

Results of the Saker Falcon (*Falco cherrug*) conservation programme in Hungary between 1980–2010

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ABSTRACT—Saker Falcon has not only been a mythical bird for Hungarians but also a highly appreciated bird of prey for falconry. Because of its high economical value population was monitored through centuries although not with scientific scrutiny. Scientifically acceptable research started only in the 20th century. Monitoring showed a dramatic population decline by the 1970s. Conservation efforts have started in the mid 70s and included nest guarding, Suslik (*Spermophilus citellus*) repatriation and installation of artificial nest sites. Due to the efforts the breeding population increased from an estimated 30 pairs in 1980 to about 240 pairs in 2010. While maintaining existing elements of the conservation programme new activities like migration studies using satellite telemetry, insulation of pylons of mid-voltage power lines and habitat analysis based on aerial and satellite photos have been included in current conservation activities.

Key words: *Falco cherrug*, conservation, Hungary, LIFE programme

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Introduction

Various Hungarian legends describe the behaviour of the mythical Turul, which enables us to identify this bird with a high probability as the Saker Falcon. Hungarians already knew the art of falconry at the time they were occupying the Carpathian Basin. They were monitoring falcon nests for centuries and sometimes they even used falcons as tax payment to the king. When selling private property in the Middle Ages, sellers sometimes maintained their rights on local falcon nests regardless of the new owner of the estate where the nest was located. Locations of nests were very well known from ancient times—it is proven through geographical names as well.

Sakers currently inhabit extensive open areas, mostly steppes and agricultural areas, in Hungary. However, raptors including Saker Falcons met heavy persecution in the lowlands during the 20th century right until the 1980s. Hunters considered them as competitors for small game species. As a consequence, most raptor species retreated to the mountains where big game hunting dominated thus birds of prey were not persecuted. That time Sakers mostly occupied mountain cliffs for nesting. However, the world has changed in the beginning of the 1990s. Persecution stopped in the lowland almost entirely. Parallel to that husbandry in mountains ceased giving space to forestation thus making prey species like European Suslik disappear from mountain areas. As a consequence of all these, Sakers reconquered the lowlands (Bagyura *et al.*, 2004). By 2007, all breeding pairs disappeared

entirely from Hungarian mountains. Peregrines, being extinct from Hungary for more than four decades, now occupy the ancient eyries again.

No accurate data exists on the Saker population in the ancient and medieval times in Hungary, however—considering original habitats—the estimation of more than a hundred pairs may not be far from the reality. Unfortunately, due to human activities like shooting and use of pesticides, the Saker population in Hungary did not count more than 8 nesting pairs in 13 known territories in 1980 (Bagyura *et al.*, 2003) when organised Saker conservation started.

Main achievements of Saker conservation in Hungary

The first decades of Saker Falcon conservation in Hungary (1980–2006)

One of the first aims of BirdLife Hungary, formed in 1974, was to save the Saker from extinction. Major causes of breeding failure were illegal shooting, disturbance by tourists and/or rock climbers, electrocution, changing land use and loss of appropriate food supply as a consequence, nest robbing by egg-collectors and for falconry. Although the effects of pesticides like DDT on the Saker population was not studied in detail, it is assumed that they affected its population similarly to that of Peregrine.

BirdLife Hungary started an organised Saker conservation programme in 1980, which focusses on the elimination of the most important threatening factors. Involvement of volunteers was a crucial element of the programme, which included the activities listed below.

Nest guarding and public awareness raising

The conservation programme has been running now for more than 30 years. The main elements of the programme and its major achievements are: guarding of endangered nests was the first step, because illegal trade of falcons was still a crucial threat at that time. Various nests were guarded on 101 occasions between 1977 and 2006, out of which breeding failed only 22 times. A total of 238 juvenile Sakers fledged from guarded nests and these contributed significantly to the increase of the Saker population in the Carpathian Basin. With the threat of nest robbing gradually disappearing, the emphasis was put on awareness raising during conservation activities. Many of the volunteers were students in schools in game management or agriculture, because raising awareness amongst those people possibly getting into contact with Sakers (and other birds of prey) later during their career was a priority action. The plan has proved to be successful, as nowadays we regularly meet game wardens in the field, who participated in the nest guarding and who have now a fully different attitude towards Sakers than the previous generation. Altogether, 1600 volunteers participated in nest guarding during the years.

Installing artificial nests

Installing artificial nests to provide safe nesting places for Sakers was another crucial element in Hungarian Saker conservation. Although placing artificial nests had started already during the period Sakers still tended to occupy mountain territories, its importance

increased significantly when lowland territories became dominant. Since human persecution in the lowland affected all raptors and almost all corvid species, only an insufficient number of good quality nests were available for Sakers at the time they moved to the lowland. Sakers, therefore, occupied any nest available, which caused breeding failure in many cases. The mortality of Saker broods was especially high (ca. 46%) in Carrion Crow (*Corvus corone cornix*) nests. To prevent further loss, members of BirdLife Hungary started to replace Carrion Crow nests with artificial nests in known eyries. The action proved very successful and since then artificial nests have been placed to many sites where Sakers had been regularly seen but no eyries were known (Bagyura *et al.*, 2004). Another phenomenon was in the 1990s that Sakers started to breed on the pylons of high voltage power lines. However, nest quality problems occurred on pylons as well, thus—in co-operation with the electricity provider companies—installation of artificial nests started also on pylons, which gave a new momentum to the programme. It was much easier to install artificial nests on pylons, and covered nest boxes proved to be safer than open nest platforms. Also, Sakers had a tendency to occupy artificial nests on pylons rather than on trees, because pylons were higher than the highest trees in the lowland. As a result, 85.4% of known pairs bred in artificial nests by 2006, out of which 43.5% were on pylons of high-voltage power lines and only 41.9% were on trees. Altogether, 3573 juveniles fledged from 1189 successful broods between 1980–2006, most of them from artificial nests (Bagyura *et al.*, 2006).

Suslik repatriation

As part of the conservation programme, 3 000 European Susliks (favourite prey of Saker) were translocated in the indicated period of the project from airports to new or former (improved) habitats. The main reason for the decline of this mammal was—as mentioned above—the abandonment of mountain meadows by farmers. As grazing livestock disappeared, the habitat became inappropriate for Susliks. The species disappeared from many sites, unfavourably affecting the Saker as well. However, after the year 2000, grazing restarted in some mountain meadows and they became appropriate for Susliks again. Renaissance of this practice was also beneficial to the raptors of Susliks, especially to Sakers.

Insulation

In order to diminish mortality caused by electrocution, following our proposal, electric companies insulated about 30 000 pylons of medium-voltage power lines, which was good news for other bird species as well. The final aim is to eliminate the threat completely; however there are more than 600 000 pylons of such type so there is still a long way to go.

Monitoring and ringing

Besides systematic annual ringing, other monitoring projects and data collection had also been carried out during the programme. Data were collected on nesting habits, habitat types, behaviour, dietary habits, breeding success and reasons for breeding failures. Prey remains were collected from 444 nests between 1992 and 2006 and in total 10 830 individuals of 114 species were identified. Analysis of data is still in progress.

Conservation of Saker Falcon in recent years (2006–2010)

The first Saker conservation LIFE project

Saker conservation in the Carpathian Basin has arrived to a new stage in 2006 when a Hungarian–Slovak project proposal on Saker conservation in the Carpathian Basin was approved by the LIFE financial instrument of the European Union (LIFE06 NAT/HU/000096). The project building on the main elements of the already running programme, also introduced new technologies and methods—like satellite tracking and habitat analyses based on aerial and satellite photos—to make conservation efforts more efficient. The project consisted of the following main elements each having significant importance in Saker conservation.

1. *Providing nest sites.* The population was strengthened by conserving old nest sites and creating new ones by placing artificial nests on potential or existing nesting areas.

2. *Studying agricultural subvention schemes and effects of the related habitat management.* Various schemes were analysed in order to propose a subvention system that supports those agricultural activities the most, which are favourable for the species.

3. *Conserving Suslik as the most important prey.* A proposal was created for a suslik-friendly habitat management on SPAs. In addition, another proposal was submitted to amend agri-environmental schemes in favour of suslik conservation. Suslik as the most important prey of Saker was re-introduced to certain Natura 2000 areas that were potential breeding sites of Saker.

4. *Insulating pylons of electric power lines.* Maybe the most important activity to reduce mortality was insulation of dangerous pylons of medium-voltage power lines in the nesting and foraging sites.

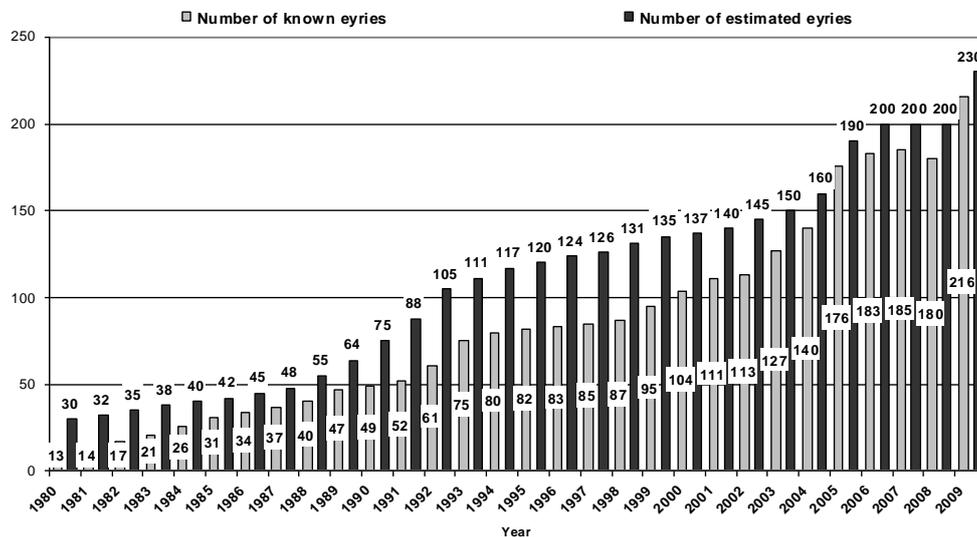


Figure 1. Changes in the Saker Falcon population in Hungary between 1980–2010

5. *Nest guarding.* In order to prevent human disturbance including nest shooting, guarding of endangered nests was organised with the involvement of many volunteers.

6. *Exploring the threats on migrating Sakers.* In order to better understand the mortality factors during migration and on wintering sites Sakers were fitted with satellite tags and an international mailing list was set up.

7. *Increasing environmental awareness.* During the project various stakeholders (farmers, game managers, politicians on local and national levels) were contacted and information signposts were erected to gain support for the conservation programme.

8. *Monitoring.* A standardised monitoring system was established, which provided precise information about changes of both Saker and suslik populations. By using the capture-recapture method, wintering success of susliks was evaluated and information was collected from the wintering areas of Sakers by using an international mailing list. Both actions were necessary to follow the changes and to evaluate the success of the conservation measures.

9. *Developing human resources and technical possibilities.* To implement conservation actions, development of both human resources and technical equipments were necessary and they were parts of the project.

10. *Ringling.* Ringling was an integral part of the project as a traditional element to gather information on the population dynamics and movements. Saker chicks were ringed with ornithological and so-called PIT (Passive Integrated Transponder) rings.

The project ended in 2010 and brought a large amount of new information on habitat use, diet, juvenile dispersal, migration and threats on the species. New findings on the specific topics are to be published at a later stage.

Population status of the Saker Falcon population in Hungary in 2010

The rainy spring of 2010 did not favour Sakers. In the last year of the first LIFE project, only 176 juveniles fledged (from 68 nests), which is about one quarter of juveniles fledging in an average year. As the population was estimated at approximately 220 pairs (with 172 known eyries), the low number is the result of low breeding success rather than that of a possible population decline: only 68 pairs were successful, the worst ratio in the last 30 years, and even they had a very low number of chicks (2.59 chicks/nest).

In 2010, 90.6% of the Hungarian Saker population bred in artificial nests (on trees or pylons) with 75% of the pairs choosing artificial nests on pylons. A total of 7.6% of the pairs bred in natural nests on trees and 1.8% in natural nests on pylons. These numbers indicate the importance of the artificial nest programme.

The second Saker conservation LIFE programme

As a sequel of the first LIFE project, a second LIFE Saker conservation programme (LIFE09 NAT/HU/000384) was launched in 2010 with the participation of Hungary, Slovakia, Romania and Bulgaria by the support of the European Union. At the same time, the project also aimed to eliminate some endangering factors in the core area, too. In 2010, the total European breeding population was estimated at 450 pairs, with Hungary and Slovakia holding about 47% of it.

During the programme, which lasts until 2014, the Hungarian and Slovak participants will share their experience with their partners to contribute to a more efficient conservation

Saker programme in those countries as well. The second project will focus on the protection of existing nest sites and the establishment of new ones by attracting Sakers there with the installation of nest boxes. Special effort will be taken to better understand the food and habitat preference of the species, Suslik (*Spermophilus citellus*) friendly habitat use will be introduced on SPAs and proposals will be made to the Agri-Environmental Scheme to reach an even better level of habitat management. Susliks will be reintroduced to some potential Saker habitats. The project takes actions to eliminate the key factors of mortality. This involves insulation of dangerous electric pylons around nesting and feeding sites and guarding nests to reduce illegal culling by hunters. To evaluate changes in population trends the project evaluates migrating losses by satellite telemetry and gathers information from the wintering grounds. Application of satellite transmitters will also provide data for mapping the habitat use of adult birds in the area of existing or planned wind farms in order to better understand their effects on Saker behaviour. This type of data collection can be used during the planning or permitting process of wind farms. An intensive communication programme targeting farmers, game managers and decision makers at local and national level, together with the posting of attention signs, will raise awareness in the target groups and create support for conservation measures for Sakers. To evaluate changes in population trends and to assess the success of conservation actions of the project a comprehensive monitoring programme will inform about the changes in population parameters both in case of Susliks and Sakers.

As a result of this project, the conditions for the conservation of Saker will improve significantly in the entire project region.

Acknowledgement

We thank to the more than 1 600 volunteers who have been participating in the Saker conservation programme in Hungary since its beginnings until today. All of them played an important role in conserving the species in Hungary. Also, we would like to thank the invaluable help that has been given by the relevant ministries, national park directorates, MAVIR (Hungarian electricity provider company), local NGOs, municipalities and many other organisations that supported the Saker conservation programme in various ways.

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