



CONSERVATION PLAN FOR WINTERING SAKER FALCON (*FALCO CHERRUG*) IN SICILY



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INTRODUCTION

The decline of biodiversity has been observed across the globe in the last century as a result of human overpopulation and related to economic activities. While it is a globe-wide phenomenon, not all the species are affected in the same way. Some species are more adaptive and cope well with human 'development', and some species are especially threatened because of their sensitivity. Usually, the smaller a species' population and the more specialised a species is, the more threatened it is. However, there are special cases, when an adaptive species with a large distribution range gets in trouble. It is exactly the case with the Saker Falcon. The species' decline has started decades ago, when large-scale agricultural and infrastructure development land transformation, intensive use of pesticides, direct persecution have created a very unfavourable environment for all birds of prey. The situation has become even worse for Saker Falcons being a favourite bird of falconers in the Gulf. The pressure on the decreasing population is still strong especially in Central Asia. International conventions and the species position on the conservation priority lists well reflect its delicate conservation situation.

The situation of the species is slightly better in Europe. After the worst period in the 1970s and 1980s, when about 30 pairs were known, the population in Central Europe recovered by the end of 2000s to more than 300 pairs¹, and now shows a slightly increasing trend. Based on ringing and satellite tracking data, a part of the Central European population spends the winter in the Mediterranean. The southern part of Italy and Sicily within is apparently the most important wintering area of the Central European population, therefore requires special attention from Saker Falcon conservation point of view.²

It is very important, therefore, to prepare a conservation plan that shows decision-makers the most important measures to be taken. This document attempts to provide a frame for a more detailed conservation plan tailor-made for Sicily. It is compiled by Hungarian Saker Falcon experts, and birds of prey experts in Sicily. The conservation plan is based on the latest information about the species, gathered mainly in the wintering Saker conservation project in Sicily. The project, as well as the preparation of the conservation plan was kindly supported by Nando Peretti Foundation³.

1 http://www.cms.int/species/raptors/saker_falcon_tf_stakeholders_ws/presentation_10_kovacs.pdf

2 http://sakerlife.mme.hu/uploads/File/laikus_saker_2010_en.pdf

3 <http://www.nandoperettifound.org>

SPECIES DESCRIPTION

Ecology of the Saker Falcon

Saker Falcon (*Falco cherrug*) is a mid-sized, brownish-coloured bird of prey, and the second largest falcon species in the world. It is physically adapted to hunting close to the ground in open terrain, combining rapid acceleration with high manoeuvrability, thus specialising on mid-sized diurnal terrestrial rodents (especially susliks – *Spermophilus spp.*) of open grassy landscapes such as desert edge, semi-desert, steppes and arid montane areas; in some areas, particularly near water, it switches to birds as key prey, and has recently substituted domestic pigeons for rodents in parts of Europe (Baumgart 1991, Snow and Perrins 1998). It uses copses or cliffs for nest sites (sometimes even the ground), occupying the old nests of other birds (Baumgart 1991, Snow and Perrins 1998). Clutch size varies from two to six, with means from 3.2 to 3.9 in different circumstances (Baumgart 1991, Snow and Perrins 1998). Breeding success varies with year (especially in areas where rodents cycle) (Baumgart 1991, Snow and Perrins 1998). Birds are sedentary, part-migratory or fully migratory, largely depending on the extent to which food supply in breeding areas disappears in winter (Baumgart 1991, Snow and Perrins 1998).

Distribution and population

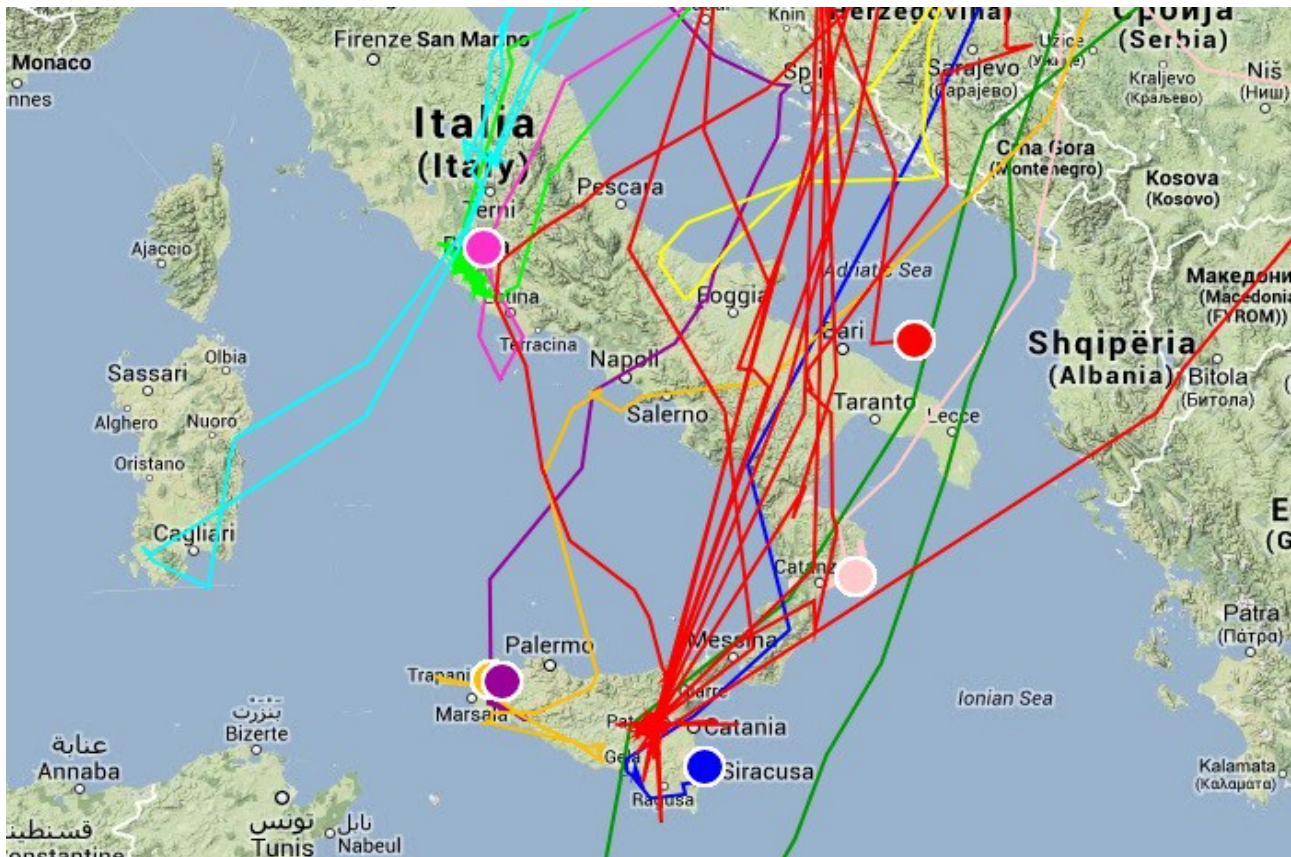
The Saker Falcon occurs in a wide range across the Palearctic region from eastern Europe to western China, breeding in **Austria, Hungary, Czech Republic, Slovakia, Serbia & Montenegro, Bulgaria, Romania, Moldova, Ukraine, Turkey, Iraq, Armenia, Russian Federation, Uzbekistan, Tajikistan, Kyrgyzstan, Kazakhstan, Mongolia and China**, and at least formerly in **Turkmenistan** and probably Afghanistan, possibly India (Ladakh), with wintering or passage populations regularly in **Italy, Malta, Cyprus, Israel, Jordan, Egypt, Libya, Sudan, South Sudan, Tunisia, Ethiopia, Kenya, Saudi Arabia, Yemen, Oman, UAE, Bahrain, Kuwait, Iran, Pakistan, India, Nepal, Afghanistan and Azerbaijan**, with much smaller numbers or vagrants reaching many other countries (Baumgart 1991, 1994, Snow and Perrins 1998, Haines 2002, ERWDA 2003). The historical and present global population size remains subject to considerable uncertainty; however, a revised analysis of available data has resulted in a global population estimate of c.17,400-28,800 breeding pairs (median c.22,100) in 1990. A total population of c.6,400-15,400 pairs (median c.10,900) is calculated for 2010. The populations in Europe, and probably in Mongolia, are now increasing (A. Dixon in litt. 2012), but the overall population trend is estimated to be negative. Assuming a generation length of 6.4 years and that the decline in the species's population had already begun (at least in some areas) prior to the 1990s (consumption in the Middle East was heavy already by the mid-1980s), the overall population trend during the 19-year period 1993-2012 equates to a 47% decline.

The main reasons behind the decline are: loss of breeding places and hunting grounds, electrocution, human persecution (shooting, poisoning) and trapping. The population status resulted in a higher international conservation status: the species is in Annex I of Convention on the Migratory Species (or Bonn Convention), Annex I of the EU's Bird Directive, Annex II of CITES and it is classified as 'Endangered' on IUCN's Red List. In addition, Saker Falcon is under legal protection in almost all across its range states. It must be added though that solely the legal protection does not guarantee the effective and efficient conservation of the species, if it is not paired with an efficient law enforcement.

THE STATUS OF SAKER FALCON IN CENTRAL EUROPE

Population history

The Central European population has gone through a large increase in the last three decades. Due to agricultural practices, including intensive pesticide use, illegal harvest, persecution and spread of electrical infrastructures like mid-voltage power lines, the population decreased to 13 known and 30 estimated pairs in Hungary and there were hardly any known pairs in the neighbouring countries. As a result of intensive conservation work, the Central European population exceeds 300 pairs, having the largest number of pairs in Hungary, which is the natural centre of Central European population because of having the largest proportion of flat steppe and agricultural areas.



Movements of eight Hungarian and Slovak satellite-tracked Saker Falcons visiting Italy 2007-2012

Movements

Saker Falcon is a partial migrant species, which means that a part of the population leaves the breeding ground for winter. Data of 30-year ringing and satellite-tracking since 2007 show that juveniles may cover large distances in the post-fledging period and can reach even Kazakhstan, however most of them stay in Pannonian basin. In the first autumn all juveniles move towards southwest regardless their actual position, and travels 50-3000 km. As most juveniles start the south-westward journey from the Pannonian basin, most birds arrive in South-Italy and Sicily (Prommer et al., 2012). It is interesting to see, that observations of Saker Falcons in Italy reflected the population changes in Central Europe: observations decreased in the period 1950-1980, and significantly increased since 1980 (Corso & Harris, 2012).

A few migrating Saker Falcons reach even North-Africa and winter in the Sahel. A large part of them, however, stay within the natural borders of the Pannonian basin. (Prommer et al., 2012)



An adult male Saker tagged with satellite-tracking device

In the spring, they return to their last position before autumn migration and keep travelling around in the coming years, until they get matured and start to breed. According to our recent knowledge, birds are insisting on their wintering sites and they keep returns every year. That gives another good reason for conservation efforts in the wintering grounds.

Diet

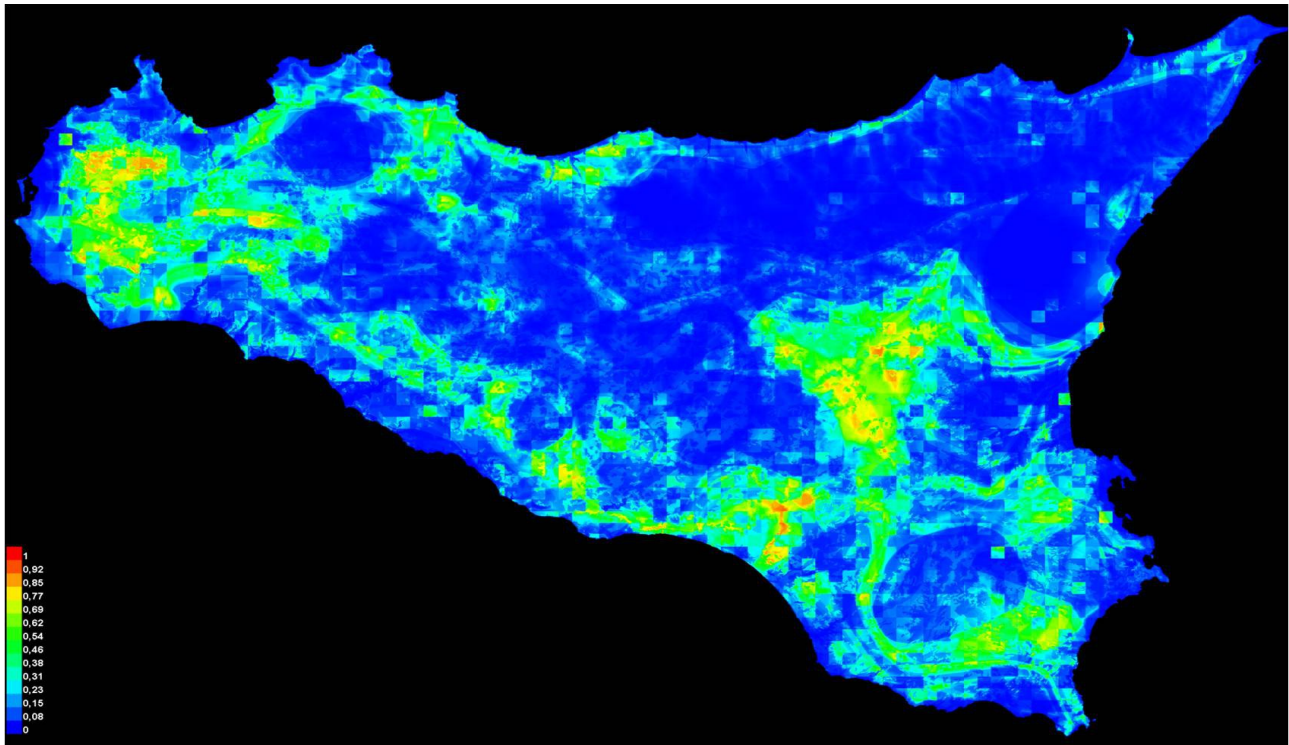
In the breeding season, Saker Falcons' main diet consists of small rodents like *Spermophilus* and *Microtus spp.* and birds up to the size of a pigeon. Usually, they hunt for themselves, however taking prey from other raptors are also an important strategy for them. In the wintering ground, the proportion of birds increases. In Sicily, feral pigeons (*Columba livia ssp. Domestica*), Starling (*Sturnus vulgaris*), Spotless Starling (*Sturnus unicolor*) and lark species (*Alauda spp.*) form the main part of Sakers' diet. Interestingly – unlike in the breeding ground – *Arthropodae* form also an important part of their diet, as the field research during the Sicilian Saker project revealed. Similarly high percentage of arthropods was found in the diet of a Saker wintering in Niger (Housseini, 2012).



In Sicily, feral pigeons are the most abundant prey items of Saker Falcons

SAKER FALCON IN ITALY AND IN SICILY

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. 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 satellite-tracked in Hungary reaching Italy (versus the birds choosing a different destination) and the number of adult breeding birds shows that Italy is a fairly important area for the species hosting 31-75 individuals each winter estimatedly (Corso & Harris, 2012), which can be as high as 18% of the annual cohort.



Suitable areas for Saker Falcons in Sicily based on GIS modelling. Suitability increases from blue to red. The GIS model was prepared in co-operation of Palermo University and MME/BirdLife Hungary

In the past, Saker Falcon was more common with a more widespread breeding range, 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. 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: there was a report about 25 Sakers observed at Cap Bon, Tunisia, during pre-breeding migration, flying towards Sicily (Corso & Harris, 2012).

As for the Sicilian wintering sites, analysis of data from satellite-tracked Hungarian and Slovak Saker Falcons shows that wintering Sakers – similarly to breeding ground – prefer to stay in

lowland or slightly hilly agricultural areas and avoid mountains and forests. GIS modelling based on known Saker movements and various environmental factors has cleared that overall winter precipitation, mean temperature, altitude above sea level and land use diversity are the most important factors respectively, that determines the presence of Sakers in Sicily. According to the model, Trapani province, Catania plain and Gela plain are the most suitable regions for Sakers in Sicily (see map), therefore conservation efforts should be targeted on those areas.



Roosting site (the eucalyptus tree) of a satellite-tracked Hungarian Saker Falcon near Castel di Iudica on a typical wintering ground with open habitat and arable land

THREATS AFFECTING SAKER FALCON POPULATION IN THE SICILIAN WINTERING GROUND

In Sicily, just as in other parts of the species range, there are a number of factors that affect negatively Saker Falcons. Direct and indirect threats are both present in the area, and the seriousness of threatenedness is shown by the fact that three out of five wintering Sakers never returned to Central Europe, but were killed in Sicily.

Habitat change and habitat loss

Traditional agricultural practices in Sicily has well supported the wintering Saker Falcon population. However, changing agricultural practices may reduce prey species' populations, thus having negative impact on Sakers. Turning cereal field into woody crop (orchard, vineyard, hop) likely has similar negative effect on wintering Sakers as in case of Lesser Kestrel (Sarà, 2010).

After the 2nd World War, agriculture has transformed significantly. Intensification and increased efficiency in harvest leaves less wasted grain in the field, and has changed husbandry practices and the transformation is still ongoing on the expense of biodiversity. Although, some habitats like wetlands seem to be saved, areas with high biodiversity, but traditionally not considered as conservation areas (e.g. non-intensively grazed grasslands, or traditionally managed cereal fields) are losing their conservation values due to new agricultural practices. The change also includes significant decrease in free ranging grazing animals like sheep and cattle (Massa & La Mantia, 2007). The effects of declining traditional agriculture are reflected in the decreased biodiversity and decreased number of prey animals (Falcucci et al., 2007), which obviously affected also the populations of birds of prey.



Abandonment of non-intensive grazing and subsequent scrub encroachment contributes to habitat loss not only in Sicily

Infrastructure development

Construction of industrial wind farms with large-sized turbines, building roads, motorways, railways, urban and industrial development or tourist facilities has direct and indirect impact on wintering Sakers. The major problem with infrastructure development is that it requires land and in many cases, development affects directly or indirectly natural habitats, as well as agricultural land, both important for wintering Saker population. In general, as

development takes more and more land, so declines the potential wintering area for Saker Falcons. Another problem is that certain type of infrastructure increases the possibility of collision, electrocution, etc. having a direct impact on birds.

Collision with man-made structures

Electric power lines (both high- and medium-voltage), transmission towers, wind turbines and other man-made structures pose a risk of collision to flying birds, especially when hunting. Collisions usually lead to instant death or cause severe injuries to birds with no hope for survival. These structures (wind turbines above all) may also be related to increased stress on birds, as well as increased energy loss, associated with their circumnavigation in various atmospheric conditions (Ruskov 2004). Wind turbines pose direct threat on Sakers as fatal collision can occur. One of the tagged Saker Falcons was found killed very close to a wind turbine in Trapani region and the assumed cause of mortality had been collision. Expanding infrastructure including wind farms, quarries and electric grids may have a negative indirect impact through declining prey animals in the feeding ground.



Wind turbines near Castel di Iudica on a wintering site of a satellite-tracked Saker Falcon

Poisoning by pesticides and chemicals

Besides reducing prey availability, pesticide use may adversely affect Sakers through the accumulation in the food chain and direct poisoning. Poisoning can result in decreased productiveness of pairs or even in the death of individuals. It is well documented that DDT had adverse effects on falcons in the past. However, there is few data available from Sicily in this respect due to lack of research.

Electrocution

Birds can be electrocuted on medium-voltage power lines (usually 10-35 kV) when trying to perch on electric poles. By simultaneously touching two energized conductors or a conductor and any grounded hardware the bird is electrocuted and dies instantly. The problem is most severe in open areas with high prey abundance and with few natural perches. Although bird-friendly design can significantly reduce or even eliminate electrocution, national standards include



An electrocuted Osprey on a typical Saker wintering ground near Catania, 20. December 2013.

dangerous pylon types in many countries. It is also the case in Sicily, however no research has been carried out to date in this respect. During our field visit in Catania plain, we have found an Osprey killed on a pole of a power line, so the risk is clearly there for Sakers too.

Shooting



Buckshot case on a Saker wintering site in Sicily, near Trapani

Shooting is a major mortality cause for all bird species in the Mediterranean and it is the case in Sicily too. During the field visits, hunters were regularly seen in Sakers wintering grounds including also the spots, where two of the tagged Sakers stopped transmitting signals. Buckshot cases were found at many locations during the field visits and a presentation in the closing workshop of the Sicilian Saker project about birds recovering in LIPU's rescue centre in Enna highlighted the problem. Shooting of birds of prey is illegal in Italy, it is practiced all around the country, but especially in South Italy, and it is a serious threat on wintering Sakers.

Trapping

Sakers are trapped in large numbers on migration routes, especially in the Middle East, Pakistan and North-Africa for use in Gulf (Arab) falconry, where it is considered an important threat. It is this trapping in Central Asia, caused by the heavy demand for falcons in the Middle-East since the 1970s-1980s, which has led to the Saker falcon being listed as globally threatened, 'Endangered' species by IUCN. In some Gulf countries such as Saudi Arabia and Kuwait, wild-caught Sakers are the preferred hunting birds for falconry. This market is fed by the trappers (many from Pakistan and Syria) who catch birds on

autumn migration and during post-breeding dispersal eg in Russia, Kazakhstan, China and Mongolia as well as other areas during migration. Turkey probably is/was also an area heavily frequented by trappers. Qatari agents regularly visit North-African countries to purchase trapped falcons (Sakers, Peregrine and Lanners) from local trappers.

Very little information is available on the extent of illegal trapping of European Sakers, however ring recoveries and satellite-tracking data suggest that they are regularly trapped in North-Africa – mostly in Libya. The use of wild-caught Sakers in falconry is not allowed in the following European range states: Bulgaria, Czech Republic, Georgia, Hungary, Russia, Romania, Slovakia, Ukraine. However, illegal trapping certainly occur in Europe, as revealed cases from Hungary, Ukraine, Bulgaria, Georgia, Romania and Turkey show. No such case is known from Italy, but it is known that illegal harvest of Lanner Falcon and Bonelli's Eagle occurs in South Italy, especially in Sicily and Calabria. Based on that, it is likely that migrating and wintering Saker Falcons are also affected on certain level.

In Europe, also pigeon-breeders trap raptors occasionally, who consider Sakers and other birds of prey as a threat to their pigeons.



Spotless Starling (Sturnus unicolor) in Sicily is a potential prey species for wintering Saker Falcons

CONSERVATION ACTIONS TO BE TAKEN IN SICILY

Although Sicily is not part of the breeding range of Saker Falcon, it is in an important wintering area for individual birds from Central Europe. It is very important, therefore, to provide a safe wintering ground for them. Obviously, conservation measures targeting Saker Falcons primarily, will benefit also to other species, especially raptors.

Habitat conservation and agri-environmental schemes

As Saker Falcons prefer open habitat with good density of prey, they regularly choose agricultural areas for wintering. Pastures, and cereal fields mixed with other crops are ideal for them, as well as other wintering birds of prey like Peregrine Falcons, Lanner Falcons, Common Buzzards and Kestrels. It is important, therefore, to maintain nature-friendly agriculture in the well-defined wintering areas and avoid the use of pesticides. Also non-intensive grazing and husbandry along with farm buildings hosting feral pigeons support the survival of wintering birds of prey. Abandoned farm houses and barns maintain rodent and feral pigeon populations that are very important for wintering Saker Falcons. Well-targeted agri-environmental schemes planned and implemented by the Italian government subsidizing farmers for nature-friendly farming will efficiently contribute to maintain the Sicilian landscapes' features important for birds of prey.



Abandoned farm buildings provide habitat for prey species like Feral pigeons, but wind turbines pose threat on Saker Falcons

Nature-friendly spatial planning

Nature conservation aspects must be considered in spatial planning especially as for wind farms. Unfortunately, wind farms have been built in or near the wintering areas of Saker Falcons. As those Saker wintering grounds are largely overlapping with breeding range of

Lanner Falcons, which create an even more serious conflict. Environmental Impact Assessments of planned wind farms, therefore, should consider the presence/absence and territorial movements of birds of prey. Other type of land use, like urban sprawl must also consider nature conservation interests and leave the sites important for birds of prey untouched.

Electrocution

Electrocution is a major threat on birds of prey including Saker Falcons. In Sicily, the problem also exists, however little is known about its extent. It is important to build up a monitoring scheme after a baseline survey and regular surveys must be carried out on various parts of Sicily, in order to identify the problematic lines and start to work on the solution. Parallel to this work, legislation should be change to make the new power lines bird-friendly and encourage companies to insulate the most problematic lines retrospectively.



Saker Falcon perching on an insulated power line pole in Hungary

Shooting & trapping

As a member of the European Union, Italy has adopted the Birds Directive long ago, and it created the relevant national legislation. While that legislation ensures the protection of birds of prey on paper, protection of birds of prey is not ensured at all in the field. Although a spectacular positive change has taken place at the Strait of Messina, when shooting of migrating Honey Buzzards and other birds of prey, in other parts of Sicily (and Italy) law enforcement is inefficient, and bird killing continues. Trapping and illegal harvest of birds of prey are also reported from the region. Law enforcement, therefore, must be strengthened

significantly in order to achieve any further improvement. As the authorities apparently cannot handle the situation, other organisations, NGOs, universities, etc. should get involved. Regular presence of the conservationists in the key areas in hunting and breeding season, as well as co-operation with police, hunters' organisations, foresters, farmers and a targeted communication campaign is indispensable for the successful protection of birds of prey.

Regular monitoring of Saker Falcon population

In order to observe the trends of wintering Saker population, as well as record any changes in land use, threat factors and prey species, a winter monitoring programme must be prepared and carried out. Beside Saker Falcons, such monitoring programme can target other species of birds of prey, and it offers an excellent platform for co-operation between authorities, universities research institutes, and NGOs. The database built on the monitoring programme can serve as a early warning system to indicate any negative changes in the Sicilian agri-ecosystem and shorten the time for reaction.

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