



**LIFE06 NAT/H/000096**  
**Conservation of the *Falco cherrug* in the Carpathian Basin**  
Beneficiary: Bükk National Park Directorate  
3304 EGER, Sánc u. 6.



## **CONSERVATION OF THE SAKER FALCON (*FALCO CHERRUG*) IN EUROPE**

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### ***SHARING THE RESULTS OF THE LIFE06 NAT/H/000096 “CONSERVATION OF THE *FALCO CHERRUG* IN THE CARPATHIAN BASIN” PROJECT***

Bükk National Park Directorate  
Eger, Hungary  
16-18 September 2010



Hungarian partners: Aggteleki-, Balatoni-, Duna-Dráva-, Duna-Ipoly-, Fertő-Hanság, Őrség-, Hortobágyi-, Kiskunsági-, Körös-Maros National Park Directorate, E-misszió Environmental Association, MME/BirdLife Hungary, Provértes Nature Conservation Public Fund

Slovak partners: Raptor Protection of Slovakia, The State Nature Conservation of Slovakia, SOS/BirdLife Slovakia, West-Slovak Electric Company



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## PROGRAMME

### 15 September (Wednesday)

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12:00 – Arrival

### 16 September (Thursday)

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07:30 – 09:30 Registration

09:30 – 09:40 Opening: Welcome by József DUSKA (*Director of Bükk National Park*)

09:40 – 10:00 László HARASZTHY, János BAGYURA: Status of the Saker Falcon in Hungary and Historic Conservation Efforts

### **RESULTS OF THE LIFE06 NAT/H/000096 "CONSERVATION OF FALCO CHERRUG IN THE CARPATHIAN BASIN" PROJECT** (*Chair: József Fidlóczky, LIFE Project Manager, Bükk National Park Directorate*)

10:00 – 10:20 József FIDLÓCZKY, János BAGYURA, Mátyás PROMMER: Overview of the LIFE06 NAT/H/000096 project's results

10:20 – 10:40 Jozef CHAVKO, Lucia DEUTSCHOVÁ: Population of Saker Falcon (*Falco cherrug*) in Slovakia Between 2000 and 2010 in Connection to the Actions Implemented within the LIFE06 NAT/H/000096 Project

10:40 – 11:00 *Coffee Break*

11:00 – 11:20 Péter FEHÉRVÁRI, János BAGYURA, Márta BELÉNYESI, Mátyás PROMMER, József FIDLÓCZKY: Modelling the Spatial Distribution of Saker Falcons in Hungary

11:20 – 11:40 Mátyás PROMMER, János BAGYURA: Satellite-tracking Sakers – Evaluating Sakers' Post-fledging Dispersal, Migration, Roaming and Habitat Use from a Conservation Point of View

11:40 – 12:00 Ervín HAPL, Michal AMBROS, Michal ADAMEC, Stanislav HARVANČIK: Restitution of Suslik (*Spermophilus citellus*) in Slovakia within the LIFE06 NAT/H/000096 Project

12:00 – 12:30 Press Conference

12:30 – 14:00 *Lunch*



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- 14:00 – 14:15 József FIDLÓCZKY, Mátyás PROMMER: Overview of the LIFE06 NAT/H/000096 Project's communication
- 14:15 – 14:25 József FIDLÓCZKY: Introducing the new Bulgarian-Hungarian-Romanian and Slovak-Saker Conservation LIFE09NAT/HU/000384-Nature Project
- 14:25 – 14:45 Opening the Poster Section
- 14:45 – 15:00 *Coffee Break*
- 15:00 – 17:00 Round table discussion: *Supervising the European Saker Action Plan – When, How, Who?*
- 17:00 – 19:00 Free Programme (Sightseeing)
- 19:00 – 20:00 *Dinner*
- 20:00 – 20:30 A Bird Returns - Presentation of the Project Film

### **17 September (Friday)**

#### **SAKERS IN CENTRAL AND EASTERN EUROPE** (*Chair of the session: Mátyás Prommer, BirdLife Hungary*)

- 09:00 – 09:20 Václav BERAN, Vlasta ŠKORPIKOVÁ, Martin VALÁŠEK: Saker Falcon in the Czech Republic
- 09:20 – 09:40 Slobodan PUŽOVIĆ, Marko TUCAKOV, Nikola STOJNIĆ: Current Status and Conservation of Saker Falcon *Falco cherrug* in Serbia
- 09:40 – 10:00 Dimitar GRADINAROV, Petar IANKOV: BSPB Saker Conservation Activities in Bulgaria
- 10:00 – 10:20 Yuriy MILOBOG, Vitaliy VETROV: Current Data on Distribution and Numbers of *Falco cherrug* in Ukraine and Moldova
- 10:20 – 10:40 *Coffee Break*
- 10:40 – 11:00 Dimitar GRADINAROV, Petar IANKOV, Mladen GRAMATIKOV, Mátyás PROMMER, József FIDLÓCZKY: Satellite-Tracked Saker Falcon (*Falco cherrug*) Highlights Threats In Staging Area Abroad



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11:00 – 11:20 Dimitar RAGYOV: Southeast European Saker Falcon Network - Scope and Findings

**RELATED STUDIES** (*Chair of the session: Lucia Deutschová, Saker Conservation LIFE Project, Raptor Protection of Slovakia*)

11:20 – 11:40 Xiangjiang ZHAN, Andrew DIXON, Michael BRUFORD, János BAGYURA, Jozef CHAVKO: Population Genetic Structure of the Sakers Across Eurasia

11:40 – 12:00 Xiangjiang ZHAN, Michael BRUFORD, János BAGYURA, Jozef CHAVKO: Study on the Turnover Rates of Saker Falcons

12:00 – 13:30 *Lunch*

13:30 – 13:50 Andrew DIXON: Falconry Hybrids and Saker Conservation: Friend or Foe?

13:50 – 14:10 Elena KMETOVA: Saker Falcon Re-introduction in Bulgaria: Preparatory Activities

14:10 – 14:30 *Coffee Break*

14:30 – 16:30 Round table discussion: Falcon Hybrids and Saker Conservation  
and/or  
Re-introduction of Saker: Human Intervention or Natural Processes?

16:30 – 17:00 Discussing and Accepting the Conference Statement

17:00 – 19:00 Free Programme

19:00 – *Dinner*

## **18 September (Saturday)**

### **Excursion**

The excursion starts in the morning and ends at about 3:00 pm. Further details about the excursion including means of transportation in field will be announced at the registration desk.



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## STATUS OF THE SAKER FALCON (*FALCO CHERRUG*) IN HUNGARY AND HISTORIC CONSERVATION EFFORTS

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In 1901 the Act 24/55 (VII.1) of the Ministry of Agriculture declared 132 species of birds protected, but among them was not a single diurnal bird of prey species, while the Barn Owl (*Tyto alba*), the Short-eared Owl (*Asio flammeus*) and four small owl species, the Little Owl (*Athene noctua*), the Pygmy Owl (*Glaucidium passerinum*), the Tengelmalm's Owl (*Aegolius funereus*), and the Scops Owl (*Otus scops*) were included.

In 1933, hunting ban on the Peregrine (*Falco peregrinus*) and the Saker Falcon (*Falco cherrug*) was introduced from 16<sup>th</sup> March until 15<sup>th</sup> June, and in 1939 it was expanded from 1<sup>st</sup> March to 31<sup>st</sup> August, then in 1940 from 1<sup>st</sup> February to 30<sup>th</sup> September. The whole-year hunting ban was introduced in 1945.

The decree 59/1954 (IX.9.) of the Council of Ministers about the 'Protection of the birds' declared almost all diurnal raptor species occurring in Hungary as protected. The decree lists the exceptions. The legal protection is not applied to the 'harmful' raptor species like Sparrowhawk (*Accipiter nisus*), Goshawk (*Accipiter gentilis*), Black Kite (*Milvus migrans*), Marsh Harrier (*Circus aeruginosus*) and the Hen Harrier (*Circus cyaeus*).

It means that all but five diurnal raptor species became protected and protection of the Kestrel (*Falco tinnunculus*), the Lesser Kestrel (*Falco naumanni*) and the Red-footed Falcon (*Falco vespertinus*) that had been declared in 1906 was confirmed.

The same decree introduces the category of 'strictly protected' species and lists the following raptors under this category: Honey Buzzard (*Pernis apivorus*), Osprey (*Pandion haliaetus*), Red-footed Falcon (*Falco vespertinus*), Saker Falcon, Peregrine, Short-toed Eagle (*Circaetus gallicus*), Red Kite (*Milvus milvus*), Lesser Spotted Eagle (*Aquila pomarina*), Greater Spotted Eagle (*Aquila clanga*), Imperial Eagle (*Aquila heliaca*), Golden Eagle (*Aquila chrysaetos*), Booted Eagle (*Hieraetus pennatus*), White-tailed Eagle (*Haliaeetus albicilla*) and Eagle Owl (*Bubo bubo*).

So the Saker Falcon has been protected in Hungary since 1954 – at least on paper. In practice, however, no one took care of the protection of habitats, nor the nests. It was because no one could have done that: there was neither an institution, nor state organisations and NGOs to do that.



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It is very likely that use of certain pesticides affected the Saker population in the same negative way as it affected the Peregrine population. As Sakers became rarer, they became more and more wanted by falconers and chicks were taken even from the nests of the last remaining pairs.

In 1975, in the second year of MME (Magyar Madártani és Természetvédelmi Egyesület/BirdLife Hungary) the preparation of the Saker conservation work has started with a national census. The population was estimated to less than 30 pairs and nests of only 14 pairs were known. The majority of them bred on cliffs in the hills.

In 2010, nests of more than 170 pairs are known and the population is estimated to more than 200 pairs in Hungary. Many things happened in Hungary in the last 35 years. The census was followed by nest guarding, Souslik (*Spermophilus citellus*) repatriation and declaration of legal protection of the species, insulation of pylons of mid-voltage power lines, systematic actions against illegal nest robberies, continuous public awareness raising, showing the Saker on the 50 Ft coins and many other activities.

The conservation of the Saker Falcon became one of the first big success stories of Hungarian nature conservation and the project as well as its results is well known also on international level. This work, however, could only be successful because more hundred volunteer bird conservationists fought by spending their free times and often their money for the conservation of the species.

The aim has been achieved by now, however there is still a lot to do as for the Saker, and as for other species too.



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## RESULTS OF THE LIFE06 NAT/H/000096 "CONSERVATION OF *FALCO CHERRUG* IN THE CARPATHIAN BASIN" LIFE-NATURE PROJECT

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Bükk National Park and its 16 partners have applied successfully for European Union's LIFE-Nature Fund and due to this fact a joint Hungarian-Slovak Saker conservation programme could be launched in October 2006. The project has aimed to strengthen the Hungarian-Slovak population of Saker Falcon – as globally endangered species listed in Annex I. of Bird Directive – living in the Carpathian Basin.

Project activities included direct and indirect actions to eliminate or lessen the threats and mortality factors on the Saker population. The outputs and results of the project are the followings:

- A GIS was established containing map files of habitats incorporating up to date land cover data. A detailed knowledge base was established on the effect of specific agricultural practices and subsidy systems on *Falco cherrug* habitats. The results made it possible to further specify the measures beneficial for *F. cherrug* and may incorporate this into the subsidies. It will help to elaborate the management plans of the SPAs. Project staffs and specialists were in close contacts annually with an estimated 360 farmers on the sites during the project period, and provided information and advise.
- Proper *Spermophilus citellus* and *F. cherrug* habitat management practice developed for the different type of grassland. A proposal is prepared for the relevant authorities how to distribute the National reserve part of the agricultural subsidies' quota to support nature conservation especially *Spermophilus citellus* and *F. cherrug*.
- It became understandable how the different conservation measures affect the *F. cherrug* population and how the population will grow and spread in the Carpathian Basin and Europe (separate presentation).
- Altogether 540 artificial nests/nest boxes were installed in Hungary and 105 in Slovakia in priority within SPAs or immediate proximity of the SPA (about within 25 km range from SPA) There are at least 3 durable artificial nests/nest boxes in each *F. cherrug* eyries what provide a sufficient number of safe breeding sites for the increasing population.
- About 4900 *S. citellus* were repatriated into about 28 habitats in 15 SPAs and by this the *S. citellus* population increased by 8% up to the end of the project period.
- Information is available on the most dangerous electric pylons around breeding and foraging sites. About 7500 pylons (6600 in Hungary & 866 in Slovakia) insulated primarily within the SPAs but partly outside of them, on those potential habitats where artificial



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nests installed. The number of birds electrocuted on identified and insulated sections of the electric power-lines decreased by 95 % compared to baseline data.

- 37 juveniles & 4 adults in Hungary and 6 juveniles in Slovakia tagged by satellite transmitter. About 1200 chicks marked with ornithological rings with serial number and about 600 by PIT rings.
- 7 cages were constructed to rehabilitate or keep insured or disabled birds. 3 recovered birds were repatriated from them. Besides chicks of disabled pairs were repatriated to some nests
- 40 addled eggs were chemically analysed. Chemicals responsible for contamination identified.

However no direct correlation with fertility effect could be identified. A comprehensive list about the chemicals accumulated in the food chain available.

- Population increase more than we expected during the project period up to at least 200 pairs.
- Lots of valuable data were collected by satellite transmitters (separate presentation).



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## **POPULATION OF SAKER FALCON (*FALCO CHERRUG*) IN WESTERN SLOVAKIA BETWEEN 2000 AND 2010 IN CONNECTION TO THE ACTIONS IMPLEMENTED WITHIN THE LIFE06 NAT/H/000096 PROJECT**

Jozef CHAVKO, Lucia DEUTSCHOVÁ

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The nesting population of Saker in Slovakia is concentrated in two areas about 200 km from each other. At present 28 pairs of the whole population are nesting in Western Slovakia and 12 pairs in southern part of Eastern Slovakia.

The first hints in the literature about nesting of a Saker in our territory are from the 19th century. From 1853 the Sakers were nesting on the rock of the Devín castle near Bratislava (Chernel 1899, Schenk 1918 ). Between 1950s and 1960s 6 pairs of Saker were nesting in Small Carpathians mountains (Ferianc, 1977).

First nesting of a Saker in Eastern Slovakia was recorded near the Muráň village in 1938 (Ferianc, 1941). 7 nesting sites were known in Slanské vrchy mountains, with one of these occupied already before 1932 (Mošanský, 1967). There is more data available showing that in the past Sakers were nesting in Eastern Slovakia in higher numbers than in Western Slovakia. (Mošanský, 1972).

The aim of the presentation is to evaluate the status, trend and distribution of the Saker population as well as the food composition of the species primarily in Western Slovakia between 2000 and 2010.

Based on the data from 1950 approximately 90 % of the population in Western Slovakia was nesting in Small Carpathians. Until about 1985 the mountains were surrounded by many pastures with numerous colonies of Suslik (*Spermophilus citellus*) as crucial prey of the Saker. Between 1960s and 1980s the structure of the country changed significantly. Due to the loss of pastures the most important feeding habitats disappeared as well as the suitable nesting habitats due to the extensive exploitation. The pairs were searching for new territories in lowlands. Due to lack of natural nesting opportunities and threats in lowland, artificial nesting opportunities were being created – the first nesting box was installed by the author on a tree in Small Carpathians in 1981. Between 1994 and 2006 about 120 wooden nest boxes and 20 artificial nests have been installed on the pylons of the high-voltage power lines and trees in Western Slovakia. The population of the Saker in this part of the country increased significantly as well as the distribution area. The Sakers moved to the lowlands – in 2009 and 2010 no pair was nesting in the mountains and the range of the nesting area increased by about 250 % comparing to 2000. 11 nesting pairs were recorded in 2000 while in 2010 we recorded 28 nesting pairs and 3 non-nesting individuals in other territories. This represents 155 % increase. From the results it is evident that the nesting area is influenced by the feeding opportunities as well as by the nesting opportunities on the pylons.



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Between 2000 and 2010 in Western Slovakia we recorded 153 cases of nesting of a Saker in lowlands and 24 in mountains (altogether 177 pairs), 2 on a rock, 21 on the trees and 154 on the pylons. In 2 cases Sakers were nesting in a rock cavity, in 14 cases in natural nests, in 21 cases in artificial nests and in 140 cases in nest boxes. 137 attempts were successful – 450 chicks fledged successfully. Average productivity was 2,54 fledglings for all the breeding and 3,29 fledglings for successful breeding.

After the breeding season, food remains were collected from most of the nests for the analysis. Between 2000 and 2010 115 samples have been analysed. 4406 specimen of 45 species were identified in these samples. The most numerous prey was the domestic pigeon (*Columba livia f. domestica*), with 63,2 % during the breeding. Among the first ten species also following were recorded: *Sturnus vulgaris* (6,8 %), *Cricetus cricetus* (5,9 %), *Phasianus colchicus* (3,9 %), *Spermophilus citellus* (3,4 %), *Columba oenas* (3,3 %), *Columba palumbus* (2,2 %), *Perdix perdix* (2,2 %), *Larus ridibundus* (1,9 %), *Lepus europaeus* (1,7 %) (Obuch, Noga *unpubl. data*). The results are showing that the Saker is trophically dependent upon urban areas with enough domestic pigeons. This represents risk of a potential conflict with the pigeon keepers.

In the nests remains of individuals which could not be hunted by a Saker were also recorded, such as *Capreolus capreolus*, *Vulpes vulpes* and large individuals of *Lepus europaeus*. This is an important proof that the Saker is feeding also cadavers.

The author is performing monitoring of the Saker population since 1977. According to his experience the most important threats for the Saker population are the illegal shooting, poisoning and nest robberies.

Besides other important actions implemented within the LIFE project 85 aluminium nest boxes and 20 artificial nests were installed, 1266 individuals of Suslik were repatriated, 866 poles were insulated, about 240 chicks were ringed by the ornithological rings, 6 of them were marked also by the satellite transmitter which provided many valuable information.

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## MODELLING THE SPATIAL DISTRIBUTION OF SAKER FALCONS IN HUNGARY

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Understanding landscape scale variables influencing the distribution of species with high nature conservation concern is fundamental for planning effective conservation management. In Hungary, the Saker (*Falco cherrug*) is an emblematic species of conservation and research, however no large spatial-scale analyses of the current distribution has been carried out to date.

Initially, we collected the data of all active territories between 2007-2010 to serve as the current countrywide distribution pattern on a 10x10 UTM grid scale. To explain this pattern we used landscape variables (Corine Landover database, OTAB), and estimated densities of potential prey species deriving from the Common Bird Census database.

We used a multi-level and multi-scale approach to data analyses. Initially we reduced the number of potential explanatory variables with an ensemble classifier (random forest algorithm). The second step was to construct Conditional Autoregressive (CAR) models in a Bayesian framework with the pre-selected variables. Bayesian CAR models give robust estimates on the global effects of explanatory variables on the probability of Saker territory presence in a given grid cell; however lack the power to reveal local deviances. Thus, we built Generalized Geographically Weighted Regressions (GGWR) to estimate the scale of local effects of the same variables.

Our results indicate that Sakers avoid UTM cells with high ratio of forests, but prefer areas with large open areas of large arable fields and grasslands. Surprisingly, the estimated densities of Skylarks (*Alauda arvensis*) and Kestrels (*Falco tinnunculus*) have high overall explanatory powers. The large spatial scale of the analyses suggests that these variables may reflect the overall good biodiversity state of these areas.



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## SATELLITE-TRACKING SAKERS (*FALCO CHERRUG*)

### EVALUATING SAKERS' POST-FLEDGING DISPERSAL, MIGRATION, ROAMING AND HABITAT USE FROM A CONSERVATION POINT OF VIEW

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For an efficient conservation programme, it is very important to know the mortality factors in case of a given animal species. Considering birds, the most mobile group of animals, the first thing to survey mortality factors is learning the most about the movements of the target species. Traditional ringing can be used for rough estimations for the range of movements including migration, but it takes a large number of ringed birds and a considerable time to acquire the appropriate amount of data. Recovery rate is especially low in case of raptors even if individual colour rings are used. Fortunately, in the last years the technology of satellite-tracking has become sophisticated and small enough to be applicable for a mid-sized bird of prey like Saker Falcon (*Falco cherrug*). The device makes possible to track the tagged bird with a few metres accuracy and it provides several GPS co-ordinates per day enabling researchers fine mapping the bird's movements and exploring mortality factors in the given area.

In the frame of the common Hungarian-Slovak Saker conservation LIFE-Nature programme (LIFE06 NAT/H/000096) 37 juvenile and 3 adult Sakers were tagged with so-called satellite-received transmitters (Platform Transmitting Terminals or PTTs) in Hungary. The aim was to track the birds in order to receive information about the habitat use of the adult and juvenile Sakers; the migration and roaming of juvenile birds; and wintering areas of migrating birds. It was especially important in case of juveniles as we did not know much about their movements in the period between fledging and first breeding, when the mortality rate is the highest. Based on the information received from tracking, mortality factors, threats can be explored and a more efficient international conservation plan can be prepared.

Data from satellite-tracking showed that fledged juveniles leave the parental eyries usually one and a half months in average after fledging. It is typical to establish their first temporary settlement area after longer – few hundred kilometres – exploring journeys. In Hungary, the region of Tisza River is an important area for juveniles in their first summer/autumn period after leaving the natal area. In their first year, juveniles may use one or more temporary settlement areas (TSA) until autumn migration season and they regularly make 'excursions' to all directions from their TSAs. Some of the juveniles leave the natal area very shortly after fledging (1 month or before) and start extreme movements usually up to even more than one thousand kilometre up to their first temporary settlement area.



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In the autumn some of the young Sakers start migration to south; others stay and spend the whole winter in the Carpathian Basin. They can be split into three different types as for migration:

- 'real' migrants that spend the winter mainly in the European part of the Mediterranean (South-Italy and Greece), but some of them migrate to Africa as far as the Sahel and Sub-Sahel zone;
- residents, which may make small scale migratory-like movements to South from the summer TSA but basically spend the whole winter in the Carpathian Basin;
- 'indecisive' birds: they start the migration but return in the same autumn, even from as far as Italy; they may spend the rest of the winter in the Carpathian Basin, but some of them start the migration again – second time in the same migration season – and winters in the Mediterranean.

Satellite-tracking confirmed the finding of ringing that adults do not migrate, although outside of the breeding season especially females may stay further away from the eyrie.

Satellite-tracking revealed the following factors affecting the survival rate of juvenile and thus the dynamics of Hungarian Saker population:

- Electrocution is a major threat on Sakers both juveniles and adults. Annual national surveys, ring recoveries and satellite tracking confirm this finding. (Satellite-tracked birds: 1 adult was electrocuted in Hungary; and 1 juvenile in Russia)
- Shooting was reported as problem in Slovakia, Italy, Malta and Romania, however satellite-tracking showed that it is still a problem in Hungary and it can be a considerable threat in the wintering areas. (Satellite-tracked Sakers: 1 adult was shot Hungary and 1 juvenile in Niger, Africa.)
- Poisoning some direct and more indirect data suggest that Sakers can get poisoned indirectly from baits placed for other (mammal) predators, or more importantly secondarily through pesticides (rodenticides or badly used herbicides) by feeding on poisoned rodents. This type of threat was reported from Hungary, Slovakia, Spain and Bulgaria, but the problem very likely exists in many other countries. Direct poisoning of Sakers by pigeon fanciers may also occur.
- Natural predation mainly by fox (*Vulpes vulpes*), but also Goshawk (*Accipiter gentilis*) contributes considerably to mortality of just-fledged juveniles and juveniles in the first 2-6 months after fledging. (Satellite-tracked Sakers: 3 juveniles were caught very likely by foxes in Hungary and 1 juvenile was killed by Goshawk in Poland)
- Other natural causes like starvation and/or dehydration may also play a role in mortality (Satellite-tracked Sakers: 2 juveniles perished in Mauritania and Kazakhstan probably because of starvation.)
- Trapping endangers almost exclusively the Sakers migrating to Africa. Direct contact to Libyan trappers, reports and ring recoveries support that theory. (Satellite-tracked Sakers: 2 juveniles disappeared in the coast of Libya where trapping known to be the most active along the coastline.)

Having finished the evaluation of information from the extensive satellite-tracking, the next step is to redesign the European action plan for the species, expand it to a higher international level and start conservation work in practice.



Hungarian partners: Aggteleki-, Balatoni-, Duna-Dráva-, Duna-Ipoly-, Fertő-Hanság, Őrség-, Hortobágyi-, Kiskunsági-, Körös-Maros National Park Directorate, E-misszió Environmental Association, MME/BirdLife Hungary, Provértes Nature Conservation Public Fund

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## NEW APPROACH IN SOUSLIK RE-ESTABLISHMENT IN SLOVAKIA

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**Key words:** Souslik, re-establishment, methodology improvements, Slovakia

A part of the project activities within the project „Conservation of Saker in the Carpathian basin“ is focused on conservation of European Souslik (*Spermophilus citellus*) as Sousliks represent an important food staple for Saker.

In Slovakia Sousliks were re-established at 3 sites during the years 2007-2010. All the sites are located in NATURA 2000 areas (SPA Muránska planina and SPA Malé Karpaty). The sousliks used for re-establishment purposes were captured at Košice or at Bratislava airports. Altogether, 1286 Souslik individuals were captured and 1259 of them were released onto new sites. 27 individuals died or escaped prior release.

Regarding methods of work, at the beginning of the project the methodology published in 2006 was followed. The methodology summarizes knowledge and experience from all the previous attempts of Souslik re-establishment in Slovakia. However, gradually as the project was progressing and plenty of new findings appeared it was necessary to adjust the former methodology accordingly. The new findings significantly improved various activities associated with Souslik re-establishment including their capture, release, monitoring and management. Because of this, the former methodology can nowadays be considered obsolete. The major objective and motivation leading to constant improvements was to minimise the losses during capture, release as well as in the newly established colony.

Capture – is characterized by transition from knot trap snares to capture to live traps. Even capture to live traps was gradually improved as new findings were discovered.

Release – is characterized by transition from a release of a high number of Sousliks into burrows pre-dug by a soil drill to a release of a small number of Sousliks into a cluster of initial burrows dug by a small narrow gardening scoop or a knife.

Monitoring – monitoring was focused especially on spatial distribution and natality. Monitoring of natality was performed at the beginning of June, spatial distribution was monitored continuously through identification of marginal burrows of a colony. It was found out that it is very important to mark as many individuals as possible. All the released individuals should be marked and if the situation allows it re-capturing and further marking should be conducted in a newly established colony. Thanks to this monitoring method various imperfections in management were discovered. For example plenty of females lost their young when the site management was conducted very late.

Site management – represents the most problematic part in Souslik re-establishment in Slovakia. Souslik re-establishment was conducted at 3 differently managed sites: temporarily not used pasture, mowed meadows used for pasture in autumn and pastures where cattle grazed freely whole year.



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## OVERVIEW OF THE LIFE06 NAT/H/000096 PROJECT'S COMMUNICATION

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Communication in the Hungarian-Slovak Saker conservation LIFE-Nature project was an important element. According to the result we managed to cover a wide range of various media and to send the message about the conservation of the species and nature conservation in general. The project achieved the following results:

- 27 information sign boards (obligatory) were erected. 5 were replaced due to damage by storm and peoples.
- An accessible and up-to-date web site (obligatory) are informing the general public and technical staff working on similar projects about the project in Hungarian, Slovak and English languages. Nearly half a million downloads from more than 100 countries over the project period were achieved.
- 2500 copies of A2 size posters in Hungarian, Slovak and English languages were produced and displayed.
- Three films have been produced and broadcasted from the project in Hungary. 500 DVD in three languages were prepared from the project film.
- 1500 leaflets were printed and distributed among farmers in Hungary.
- 500 copies of a coloured A4-size 16 pages brochure were produced and has been being distributed among hunters on meetings in cooperation with the Slovak Hunters Association.
- 9 press conferences were organised.
- 25 press releases circulated.
- Presence in the media: 23 times in TV, 22 times in radio, 25 times in printed, 2 times printed and on line, 67 times in online magazine, 50 times online – all with different topics related to Saker conservation.



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## **CONSERVATION OF FALCO CHERRUG IN NORTHEAST BULGARIA, HUNGARY, ROMANIA AND SLOVAKIA**

József FIDLÓCZKY

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This LIFE Nature project aims to stabilise and further strengthen the core European populations of the Saker Falcon by implementing best practices for conserving the species in Bulgaria and Romania. Knowledge and experience will be transferred from the Hungarian and Slovak partners involved in LIFE06 NAT/H/000096 to Bulgarian and Romanian partners. In addition, threats in the falcon's core area will be eliminated to help further strengthen its conservation status.

### Expected results:

- By 2014 there will be at least 10 Saker Falcon pairs in Romania, 5 pairs in Dobrudzha in Bulgaria, 200 pairs in Hungary, and at least 35 pairs in Slovakia.
- A trend should be set to facilitate further increases in population numbers.
- Nesting sites will be improved and nest boxes will be installed. Know-how regarding feeding and habitat preferences will be enhanced.
- Prey populations will be increased by improving habitat conditions for Souselik (*Spermophilus citellus*). This will include reintroducing Souseliks in some areas and supporting their habitat via agri-environment schemes.
- Risks from electric pylons will also be addressed.
- A comprehensive monitoring programme will result in improved knowledge about the changes in population parameters of both the Souselik and the Saker Falcon.
- Information about migratory losses of Saker Falcons will be increased using satellite telemetry and by gathering data from wintering grounds.
- An intensive communication programme, targeting farmers, game managers and political decision-makers at local and national level will increase awareness in the target groups and create support for Saker Falcon conservation measures.

Co-ordinating beneficiary:

Bükk National Park Directorate, Hungary

Associated beneficiaries:

Kiskunság National Park Directorate, Hungary  
Körös-Maros National Park Directorate, Hungary  
MME/BirdLife Hungary,  
Zöld Folyosó Közalapítvány Hungary,  
Pro Vértés Nonprofit Zrt., Hungary  
MAVÍR Zrt., Hungary,



Hungarian partners: Aggteleki-, Balatoni-, Duna-Dráva-, Duna-Ipoly-, Fertő-Hanság, Őrség-, Hortobágyi-, Kiskunsági-, Körös-Maros National Park Directorate, E-misszió Environmental Association, MME/BirdLife Hungary, Provértés Nature Conservation Public Fund

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ELMŰ-ÉMÁSZ, Hungary  
DÉMÁSZ Hálózati Elosztó Kft., Hungary  
Bulgarian Society for the Protection of Birds, Bulgaria Association MILVUS Group,  
Romania  
Romanian Ornithological Society/BirdLife Romania  
Raptor Protection of Slovakia  
Západoslovenská energetika a.s., Slovakia

Duration 01-OCT-2010 to 30-SEP -2014

Total budget 4,032,828.00 €

EU contribution 3,006,470.00 €

Project location: Northeast Bulgaria, Hungary, Romania, Slovakia



Hungarian partners: Aggteleki-, Balatoni-, Duna-Dráva-, Duna-Ipoly-, Fertő-Hanság, Őrség-, Hortobágyi-, Kiskunsági-, Körös-Maros National Park Directorate, E-misszió Environmental Association, MME/BirdLife Hungary, Provértes Nature Conservation Public Fund

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## SAKER FALCON POPULATIONS IN THE CZECH REPUBLIC BETWEEN 1999 and 2009

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The Saker Falcon belongs to the most endangered regularly breeding bird species in the Czech Republic. There is a long term interest of humans concentrated on this species not only because of its rarity, but as well because of its magnetism as a falconry bird. Historical data about the Saker population in the Czech Republic are very scarce. We only know, that in 19<sup>th</sup> century, it was breeding as well in Bohemia. We have only very few breeding records from the first half of 20<sup>th</sup> century documented, but in the second half of the century, a breeding population in South Moravia was discovered established. Systematic research was started in 1976 by Petr Horák and Vladimír Gahura. We present data from the year 1999 onwards, because previous data are not fully accessible for us and were already published by Mr. Horák.

A management plan for the Peregrine and Saker Falcons was prepared in 1996. Since then, most of the activities connected with the Saker Falcon were coordinated by a group of experts – ornithologists, amateur and professional conservationists, falconers and scientists. The group was dissolved in 2006. Since then, monitoring and ringing of the Saker Falcon is coordinated by the Agency for Nature Conservation and Landscape protection of the Czech Republic. Other activities are not centrally coordinated. Thanks to the activity of Petr Horák and since 2005 of other ornithologists, the development of Czech populations since 1976 is well documented. Population size in the Czech Republic probably reflected mainly the status of the populations in whole Europe and in smaller part was influenced by the coordinated activities.

84 breeding pairs and 23 occupied territories were registered between 1999 and 2009. Breeding of another 33 pairs was not proofed, but was supposed. The annual estimate of the population is 10-20 breeding pairs in this period. From 84 breeding attempts, 66 were successful and 182 chicks were reared. The breeding success is therefore 2,1 chicks/all breeding pairs and 2,75 chicks/successfully breeding pairs. Only 21% of breeding attempts were not successful. In comparison, 41,6% of breeding attempts were not successful in the period 1976-1998.

The increase of breeding success was obviously positively influenced by the support of the breeding success (by repairing of old nests and preparing new breeding possibilities, protecting the nests from human disturbance etc.). It is possible to observe evident change in habitat preference in last 30 year. First, the population was restricted to the riverine forest,



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later expanded to the agrocenoses and retreated from the riverine forest. Now both habitats are used.

Nests on trees are the most common type of breeding site. Breeding on pylons is not unusual, but breeding on the rocks is scarce (one case in this period).

One pair was at least nine-times breeding in a tree cavity. It was the most productive pair (female) in the Czech Republic we have evidence about. She produced at least 27 chicks.

We have evidence about second clutch in five cases, in next two cases we are not sure. 73% of clutches were started between 10.3.-10.4.

151 Saker Falcons were ringed in this period (released birds from captivity are not included). Those were 9 adults and 142 chicks on nests. We have only 24 recoveries and no extraordinary ringing results were achieved. The most important is a proof of connectivity between isolated pair breeding on the polish border with the south Moravian population. A male ringed as a chick of the northern pair performed later breeding in south Moravia. Further information was obtained from the coloured rings. Unfortunately those rings did not have individual codes, so the results give us only information about breeding pairs. But thanks to them we have got some new knowledge about pair bonds and productivity of individual birds. Colour rings with individual codes are used since 2009.

Unfortunately, falconers are not reflecting our knowledge about inefficiency and no need of support of the population by releasing of captive bred individuals. We are convinced, that if these activities are realised within existing and well prospering population, they can be not only ineffective, but even contra-productive. More than 250 captive bred Saker Falcons were released in last years, but there is not a single proof of their breeding.



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## CURRENT STATUS AND CONSERVATION OF SAKER FALCON *FALCO CHERRUG* IN SERBIA

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Saker Falcon (*Falco cherrug*) is rare bird species in Serbia. Its breeding range is concentrated to Pannonian Vojvodina Province (95%), but there are several observations from the breeding season from highland plateau steppes in the south-eastern Serbia (Stara Planina Mt, Vlasina Mt, Dukat Mt.), inhabited by Suslik (*Spermophilus citellus*). Saker population is relatively evenly spread in the lowlands, inhabiting agricultural land and preserved steppes and alkaline grasslands. The densest concentrations of territories is in the regions of South Banat, East Srem, Fruška Gora Mt. and South and Central Bačka. Saker in Serbia nests on threes (Deliblato Sands and alluvial forests), probably rarely on cliffs (Stara Planina Mt.) and loess walls (Titel Hill). However, in the last 30 years majority of nests are located on high voltage electricity pylons in Vojvodina.

Monitoring of breeding population of Saker in Serbia 2007-2009 was done by Bird Protection and Study Society of Vojvodina with support of IWC, Institute for Nature Conservation of Serbia, Provincial Secretariat of Environmental Protection and Sustainable Development and Public Enterprise «Elektromreža Srbije». Project comprised a survey of all areas where breeding of this species was possible, with particular focus to electric power lines, steppe and saline habitats and alluvial forests. All of *portal* type (lattice portal tower) and majority *jela* type (single circuit tower-triangular configuration) pylons were surveyed in Vojvodina, Mačva and in North Pomoravlje. In 2007 season, 40 areas with presence of adult Sakers in breeding period (territories) were found in Serbia, 39 of them in Vojvodina. Among them, 20 active nests were located. More than 90% of all pairs breed in Raven (*Corvus corax*) nests. In Vojvodina, 15 territories were found in Banat, 14 in Bačka and 10 in Srem. During summer (June-September) in 2007-2009 Bird Protection and Study Society of Vojvodina and Provincial Institute for Nature Conservation with Public Enterprise «Elektromreža Srbije» installed 95 trey-type wooden platforms on high voltage pylons, but there is no evidence on succesifal colonization by Sakers. Fours additional platforms are installed on trees. Present estimate (2009-2010) is cca 55 pairs in Serbia (50 in Vojvodina and 5 in other parts of country). In 2006 it was 50-60. The population trend is predominantly stable, but there are local fluctuations caused by nesting conditions, climate, availability of natural nests and human pressure.



Hungarian partners: Aggteleki-, Balatoni-, Duna-Dráva-, Duna-Ipoly-, Fertő-Hanság, Őrség-, Hortobágyi-, Kiskunsági-, Körös-Maros National Park Directorate, E-misszió Environmental Association, MME/BirdLife Hungary, Provértes Nature Conservation Public Fund

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## **CONSERVATION STRATEGY FOR THE SAKER (*FALCO CHERRUG*) IN BULGARIA**

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During the last decade the Saker (*Falco cherrug*) is facing real risk of extinction from Bulgaria. The nest robbing is considered to be amongst the main reasons for this, although a complex of other negative factors, affecting its habitats and sites have possibly additional negative effect. There are different visions about how to prevent this negative trend and to reverse the situation.

The BSPB strategy in Saker (*Falco cherrug*) conservation in Bulgaria is presented. The concept is based on: (1) current status of the species in the country (2006-2010); (2) the situations and trends of the Central and Eastern European Saker populations; (3) the natural and socio-economic conditions and (4) the results of hitherto prevailing conservation actions in Bulgaria. Different scenarios aiming to prevent extinction of the species from the country are discussed. The approach to support natural recolonization of the Saker population in Bulgaria was considered as the most feasible. It avoids the risk of genetic interference to the wild Saker population (including those of the rest of Central and Eastern Europe) inevitable with possible restocking programme.

During the period 2006-2010, there are a total of 176 records of the species (range: 23-44 per year), some of them with high level of breeding evidence. Based on these data, the presence of 2-9 pairs in the country were assumed, although no occupied nest was documented. Breeding records are affiliated to 33 different areas. The number of Sakers in Bulgaria during the study period was relatively stable, however lower values were observed in 2010.

The main facts upon which the BSPB conservation strategy was based are as follows: (1) increase of Saker populations in Hungary and Serbia; (2) roaming of juveniles towards South-Eastern Europe; (3) shift of Saker's nests from natural substrates to electricity pylons in the countries where Sakers visiting Bulgaria originated.

Since 2008 a total of 196 artificial nests for Saker have been installed. Of them 23,5% have been occupied by the Kestrel (*Falco tinnunculus*) with single cases of Common Buzzard (*Buteo buteo*) and, possibly, Hobby (*Falco subbuteo*). The most effective appeared to be the newest aluminum nest boxes of 'Hungarian' design, occupancy of which by the Kestrel in some areas reaches 94%.

During the period solid evidences about continuing active poaching on birds of prey in Bulgaria were obtained. In 2010 custom officers confiscated two Bonelli's Eagles (*Hieraetus*



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*fasciatus*), there were two robbed juvenile Imperial Eagles (*Aquila heliaca*) from guarded nests, step-ladders and ropes were found at several Saker's sites. These facts once again showed that important negative factors are not removed yet, they confirmed the necessity of confidentiality about the Saker records and allowed BSPB to put the focus of its strategy on encouraging Saker to breed on high voltage electricity pylons as the safest possible places from nest robbing.

Based on the above facts and considerations, the BSPB strategy accepts as a best alternative the natural re-colonization through a complex of measures at habitat, site and species levels, supporting the natural trends and processes favourable for the species also including the nesting on high voltage pylons.



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## SAKER FALCON (*FALCO CHERRUG*) IN UKRAINE AND ADJACENT AREAS

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The studies were conducted during 10 field seasons of 2001-2010 in 11 regions of Ukraine (steppe and partly forest-steppe zones), in 2005 - in Moldova, and in 2004, 2008, 2009 - in Southern Russia (Rostov Region and Ciscaucasia). During this period there were examined various forests, planted forests, main power lines in the steppe zone, most of the coastal cliffs of the Black and Azov Seas (including the Bay of Sivash), as well as rock outlets in the foothills and mountains of the Crimea. The total length of automobile routes across Ukraine, Moldova and Russia amounted to 76,370 kilometres. As a result of these works it was surveyed about 75% of the area potentially suitable for breeding Saker. Total for this period we found 248 breeding sites with 240 breeding cases. In addition, it was checked the contents of 66 nests, 2 of which were with clutches and 64 - with chicks.

Distribution of the Saker Falcon in Ukraine and adjacent areas has changed dramatically in the last century. Thus, from the beginning of the 20<sup>th</sup> century and until the 1950s-60s the species was rather common and nested there in most areas except the Transcarpathians and western part of Polissia. It occupied mostly forest-steppe and steppe zones, the mountains of the Crimea; some pairs have met in Polissia (Averin et al. 1971; Zubarovsky 1977). In the late 1980s - early 1990s the Saker Falcon still nested in places in the forest-steppe, for example, in Kiev Region (Domashevsky 2004). It was also met at that time in Poltava and Kharkiv Regions of Ukraine, the most part of Moldova and in some areas of Rostov region of Russia. In next years the reliable findings of the Saker in forest-steppe and forest zones of Ukraine and Moldova were not observed. At present, in Ukraine and Moldova Sakers' breeding sites are concentrated in the steppe zone. It is connected with disappearance of Sausliks, being the main prey in the forest-steppe and forest zones, adjustment of the Saker to other mass feeding forages, in particular - rooks (*Corvus frugilegus*), which numbers at that time were steadily growing in the steppes of the Ukraine for the aging shelter belts. Furthermore, adaptation of the Saker Falcon to a new type of nesting occurred – on pylons of power lines, the network of which in the steppe zone had greatly increased exactly by the 1970s. These reasons led to a noticeable change in the bird range - it moved mainly in the steppe zone; where earlier it was almost no breeding habitats for this species. Thus, the Saker stopped nesting in the forest zone of Ukraine in the mid-twentieth century, and in the forest-steppe – in the 1980s-1990s. Currently in Ukraine there are two ecological groups: the first nests on cliffs and precipices, narrowing its spread to the territory of Crimea; the second almost entirely moved from the trees on pylons of power lines, having settled most of the steppe zone.



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On the territory of Moldova the Saker Falcon was found only in the southernmost part, and in adjacent areas of Russia the species was not detected at all.

In Ukraine in the first half of the twentieth century the Saker was quite common. But in the 1960s-1970s there was a tendency of reducing the total number of the species, which also continued in next decades (Zubarovsky 1977). In the mid 1980s the Saker population in Ukraine was estimated at 30-40 pairs (Zhezherin 1988). In our opinion, these data were clearly underestimated. To judge on the dynamics of the species numbers in Ukraine is possible only in general terms, as before our researches any large-scale counts of the Saker Falcon in Ukraine did not take place. Analysis of the literature data shows that during the 1980s-1990s there was a decrease in the number of forest-steppe Sakers, but the bird appeared on breeding in many places of the steppe zone. Therefore, in the mid 1990s with the overall reduction of the Saker number in the country, in the steppe zone it was already known about 30 pairs (Prokopenko 1994). V.I. Pilyuga (1999) only in the interfluves of the rivers Danube and the Southern Bug writes of a possible breeding of 80 pairs. In the early 1990s the species population in Ukraine was approximately 150 pairs (Prokopenko 1994). Similar data were given for Ukraine in the European reports as well: 120-150 pairs, with a tendency of reducing the range and numbers (Tucker, Heath 1994); 120-150 pairs, with a weak reduction in the number (Snow, Perrins 1998); 150-200 pairs in 1998, with a little reduction in the range and numbers (Heath et al. 2000), and 45-80 pairs in 1990-2000 (BirdLife International, 2004).

The number of the Saker Falcon was rapidly declining throughout Europe during the 1980s-1990s. In the European part of Russia it was 80-150 pairs in 1990 (Tucker, Heath 1994; Hagemeyer, Blair 1997), 120 pairs (Heath et al. 2000), and in the early 21st century it was equalled only to 30-60 pairs (BirdLife International, 2004). The decline of numbers occurred everywhere up to complete disappearance (Belik et al. 2003). In Moldova, the number of the bird was steadily low - in the late 1980s there bred 5-7 pairs (Tucker, Heath 1994; Snow, Perrins 1998; Heath et al. 2000), in 1990s-2000s - 4-7 pairs as a stable population (Birds in Europe, 2004). Current numbers of the Saker Falcon in the study area are estimated by us within the 330-360 pairs, of which 315-345 inhabit the territory of Ukraine, which is about half of the entire European population of the species. The vast majority of pairs breed on the territory of its five administrative regions and the Crimea Autonomous Republic, where this bird of prey reaches maximum numbers. In the surveyed areas of Luhansk and Poltava Regions the species was not found, the breeding of individual pairs in Kharkiv Region is assumed. On the territory of Moldova in 2005, we have revealed only 8 nests of the Saker. All of them were placed on pylons of main power lines. According to our estimates, the number of species in this republic does not exceed 10-12 pairs. In adjacent to Ukraine areas of Russia the Saker now, probably, does not breed.



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## SATELLITE-TRACKED SAKER FALCON (*FALCO CHERRUG*) HIGHLIGHTS THREATS IN STAGING AREA ABROAD

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A new result of the Hungarian-Slovakian Saker (*Falco cherrug*) conservation LIFE-Nature project showed that despite strong efforts in the home countries for their conservation, juvenile Sakers face serious threats after fledging when visiting remote areas during their post-fledging dispersal. The movements of one satellite tagged Saker Falcon helped Bulgarian and Hungarian experts to unveil threatening factors on raptors in North-East Bulgaria.

The juvenile Saker male Karcsi, hatched in Apaj in Hungary was provided with satellite tag on 7<sup>th</sup> June 2009. After staying in the eyrie until 19 July, the falcon headed to southeast traveling 420 km to the Serb-Romanian-Bulgarian border region. There he turned sharply to northeast and he crossed the Southern Carpathian Mountains. He spent a few days in Transylvania in Romania and then continued his way northeast crossing Ukraine and Southern Belarus. Apparently he stopped traveling and spent the period 26 July – 26 August in Kursk region, in Russia. The area he chose is a vast, flat agricultural land somewhat similar to his fledging place. On 26 August, he continued his journey and headed to south arriving South-East Ukraine where he spent about a week before traveling to southwest across the southern part of Ukraine, Moldova and East-Romania. On 12 September Karcsi entered Bulgaria and set his temporary settlement area near the town of Kubrat, North-East Bulgaria. There he used an area of roughly 16x17 km, located in an agricultural land with scattered woods within. Agricultural fields provided the hunting ground and woods were usually the night roosts for sleeping. Here he spent his time until the last signal we received on 17 October 2009.

Surveys of the experts from the Bulgarian Society for the Protection of Birds/BirdLife Bulgaria (BSPB), done 15-19 October 2009 and 07-08 November 2009 obtained detailed information on the state of the habitats in Karcsi's temporarily settlement area, potential foraging conditions, hunting and roosting areas and possible threats and reasons for disappearance of the falcon. The work, supported by the BBC Wildlife Fund, was based on the precise coordinates of all signals from Karcsi (in total 79 coordinates), provided by the LIFE-Nature Project.

The area Karcsi staged in North-Eastern Bulgaria, falls into the geographical area of Ludogorie, which historically hosted breeding Sakers. Karcsi stayed most of the time in generally plain area with very hilly terrain of low hills. The entire territory is of very open agricultural area and its general aspect is formed of slant slopes gently turning into shallow



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open valleys with grasslands. There are no or very little trees or bushes on most of the area, but patches or wider areas of woodlands occur in the region. High numbers of migrating and staging birds of prey was recorded in the area.

As for prey, apparently, Karcsi has found an excellent place because there were a number of potential prey items. BSPB expedition recorded calamity of voles (*Microtus spp.*), but other rodents and high numbers of migrating passerine birds and waders were found as well.

In spite of the thorough survey no remains from Karcsi or the satellite transmitter were found. A range of threatening factors was discovered in the area. Amongst the possible reasons for Karcsi's disappearance were power lines, use of rodenticides to control the calamity of voles, predation, shooting. As the most significant potential threat should be considered the 20 kV power line, crossing East-West the southern part of the area. It is situated between the most often used hunting area of Karcsi and the forests, where the falcon roosted 4 times. The danger from this power line comes from both possible collision and electrocution. The search on 08.11.2009 along 4,74 km length of the power line discovered remains of in total 36 dead birds (34 most probably electrocuted and 2 – victims of collisions). In November within the crop fields spreading of rodenticides (bromine chemical) was underway. Dying rodents were found at several places on the surface, although no raptors or other birds were discovered dead on the affected fields. Another factor can be predation from the side of Goshawk (*Accipiter gentilis*) and, possibly Eagle Owl (*Bubo bubo*). Signs of possible impact of shooting were found, although with minor probability.

Besides highlighting the importance of using state-of-the-art technology for conservation purposes, the case showed that Bulgaria is not just an occasional destination during the post-fledging movements of juvenile Sakers from Hungary. It has also shown how important is to have effective and complex conservation measures at the areas far from the Sakers breeding grounds and that wide international co-operation is the only way for the efficient conservation of such a mobile species like the Saker.

The case showed the importance of extending the successful conservation effort of the Hungarian-Slovakian LIFE-Nature project towards Romania and Northern Bulgaria. This will be the main goal of the starting in 2010 new LIFE+ project for conservation of the Saker in Bulgaria, Hungary, Romania and Slovakia. Complex of coordinated activities for supporting the wild Saker population in those countries will include measures for eliminating threats, including those highlighted by the case of Karcsi.



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## SOUTHEAST EUROPEAN SAKER FALCON NETWORK - SCOPE AND FINDINGS

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Southeast European Saker Falcon Network (SESN) is a group of organizations located in the western part of the Saker breeding range. The network includes scientific and nature-conservation, non-governmental and academic institutions working on the field of raptor research and conservation. SESN was established in 2006 when the information on Sakers in Eastern Europe was limited and the population size estimation was based on low quality data (as it was outlined in the European Saker Falcon Action Plan - Nagy & Demeter, 2006).

The main SESN goal is to implement science based conservation in order to prevent local Saker extinctions, stop further population decline and maintain a favourable species population status.

SESN activities took place in nine European countries so far. They were focused on getting better understanding of the Saker population figures and threats. Conservation activities like awareness campaigns and artificial nest programs were also initiated.

The main findings by countries:

**Bulgaria.** Formerly abundant and numerous raptor species in Bulgaria the Saker is on the brink of extinction, if not extinct at the present, with population estimated of 0-3 breeding pairs. As a result of the Saker study we prepared a Feasibility Study document, dealing with the possibilities for re-introduction of the species in Bulgaria, with Central Balkan Mountains chosen as the best place for initial reintroduction.

**Croatia.** Surveys on power lines in Croatia were implemented. As a result the first 2 nests on pylons in eastern Croatia were discovered. The Croatian population is estimated of about 3-5 breeding pairs.

**Macedonia.** Confirmed breeding of Sakers in Macedonia have never been reported. The species have always been rare in the past and it is probably extinct nowadays.

**Moldova.** Eight pairs were discovered in 2005 – nesting on a high voltage power line. This was the first record of Saker breeding on artefact in Moldova. The Saker numbers seem to stay stable during 2005 – 2009. Population size was estimated of 10-12 pairs.



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**Romania.** Field surveys were focused on Dobruzha and the Danube Delta – formerly strongholds of the population. The results showed that Sakers breed regularly but in low numbers in north Dobruzha with extremely low breeding success. The Saker population was estimated of about 15-30 pairs.

**Serbia.** The riparian forests, wetlands and open spaces around them were important Saker haunts in Serbia in the past. The adoption of power line support structures as nesting sites in 1980s has resulted in Sakers occupying lowland agriculture areas where alternative nesting sites were limited. The surveys in north Serbia gave us the opportunity to assess the population in the province of Vojvodina – 50-55 breeding pairs. A breeding season diet study showed that Pigeons *Columba sp.* and European Hamster *Cricetus cricetus* are key prey species.

**Slovakia.** Slovakia joined the SESN in 2010 with a project aiming to: 1) get a complete overview about the population of Saker in Western Slovakia through the monitoring in southwest Slovakia; 2) create connection between Slovak and Hungarian Saker population through the artificial nests; 3) identify the habitat conditions and the possible threats for Saker in southwest Slovakia; 4) ensure successful breeding in case of discovering nesting Saker pairs in the area.

**Turkey.** The breeding population in Thrace (NW Turkey) had disappeared by the 1950's, in line with dramatic declines in the Southern Balkans. In the 1960's, the Saker Falcon was a rare breeding species found mainly in steppe habitats of Central and Eastern Anatolia. Our survey confirmed that the Saker is a rare breeding species in Central and Eastern Anatolia despite there being much apparently suitable habitat and prey available in these regions. Turkish population is probably in the region of 50 breeding pairs. The Anatolian Souselik *Spermophilus xanthoprimum*, is a main prey species

**Ukraine.** Surveys revealed 218 breeding territories of Sakers (among them 182 breeding pairs). 84% of them were located on electricity pylons, 15% on cliffs (mountain rocks and coastal precipices) and 1% on trees. The population size was estimated to 270 – 345 pairs in Ukraine in 2006, but the minimum population size might easily exceed 400 pairs if a larger scale survey is performed.

SESN work is financed by International Wildlife Consultants (UK) Ltd. on behalf of Environment Agency - Abu Dhabi (UAE).



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## POPULATION GENETIC STRUCTURE OF EURASIAN SAKER FALCONS

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The Saker Falcon (*Falco cherrug*) is a 'globally threatened' species with an estimated population size of 3600-4400 pairs only (Birdlife International 2006). In recent years, much attention has been paid to conservation of the species across its distribution in the Eurasia (Nittinger et al. 2007). However, until now, population structure of the Sakers in the wild remains unresolved, for example, no substantial genetic structure has been detected, even though Nittinger et al. (2007) used two sets of molecular markers, mitochondrial DNA and nuclear microsatellites. In this study, we isolated Single Nucleotide Polymorphisms (SNPs) from the genomes of wild Saker Falcons and analysed the genetic structure of the populations across its Eurasian range. From more than six thousand base pairs of nuclear DNA sequences distributed across ten chromosomes in the chicken genome, we identified 117 polymorphic SNP loci from 187 Saker Falcons sampled from 12 sites across Eurasia. The SNP diversity rate is therefore one per 55 bp, similar to that in *Larus dominicanus* (one per 79 bp) but much higher than that in *Thryothorus pleurostictus* (one per 305 bp). Of the 117 SNP loci, 19 deviated from Hardy-Weinberg equilibrium ( $P < 0.01$ ).

Principle Coordinates Analysis (PCA) found that intronic (neutrally evolving) SNPs once again failed to resolve substantial population structure in the Saker. Two functional genes, MC1R (plumage related) and MHC (disease resistant), were therefore analysed and generated exonic SNPs to study these selected markers. We obtained 13 and 15 SNPs from the two exons respectively. Both genes showed that one of the Chinese populations was genetically distinct from the remainder. While the MHC gene showed clinal variation across the Saker's distribution from the east to the west, MC1R sequences showed strong signatures of local adaptation in that five amino acid changing (non-synonymous) mutations were restricted to a single region. We also noted that the Sakers in European locations were much less genetically differentiated, which made population assignment within this region problematic. However, we cannot exclude the possibility that our current SNP system is not sensitive enough to separate Saker populations in central Europe. In this case, more strongly selected genes or data from the whole genome are needed to fully explore genetic structure of the Saker populations.



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## FALCONRY HYBRIDS AND SAKER FALCON (*FALCO CHERRUG*) CONSERVATION: FRIEND OR FOE?

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The use of captive-bred falcons instead of wild-sourced Saker Falcons in Arabic falconry is regarded as a positive benefit for Saker Falcon conservation as it could potentially reduce demand for wild birds obtained from unsustainable sources. The increased use of captive-bred falcons is associated with a decline in the importation and use of wild Sakers for falconry in the UAE, suggesting that the promotion of captive-breeding can indeed play a role in reducing demand for wild falcons in Arabic falconry. However, the promotion of captive-bred falcons in Arabic falconry depends largely on the production of hybrid falcons in order to overcome the negative aspects of captive-bred birds, which require longer more intensive training and expensive, time-consuming production effort. In contrast, a second conservation activity is the lobbying to ban the production of hybrid falcons in the European Union and beyond, in order to minimise a perceived risk of extinction of the Saker Falcon through genetic introgression caused by escaped falconry birds. Such a ban would likely have negative impacts on the use captive-bred falcons in Arabic falconry and could potentially increased demand for wild Saker Falcons, whereas the risk of extinction of the Saker Falcon through genetic introgression is regarded as extremely unlikely given the low frequency of escaped falconry hybrids breeding in the wild.



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## **SAKER FALCON REINTRODUCTION IN BULGARIA: PREPARATORY ACTIVITIES**

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The Saker Falcon is a rare species, included in the Red List of the International Union for Conservation of Nature and Natural Resources (IUCN) as “Endangered”. The last ascertained successful nesting of the species in Bulgaria dates back to 1997, while the last active but yet unsuccessful nest of Sakers was documented in 1998. In 2005 in the Central Balkan Mountains a pair with a fledged young was observed in the beginning of August – it is therefore possible that the pair had nested somewhere in the area. Otherwise in the period 2006 – 2009 only single birds, possibly a part of the wandering non-breeding Western Palearctic population were regularly seen in Bulgaria.

In 2009, after 4 years of studying the status and ecology of Saker Falcon in Bulgaria, a team of Bulgarian and foreign organizations (Central Laboratory on General Ecology, Green Balkans, International Wildlife Consultants, National Museum of Natural History, Institute on Zoology, Helmholtz Centre for Environmental Research) came up with a Feasibility study, discussing the need for reintroducing Saker Falcons and the means of completing the task in the country.

The study was an obligatory element, required by the International Union for Conservation of Nature and Natural Resources – IUCN prior to the initiation of a release programme. It was completed within the activities of the Southeast European Saker Network, coordinated by the Central Laboratory on General Ecology at the Bulgarian Academy of Science and funded by the Environment Agency of Abu Dhabi и People’s Trust for Endangered Species.

Among everything else, the Feasibility Study discussed the main habitat and food requirements of the Saker Falcon, set up particular qualitative criteria and explored the potential of 15 key areas to sustain reintroduced Saker Falcons. The study pointed the area of the Central Balkan National Park as most suitable for initiating a Saker Falcon reintroduction programme.

As a second phase, a series of activities were initiated to prepare the area of the Central Balkan National Park for a potential start of Saker releases. The preparatory actions comprise activities directed towards food supply and limiting some of the major threats remaining in the area as follows.

Sousliks are considered among the main potential prey of Sakers. Therefore major conservation work is directed towards Souslik conservation. A project run by Green Balkans



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aims at preserving one of the last remaining vital Souselik colonies in the high alpine pastures of the Central Balkan National Park. The project provides for clearing the bushes, thorns and tall grasses overgrowing the Souselik colony, what would later allow for introducing the pilot grazing scheme just adopted by the Park to maintain the habitat in appropriate condition. In addition to that, adjacent areas are being cleared from tall vegetation to allow for further expansion of the colony. Groups of 2-3 holes are being drilled at a depth of minimum 50 cm in all cleared areas to secure hiding places and stimulate the dispersal of the Souseliks. In addition to that, the same team is gaining experience using the technique used by our Slovak and Polish colleagues to relocate endangered Souselik colonies in another area of the Balkan Mountains – the Sinite kamani Nature Park.

As for limiting the direct threats, 9 linear transects 6-10 km each, have been identified along major power lines connecting the settlements in the areas adjacent to the Central Balkan NP to establish the electrocution mortality rates and monitor the birds of prey and other soaring birds inhabiting the area. The study would help identifying and documenting the most dangerous types of electric pylons, collecting data on the mortality caused by each type of pylon and wire configuration. This information will be later used to identify the exact location of an initial Saker reintroduction site and choose priority measures for securing the problem pylons.

Human disturbance and persecution is being tackled through specialized paper inquiries directed towards local hunter and pigeon-breeders. These inquiries are intended to investigate the attitude of the local people towards birds of prey and to determine their present support for the Saker reintroduction process. The analysis of data would allow for identifying the best tools to approach the local communities, increase their awareness and motivation to support the Saker reintroduction process.



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## POSTER SECTION



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## SATELLITE TELEMETRY OF SAKER FALCONS (*FALCO CHERRUG*) IN AUSTRIA: POST-FLEDGING DISPERSAL AT THE WESTERMOST LIMIT OF DISTRIBUTION

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The Saker Falcon (*Falco cherrug*) is widely distributed across Eurasia, reaching its westernmost breeding range in eastern Austria (c. 25 pairs). Although Sakers can be observed throughout the year, the frequency of observations varies between seasons. To date nothing is known about the species' dispersal and migratory behaviour, either of young or of adult falcons.

In the Viennese raptor rehabilitation centre (GVZ-Lobau), captive bred Sakers from the autochthonous Pannonian population have been released since 2006. Three females released at the border of the National Park Donau-Auen were fitted with Microwave 22g solar ARGOS/GPS PTTs-100 transmitters shortly before fledging, two in 2009 and one in 2010. The weight of the birds ranged between 1021g and 1200 g, so the transmitter comprised 1.8-2% of the body weight. It is assumed that the dispersal behaviour of released Sakers mirrors that of wild birds; this has been proven for other birds of prey (e.g. Peregrine *Falco peregrinus*, Aplomado Falcon *Falco femoralis*, Bearded Vulture *Gyps barbatus*).

The project focuses mainly on (1) post-fledging dispersal of Sakers after independence; (2) the influence of areas rich in food (e.g. the surroundings of Vienna) on early movements; (3) migration routes; and (4) seasonal variation in habitat selection and size of home range.

Saker 1 left the hatching site three weeks after tagging on 6 July (age: 65 days). She was very mobile, stopping only for short times in SW Slovakia and W Ukraine. Within two days she covered a distance of >700 km. A further two days later, on 11 July, she was already recorded in S Poland, c. 500 km WNW of her easternmost location in Ukraine. During the following days she moved northwards (>700 km from GVZ-Lobau). Signals were received from the area W of Gdańsk up to the coast (Słowiński National Park) and even from a short trip across the open sea. At the end of July, six week days after fledging, the bird was killed by a car in N Poland.

Saker 2 was seen for the last time at its hatching site on 7 July (age: 64 days). Initially this bird did not move very far. She flew 90 km east to SW Slovakia, where she used an area of about 1500 km<sup>2</sup> during the following three months. Especially after mid August she made short excursions to E Austria and N Hungary as well as to the S and E of the Czech Republic. After the sudden onset of winter she left her Slovakian core area on 14 October. Five days later she reached Sicily (>1200 km SSW), from where the last signal was received on 22 October. Surprisingly, sightings from Italian colleagues in December and January 2010 confirmed that she was still there.

Saker 3 undertook her first long trip at the age of 62 days to SW Slovakia. Interestingly, all three birds spent at least a short time in the same region (Trnava district). In the following days, under very summery weather conditions, she flew a wide route across W Slovakia,



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south across E Austria to Slovenia and north through W Hungary back to the starting point. After a short break she flew due north to N Czech Republic.

The initial conclusions are that (1) dispersal of the three females was different and non predictable, although the birds were closely related (sisters). Some birds showed a tendency for long trips, others not. It was remarkable that the first longer dispersal flights were in an easterly direction and that extensive northern roaming was not unusual. Whether this tendency is new and associated with global warming is not clear. (2) Although the surroundings of the site of hatching are rich in food (high breeding density of Sakers), this had no influence on the early dispersal. (3) Autumn migration was recorded for only one Saker, which overwintered in Sicily. (4) Data on habitat and home range have yet to be analysed in detail. However, it is clear that conservation measures must have an international focus as at least young Sakers use areas that are far more extensive than previously thought.



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## PROTECTION OF SAKER (*FALCO CHERRUG*) ON THE OPERATION AREA OF HORTOBÁGYI NATIONAL PARK DIRECTORATE

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Active protection of birds of prey in the HNPD has been carrying on since the settling of the organization. After the first decade without any breeding attempt of the enigmatic Saker, the first nesting pair appeared in 1987. Due to several artificial nests and trays placed over before, small population started to increase. New pairs occupied territories on the wooden steppe and alongside the high-voltage electric power lines. Latter became the home place of the stronghold of population. In the early 1990's was the golden age of Souslik (*Spermophilus citellus*) on Hortobágy. On the northern areas several Sakers, Imperial Eagles (*Aquila heliaca*) and – sometimes Booted Eagles (*Aquila pennata*), also - could have been spotted as feeding on the small rodent in the same time. After some years livestock went poor number, meanwhile humid period did not support population structure. Souslik became a rare mammal species in the HNP. That was the trigger reason, some employee started to reintroduce the species for those places that were occupied before by sousliks, although success of re-colonisation was not without doubt in some cases. HNPD tried to encourage tenants to do their animal husbandry fitting to requirements of Souslik management with some benefits, like earlier grass cutting opportunity. By 2010 there are local places, where Souslik is common, but their number lag far behind the former one. HNPD management continued producing artificial nesting possibilities, which was a very good action to increase the number of breeding pairs of Saker, first of all in Jászság and areas connected to Tisza valley. In the last 10 years the number of known pairs changed from 5 to 35 over there! Since the beginning some research has been started on chick-age mortality and influence of toxic chemicals (Hg, Pb, DDT, DDE, PCB, etc.) on reproductivity. HNPD has good relationship with electric power supplier. In the last 25 years there are covering (wrapping) activities on medium-voltage electric network. Against electrocution we try to cover (aka insulate) metallic holders and joining cables with plastic. Year by year newer and newer inventions appear in this field and HNPD has been trying to use them on as broad scale as it allowed by its sources. We put emphasis on strengthening of social awareness and try to demonstrate the importance of protection of Saker in every line we can do. Lectures, guided tours, information boards and publications are all in our repertoire of methods. HNPD has been running a bird repatriation centre in the puszta since 1990. We collect hurt birds (mainly raptors and storks) there, try to cure and release them. There are several birds in the cages that are unable to live free. Those are tried to be paired and make them reproduce. In last years we kept Sakers, also in these conditions. Hopefully, this mythical and sacred bird of Hungarians will constantly live in good number in the Carpathian Basin!



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## EXPERIMENTAL APPLICATION OF A WILDLIFE CAMERA AT A SAKER FALCON (*FALCO CHERRUG*) NEST

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In June 2009 we have fixed an automatic motion detection camera, having been used for a long time in watching wildlife, next to the breeding site of a pair of Saker Falcon in Western-Hungary for a two week period of time.

The device documented the life of the parent birds and their young, as well, in 24 hour a day. 50 feeding occasions were recorded: in 21 cases of them the prey could not be seen well enough to be identified, as it was covered mainly by the female bird and partly by the chicks.

*Prey distribution in the rest 29 cases was the following:*

<i>Pigeon</i>	2
<i>Common Vole</i>	9
<i>Hare (young ones, the size of a Suslik or a Hamster)</i>	5
<i>Lark (likely to be Skylark)</i>	3
<i>Starling</i>	2
<i>Other songbird</i>	1
<i>Pheasant</i>	1

In comparison to the above table, prey distribution based on the larger pieces of prey remains found in the nest was the following:

<i>Pigeon</i>	4
<i>Pheasant</i>	1
<i>Corvid bird (possibly Magpie)</i>	1
<i>Pellets containing almost exclusively fur at a first sight</i>	20

It can be stated that in the case of the Saker Falcon the prey residues found in the man-made nests built on the pylons of high voltage power line do hardly or not at all represent the distribution of prey animals really taken into the nest, respecting their species and quantity. Therefore, if we want to get precise data on the feeding habits of a bird of prey species, then the application of a so called wildlife camera seems to be an adequate method.



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## **SAKER FALCON *FALCO CHERRUG* IN POLAND (2008–2009)**

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In Poland Saker has so far been very rare. In 19th century Saker was recorded 6 times, in the first half of 20<sup>th</sup> century only 4 times. In the second half of 20<sup>th</sup> century there were total of 48 confirmed observations. In 1998 there was the only case of confirmed nesting near the Czech border. Since the beginning of the 21<sup>st</sup> century a number of observations of Saker in Poland is growing. Sakers are recorded by Faunistic Commission almost every year, with maximum of 3 observations in 2004 and 1–2 in other years. In 2008 the first Saker from Hungary with satellite transmitter was recorded in Poland, in 2009 another three birds with satellite transmitters were recorded. In 2009 two Sakers ringed in Austria were found dead, one of them bearing satellite transmitter. Separately from birds satellite tracked one Saker was observed and photographed many times in SE Poland, while another 3 were observed and confirmed by Faunistic Commission. The bird observed and photographed near Sanok was seen there for a period of ca. 40 days. That observation was an exception, as usually Sakers were observed only for a very short time in one place.

The total number of confirmed Saker observations in Poland in 2009 was thus 9, what is 3 times higher than in 2004.

High number of confirmed Saker visits to Poland suggests also that possibly there are many more Sakers, but they are not recorded any way.

Most ornithologists do not expect Saker to be seen in Poland. This species is not very different from young Peregrines and for inexperienced observer it is quite difficult to distinguish those two species. We know that none of our satellite tagged birds was recorded by field ornithologists during their life, only dead birds were found. On the other hand Polish Faunistic Commission does not record observations of Peregrine Falcon, for that species only nesting attempts are checked and recorded. That means that uncertain observations of Peregrine are not checked by specialists.

In Hungary and Slovakia a total of 10 juvenile Sakers were tagged in 2007, 20 juvenile and 3 adult in 2008 and 13 juvenile birds in 2009, while in the Austrian project 2 birds. A total of 48 birds got the satellite PTTs. Three of them were confirmed in Poland, which makes about 6%.

If we assume that in this regions ca. 200 pairs are existing and that in those 3 countries at least 400 offspring were produced, the number of juvenile Sakers that could visit Poland every year could be estimated at some 20-25 birds. Some older birds can visit Poland as well. All above shows that probability to see Saker in Poland is much higher than expected before.

From Hungarian satellite tracking project we know also that Sakers visited Belarus, Lithuania, Latvia and Estonia. Only once in history Saker was recorded in Belarus and never in the three Baltic states. That means that the living range of Saker is much bigger than expected before. That was believed that Saker can survive only in a steppe zone, where sousliks occur. Perhaps it is still truth for the breeding season, but definitely not for the



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migration. On the other hand it is possible, that the northern trips of Sakers are possible because of some climate changes and the higher density of Saker in its European breeding range.

**Key words:** Saker Falcon, *Falco cherrug*, satellite tracking, Poland, Hungary, Slovakia, Austria



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## OVERVIEW OF THE RESULTS OF SOUSLIK REINTRODUCTION AS THE IMPORTANT FOOD SOURCES OF SAKER IN THE OPERATIONAL AREA OF THE BALATON UPLANDS NATIONAL PARK DIRECTORATE

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The Balaton Uplands National Park Directorate plays an important role in the conservation of European ground squirrel (*Spermophilus citellus*) populations in Hungary. There are 48 ground squirrel colonies within its operational area and further 21 earlier colonised but recently abandoned potential habitats. The number of animals representing a colony is between some ten and about 10 000 specimens. Generally the colonies consist of some hundred animals. The ecological status of colonies is influenced by the type and intensity of their habitat management method and traditions. It is supposed, that the spatial communication among colonies follows the meta-population model. The appropriate habitats and the linkage between them are reducing and disappearing as a result of decreasing grazing activity and human disturbances. In order to change the negative tendency, the Directorate has planned a reintroduction program as a long term project which started in July 2003. Until now four successful reintroduction processes have been performed within its operational area. Further two reintroductions were made within two years, however, success is not yet known. The two oldest artificially started colonies are seven years old and one of them has already been serving as stock colony for further reintroduction processes in the last four years. The spatial distribution and the number of holes of new colonies have been monitored yearly. The colonisation processes and spontaneous habitat choosing have been documented. The catching method, the transfer, the release and after-care circumstances have been improved during the consecutive reintroductions. According to our experience it could take years for the animals to choose the most appropriate part of habitats and to start colonisation from these patches. An artificial recolonization process could be considered successful if the animals are colonising their habitat even after three years of their reintroduction.

Our results are in compliance with the Slovak method namely that release, after-care activity, guarding and protection against carnivores are key factors for the success. Only the adequate habitat management and/or reconstruction complemented with grazing, mowing and bush cutting can ensure long term survival for the reintroduced ground squirrels.



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## SAKER FALCON IN BULGARIA – PAST AND CURRENT POPULATION STATUS

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The study was performed from 2005 to 2009. The aims were to assess the Saker population status and identify the threats for the species. Overall literature review was undertaken, aiming to collect the bits of the scarce data on Saker in the country. An electronic data base with information about the Saker was created to serve as a tool for future investigation and to inform the conservation activities. This first phase was followed by a 4-years national survey on the territory of the country with a purpose to clarify the Saker population status nowadays. Prior to the 1930's the Saker was a common breeding species in Bulgaria. It was widely distributed, especially in North and Northeast Bulgaria. In the second half of the 20th century the breeding population was believed to be less than 50 pairs. Further decline was mentioned in the late 1990's and the population crashed to 2-6 estimated breeding pairs around 2000.

The current situation is characterized with continuing decline of the population that started in the late 1990's. Despite the large-scale national surveys during the period 2006 - 2009 no confirmed breeding was recorded. In contrast, during the field work 590 breeding territories (bt) of other raptors were revealed. On average about 30% of the Bulgarian populations of the following species were located and mapped: Long-legged buzzard (163bt), Raven (120bt), Peregrine (45bt), Golden eagle (50bt) and Imperial Eagle (12bt).

The last successful Saker breeding attempt was recorded in 1997 and the last active nest in 1998 – the pair laid eggs but failed to raise chicks. The species is extremely rare in Bulgaria nowadays if not extinct, with national assessment 0-3 breeding pairs.

Negative factors before 1980's:

**Direct extermination.** There were government sponsored programmes to eradicate birds of prey from the environment. Persecution continued well into the middle of the century with official data showing that 70,000 raptors were killed in 1957 alone;

**Habitat loss and decline of prey species.** Massive changes in agricultural practices dramatically altered the Bulgarian landscape in the middle of 20th century. This in turn contributed to the decline of important prey species for Sakers such as the European Sousek *Spermophilus citellus* and various grassland birds;

**Organochlorine pesticides.** The impact of organochlorine pesticides on Sakers is not well documented, but population declines were noted for Peregrines in eastern Europe from the mid 1950's through to the 1970's. DDT was used in the 1950's but its use declined in the following decade with the introduction of Aldrin, Dieldrin and Heptaclor. Most of these chemicals, which were implicated in the population crash of the Peregrine, were used in large quantities until they were eventually banned in 1969, but the Heptaclor was used up to 1991. It is likely that organochlorine pesticides had some detrimental impact on Saker



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populations in Bulgaria, and may have significantly contributed to their disappearance in lowland agricultural regions;

After 1990's:

**Nest robbing and trapping.** These illegal activities were first documented in 1980's with ten groups of falcon poachers operating on the Balkan Peninsula. In the 1990's major politic and social changes took place in Bulgaria which lead to a period of economic instability combined with lax enforcement of conservation legislation. This situation enabled criminal gangs, intent on taking wild falcons for commercial gain, to act with relative impunity. The illegal, commercial exploitation of wild Sakers coincided with the beginning of the final crash of their population in Bulgaria;

**Pasture abandoned.** The socio-economic changes of the 1990's saw yet more areas of pasture abandoned or turned-over to cultivation and development for construction. These changes continue into the 21st century with an impact on the European Sourslik;

**Chemicals.** The use of chemicals in agriculture lands might be the main limiting factors nowadays in large areas in the lowland of North Bulgaria.

The study is part of "Saker Falcon in Bulgaria – Research and Conservation" project implemented by Institute of Biodiversity and Ecosystem Research (formerly Central Laboratory of General Ecology) in cooperation with Green Balkan Federation NGOs, Central Balkan National Park Directorate and Birds of Prey Protection Society. The project is financed by International Wildlife Consultants (UK) Ltd. on behalf of Environment Agency - Abu Dhabi (UAE).



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## **SURVEYING WINTERING SITES OF CENTRAL-EUROPEAN SAKER FALCONS (FALCO CHERRUG) IN THE SAHEL**

**In Context Of The Hungarian-Slovak Saker Conservation LIFE-Nature Project  
(LIFE06 NAT/H/000096)**

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In 2006 a common Hungarian-Slovak Saker conservation project was launched that was supported by the European Union's LIFE-Nature fund. One of the aims of the project was to learn more about the migration habits and routes of the Sakers and to explore their wintering areas. Although Saker ringing in Hungary shows a very low recovery rate (3,5%) and it provides scarce and sporadic information, it allowed conclusions on the main directions of Saker movements in the last 30 years. For the present, more detailed work, a more sophisticated tool was used: satellite tracking, using 22g solar-powered and GPS embedded tags (so called Platform Transmitter Terminals or PTTs) mounted on the backs of the falcons. They do not hinder the birds nor alter their behaviour, but locate them with GPS accuracy and transmits the information to a database via Argos satellite system.

Satellite-tracking confirmed that only juvenile and subadult Central-European Sakers do long-range migration: adults are sedentary. Migrating juveniles winter mainly in the Mediterranean, but some of them make it to Africa. Recoveries of Hungarian ringed Sakers proved their appearance only in Libya, but now satellite-tracking showed that they can travel further south and west. Three out of 37 juvenile satellite-tracked Sakers made it across the Sahara to the Sahel. This result confirms the historic data in various sources about sporadic occurrence of the species in the area.

Parallel to the conservation activities on the breeding grounds, it was important to survey also the wintering areas to learn about mortality factors that may influence the dynamics of the Central-European Saker population. A field survey took place in Niger, where one of the Hungarian satellite-tracked Sakers, Dorottya, spent the winter 2009-2010. The area is relatively close to the other site in Niger where a Slovak satellite-tracked Saker spent the preceding winter.



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Late October 2009 the satellite-tracked Saker Dorottya from Hungary arrived in Niger. She spent most of the following four months 50-25 km NNE of Zinder (roughly 14.00 N 9.00 E). The areas where she stayed are mostly quite flat cover sands. Local rainfall averages 300-400 mm/yr. The main crop is the grain crop millet, grown by Hausa farmers. The other main land use is pastoralism, carried out primarily by Peul families.

From 7-16 February field work was carried out to investigate her behaviour and ecology in that area. She was observed twice. One regurgitation pellet and one plucking remains were found. Twenty km of power line were walked, and 25 prey-and-vegetation transects of about 2 km each.

The pellet contained remains of a beetle or beetles and of birds. No mammal hairs were found. The plucking remains may have been of a chicken. The local vegetation structure proved to be very open, with less than 20 trees/ha. The area where Dorottya stayed the first two months, around Dania, still contained some more or less natural habitat. Where she stayed the second two months, around Toumnia, all had been converted to millet fields. A third area, 70 km further south-west, where she stayed only one night, had more trees (70 trees/ha) but was also mostly millet fields. Local bird biomass observed varied from 1 to 2.5 kg per km of transect. Grasshopper presence and reptile presence were low, mammal hole presence was not very high either. Comparison with habitats and prey availability in areas in Europe would be of interest.

The main danger to Saker appears to come from boys with slingshots and from local hunters. On the other hand birds like the Saker are seen as bringing good luck, and as useful in controlling birds and rodents that may attack millet crops. These aspects may be entry points for a conservation campaign for Saker and other raptors.



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## THE SAKER FALCON STATUS IN THE RUSSIAN PART OF ALTAI-SAYAN REGION

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In Russia, Saker Falcon (*Falco cherrug*) is found on the northern fringes of its breeding range. Before 1940's, judging by the area of known habitats and data presented in literature, there were no less than 9000 Saker Falcon pairs nesting in Russia. The biggest populations were concentrated on the forest steppes of Eastern Europe and Altai-Sayan region. Now the number of Saker Falcon in Russia is estimated to be from 2100 to 2900 pairs. The Eastern European population has practically died out completely due to the situation in wintering and migration areas.

At present 73.5% of the Russian Saker Falcon population nests in the Altai-Sayan region. Monitoring of the Altai-Sayan Saker population were carried out in 1999, 2000, 2001, 2002, 2003, 2005, 2008, 2010. The census was performed in 18 study plots with a total area of 12,150 km<sup>2</sup>. Density parameters were calculated for main habitats separately and were extrapolated for similar habitats of the region using ArcView 3.3 ESRI.

We found 372 breeding territories of the Saker in the Altai-Sayan region in 1999–2006. A total of 50 known breeding territories became extinct by 2006. In 2006–2008, Sakers were not recorded in 17 breeding territories. During surveys in 2008 we found 57 new nests in new territories. Thus, at the moment we know 362 breeding territories of Sakers in the Altai-Sayan region.

We surveyed 125 breeding territories in 2008 (34.53% of a total number of known territories in the Altai-Sayan region), 108 of which were occupied and 55 were successful. A total of 1500 pairs are estimated to inhabit the Altai-Sayan region in 2008.

Thus, the negative trend of the Saker numbers has been registered all over the Altai-Sayan region. However, while the total number decreased during the last 5 years (2003–2008) by 18%, changes in different breeding group numbers were not the same.

Populations in Khakassia suffer very much; there is a steady decline of numbers for the past 5 years by 26%. While the breeding group in the northwest of Khakassia remains more or less stable, the breeding groups in the central part decreased by 40%. In Tuva a number decreased by 17% was noted only in 2003–2006, and the number has been stable for the last years or has even increased a little. The number has decreased by 15% in Altai due to the disappearance of males from territories on the periphery of the Chujskaya steppe, where females disappeared in 1998–2002 and pairs have not recovered until this day.

What are the reasons of the population decline?

Most of the Saker nests in the Altai-Sayan region ( $n=364$ ) are located on rocks and cliffs (86%). Altogether, 68% of the nests were originally constructed by the Upland Buzzard (*Buteo hemilasius*). Saker also occupies nests of the Upland Buzzard located on trees and



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artificial constructions. The Raven (*Corvus corax*) holds the second place as a nest builder used by Saker (16%), all these nests were on rocks.

Saker nesting on electric poles and other artificial constructions were known only in vast steppes of the Ubsunuur and Tuva depressions before 2008. Most of the nests located on wood electric poles were destroyed by local herders as timber. In particular, only in the area of Tes-Khem in southern Tuva, 16 nests out of 33 were destroyed.

In 2008 we have noted a new trend: the Saker began to use metal electric poles of power lines with high voltage for nesting. Falcons in 3 breeding territories were noted to relocate from cliffs to nests of the Upland Buzzard on electric poles.

The Sakers in Tuva turned out to be nest-site limited. Hence we initiated an artificial nest project in places which lacks suitable nest substrates. In 2006 we have set 85 nesting platforms in the Tuvinskaya depression, in 2009 we have added 20 platforms in the Ubs-noor depression.

Checking of platforms in Tuvinskaya depression in 2008 showed that half of them were occupied by raptors: Upland Buzzards, Black Kite (*Milvus migrans*) and Kestrels (*Falco tinnunculus*). In 2010 3 of them are occupied by Sakers. Saker demonstrates a noticeable plasticity. The average brood size is 2.6 chicks ( $n=243$ ; range 1–5 chicks). Depending on prey numbers and spring weather conditions breeding success of falcons may vary greatly.

Main sources of nutrition for Saker Falcon are: different species of piping hare (*Ochotona spp.*), sousliks (*Spermophilus spp.*), gerbils (*Meriones spp.*) and big voles, such as Brandt's voles (*Microtus brandti*).

Occupancy and breeding success of falcons fluctuate asynchronously in different parts of the region every year. This is connected with differing fluctuations of numbers of species that comprise the main part of the Saker's diet, varying between regions. In 2008 the maximum breeding success was observed in Altai where high numbers of the Mongolian Pika (*Ochotona pallasii*) were observed in the southeast and the Long-tailed Souslik (*Spermophilus undulatus*) was abundant in the west. Breeding success was the lowest in the Ubsunuur depression of Tuva, where numbers of the Daurian Pika (*O. dauurica*) and the Mongolian Gerbil (*Meriones unguiculatus*) sharply decreased.

Occupancy of nests and brood size change asynchronously, in relation to changes in number of food sources. Abundance of the principal prey species of Saker in the Altai-Sayan region fluctuates within standard deviation. There was no noticeable decrease in prey abundance throughout the years of observation. Short-term decline of prey abundance in some years cannot result in continuous decline of Saker numbers.

Mortality of Saker Falcon due to predation by Eagle Owl (*Bubo bubo*) does not exceed 10% and is substantially less than death of young falcons from starvation during years of low food accessibility.

Since none of the natural caused can result in the obvious decline of the Sakers in the region, we suspected that the main reason of the decline is illegal trapping. In 2006 we run a questionnaire of the local people and checked reports on illegal trapping from customs and police.

The result of the questionnaire was not very encouraging. For the past 10 years it is estimated that 200 birds are taken out of the region annually for subsequent falconry trade. The overall damage for the population with losses during transportation and trapping is roughly 1000 individuals.



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It appears that the trappers target large females. Nesting sites cease to be successful principally because of disappearance of females; they are occupied by solitary males. On 29 nests during 10 years we filmed both females and males and recorded a disappearance of couples from 2 nests, disappearance of females from 5 nests and change of partners in 19 nests, comprising change of males in 3 nests and of females in 16 nests. Deliberate catching of females leads to skewed sexual ratio in the population. The number of young females is not sufficient and as a result there are many territories with only males and thus do not participate in breeding.

It appears that every year more and more birds disappear during winter migrations. In 2010 all pairs which breed in the mountains and pinnacles where they also winter, all took part in breeding. However the birds from depressions, which are not stationary, were either empty or had only male present. Hence we conclude that one of the main reasons of Altai-Sayan population reduction is the catching of birds that takes place not only in the region, but outside of it in Mongolia and China.



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## **WILDLIFE REHABILITATION AND BREEDING CENTRE - GREEN BALKANS FEDERATION**

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The Wildlife Rehabilitation and Breeding Centre (WRBC) is a specialized unit of the Green Balkans Federation of Nature Conservation NGOs – Stara Zagora, concerned with the rehabilitation, treatment, recovery, and release of rare wild animals or species threatened with extinction. The Centre was created in the period 1990-1994 by activists of Green Balkans. In 2003 it was also designated as an official CITES Rescue Centre.

The main fields of activity of the Centre are:

- Treatment and rehabilitation of rare animal species in distress and their return to the wild;
- Breeding of rare species of birds of prey with long-term injuries that can't be released back in nature;
- Development of reintroduction programs and strengthening of population of the following species: Bearded vulture, imperial eagle, Eurasian Black vulture, Saker Falcon and Lesser kestrel;
- Provision of shelter for confiscated rare animal species subject to illegal trade;
- Educational activities and environmental youth programs.

The Rescue Centre operates with over 50 facilities specialized for rehabilitation, treatment, breeding and raising of rare species, including a clinic with specialized equipment, a surgery, an X-ray room, rehabilitation and recovery rooms, a quarantine room and differently sized aviaries for housing birds able to fly. The entire complex covers a total area of 6 800 m<sup>2</sup>.

Despite of the high percentage of animals, successfully treated and released back in the nature, some of the patients have permanent injuries that do not allow their survival in the wild. Many of these animals are being adapted for life in permanent captivity and included in the Centre's program for breeding of rare species. So far the Centre has succeeded in breeding Eagle Owls, Barn Owls, White Storks, Common Kestrels and has had some progress breeding species such as Lesser Kestrel, Long-legged Buzzard, and Griffon vulture. In 2007 the team of Green Balkans got actively involved with the Feasibility Study for the potential reintroduction of Saker Falcon in Bulgaria. The team of the WRBC was in charge of preparing the part on the possible captive breeding of Sakers for release.

Two employees of the Centre underwent several months of training in the Falcon Breeding Facilities of the International Wildlife Consultants Ltd in Carmarthen, Wales. As a result of the study visit, the experience and Saker Falcon breeding techniques applied in UK are currently being introduced in the WRBC. A modern incubation room with two fully-automatic HEKA incubators and two hand-made brooders was equipped. The Bulgarian team of breeders managed to also successfully employ the falcon feeding schemes tested in the IWC. The team managed to secure regular deliveries of rats and mice and is presently working on supplying quail. In addition to that, the team re-created the breeding aviaries and has a preliminary capacity to accommodate a pair of Sakers, though the construction of new,



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“Saker-suited” aviaries is pending. The entire falcon breeding technique used by the UK team comprising a combination of incubation, hand-rearing and foster parenting was successfully tried out with a brood of Common Kestrels in the WRBC. The experience gained will be in favour of a potential captive breeding of Sakers for further release into the wild.

In addition to that, the Rescue Centre is presently testing an experimental hacking technique in special adaptation aviary constructed in the Bulgarka Nature Park. The aviary is located in close proximity to the Central Balkan NP, which is expected to become the initial Saker release site. Various young diurnal and nocturnal raptors are left in the adaptation aviary and fed with life prey before the doors are eventually released and the birds are left to leave whenever they decide. Food is secured on a familiar site even after the birds have left the aviary. The experience gained will be an additional help in developing the Saker release methodology.



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## ANALYSING HABITAT USE OF SAKER FALCONS (*FALCO CHERRUG*) IN RELATION TO WIND FARMS IN WESTERN HUNGARY

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The Hungarian Kisalföld (Small Plain) stretches along the Danube from the northwestern border of the country about to Pilis Hills. It is a lowland mainly with agricultural areas, but wetlands, remains of Pannonian steppes can also be found here. Kisalföld provides appropriate habitat to a number of rare and endangered bird species such as Great Bustard (*Otis tarda*), Imperial Eagle (*Aquila heliaca*), Red-footed Falcon (*Falco vespertinus*), Montagu's Harrier (*Circus pygargus*) and Saker Falcon (*Falco cherrug*).

At the same time, the area is one of the most important places for utilizing wind energy in Hungary and new wind farms are being erected continuously beside the existing ones. The turbines of the farms may pose serious risk on birds of prey as several studies revealed. Regional nature conservation authority, therefore, obliged investors to carry out monitoring activity to survey potential effects of wind farms on bird species. The recent study financed by Energy Corp. Hungary Ltd., owner of several wind farms, aimed to reveal the level of threat posed by the wind farms on birds of prey especially Saker Falcon a globally threatened species that breeds in the area.

In order to achieve the aims, two adult male Saker Falcons – called Ákos and Anti – in neighbouring eyries were mounted with 22g solar Argos/GPS satellite-received transmitters on Mosoni-sík (Moson Plain), Western Hungary close to the Hungarian-Slovak-Austrian border on 27<sup>th</sup> February and 5<sup>th</sup> March 2009. Both males were in pair and later both of them bred successfully during the research period. Parallel to the satellite tracking, a field monitoring was carried out by visiting the area of the wind farm in every second week for looking carcasses or injured birds resulted from collision with turbines.

The transmitters (so called Platform Transmitting Terminals or PTTs) were attached by using Teflon ribbon as in the Hungarian-Slovak Saker conservation LIFE project. Both males were released immediately after tagging and they flew to perch on their favourite places right after their release. The PTTs were set to locate the birds ten times a day and to send the data every third day. Both PTTs worked well and submitted more hundred GPS coordinates in the research period. The GPS coordinates were placed and analysed on a digital map by using the Kernel-analysis.

It is well visible from the analysis that there are only a few coordinates outside of a central part with many GPS locations. Filtering those few extra locations we will receive the home range of the bird – an area that he uses the most frequently. Using Kernel analysis, 60, 70,



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75, 80, 85, 90, 95 and 100% filtering were tested, but finally only results of 60 and 90% filtering were considered.

Looking at the polygons received, it is well visible that the home ranges of the two birds are very distinctive, they did not approach each others' nest. The most frequently used (90% filtering) ranges are irregularly shaped and adjusted to the features of the sites. Sakers are using the open agricultural areas and avoid the settlements. Busy roads (e.g. M1 highway), railway tracks, farms and high-voltage power lines, however, do not form any obstacle. Falcons often use those latter for perching too.

Ákos was using the wind farm site close to the nest as frequently as the agricultural area nearby. However, he was using considerably less frequently the area having more wind farms a bit further away from the nest, although that area was at the same distance from the nest as an agricultural area he visited more often. We found that unlike Kestrels (*Falco tinnunculus*) Sakers do not perch close to turbines. GPS coordinates showed that despite Sakers usually prefer to perch on the high pylons of 400 kV high-voltage power lines; in the vicinity of wind farms they preferred the lower pylons of 200 kV high-voltage power lines if those were located further from the turbines than the higher pylons.

In the frame of the Hungarian-Slovak Saker conservation LIFE-Nature (LIFE06 NAT/H/000096) project a juvenile female of the brood of Ákos was also tagged with a PTT. Accordingly to the data, she was using the pylons with the same frequency and usually she got closer to the turbines than the adult male. In addition, she perched more often in the wind farm area than the adult male in the research period.

Analysing the data from the breeding season of 2009, adults show a certain avoiding behaviour to certain turbines and probably to wind farms as well. Such behaviour was not observed in case of the tagged juveniles. Although direct mortality was not observed in the research period, data suggest that juveniles fledged near wind farms are posed to the risk of collision with turbines considerably more than adults.



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## MONITORING SAKER FALCON IN CROATIA

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Nature Conservation Society "Drava" conducted a four-year research project on Saker Falcon (*Falco cherrug*) in the Croatian Republic. Saker Falcon is a rare and critically endangered species of birds of prey in our country and globally.

Our goal was to collect as much information as possible for a better protection of the endangered species. We wanted to contribute to a better understanding of the Saker Falcon population in Croatia. The project was a part of an international project to be carried out almost the entire distribution range of the Saker Falcon. We are in contact and collaborate with researchers from neighbouring countries.

During 2007, 2008, 2009 and 2010 we have controlled more than 3000 pylons of power lines in continental Croatia, as well as potential nests in forests along the Danube and Sava rivers. From the collected material in the vicinity of the nests (pellets and feathers), we learnt also about the diet of the Saker.

In 2007, two pairs of Saker bred successfully in Croatia. In 2008, two confirmed nesting of Saker Falcon were recorded, but only one was successful. In 2009 again, two pairs of Saker nested on pylons of power lines. Chicks of both pairs were ringed and, samples for a later DNA analysis were collected. Close to the Serb border, but on the Serb side breeding of another pair was recorded, as Serb ornithologists informed us. In addition to those pairs, at the same time adults (possibly breeding) were observed in the vicinity of Vukovar and Lonja field. According to data collected about the species, Sakers had been breeding in that area in the past.

During 2010, there were two breeding, of which one was successful and only one juvenile fledged. Also in 2010, we successfully released a Saker Falcon back into the nature, which was found in 2009 beneath the nest in very poor condition.

Saker Falcons still nest successfully in Croatia, in a small number though. The Croatian population likely does not consist of more than five pairs. In case of such a small number of nesting pairs, every lost Saker is a big loss for the Croatian population. To reduce the risk of extinction of this species in Croatia, it is necessary to collect more data and take appropriate protective measures that would enable the survival of the Saker Falcon in this area. In agreement with the national power company (HEP), our intention is to set platforms for supporting the nesting of the falcons.



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## STATUS OF SAKER FALCON IN ITALY: PAST, PRESENT AND FUTURE

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Saker Falcon *Falco cherrug* Gray, 1834 (ssp.) was a rather common wintering and passage species in Italy on XIX<sup>o</sup> to mid XX<sup>o</sup> centuries, while it apparently became much scarcer later at the end of XX<sup>o</sup> century, when it was considered scarce, in some Italian regions even irregular or vagrant. In this short overview summary, we would like to give a brief and summarising figure of its status according to date, trying to give a prospective of its past, present and future in Italy.

### PAST

According to past records, Saker Falcon in Italy was most common in Puglia and Calabria regions, but also in Sardinia. The species must have been more common and even speculate that may breed in Italy, according to some summer records. Indeed, the authors during his study on raptors sexing, ageing and identification in European museums, found no less than 90 (mostly juveniles) skins preserved (Tring, Wien, Paris, Malmo, Milano, Roma, Switzerland, etc.) all labelled as Puglia, Foggia area, either February or November between the years 1911 and 1930: these data showing as Southern Italy, and Puglia in that case in particular, was surely known to bird collector and ornithologists as an important wintering ground for Saker, and that many birds were easily obtained from this area. A study by Brichetti et al. mentions 40 records up to 1992, of which most are between 1800 and 1950, later on becoming scarcer. Most birds are juvenile/immature according to some authors. In conclusion, the species was surely common and widespread, mostly during pre-breeding migration and in winter time, with several tens captured in Puglia, SE Italy, showing as this region must have been a main wintering ground for European Saker at the time. Interestingly, several records came also from Sardinia, where more recently the species is just occasional.

### PRESENT

Later on '80 to '90 years of XX<sup>o</sup> century, the records confirmed in Italy became scarcer, with many of the checked records by one of us (AC) referable to mis-identification with juvenile female *Falco peregrinus calidus* Latham, 1790. Many specimens in museum were indeed re-identified by Andrea Corso as being juvenile *calidus*, either captured during migration or during winter, this subspecies being a regular and common as well as widespread over Italian regions (Corso, 1999, 2001). Brichetti & Fracasso (2003), report that the species is a regular migrant in both pre and post-breeding passage, while it is irregular in winter; they also report that the records were far more abundant in historical time, decreased progressively from mid XX<sup>o</sup> century. The same authors report that the migration passage is more regular and conspicuous in Southern Italy, while scarcer in Central Italy and occasional if not very rare in Northern. They report 4 birds counted at Monte Brisighella (Marche, C Italy) during spring 1993 and 1 at nearby Mt. Conero during the springs surveys 1987-1990. Corso (2005) and Corso & Iapichino (1998) for Sicily mention only 6 old records between 1967 and



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1989 and 8 records between 1990 and 2005; also 1-3 birds annually counted at the Strait of Messina during pre-breeding migration by the MAN-WWF group (Corso, 2001b, Corso, 2005). In total, together with the unpublished records we are aware of 21 records in the triennial time 2003-2005, 31 records in 2006-2008 and more than 20 records in 2009 alone, mostly in winter 2009/2010. As regarding the season, we know 40 wintering records and 18 during migration (mostly pre-breeding). Indeed, therefore, the species is a regular wintering in Italy, and also but less abundant regular migrant, with more records in spring most probably because in this season there are far more observation surveys all along Italy.

#### FUTURE

In the past the Saker was a commoner breeding species, with a more widespread breeding range (BirdLife, 2010), therefore also the records in Italy were more numerous. However, as shown by most recent data it seems to there has been a positive trend in the last 10 years. It is hard at the present state of knowledge to understand if this is mainly due to increasing in awareness – also thanks to the radio-satellite projects in Hungary, Austria and other countries – and better identification skill in Italian birders as well as a growing itself in the number of those birders, or if the trend is truly positive and the increasing is real. However, in Sicily, where there are the same observers with same knowledge in last 20 years, there indeed it seems that the number of birds observed is growing. Also, as radio-satellite birds clearly show, the number of birds wintering and passing in Italy is surely far more numerous and important, as the very scarce and localised amount of observers in such a huge and habitat-rich country could not at all provide good coverage of the territory. In the future, we should aim to have a better coverage with a better and more organised co-operation between observers, always having the species protection as main target, but also the better understanding of its real national status. Threats, landscapes and habitat transformation, environmental health status should be all monitored and environmental organisations should arrange researches and funds for that.



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