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Notes

Spring raptor migration at Ustica, southern Italy

The island of Ustica, lying at 38°42'N 13°12'E in the Tyrrhenian Sea, is approximately 60 km north of western Sicily and 270 km northeast of the Cap Bon promontory in Tunisia (fig.1). Although covering an area of only 7,600 ha, its isolation makes it attractive to migrant birds. In order to establish the importance of Ustica for the spring migration of raptors in the Mediterranean basin, counts of migrating raptors were made from the highest point of the Falconiera promontory, which dominates the northeast coast of the island, between 22nd March and 20th May 2002.

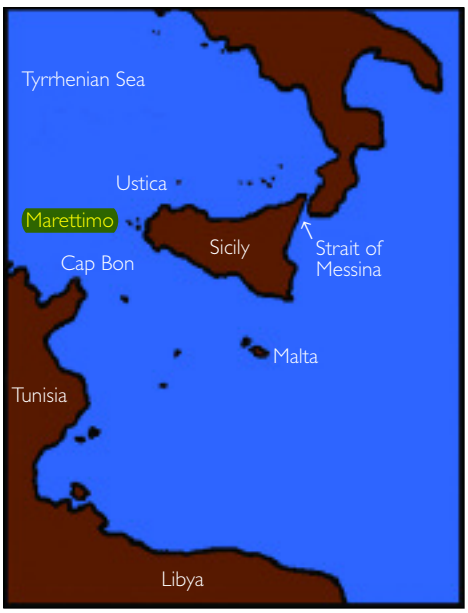

Fig. 1. Map showing the position of Ustica, and other key raptor migration watchpoints in the central Mediterranean.

Spring raptor migration in southern Italy

Each spring, thousands of raptors cross the Mediterranean Sea between Africa and southern Italy during their northward migration to European breeding areas. Within this region, the largest concentrations have been reported at the Strait of Messina, between southern mainland Italy and Sicily (fig. 1). Corso (2001) documented an average of 26,062 raptors migrating across the Strait of Messina each spring between 1996 and 2000 (table 1). At this site, raptors crossing the Strait of Sicily, between the Cap Bon peninsula and western Sicily, converge with those migrating north from Libya to southern Sicily, via Malta (fig. 1).

Some species, particularly those with relatively long wings, including Osprey *Pandion haliaetus*, harriers *Circus*, kites *Milvus* and

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249. The Falconiera promontory, Ustica, southern Italy, April 2002.

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Table 1. Number of raptors observed on Ustica, southern Italy, from 22nd March to 20th May 2002. These are compared with those recorded at the Strait of Messina during spring migration 1996-2000, based on data from Corso (2001).

Species	Ustica, spring 2002	Strait of Messina, spring 1996-2000 (minimum-maximum)
Honey-buzzard *Pernis apivorus*	1,822	16,700-27,297
Black Kite *Milvus migrans*	302	546-1,008
Short-toed Eagle *Circaetus gallicus*	2	1-4
Marsh Harrier *Circus aeruginosus*	1,174	1,621-3,074
Hen Harrier *Circus cyaneus*	1	3-84
Pallid Harrier *Circus macrourus*	44	25-83
Montagu's Harrier *Circus pygargus*	129	155-866
Pallid/Montagu's Harrier *Circus macrourus/pygargus*	86	33-159
Eurasian Sparrowhawk *Accipiter nisus*	3	2-14
Common Buzzard *Buteo buteo buteo*	6	18-74
'Steppe Buzzard' *Buteo buteo vulpinus*	3	12-36
Booted Eagle *Hieraaetus pennatus*	1	5-19
Osprey *Pandion haliaetus*	8	10-19
Lesser Kestrel *Falco naumanni*	30	18-46
Common Kestrel *Falco tinnunculus*	28	464-934
Lesser/Common Kestrel *Falco naumanni/tinnunculus*	176	48-127
Red-footed Falcon *Falco vespertinus*	53	135-1,012
Hobby *Falco subbuteo*	65	97-276
Eleonora's Falcon *Falco eleonorae*	4	4-28
Peregrine Falcon *Falco peregrinus*	1	9-25

falcons *Falco*, regularly undertake sea crossings using powered flight (Kerlinger 1989). After crossing the Strait of Sicily, some continue migrating over the Tyrrhenian Sea towards central Italy via the island of Ustica, thus bypassing the Strait of Messina (Agostini 2002). This involves a further sea crossing in excess of 300 km between western Sicily and the Italian peninsula.

Results and discussion

A total of 3,938 migrating raptors was counted at Ustica during 540 hours of observations between 22nd March and 20th May 2002 (table 1). Of these, the most abundant species were Honey-buzzard *Pernis apivorus* (1,822), Marsh Harrier *C. aeruginosus* (1,174), Black Kite *M. migrans* (302) and Montagu's Harrier *C. pygargus* (129). Counts of migrating raptors were grouped into ten-day periods, and the numbers recorded within each interval were then compared to establish peak passage periods.

Honey-buzzard

A total of 1,530 Honey-buzzards passed over Ustica during the first ten days of May. Numbers peaked on 10th May, when 542 birds, 29.8% of the spring total, were counted. Of these, it was estimated that 1,475 (96.4%) were adults, the remainder being first-summers. Many first-summer Honey-buzzards are known to spend the northern summer in Africa, (Forsman 1999), so the low total recorded is not unexpected.

Marsh Harrier

Marsh Harriers migrate earlier than Honey-buzzards, and passage is concentrated within the first ten days of April (fig. 2). Passage peaked on 1st April, when 314 were counted. Our observations confirmed that first-summer birds migrate later than adults and, among adults, males earlier than females (fig. 2). The total number of males, females and immatures recorded during each ten-day period was estimated by multiplying the proportion of individuals of known age/sex by the total count (see Kjellén 1992). To avoid the potential bias resulting from the easier identification of adult males, the proportion of females and immatures was estimated by dividing known females/immatures between the two age classes according to their proportion among the identified birds. It proved possible to establish the age/sex of 422 Marsh Harriers in total (58, 198, 46, 46, 53, 21 during each ten-day period respectively).

During the first two of the six ten-day

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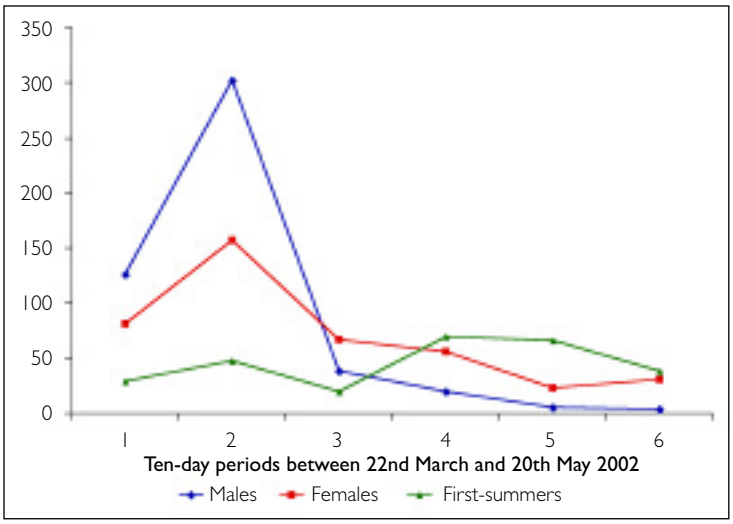


Fig. 2. The occurrence of migrating Marsh Harriers *Circus aeruginosus* over Ustica, southern Italy, between 22nd March and 20th May 2002, during the six ten-day periods of the study.

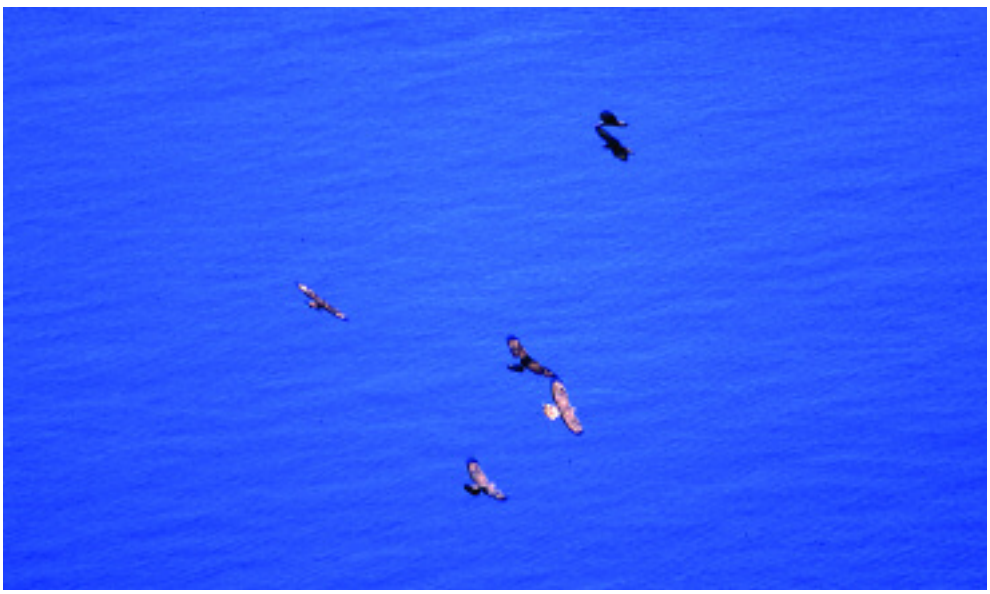
periods, males (428) outnumbered females (238) (χ^2 = 53.64, d.f. = 1, P < 0.01), while during the remaining four ten-day periods, females (176) outnumbered males (66) (χ^2 = 49.09, d.f. = 1, P < 0.01). Moreover, of 277 birds reaching the northeast coast of the island and then pausing during migration, it is interesting to note that immatures (197) outnumbered adults (80) (χ^2 = 48.57, d.f. = 1, P < 0.01). This difference may reflect the fact that immatures are less strongly motivated to migrate, so migration is more leisurely.

Black Kite

Our observations revealed that Black Kite did not show a peak passage period. This accords well with observations made at the Strait of Messina (Agostini 2002). Adults were recorded throughout the period, while immatures migrated only during the second month of observation. In this species, some pairs commence breeding in Europe at the end of March, while others do not start until May (Cramp & Simmons 1980).

Discussion

These observations establish that raptors crossing the Tyrrhenian Sea make use of Ustica in one of two ways: either as a temporary migration stopover during which birds can rest and feed, or as a means of gaining altitude on the rising thermals above the island before con-



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250. Honey-buzzards *Pernis apivorus*, Ustica, southern Italy, May 2002.

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tinuing on their migration. Our data compare well with observations at the Strait of Messina and over Marettimo (Agostini & Logozzo 1998; Agostini 2001; Corso 2001). Not surprisingly, few broad-winged raptors, which require thermals of rising air to assist in their migration, were recorded on Ustica. Conversely, the low numbers of falcons and Ospreys reported during this survey probably reflects the fact that these species are less attracted by islands during sea crossings, being able to use powered flight with relatively low expenditure of energy, and thus migrating across a broad front (Kerlinger 1989).

Although based only upon a single season of observations, these findings seem to confirm the importance of Ustica for migrating raptors. Further studies are required to establish whether similar numbers pass each year, and these are planned. If numbers remain consistently high each spring, they may be sufficient to warrant the recognition of Ustica as an Important Bird Area for the spring migration of raptors in the Mediterranean basin (Grimmett & Jones 1989).

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Is the Conero promontory, central Italy, an important bridge for migrant raptors entering eastern Europe in spring?

Spring passage of raptors crossing the Mediterranean region is concentrated through three main bottlenecks: Gibraltar, the Strait of Messina and the Bosporus (Zalles & Bildstein 2000). Having crossed the Strait of Messina, raptors breeding in eastern Europe pass over the Apennines ridge and, from there, cross the Adriatic Sea. Recent studies by Gustin *et al.* (2002) suggest that the Conero promontory, located on the Adriatic coast of central Italy within the Monte Conero Natural Regional Park (43°32'N, 12°45'E) is a preferred starting point for this sea crossing (fig. 1). Nonetheless, raptor migration through the Conero promontory has, until recently, been poorly studied. In recent years, the Lega Italiana Protezione Uccelli (LIPU) has co-ordinated a series of surveys, intended to establish the magnitude and diversity of migrating birds using this region. This paper presents the results of the first three years of these surveys, and highlights the need for further in-depth investigation.

Spring raptor movements at the Conero promontory

Between 1999 and 2001, daily observations were carried out from the Pian Grande watchpoint, located 415 m above sea level along the northern sector of the Conero promontory, to monitor the number of migrating raptors passing through this region. Observations commenced on 20th April and continued until 20th May, although in 2001 observations were also carried out from 20th March to 15th April. The number of observers varied daily, between two and ten, each equipped with 10× binoculars and