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## Status of the Saker Falcon (*Falco cherrug*) in Italy: past, present and future

Andrea Corso & Paul Harris

**ABSTRACT**—Saker Falcon was a fairly common wintering and passage species in Italy from the 19th to the 20th centuries, when it apparently became much scarcer, in certain regions of Italy its status turned even to irregular or vagrant. In this brief overview, we provide a summary of its present status, giving some insight of its past, present and postulated future presence in Italy. The known records in the last 10 years in Italy range from a few birds up to twenty individuals annually; however, due to the extreme paucity of observers in Italy, the huge and varied territory potentially suitable, and the scarcity of focussed search for the species the number of birds annually wintering and passing through Italy is definitely much higher. An estimation, using percentage of those birds radio-tagged in Hungary reaching Italy (versus the birds choosing a different destination) and the number of adult breeding birds, is given in order to make an attempt to define a first, though only indicative, figure of the potential number of Sakers reaching annually Italy, in order to show that this country is a fairly important area for the species and where urgent protection actions should be undertaken.

**Key words:** *Falco cherrug*, Italy, past and recent status, estimation of occurrences

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### Introduction

Italy is one of the richest European country for bird diversity, and a very important area for breeding, migrating and wintering raptors (Corso & Iapichino, 1998; Corso, 2001, 2005; Brichetti & Fracasso, 2003) with the most important known world population of Lanner (*Falco biarmicus*) of the ssp. *feldeggii* (Corso, 2001c) and a healthy and expanding population of Peregrine (*Falco peregrinus*) (Brichetti & Fracasso, 2003; Corso, 2005). The country lies to the West of the known breeding range of Saker Falcon (*Falco cherrug*) (Cramp & Simmons, 1980). This latter, endangered species was formerly regular and fairly common during winter time and on migration in Italy (Arrigoni degli Oddi, 1929; Martorelli, 1931; Brichetti & Fracasso, 2003), and the southern regions such as Apulia were probably amongst the most important wintering areas of the species in Europe (Foschi, 1986). The records became scarce and irregular during the mid 20th century. In the last fifteen years radio-satellite tracked birds from Hungary and also from other countries (Austria, Slovakia e.g.) have shown together with an increasing number of observations that Italy should still be considered a very important area for Saker Falcon. In this paper, a brief overview of the past and recent status of Saker is given, while tentatively, an estimation of the number of birds reaching Italy is furnished according to the percentage of radio-satellite tagged birds that reached the country in the last decade.



**Figure 1.** Past records (1800–1986) of Saker Falcon (*Falco cherrug*) in Italy. Most records are concentrated in the Puglia region, with >40 specimens collected (see text) and between Calabria and Sicily, chiefly at the Strait of Messina area. It was quite frequent in Central Italy but fairly scarce in Northern Italy.



**Figure 2.** Recent Italian records (1987–2012) of Saker Falcon (*Falco cherrug*) in Italy. Most records are concentrated in Sicily, where it is a regular wintering and migrant bird at the Strait of Messina area. It is also regular, chiefly during winter, in Central Italy (like Lazio, Tuscany, Abruzzo and Marche) while it is scarce in Northern Italy.

## Analysis of data

### *Past Italian records of Saker Falcon (from 1800 to 1986)*

According to historical records (1800 till 1980), the species was regular in Italy, found mainly in the Southern regions (Figure 1). It was common and widespread, especially during pre-breeding migration and winter, with several dozen birds captured in Apulia, South-east Italy (>40 specimens), showing that this region must have been a main wintering ground for European Sakers at the time (Arrigoni degli Oddi, 1929; Foschi, 1986). In addition, there were several records from Sardinia as well, where the species is only recorded occasionally in more recent times (Brichetti *et al.*, 1992; Brichetti & Fracasso, 2003).

The information found in major historical ornithological reference works for Italy is summarised as follows. According to Arrigoni degli Oddi (1929) the species was difficult to obtain, being the commonest in Puglia and Calabria regions, but also frequently recorded in Sardinia. In Arrigoni's bird collection, nowadays preserved at Museo Civico di Zoologia di Roma (MCZR), there are still 12 specimens, mostly taken in Southern Italy; of those, four birds were taken during the pre-breeding migration in April–May at Reggio Calabria,

Strait of Messina, while three were collected in Sardinia in spring and autumn, two in Northern Italy and one in Central Italy (Foschi *et al.* 1996; AC, unpubl., C. Marangoni, pers. com.). The species, however, was probably more common than shown by such a few number of captures and, based on some summer records, there were even speculations that it might have bred in Italy (Arrigoni degli Oddi, 1929). Giglioli (1886, 1907) characterised the species as fairly common both in winter and during migration. He mentioned 22 records, and he referred to Calabria, chiefly the Strait of Messina, as an area where the species was a regular pre-breeding migrant between March and May. According to Martorelli (1931) the species was also common and possibly even a breeding bird. Foschi (1986) quoted 20 individuals captured with traps in Foggia province, Puglia region (South Italy) between 1905 and 1927; in his bird collection, preserved at Museo Ornitologico Ferrante Foschi in Forlì, there are three juvenile females caught in September 1911, February 1930 and November 1942 (Foschi, 1984). Interestingly, one of the authors (AC), during an extensive study of skins in various European museums, found as much as 40 skins (mostly juvenile) preserved (Tring, Wien, Paris, Malmo, Milan, Roma, etc.) all labelled as being collected in Apulia, Foggia area, either in February or November between the years of 1911 and 1930.

These data prove that southern Italy, and Apulia in particular, was certainly well-known to bird collectors and ornithologists as an important wintering ground for Sakers, and that many birds were easily found in this area. Further south, Lucifero (1901) recorded the capture of two birds while migrating at the Strait of Messina, Reggio Calabria, in April 1892 and 1899. Brichetti *et al.* (1992) mentioned 40 records up to 1992, mostly from the period between 1800 and 1950 with records becoming scarcer afterwards. According to certain authors (Martorelli, 1931; Foschi, 1986; Sorci *et al.*, 1972 e.g.), most birds were aged as juveniles or immatures.

#### ***Recent data of Sakers in Italy (from 1987 to 2012)***

Current assessment of the Italian status of Saker is biased for at least two known reasons: the species is easily misidentified and the sampling effort considerably increased recently due to migration monitoring campaigns and due to a much higher number of observers in the country nowadays. While it was relatively easy to collect or at least see the species by bird collectors or ornithologists (chiefly in the 19th to mid 20th century), the species became scarcer and the species was considered a rare vagrant after the mid 1980s. From this time on, confirmed records became scarcer in Italy. In particular, examination of the photos of claimed records from 1990 to 2012 (checked by AC) indicate that 20 out of 31 birds claimed (64.5%) were misidentified juvenile Peregrines (*Falco peregrinus calidus* Latham, 1790) from the North (mostly females due to their huge size). Similarly, 15 of the 32 (46.8%) specimens (analysed by AC) in Italian museums and bird collections were indeed re-identified as being juvenile *calidus*, captured during migration or winter—this subspecies is regular and common as well as being widespread throughout Italy (Corso, 1999; 2001); the same problem occur regularly elsewhere in Europe (Corso, pers. obs. and data from the Association of European Rarities Committees) and being recognized as a common pitfall identification problem with *Falco biarmicus* and *Falco cherrug* (Duquet, 2011).

Year	No. of birds	N Italy	C Italy	S Italy
2003	3 (3 juv.)		2	1
2004	6 (5 juv.)		4	2
2005	5 (1 juv.)	2	3	
2006	4 (4 juv.)	1	3	
2007	8 (6 juv.)		6	2
2008	12 (8 juv.)	2	5	5
2009	11 (8 juv.)		6	5
2010	13 (7 juv.)	1	3	9
2011	3 (3 juv.)		2	1
2012	6 (6 juv.)		2	4
<b>Total</b>	71 (51 juv.)	6	36	29

**Table 1.** Number of Saker Falcons (*Falco cherrug*) reported in Italy annually in the EBN Italia annual report for the years 2003–2012 according to different geographical areas (Northern, Central and South Italy – as shown in Figure 1); numbers of juveniles (juv.) are indicated in brackets

Brichetti & Fracasso (2003), reported that the species was a regular on passage during both the pre- and post-breeding migration, while it was irregular in winter; Saker records were far more abundant in historical times, decreasing progressively after the mid 20th century. The same authors also reported that the migration was more regular and conspicuous in southern Italy, while scarcer in central Italy and occasional, if not very rare, in north Italian regions (Figure 2). According to them four birds were counted at Monte Brisighella (Marche, central Italy) during spring 1993 and one at the nearby Mt. Conero during the 1987–1990 spring surveys.

For Sicily, only six old records were listed between 1967 and 1989 and eight records between 1990 and 2005 (Corso & Iapichino, 1998; Corso, 2005). One to three birds were counted annually at the Sicilian side of the Strait of Messina during pre-breeding migration by the MAN-WWF group (Corso, 2001b; 2005).

In the annual reports of EBN Italia a total of 71 Sakers were reported from 2003 to 2012 (Ruggieri, 2003, 2004, 2005; Ruggieri & Sighelle, 2007, 2008; Ruggieri & Nicoli, 2009, 2010, 2011, 2012, 2013), of which 51 (71.8%) were aged as juveniles. The geographical distribution of data indicates a concentration of observations in central and southern Italy, with 36 records in the former and 29 in the latter area, respectively. However, due to the paucity of birdwatchers and ornithologists in the southern regions, the species is far more common than what data indicate. In particular, Sicily and Apulia are definitely the most important wintering areas in Italy (Corso, 2005) and possibly one of the most relevant ones in the Mediterranean basin (M. Prommer, pers. com.).

Considering also unpublished records, we are aware of 21 records during the years 2003–2005, 31 records during 2006–2008 and more than 20 records in 2009 alone (mostly during the winter of 2009/2010) and a total of 35 records from 2010 until January 2013 (Corso, pers. data; EBN list and forum online). As far as seasonality is concerned, 40 records refer to wintering and 18 records to—mostly pre-breeding—migration. We can state therefore that this species winters regularly in Italy and is also a relatively regular passage migrant. The higher number of spring records is most probably because there are far more raptor migration surveys throughout Italy during this season. The species is most abundant

	2007	2008	2009	2010
Estimated breeding population in Hungary (pairs)	172-190	180-200	216-230	220-230
Number of fledged juveniles	348	341	429	176
Total number of adults	≥ 344	≥ 360	≥ 432	≥ 440
Total number of 1st year birds	348	341	429	176
Total number of 2nd year birds			?	
Total number of 3rd year birds			?	

**Table 2.** Breeding numbers and success rates of Saker Falcon (*Falco cherrug*) in Hungary, during 2007–2010 (M. Prommer, pers. com.; Saker Group).

	2007 (M+F)	2008 (M+F)	2009 (M+F)	2010 (M+F)
Number of satellite-tagged birds of same year	10 (5+5)	19 (9+10)	13 (5+8)	2 (0+2)
Cumulative number of satellite-tagged birds	10 (5+5)	29 (14+15)	42 (19+23)	44 (19+25)
Calculated number of 1CY birds wintering in Italy	61	60	75	31

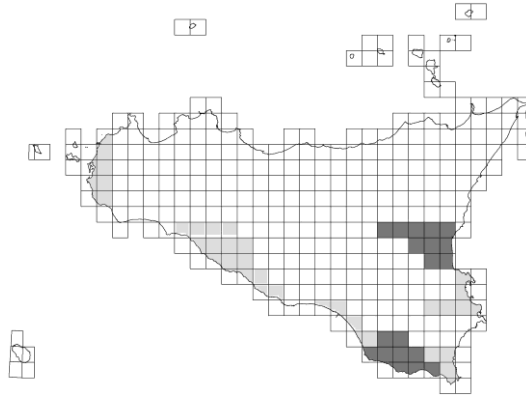
**Table 3.** Satellite-tagged Saker Falcons (*Falco cherrug*) in Hungary between 2007–2010 (M = males; F = females) with the calculated minimum numbers of first calendar year (1CY) birds wintering in Italy (method of calculation is explained in the text)

in Central and Southern Italy (Table 1, Figure 2) with Sicily being the most important wintering region in Italy (Figure 3).

Interesting records, the southernmost known for Italy and one of the southernmost records in Europe, were done during migration movements on islands of the Sicilian Channel: 1 juv. observed by the MISC group at Linosa, Pelagie Archipelago (AG) (Sicilian Channel, Sicily) in November 2010 and in November 2012, 1 observed at Lampedusa island (AG) (Sicilian Channel, Sicily) in September 2012 (Ruggieri & Nicoli, 2011; 2012; 2013), as well as from the past records, 1 bird being collected in April 1910 at Pantelleria island (Agri-gento, Sicily, Sicilian Channel) (preserved in Arrigoni degli Oddi's collection at MCZR).

#### **Mathematical evaluations from the project data**

A preliminary calculation, largely based on the results from the Hungarian satellite-tracking project, estimates that at least 30 to 75 1CY Sakers may be expected to winter in Italy annually (Tables 2 and 3 and estimated values given below). In future years, with more data available hopefully, it will be possible to estimate this value with more precision. Thanks to satellite tracking studies on Sakers it is possible to have precise data on their winter movements, and even though the total number of tracked individuals is not extremely high currently, some conclusions can be drawn from the data available. The aim of this brief mathematical study is to estimate how many of those Sakers born in Hungary winter in Italy. As input data we used the breeding survey data in Hungary from 2007–2010 (Table 2) and the total number of satellite-tagged Sakers in Hungary (Table 3) (M. Prommer, pers. com.).



**Figure 3.** Known wintering areas of Saker Falcon (*Falco cherrug*) in Sicily; sites with fewer records were indicated in light grey while areas with records annually were indicated in dark grey (based on data from Hungarian and Austrian birds tracked with radio-satellite telemetry and from direct field observations)

The following Hungarian Sakers wintered in Italy or visited the country at least briefly: *Barna*—2007/8, 2008/9, 2009/10; *Julia*, *Konrád*, *Boglárka*, *Csanad*, *Izabell* (brief visit), *Romi*—2008/9; *Attila*, *Lucia*—2009/10 (the names were given to the individuals at the time of their tugging). Altogether, there were 11 Sakers from Hungary occurring in Italy during the winters 2007/2008, 2008/2009 and 2009/2010. *Barna* wintered in the same area in Sicily for 3 consecutive winters.

*Izabell's* case was also unique as she had a very short visit to Italy, from 29–30 October 2008, much in the same way as *Julia* briefly visited Sardinia on the 19th/20th November 2008. Thus *Izabell* cannot be considered as a true wintering Saker in Italy, and so we can calculate only with 10 true wintering records, of which three refer to the same individual (*Barna*). But what is the total sample size of wintering Sakers for these three years? Eliminating the wintering of individuals where data is unavailable for some reason (death, malfunctioning, etc.), there are 43 wintering seasons of tagged Sakers with their movements accurately recorded. Of these records, 10 (or 23.3%) refer to Italy. However, several Sakers did not migrate very far and therefore cannot be considered as true migrants. If we calculate only the true migrant Sakers, there are 16 cases and Italy represents  $10/16 = 62.5\%$  of the raptors' choice as a wintering destination (in both cases we counted all the repeated visits of *Barna* to Italy; we do not know yet if such a wintering site fidelity is an exceptional case or it represents accurately the wintering behaviour of Sakers). So how many Sakers can be estimated to winter in Italy? The sample size is not very large, so we need to be careful not to over-estimate this value. Therefore we assume that only juveniles (1CY) migrate extensively (we only have four Sakers which have been monitored for more than one winter, and out of these three were basically non-migratory, the 4th being *Barna*). A total of 31 1CY birds were providing satellite data during their 1st winter with 26 (84%) being migratory and 5 non-migratory (*Prommer et al.*, 2012).

We have accurate data for 43 wintering seasons of Sakers, of these in 27 cases the birds were relatively “sessile” in the Carpathian basin, while 14 birds in 16 cases (*Barna* wintered 3 times) were long-distance migrants. Out of these 14 individuals, 8 wintered (in 10 cases) in Italy. Data on the migration behaviour of 2CY and 3CY birds is not sufficient to draw any conclusion. At this time we can only apply conservative calculations using these figures. We must also bear in mind that 7 young Sakers out of 44 (15.9%) certainly died before they had time to migrate. A further 6 birds ceased to provide signals due to malfunction of the transmitter or they may have perished together with the unit before their migration age, so it is safe to say that, according to our data, 31 out of 44 (70.5%) 1CY Sakers survived definitely long enough to start migration. Out of these 1CY birds, 8 (30.7% of the 26 true migrants or 25.8% of all 1CY birds providing satellite data during migration time) wintered in Italy.

If we assume that 70% of young Sakers reach a migrating age and only 25% of these birds winter in Italy (instead of the calculated 70.5% and 25.8%, respectively) then 17.5% (70% times 25%) of the fledged juveniles in Hungary can be expected to winter in Italy in any year. This would mean, using the fledged young figures in the first tables, that at least 61, 62, 78, and 32 1CY Sakers may be expected to have wintered in Italy during the winters of 2007/8, 2008/9, 2009/10 and 2010/11, respectively. These figures may overestimate real values due to a possible statistical distortion resulting from a relatively small sample size, but it is much more likely that numbers are significantly higher, rather than smaller, for 3 reasons. (1) We assumed only 1CY birds are long distance migrants for winter (we know this is certainly not always true from the example of *Barna*; and from Table 1 we can see that only 72% of the Sakers observed in Italy are juveniles). (2) We have rounded down the percentage values used for our calculations (to 70% from the 84.1% of probable and 70.5% of definite survivor rate of all Hungarian juvenile Sakers and to 25% from 25.8% for 1CY Hungarian migrants wintering in Italy). (3) Most importantly, we have only considered Sakers born in Hungary, i.e. deriving from the population figures given in the Hungarian Saker satellite study. It is certainly possible, given the very long distances some of these Sakers undertake, that a significantly higher number of Sakers visit Italy from other countries with viable populations. Radio-tagged birds from Slovakia and Austria have in fact reached Italy in the last few years (*A. Gamauf*, pers. com.; *M. J. Riesing*, pers.com.).

## Discussion

In the past, Saker Falcon was more common with a more widespread breeding range (*BirdLife*, 2010), and therefore Italian records were also more numerous. However, as shown by the latest available data it seems that there has been a positive trend during the last 15 years. With the present state of knowledge it is premature to state if this is mainly due to an increase in awareness—also thanks to the radio-satellite projects in Hungary, Austria and other countries—and better identification skills and increasing numbers of Italian birdwatchers, or whether the positive trend is also due to a real increase in Saker occurrences in Italy. Some data indicate that latter is the case: in Sicily, where observation efforts and skills can be considered stable for the last 20 years, there is an increase in the



numbers of Sakers observed (Corso, 2005; Brichetti & Fracasso, 2003; Ruggieri, 2003, 2004, 2005; Ruggieri & Sighele, 2007, 2008; Ruggieri & Nicoli, 2009, 2010, 2011, 2012, 2013). Radio-satellite projects demonstrated that the number of wintering and migrating birds in Italy is even higher, and this difference is due to the very scarce numbers and localised distribution of observers in such a large and habitat-rich country, where a good coverage of the territory is not possible. Direct passage observations also support the overlook hypothesis: Thiollay (1977) reported up to 25 Sakers observed at Cap Bon, Tunisia, during pre-breeding migration, flying towards Sicily.

We urge extensive surveys on the presence of Saker in the future all over Italy with more skilled observers involved. Also, Italy being without doubt one of the most important wintering country, at least in Europe, for this endangered species, conservation measures and actions should be undertaken by LIPU.

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