CONSERVATION PLAN FOR SAKER FALCON (*FALCO CHERRUG*) IN UKRAINE

- Draft Version -

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CONTENT

- INTRODUCTION

- SPECIES DESCRIPTION
  - Ecology of the Saker Falcon
  - Distribution and population

- THE STATUS OF SAKER FALCON IN UKRAINE
  - Population history
  - Breeding characteristics
  - Movements
  - Diet

- THREATS AFFECTING SAKER FALCON POPULATION IN UKRAINE

- CONSERVATION ACTIONS TO BE TAKEN

- REFERENCES
INTRODUCTION

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

The situation of the species is slightly better in Europe. After the worst period in the 1970s and 1980s, the population in Central Europe recovered by the end of 2000s. The situation seems to be stable in Ukraine, however high level of uncertainty about the population trend, disappearance of the species in the European Russia, shrinking habitats, exposed crimes against raptors including Sakers are warning signals.

It is very important, therefore, to prepare a conservation plan that shows decision-makers the most important measures to be taken. This document attempts to provide a frame for a more detailed conservation plan tailor-made for various regions of Ukraine. It is compiled by the Saker Falcon experts of Ukraine and Hungary, and based on the latest information about the species partly from projects in Ukraine, partly from other countries.

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SPECIES DESCRIPTION

Ecology of the Saker Falcon

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

Distribution and population

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

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

Population history

The Saker Falcon is a partly migratory, breeding species in Ukraine, with a core population in the Crimea. In the late nineteenth - early twentieth century Sakers were fairly common in the steppe zone. Thus, in the former Kharkiv province was a 'traditional breeding bird' being more numerous in the western part of the province and along Seversky Donets. In Poltava was also common. Saker was common breeder in the appropriate habitats of the other parts of the province. In the 1920-1930-ies along Seversky Donets this bird of prey was already in decline - in 1936 six pairs were known, and noted a downward trend. The nesting sites were four artificial forests of south Ukraine. In the mid-twentieth century Sakers became increasingly rare in eastern Ukraine. In the first half of the twentieth century the bulk of the Ukrainian Saker population bred in forest. In the steppe zone only 20 nesting sites were known. In the mid-twentieth century there was a noticeable reduction in the number of breeding pairs, which continued to decline in the following decade. In the 1980s, the Saker population in Ukraine was estimated to only 30-40 pairs, of which only 11 were known in the steppe zone, and 5 of them in the Crimea. It is likely, however, that these data do not entirely meet the real numbers.

The population decline in the twentieth century were caused by logging old forests, disappearance of susliks as the main food base, human persecution of Sakers and destruction their nests, infectious diseases and electrocution. The population was affected negatively also by logging floodplain forests to create reservoirs. In the 1970-1990's, an overall population decline was observed throughout the European part of the distribution range of the species.

In the 1980-1990's the number of Sakers breeding in forests decreased dramatically, but the population appeared to be stable in the steppe zone. At this stage the cora population shifted the central and northern steppes to the southern steppe zone, where have power line pylons provided the most suitable nest sites.

In some Central European countries, slight increase of Saker populations were reported already in the period 1990-2000. Also in the middle of the 1990s, despite the general decrease, the known Ukrainian population in the steppe zone increased to 30 pairs and six of them were breeding in the Crimea. At the end of the 1990s, the estimated population only along the rivers Danube and Southern Buh was about 80 pairs. For late 20th - early 21st century the population was more or less stable.

On the basis of mapping Saker nests in the steppe zone, and also considering the potential pairs in appropriate areas outside of the study area, the Saker population in the Ukrainian steppe zone can be assessed to 285 - 312 pairs. The vast majority of birds can be found in six administrative regions in Ukraine, and in the Crimean steppe – here the population reaches a maximum of - 115-127 pairs. In the study areas in Luhansk, Poltava and Kharkiv regions no nesting pairs were found.

According to recent satellite tracking projects in Central Europe and Ukraine, Sakers prefer to use agricultural land to natural grasslands. Probably, the reason is that prey is more concentrated in agricultural areas and also it is easier to hunt in an open land than in an area covered by grass.

Breeding characteristics

Like other falcons, Sakers do not build their own nest eather, but they occupy old nests of other birds, generally those of ravens. In the first half of the twentieth century, almost all groups of Sakers, which nested on trees, took the old nests of other birds of prey, as well as ravens, or less frequently rooks and herons. The Crimean population nests now partly on clay or limestone cliffs...
and usually they lay their eggs directly on the floor of cavities and ledges.

As for the environmental characteristics of the nesting, some changes can be observed through the last century. At the end of 19th – the first half of the 20th century, Sakers nested mostly in old deciduous and coniferous (pine) woods. As little left by that time of the ancient forests, the birds chose the woods that remained after felling. Sakers occupied the nests close to the edges.

Nowadays birds prefer pylons of electric power lines using old nests of other raptors or corvids. Sakers in Ukraine almost stopped breeding on trees only a few decades ago. The development of the electric grid across the steppe zone started in the end of 1970s - beginning of the 1980s. During the 1980s - 1990s, the number of nests located on pylons increased dramatically. Since 1980, there has been only 4 cases known, when Sakers were found nesting on trees.

Another group of Sakers in Ukraine inhabits mainland and coastal cliffs, as well as abandoned and existing sand pits and limestone quarries in Crimea in a more arid environment. It is very likely a recent phenomenon, as in the 19th century, Sakers in the Crimea were very rare. In the middle of the 20th century, only a few nests were found on cliffs. Now steppe region of Crimea hosts one of the largest Saker groups in Ukraine - about 130 pairs, out of which about 15-16 pairs nest on cliffs.

Thus, there are two main groups of Sakers in Ukraine, as for nesting characteristics. One group inhabits rocks and cliffs, limiting its range to the Crimea, while the second group nests almost entirely on power lines and it is widely spread across the steppe zone. Tree nesting pairs are rare nowadays and they can be found in food-rich areas without power lines, and lacking significant human presence.

Saker nests can be found at various heights. Birds nest on coastal cliffs, occupy cavities and ledges at the top of the walls. On the peninsula Tarhankut (Crimea) they nest at a height of 20-30 m in limestone ledges. On the banks of Sivash (Crimea, Kherson region) and some coastal cliffs of the Black and Azov Seas they nest at the top of the clay ledges, mostly on 10-12 meters, but sometimes only 5-6 meters from the water. In some cases the nest is a small platform in a vertical crack of the clay, which broke away from the main part as a result of abrasion. In these places, Sakers were found using the nests of ravens also using the cracks as nest platforms. Birds nesting in trees, choose nests with not less than 12-15 meters high from the ground – mostly at a height of 20-25 m. Sakers nests on pylons are usually not below 20 meters. There has been only four cases when the nests were lower than 10-12 meters.

The least distance between nests is less than 1.5 km. However, only Sivash clay cliffs (Kherson region) are so densely populated by Sakers. The minimum distance between nests in Donetsk and Kherson regions is 2-2.5 km. Typically, neighboring nests located 4-5 km from each other in most cases, and this distance may go up to tens of kilometers. Perhaps this latter can be explained by poor prey availability in the breeding areas.

In southern Ukraine the laying take place in late March, while it occurs later – from the beginning of April – in other areas. The full clutch usually consists of four eggs, but the number of of eggs ranges from three to six, but a six-egg clutch is very rare phenomenon. Repeated laying can also occur in case the first breeding attempt fails within a certain period from the start of the breeding. The average number of chicks per nest in Ukraine is 3,09 ± 0,11.

Young Sakers stay in the nest for about 1,5 month and they fledge from the middle to end of June. Juveniles leave the nest 7-10 days earlier in the Crimea.

**Movements**

It is about end of July, when juveniles leave the natal eyrie. Satellite tracked 1st calendar year (1cy)
birds in the Crimea showed that they may disperse as far as Russia, flying around the Azov Sea, but they prefer to stay in the Crimea. One bird reached Cyprus on his pre-migratory nomadic move, but unfortunately he was electocuted in Turkey before the autumn migration started. One satellite tracked male left Crimea on his 2nd summer and spent some months on the Russian-Kazakh border, but then he returned to Crimea for winter.

Little is known about autumn migration. Apparently, a part of the population remains in the breeding area, while the other part migrate. Satellite tracked Saker Falcons provide new information on the movements of Ukrainian birds. According to the latest data, some individuals (only 2nd cy females, so far) migrate from the Crimea to North Africa for winter, while others (only males until now). However, more data is needed to understand better the movement patterns of the Ukrainian Saker Falcons.

Until the end of the 20th century, winter observations of Sakers in Ukraine were rare. Wintering birds were first recorded in breeding areas in Crimea in December 1980 and January 1985. During the last two decades, winter observations of Sakers became regular. In January 2010, nine individuals were observed, in five steppe regions of Crimea.

**Diet**

Small rodents and various, small medium size bird species are the main prey of Sakers. Susliks (*Spermophilus spp.*) play a significant role in Sakers’ diet. In Dnipropetrovsk region, rodents accounted for 78-93% of prey items, the rest 8-13% were birds. Other authors claimed 90% for rodents and 10% for poultry. In Crimea, rodents accounted for 70% of the diet, the remaining 30% were birds.

In the steppe zone of Ukraine, birds are the most important preys in Sakers' diet, while rodents have now only secondary importance. Among the birds, Rook (*Corvus frugilegus*) has a considerable percentage and that shift largely contributed to the conservation of the species in Ukraine, when the suslik population decreased significantly.

In the diet of some pairs nesting on coastal cliffs, and clay cliffs of Sivash, various species of gulls are dominant. Some couples may specialize in certain species: e.g. a pair nested on on a clay ledge on Tarhankut Peninsula near the Black Sea, remains of 11 stone curlews (*Burhinus oedicnemus*) were found. Especially in winter Sakers often prey on domestic pigeons and starlings.

**Legal status in Ukraine**

The Saker Falcon (*Falco cherrug*) is listed in the Red Data Book of Ukraine as “Vulnerable”. The species is “strictly protected” by the law.
THREATS AFFECTING SAKER FALCON POPULATION IN UKRAINE

In Ukraine just as in other parts of the species range, there are a number of factors that affect negatively the Saker populations. This section gives an overview of the threats and their causal relationship.

Habitat change and habitat loss

Recent agricultural practices in South-Ukraine and the Crimea apparently supports the existing Saker Falcon population. However, changing agricultural practices may reduce prey species' populations, thus having negative impact on the Saker Falcon's population. The recent plan of the Ukrainian government to reclaiming abandoned agricultural areas and lend them to foreign investors with modern technologies may pose various problems. Modern seed treatments and cultivation technologies, as well as the use of GMO plants provide better defence for the crops against rodents. In addition, increased efficiency in harvest leaves less wasted grain in the field. The effects of all those will be reflected in the decreased number of prey animals. In case, the land is used for agricultural activities not favourable for Sakers (e.g. vineyards), a clear habitat loss will occur. Intensification of chemical use in the agriculture may cause direct or secondary poisoning (see also below) to Saker Falcons.

Although grasslands are not the most important sites for Sakers anymore, they are very important sites for the susliks (Spermophilus spp.), an important prey for Sakers. Thus further conversion of grasslands into agricultral land will decrease suslik populations and that may affect also Sakers. The intensification of agriculture and conversion of grasslands to arable land (or to vineyards in Bulgaria) leads to the reduction of prey availability for Saker.

Decrease in grazing animal stock

Without grazing, pasture vegetation becomes taller and denser, bush encroachment and afforestation start and thus the ae becomes unfavourable for susliks and other important prey. The reduction in the number of non-intensively grazing animals is a result of lower profitability of animal husbandry in the countries that went through social and economic transition. As with conversion of pastures to other land use, the impact of this threat is greater where the availability of alternative prey for Saker is more limited (e.g. in steppic areas). Possibly it is a significant threat in Russia (Galushin et al. 2001; Galushin 2003; Antonchikov, Piskunov 2003; Chernobay 2004; Karyakin 2005), Ukraine and Bulgaria, as well as, locally in Romania and Serbia (Ham 1980).

Overgrazing

Overgrazing of pastures by domestic livestock decreases the food source for the suslik thus leading to the decrease in their numbers. It is reported as a recent threat only from Turkey and Georgia, but it may be a problem also in some parts of Ukraine.

Eradication of rodents

The suslik used to be considered as a pest in areas where it caused damage in crop fields or to dykes or where it was supposed to be a grazing competitor with livestock. Eradication campaigns have contributed significantly to the decline of the suslik in parts of Russia and the Ukraine (Belik 1999; V.Vetrov pers. comm.), but were abandoned in the European range of the species recently. However, eradication of rodents, especially Brandt's vole (Fox et al. 2003), are reported from Asia. Using poison for eradication is not only
decreasing the Sakers' prey population, but also it can cause secondary poisoning to birds of prey and mammal predators.

**Afforestation**

Large scale afforestation may reduce the availability of open hunting grounds for the Saker. It has an especially adverse impact when it is targeted at grasslands in areas where the availability of this habitat is limited. Carbon sequestration attempts in the context of mitigating impacts of climate change are also encouraging the increase of forest cover. However, negative impacts associated with afforestation are the consequence of poor planning and the fact that afforestation aid is often granted without considering the Saker and other open land specialists' requirements. Example for the impact of afforestation can be found in the Deliblato sand plains (Serbia) with decreasing Saker breeding population.

**Infrastructure development**

Construction of industrial wind farms with large-sized turbines, building roads, motorways, railways, urban and industrial development or tourist facilities can directly destroy breeding and feeding habitats of the Saker. Wind turbines, in addition, pose direct threat to birds including Sakers (see below).

**Shooting**

Occasional shooting of Sakers (and probably other birds of prey) may occur especially during the autumn hunting season. However, it is very likely that the scale of this type of persecution is low and this threat does not have a significant impact on the Ukrainian Saker population.

**Poisoning by pesticides or chemicals**

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

**Electrocution**

Birds can be electrocuted on medium-voltage power lines (usually 10-35 kV) when trying to perch on electric poles. By simultaneously touching two energized conductors or a conductor and any grounded hardware the bird is electrocuted and dies instantly. The problem is most severe in open areas with high prey abundance and with few natural perches. Although bird-friendly design can significantly reduce or even eliminate electrocution, national standards include dangerous pylon types in many countries. Ukraine, in this respect, is less dangerous for birds, as most pylon types have bird-friendly design. However, dangerous pylons can be found as well in the country.

**Collision with man-made structures**

Electric power lines (both high- and medium-voltage), transmission towers, wind turbines and other man-made structures pose a risk of collision to flying birds, especially when hunting. Collisions usually lead to instant death or cause severe injuries to birds with no hope for survival. These structures (wind turbines above all) may also be related to increased stress on birds, as well as increased energy loss, associated with their circumnavigation in various atmospheric conditions (Ruskov 2004). However, due to their
built (smaller size than large Western European wind turbines), Ukrainian wind turbines do not threaten larger birds directly. Loosing habitats because of wind farms may be a problem though.

**Trapping**

Sakers are trapped in large numbers on migration routes, especially in the Middle East, Pakistan and North-Africa for use in Gulf (Arab) falconry, where it is considered an important threat. It is this trapping in Central Asia, caused by the heavy demand for falcons in the Middle-East since the 1970s-1980s, which has lead to the Saker falcon being listed as Globally threatened. Very little information is available on the extent of trapping of European Sakers on migration, however ring recoveries and satellite-tracking data suggest that they are regularly trapped in North-Africa – mostly in Libya. The use of wild-caught Sakers in falconry is not allowed in the following European range states: Bulgaria, Czech Republic, Georgia, Hungary, Russia, Romania, Slovakia, Ukraine. However, some illegal trapping may take place even in Europe, including Ukraine, Bulgaria, Georgia, Romania and Turkey. In some Gulf countries such as Saudi Arabia and Kuwait, wild-caught Sakers are the preferred hunting birds for falconry. This market is fed by the trappers (many from Pakistan and Syria) who catch birds on autumn migration and during post-breeding dispersal eg in Russia, Kazakhstan, China and Mongolia as well as other areas during migration. Turkey probably is/ was also an area heavily frequented by trappers. Qatari agents regularly visit North-African countries to purchase trapped falcons (Sakers, Peregrine and Lanners) from local trappers. In Europe, also pigeon-breeders trap raptors occasionally, who consider Sakers and other birds of prey as a threat to their pigeons.

**Nest robbing**

Robbing of Saker nests used to be to some extent a critical threat in the western part of the range (i.e. in the Czech Republic, Slovakia and Hungary) where its importance has decreased drastically since the 1980s. Nest robbing is likely to have greatly contributed to the species’ fast decline in Bulgaria. It is suspected that during the 1990s almost all known nests were regularly robbed there (Ruskov 1995, 1998a, 1998b). A similar situation occurred in Hungary where the Saker population has started to increase only after nest robbing was strictly controlled. Currently, nests are supposed to be regularly robbed in Russia (Karyakin 2005), Bulgaria and Turkey as well as in Kazakhstan (Karyakin et al. 2004b). It is proven that nests are robbed in certain region in Crimea, Ukraine and direct link to Gulf falconry was found (V.Vetrov, Ju.Milobog pers. comm.). Apparently, some of the robbed chicks are sold for falconry purposes, while some others – usually the smaller males – are used for showing them to tourists and asking money for the photographs (e.g. in Bakhchisaray). Unfortunately, neither the responsible conservation authorities, nor the police are in the position to enforce the law rigorously (due to lack of financial and human resources, as well as because of emphasized demand from the responsible ministry and lack of training).

**Predation**

Predation is a natural mortality factor. Ravens (Corvus corax), martens (Martes martes), goshawks (Accipiter gentilis), Eagle owl (Bubo bubo) or other animals can take eggs or small chicks from Saker nests. Foxes (Vulpes vulpes) regularly predate on freshly fledged juveniles that cannot fly well and spend much time on the ground. Eagle owls may also take fledged juveniles or even adults on cliffs if the two species occur together. Casualties from most of these species usually happen to inexperienced Saker breeding pairs. However, in the case of experienced breeding pairs predation of the clutch is usually the secondary consequence of human disturbance.
Collapsing nests

Sakers may occupy weak nests of ravens or crows or old, unstable nests of other birds of prey such as buzzards. These nests may not hold up until the end of the nestling period, collapsing and usually causing the failure of the breeding attempt (chicks die). Provision of artificial nests has been proven as the fastest way to increase the number of successfully breeding Saker pairs and so it is an effective way to increase Saker populations in areas where abundant food is available. Population modelling supports this observation and suggests that, although higher egg and chick mortality caused by collapsing nests is a natural phenomenon, addressing this issue can effectively compensate for higher adult and juvenile mortality caused by other threats within certain limits (Nagy, unpubl.).

Extreme weather

Strong windstorms can throw nests from trees or fell the entire tree. Cold or rainy weather in the period of hatching can lead to death of embryos or small chicks. Large amounts of rain can flood thick nests and especially breeding niches on cliffs leading to the death of either eggs or chicks. Occasionally lightning can also hit nest-trees. Losses caused by extreme weather conditions are rare, but occur regularly throughout the Saker’s range. The threat is largely unpredictable and can cause only some fluctuations in the population.

Hybrid falcons breeding with wild Sakers

Although it may occur in other parts of Europe, it is unlikely that hybridization between Sakers and escaped falconry birds (hybrids) and replacement of pure Sakers from pairs by hybrids is a problem in Ukraine. It is because falconry is not existing in the country apart from a modest attempt of a very few individuals. Besides, it is unlikely that any escaped hybrid will make its way from Central-Europe (where hybrids are bred at closest to Ukraine) establish a pair and start to breed causing introgression of other species genes into natural Saker populations. Should falconry be expanding in Ukraine, this threat may become actual.
CONSERVATION ACTIONS TO BE TAKEN

In order to achieve a favourable conservation status, there is a number of actions to be taken. The most important actions are listed below.

Active involvement of authorities

It is very important that the responsible ministries and their various local organisations (Ministry of Environment, Ministry of Agriculture, national park directorates, environmental authorities, police, custom authorities, etc.) involve more actively in species conservation. Fulfilling their role in the species conservation, especially as for law enforcement, monitoring – is essential for the efficient conservation. Establishing a national Saker Falcon working group consisting of representatives of the above mentioned organisations is desirable. Its task will be to elaborate a detailed conservation plan for the species and to carry out field activities.

Regular monitoring of Saker Falcon population

In order to observe country-wide population trends, a monitoring programme must be prepared and carried out on long term. Sites to be monitored have to reflect the most important Saker Falcon habitats and monitoring has to be carried out at least bi-annually.

Understanding conservation biology of the species in Ukraine

Detailed studies must be carried out to complete our recent knowledge on the needs and threats of Saker Falcons in Ukraine. Available state-of-the-art technology (e.g. satellite-tracking, nest-cameras) should be applied to reveal diet and movement patterns in depth in order to support conservation efforts.

Installing artificial nests

As Sakers, similarly to other falcons, do not build nest, but occupying nests of other species, lack of nests is a limiting factor to the population. Installment of artificial nests, therefore, can have a significant positive impact on the Saker population. Based on the positive results of previous projects (mainly in Hungary, Slovakia and Mongolia, but also in Ukraine on a smaller scale) artificial nests must be installed in favourable habitats without nesting opportunities.

Insulating dangerous pylons of mid-voltage power lines

Electrocution is a major threat on Saker Falcons as it has been experienced in Central Europe. Although Sakers are less exposed to this threat in Ukraine because of the bird-friendly design of the most pylons, dangerous pylons still can be found in some areas. The first step is to survey the areas and map the dangerous pylons, monitor them (if they pose risk to birds indeed) and then insulation of dangerous pylons must be organised with the local electricity providers. It is also important to keep the recent bird-friendly standards on pylon design for electricity providers in order to prevent the introduction of dangerous pylon design. Problematic pylons as well as related design standards should be phased out on longer term.

Conservation programme for suslik species

Establishing a conservation programme for important and decreasing prey species (Spermophilus spp.) is a key element of Saker conservation in some region. Suslik species have been known to be decreasing for decades and not only in Ukraine, but European-
wide. It is important to reveal the reasons of decline and prepare, and implement an effective and efficient conservation plan.

**Agri-environmental schemes**

As nowadays Saker Falcons are living mainly on agricultural land, establishing agri-environmental schemes for supporting nature-friendly agriculture can contribute to the survival of the species on long term. Such schemes could ensure the conservation of steppe-like habitats and wildlife including Sakers at least some parts of the country by preventing large-scale habitat change (from non-intensive to intensive use).

**Nature-friendly spatial planning**

Including nature conservation aspects in spatial planning (e.g. wind farms or other large scale infrastructure development projects) must become everyday practice in order to prevent ruining Saker Falcon habitats. It is also important in this respect to prevent installation of any large (western European type) wind turbines, especially in the Crimea and along the Black Sea coast in the migration routes.
REFERENCES


