats), or islands devoid of mammalian predators (Newton 1979, *Population ecology of raptors*, Buteo Books, Vermillion, SD U.S.A.). Moreover, this behavior has not been described for large diurnal raptors with long