



# FALCO

The Newsletter of the Middle East Falcon Research Group  
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**Objectives of the MEFRG** ([www.mefrg.org](http://www.mefrg.org)):

**Provide a forum for information exchange on matters relating to falcons and falconry in the Middle East**

**Promote and/or improve the understanding of:**

- The cultural heritage of Arabic falconry
- The utilisation and management of quarry species
- The conservation of wild falcons used in Arabic falconry
- The management of falcons in falconry
- Advances in veterinary and aviculture care of falcons
- International issues impacting on, or arising from, Arabic falconry

**The objectives of the MEFRG will be achieved by**

- Holding regional workshop meetings and international conferences
- Publishing and distributing a paper and electronic Newsletter (**FALCO**) on issues of common interest to the MEFRG
- Coordinating and hosting a website and maintaining an online subscribers database

We welcome the submission of articles for **FALCO**. Please bear in mind that **FALCO** is not a scientific journal and we would like authors to remember that articles should be accessible to a diverse readership comprising falconers, biologists, veterinarians and policy makers. We are interested in authoritative, accurate and informative articles related to the subject areas listed below

### Falconry

articles about the practice of falconry of interest and relevance to Arabic falconers

### Falconry Heritage

articles about Falconry Heritage of interest and relevance to Arabic falconers

### Quarry Management

articles on the conservation and management of quarry species utilised in Arabic Falconry or of interest to Arabic falconers

### Raptor Conservation

articles on the conservation and management of raptors used in Arabic falconry, but also more generally of any raptors in the Middle East

### Avian Health and Management

articles on veterinary and avicultural issues specifically originating from work carried out in the Middle East, but external studies that are relevant to improving the health of raptors in the Middle East will be considered

### Research Biology

articles on biological research of falcons used in Arabic falconry, to cover issues such as migration, taxonomy, genetic research, etc

### International Issues

articles and updates on international policy decisions and discussions relating to falconry, conservation, trade and animal health that is of relevance and interest to Arabic falconry

### Public Awareness and Education

articles on initiatives that can contribute to a better understanding of Arabic falconry and the wider issues surrounding it

### Technical Updates

reviews and updates on new products/equipment etc. that may be useful for biologists, falconers and vets working with raptors

### Photo Section

interesting images of relevance to subjects covered by the MEFRG

### Raptors in the News

summary of recent press releases relating to subjects covered by the MEFRG

### What's New in the Literature

Review of recently published scientific literature relevant to the objectives of the MEFRG

We also accept and publish Book Reviews and Letters. If you are in doubt about whether or not an article fits any of the above categories please contact the editor:

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**Cover picture**

Gyrfalcon carrying prey, Kolyma River, Yakutia, Russia  
(Ed Duthie)

**Back Cover picture**

Artwork from the School Links Programme

Many readers of *Falco* would have had the opportunity to attend the 3<sup>rd</sup> International Festival of Falconry held under the patronage of HH Sheikh Khalifa bin Zayed Al Nayhan and hosted at Al Forsan International Sports Resort, Abu Dhabi from 11-13 December 2014, and the falconers' desert camp that preceded it from 07-09 December in Al Gharbia. In addition to being a celebration of falconry and its recognition on the UNESCO representative List of Intangible Cultural Heritage of Humanity, further objectives of the 3<sup>rd</sup> Festival of Falconry were "to provide a suitable platform for exchange and dialogue between people, organisations and individuals who are interested in falconry, with the aim of supporting, protecting and developing this heritage" and "to emphasize the role of the Emirate of Abu Dhabi and the UAE in the protection of the environment and the promotion of its sustainability".

With these objectives in mind, a meeting was held at Al Forsan that set out to address the issue of electrocution of birds of prey in Mongolia. The Environment Agency-Abu Dhabi research and conservation management projects for Saker Falcons in Mongolia have identified electrocution as a major cause of mortality for the species, with thousands killed this way each year along with many other birds of prey such as buzzards and eagles (see article on p.16 for further information). The meeting targeted key individuals from power companies and government in order to inform them of the scale of the electrocution problem and ways in which it can be addressed. It was a useful forum for researchers and policy makers to hear directly from power company executives and engineers. In the end there was a consensus that there is a severe problem that needs to be solved and delegates agreed a resolution to be submitted to the government of Mongolia that:

*The Conference of the 3rd International Festival of Falconry (i) encourages the government of Mongolia to develop and enact regulatory or other measures, including standards, to ensure that all new power lines are safe for birds of prey, (2) urges the government of Mongolia to facilitate the mitigation of the existing electricity distribution infrastructure in order to reduce the incidence of bird of prey electrocution, (3) requests that the working group established by the Ministry of Environment and Green Development on electrocution to be reconvened in order to produce clear guidance, in Mongolian, on bird safe power infrastructure and mitigation options and (4) strongly recommends that adequate technical and*

*financial resources are allocated to the development and deployment of new power lines that are safe for birds of prey, and that due consideration is given to the potential of utilizing income from international trade in the Saker Falcon in order to fund the mitigation and remediation of existing dangerous power lines.*



Electrocution of birds of prey is not a new issue, nor is it a problem confined to Mongolia. Yet for decades the relatively simple solutions have not been implemented widely and new dangerous power lines continue to be built. This state of affairs highlights a failure of communication by conservationists – we have not engaged sufficiently with the people who really can make a difference i.e. the engineers and executives of power distribution companies and those who commission and construct new power lines. We hope that the initiative of direct contact with power companies seen at the Festival of Falconry will result in real changes on the ground through the implementation of remediation work to reduce the risk of electrocution to birds of prey.

Falcons face many threats across the globe, some of which are directly linked to falconry and the trade driven by demand from Gulf States. In this issue Arya Shafaeipour and colleagues provide an insight into the operations of falcon trappers and smugglers in Iran. The vast amount of good work done by falconers for falcon conservation and welfare is undermined by these nefarious activities, and it is the responsibility of all falconers to eliminate this stain on the image and integrity of falconry.

Advances in treatment of health conditions of falconry birds, such as aspergillosis, have resulted in improvements in welfare and survival in captivity. In this issue veterinary experts from Topet Farma in the Netherlands have provided an article focusing on 'asper', including its diagnosis, treatment and prevention. At *Falco* we have been fortunate to receive several articles in the past from Dr Soma in relation to his ethnographic studies in western Mongolia, and he has now provided us with details of the artwork and handicrafts associated with the artifacts and furniture used in Kazakh eagle-hunting.

**Andrew Dixon**  
Editor, *Falco* Newsletter

## Falcon and bustard smuggling in Iran

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### Introduction

Birds of prey are at the top of the food pyramid in nature, where they play a role in regulating populations of insects, rodents and reptiles. So, declining raptor populations causes disruption to natural ecosystems. In addition, raptors have aesthetic, sporting and ecotourism value but unfortunately populations of several species are declining in Iran. Due to their use in falconry and their value to wealthy Arabs, Saker Falcons *Falco cherrug* and Peregrine Falcons *Falco peregrinus* (including Barbary Falcons *F. p. pelegrioides*), have attracted attention of traders on southern coasts of the Persian Gulf.

### Falcon trapping in Iran

Each year in early autumn, illegal trapping of falcons takes place in many areas of Iran such as the plains of Bushehr, Hormozgan, Sistan and Baluchistan, Golestan, Lorestan, Khuzestan and Hamedan provinces. The trapping season usually starts in late September and continues to late winter, with its peak in the autumn.

Target falcons are Saker, Peregrine and Barbary, respectively; depending on the species, they will be sold at different and high prices. Trappers use birds, such as Kestrel *Falco tinnunculus* and doves *Streptopelia* spp., to catch them. The falcons are smuggled to Gulf countries, such as Saudi Arabia, UAE, Qatar and Bahrain after trapping, and the transported birds have their eyes covered either by sewing the eyelids together or by hooding them.

The Saker Falcon population in Iran has declined in recent years and is now very low, so most of the falcons trapped within the country are Peregrine and Barbary Falcons. However, Saker Falcons comprise a large percentage of the falcons which are trapped outside Iran and smuggled through the Iranian maritime border.

### Efforts to combat illegal smuggling

During the smuggling process, a proportion of the trapped falcons are discovered by the guards of the Iranian Department of Environment (DOE) and the police. These birds are confiscated and returned to the wild by being released in appropriate habitats. Anyone who attempts to trap, trade, transport, cage and traffic birds of prey, such as the Saker, Peregrine, Barbary and Kestrel can be convicted by the law. Those convicted can be imprisoned up to a maximum of three years and face a fine of up to 1.8 to 20 million Rials (ca. 68-640



**Picture 1.** Saker Falcons are frequently trafficked by falcon smugglers through Iran or around its coastline.

Euros). In addition to the above penalties, a payment of 200 million Rials in fines has been assigned to illegal hunting with Saker, Peregrine, Barbary, Goshawk and Lanner.

### Recent figures relating to falcon smuggling in Iran

We have compiled, according to official data, various information on birds of prey discovered in trade shipments in recent years, and in particular one of the largest confiscations of falcons in the world.

According to the official data from the DOE a total of 57 falcons were seized from traffickers in 2013 and 184 in 2014. The Saker Falcon is the most trafficked species with 26 and 93 individuals seized in 2013 and 2014, respectively. The corresponding figures for Peregrine are 19 and 63 seizures, with 12 and 28 seizures of Barbary Falcon. The largest number of smuggled falcons, with 160 individuals, in the last two years, has been discovered in Sistan & Baluchistan province; Hormozgan province, with 34 individuals, is in second place. In 2013, 16 Saker Falcons were discovered after being illegally imported to Iran in Khorasan province, which has a border with Afghanistan.

Obviously, the number of detected falcons is just a small percentage of the true number being trafficked. Smugglers use many ways to hide their illegal shipments.

### Case study: the interception of a consignment of falcons and bustards

One of the largest falcon shipments in the world was discovered in the Oman Sea in November 2014. Due to the importance of this shipment, we review it here:

On Friday, 14<sup>th</sup> November 2014, the Chabahar Coast Guard in cooperation with the DOE Guard stopped an Iranian motor vessel on its way from Jiواني Port, Pakistan to Bahrain, at 35 miles from Chabahar coast in Oman Sea. The arrested vessel was transferred to Shahid Kalantari Port in Chabahar for further investigation. During the



Picture 2. Some of the confiscated bustards

inspection of the vessel, 142 falcons and 240 MacQueen's Bustard *Chlamydotis macqueenii* were discovered, and eight Iranian and Pakistani men (including the Iranian captain, crew and three veterinarians) were arrested. It should be noted that the Pakistani cargo owners were among those arrested. After a thorough inspection, the birds were immediately transferred to the treatment and maintenance center of the DOE in Chabahar.

To avoid possible loss, the birds were immediately removed from boxes after arrival in Chabahar and supportive therapy and nutritional care was provided. The cargo included 142 falcons, of which 138 were live (83 Saker, 34 Peregrine and 21 Barbary) and four were dead (two Saker, one Peregrine and one Barbary) and 235 MacQueen's Bustards, of which 229 were alive. Most of the falcons in this shipment were immature. All of the species in this cargo were protected under the criteria of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The birds were cared for and helped to recover their health by the authorities of the DOE and chief executive of CITES. Afterwards, expert studies were done and the birds, being in better condition, were ringed and a feather sample collected from each for a gene bank. In total 129 falcons and 208 MacQueen's Bustards were ringed and it was finally decided that the birds should be released in their natural habitats in central and southern provinces of Iran.

	Province	Saker	Peregrine	Barbary Falcon	MacQueen's Bustard
1	Hormozgan	17	8	5	15
2	Kerman	17	6	4	30
3	Southern Khorasan	17	6	4	45
4	Yazd	10	5	3	61
5	Fars	14	6	4	30
6	Sistan and Baluchistan	2	0	0	3
	<b>Totals</b>	<b>77</b>	<b>31</b>	<b>20</b>	<b>184</b>

The birds of prey were divided, based on the availability and abundance of prey among these habitats. After 10 days of treatment and adequate feeding, birds were placed inside their boxes, transferred to their

destination provinces, and were released in appropriate habitats of Sistan & Baluchistan, Hormozgan, Kerman, Fars, Yazd and Southern Khorasan provinces (Table 1).

Table 1. Number of birds released in each province

All the stages from the initial moment of discovery to treatment and release, were performed in cooperation with the CITES secretariat. The birds were not released on the same day of arrival at the release provinces. Instead, they were removed from the boxes and kept to recover from the long travel and in this period their health was examined by a veterinarian. The birds were released to the wild habitats on the following day.

Some of the birds were transferred to adjacent provinces where they were released in appropriate habitats. After arriving at the release site, the falcons were fed and water was sprayed on them to keep them cool.

Protective tape over the primary feathers of wings and tail was carefully removed, the legs were freed and their hoods taken off before they were released. A large number of falcons flew immediately after release, while a few of them landed on the ground first and then flew. They had largely retained their power of flight and it is hoped that their chance of survival in the wild was relatively high. In some provinces, the birds were released in large crowds (including DOE guards, reporters, photographers etc.), but it is believed that this may result in a lot of additional stress to the birds.

However, 10 falcons, including five Sakers, three Peregrines and two Barbary Falcons, that were in poor physical condition, stayed in the Chabahar DOE facility and were released a few days later in the same area.

It should be noted that due to physical weakness an immature Barbary died during the release in Kerman, and two immature Barbary Falcons died two days after releasing in Yazd. Also, during the release in Yazd province, two Peregrines were not released because of injury and instead were transferred to the Yazd DOE where they were treated and released later. It is also noteworthy, that in the data obtained from the last two years, 13 confiscated falcons died before releasing due to injury or disease.

Regarding bustards, a large number were in bad physical condition. Although releasing in such bad conditions is not rational, keeping them in captivity had its own difficulties. Therefore it was decided to release them in safe natural habitats.

### **Guidelines and recommendations**

To conclude, we present some guidelines and recommendations to prevent smuggling and trapping of raptors:

- 1- Education of local people
- 2- Increase environmental awareness
- 3- More controls on customs, ports and shipping organizations
- 4- Further cooperation between DOE and police
- 5- Specialized training to the DOE guards
- 6- Improving the welfare of the DOE guards
- 7- Cooperation with NGOs for public education
- 8- Media cooperation (TV, radio, newspapers etc).



### Aspergillosis infections in birds of prey

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#### Introduction

The subject of this article is infection with *Aspergillus* in birds of prey. The disease caused by *Aspergillus* is called aspergillosis. Aspergillosis is the most common infectious disease found in captive birds of prey.

The disease is mainly caused by *Aspergillus fumigatus*, but other fungi of the same genus, such as *Aspergillus flavus* and *Aspergillus niger* also cause this disease incidentally. The most common location in which aspergillosis is found is the respiratory tract.

*Aspergillus* is a fungus. It grows in environments rich in oxygen. *Aspergillus* grows by forming hyphae; these are threadlike structures which cover surfaces. When ready for reproduction, spores are formed. Spores are very small particles of infectious material. They detach, become airborne and are capable of contaminating the environment.

Inhalation of the airborne spores is the principal mode of transmission. *Aspergillus* spores adhere to the mucosal linings of the respiratory tract and start multiplying. Next to the space invading properties and covering of mucosal surfaces, there is additional pathogenic activity from the toxin producing strains. Some toxins produced by *Aspergillus* are known to suppress the immune system of the bird. This predisposes the patient to other conditions. Also, toxins can evoke allergic-like reactions, causing acute respiratory distress.

Some species of birds of prey appear to be particularly susceptible to aspergillosis, among them Goshawks *Accipiter gentilis*, Gyrfalcons *Falco rusticolus*, Red-tailed Hawks *Buteo jamaicensis* and Snowy Owls *Nyctea scandiaca*.

Whether or not a bird gets clinically ill after coming into contact with *Aspergillus* depends on different factors. Aspergillosis is often seen as a secondary disease. This means it arises more easily when a stressor or condition is present, affecting the health of the bird. These stressors can be present in the birds or its environment and compromise the immune system. A stressor can be for example: travel (death caused by *Aspergillus* infection is an important problem in the import and export of birds), nutritional deficiencies, cutting back the offered food load, concurrent disease and/or trauma.

#### Acknowledgements

We are grateful to Dr. Saeid Mahmoudi, Meysam Ghasemi, Hadi Ansari, Dr. Hossein Delshab, DOE of Iran and abovementioned provinces for their assistance and providing data.

#### \*\*\*NEWS UPDATE\*\*\*

An illegal consignment of 13 Saker Falcons (12 live and one dead) and 39 Houbara (36 live and three dead), which were destined for Qatar was discovered in an Iranian ship at Asaloooye Port on 02 March 2015.



MacQueen's Bustard (Houbara) being released from an illegal consignment intercepted on 14 November 2014 when traveling from Pakistan to Bahrain.

Another factor contributing to the development of the disease is the pathogen load. An environment high in *Aspergillus* spores promotes the development of aspergillosis.

## Aspergillosis

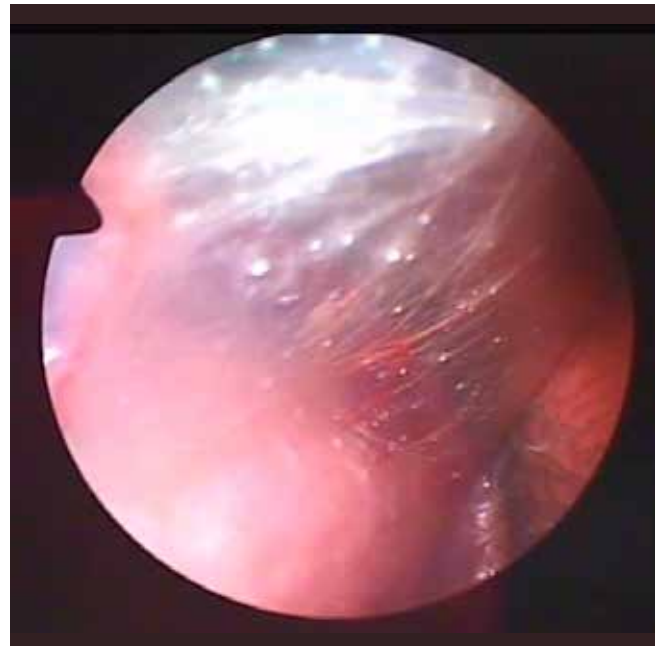
After inhalation of *Aspergillus* spores, disease can develop following different pathologies. Because of the unique anatomy of birds, spores can adhere to the mucosal wall of trachea, bronchi, air sacs and to the lungs. This doesn't always cause disease. The immune system of a healthy bird can prevent spores from causing disease after they are inhaled. Problems arise when the immune system isn't capable of neutralizing the spores. A large burden of spores is sometimes too much for the immune system to eliminate, even in healthy birds. In these cases the spores can adhere, flourish and grow into fungal colonies.

*Aspergillus* spores can develop into large granulomas. These are masses of hyphae and infected tissue. These cause problems because of their space invading qualities. Additionally, they are a constant source of new spores, causing contamination of the environment and also causing a more extensive spread in the body of the infected bird.



**Picture 1** shows a large granuloma in an air sac. The spore forming hyphae give the granuloma a 'fluffy' appearance.

In other patients the lesions are more dispersed through the body and consist of smaller masses of *Aspergillus*. An example of a more diffuse manifestation of Aspergillosis is shown in Picture 2.



**Picture 2.** small foci of fungal growth are visible on the air sac.

### Acute aspergillosis

The acute form of aspergillosis is often seen after inhalation of a large number of spores, combined with a compromised immune system. Most commonly affected in this pathology are the lungs, which exhibit many small granulomas throughout the lung tissue. This causes acute respiratory distress and often leads to the death of the patient. Especially in toxin producing strains of *Aspergillus*, the disease can have a very short course before leading to the death of the bird.

### Chronic aspergillosis

More often aspergillosis presents itself as a chronic condition. It often takes weeks to months to cause visible signs of disease. Usually the first signs to be noticed are unspecific and consist of weight loss and a loss of performance in flight. The birds may exhibit subtle changes in behaviour and have a reduced appetite. In the next phase of the disease more prominent signs may become visible, such as dyspnoea, a change of voice. Further clinical signs will depend on the location of the *Aspergillus* in the body.

Early in the disease granulomas often arise in the trachea, bronchi, lungs and air sacs. Because of the unique anatomy of birds, and the lack of a diaphragm, infections in the respiratory tract can spread easily to other parts of the body, including the abdominal organs. Depending on the severity of the lesions, different clinical signs can present themselves. Examples of organs commonly affected are the ovary and testis; this can result in poor breeding. In case of involvement of the kidneys, polyuria, polydipsia and gout may be observed.



An acute deterioration of the condition of the bird suffering from the chronic form of aspergillosis is in the occurrence of a granuloma in the trachea. Sometimes parts of these granulomas tear off and can get lodged in the trachea, on the syrinx or in one of the main bronchi. This leads to very acute, severe respiratory distress and can even result in suffocation and death.

## Diagnosis

There are several diagnostic methods to diagnose aspergillosis.

### Haematology and biochemistry/bloodwork

This can be useful to determine the condition of the birds and it also can give an indication about the presence of a fungal infection. In case of aspergillosis the results will often indicate a chronic inflammatory process. The white blood cell count is often high (white blood cells are important cells to the immune system, their numbers are elevated in case of increased need, as is the case in infections). This elevated level of white blood cells is often caused by elevated heterophils (a special kind of white blood cell), sometimes these exhibit abnormal shapes or contents which further suggest the presence of aspergillosis. In case of aspergillosis which also involves liver and kidneys (as is usually the case in chronic aspergillosis), the values providing information about these organs are also elevated (UA, ALT, AST, GGT). Globulin and Total Protein in the blood are often elevated (indicating infection), and several minerals are found to be present in the blood in higher concentrations than usual (Iron, Calcium, Phosphate). This could possibly be caused by impaired liver function due to the *Aspergillus* infection. Unfortunately, all these changes could also be attributable to other chronic inflammatory processes. Therefore mere blood work does not suffice to diagnose a bird with aspergillosis, but aids in the diagnosis and gives an indication of the overall severity of the condition.

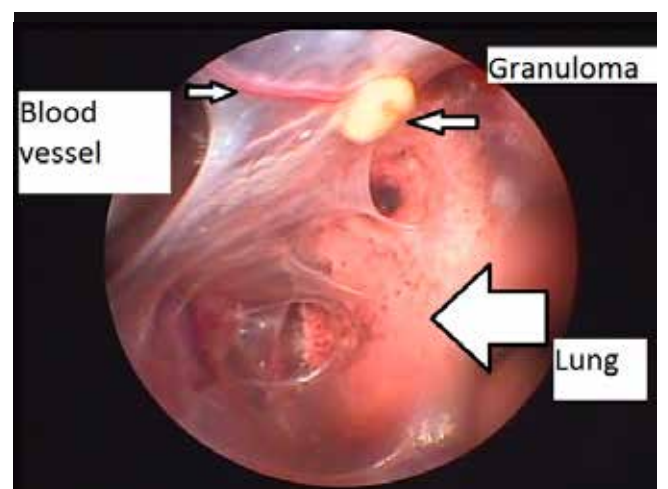
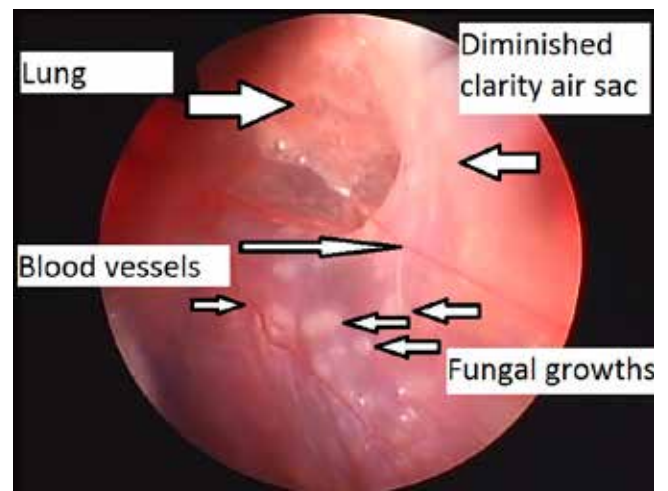
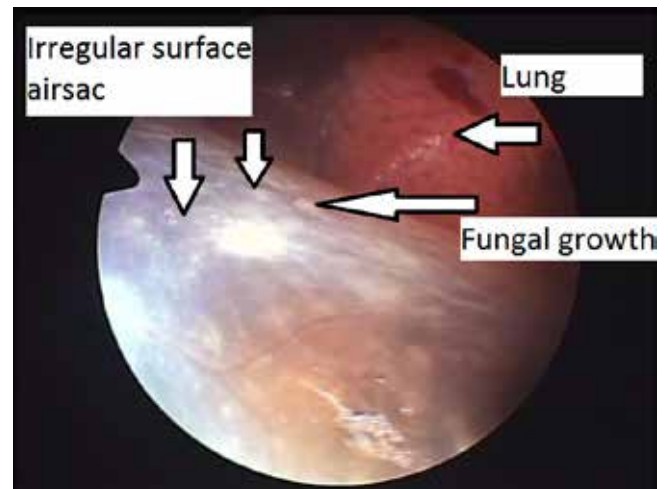
### Radiographs

Radiography can be useful in the diagnosis of aspergillosis. It is not a very sensitive method and lesions tend to be quite extensive before becoming visible on radiographs. Usually *Aspergillus* lesions are visible as distinct nodular lesions. Since other pathologies may cause similar images, caution should be taken with the interpretation of these radiographs. Also, sometimes a severely affected bird will exhibit no abnormality on radiographs.

### Endoscopy

Because the anatomy of birds allows with relatively minimal invasiveness to directly examine the inside of the bird, this is a very useful method to directly visualize a lot of problems. By entering the most abdominal air sac, the mucosa of the air sacs can be inspected, the

internal organs including the lungs can be visually examined and biopsies can be obtained for further diagnostic procedures. In cases of well-developed granulomas, diagnosis can usually be confirmed during the endoscopic procedure. In case of more indistinct lesions, biopsies can be obtained from the suspected lesions.



**Pictures 3, 4 and 5 (above)** show different photographs taken during endoscopic examination. They show the different manifestations of aspergillosis. Pictures 3 and 4 are pictures of a bird with a widespread form of aspergillosis with small lesions on the airsacs. Picture 5 is a more localized form of aspergillosis, with distinct granulomas.

## Microscopy/ Culture

In case of *Aspergillus* granulomas in the trachea, a tracheal swab can be examined microscopically and the fungal hyphae can be visibly determined. The diagnosis can be confirmed by culturing the material from the swab on a specialised plate and incubating until fungal growth is visible.

Since *Aspergillus* can be found in the environment in low numbers, tracheal swabs from both affected and healthy birds may yield *Aspergillus* on culture. It is therefore advisable to always examine the swabs under the microscope to identify hyphal structures, after performing the collection of material. Hyphae indicate a growing fungus and are a more sound evidence of the presence of an active infection. Biopsies taken during endoscopy can be examined in a similar manner.



**Picture 6** shows fungal growth on this plate. The material in the centre of the fungal growth is a biopsy of a suspicious lesion in an airsac. It was taken during endoscopic examination.

For diagnosis of *Aspergillus* infection in birds of prey, combining diagnostic techniques is recommended to diminish the chances of an incorrect diagnosis and to have a complete picture of the overall health of the bird.

## Treatment

Over the years several treatments have been developed for aspergillosis in birds of prey. Since the disease is often fairly extensive, treatment can be a challenging and long-term process.

Antifungal drugs are used to eliminate the fungus. There are different groups of medicines, each with their own mode of action. Also there is a variety in ways of administration of these different drugs.

Until recently there was a vast lack of medicine research in birds. No registered products especially for birds intended to treat fungal infections were available.

## Oral administration

*Nystatin* and *amphotericin B* are polyene antimycotics and bind to ergosterol within the cell wall of the fungus. This creates a hole in the cell wall, which causes the degradation of the fungus. These drugs are not absorbed after oral administration. Therefore they are effective in treating fungal infections of the mouth and intestinal lumen, but won't reach effective concentrations in other tissues. Given as oral medicine it has thus limited use in the treatment of aspergillosis in birds of prey.

Another group of antifungal medicines are the azoles. The best known member of this group is *itraconazole*. Itraconazole inhibits the synthesis of ergosterol (an important component of the fungal cell wall). It also affects membrane permeability, resulting in structural degeneration of the fungus. Itraconazole is thereby a medicine with an activity which consists of stopping the expansion of the fungus, but it will also diminish the lifespan of the fungus.

Using a product which has not been tested on birds, can have unexpected side effects, due to differences in excipients, which can influence bioavailability. Unfortunately, very few well researched, registered avian medicines are currently available.

In March 2014, an antifungal medicine was authorized in Europe specifically designed for the treatment of fungal infections in birds. Fungitraxx® is a solution containing itraconazole. During the registration procedure a large field study was conducted, with very favourable results. Next to the active ingredient (itraconazole), Fungitraxx® contains a high dose of cyclodextrin. This is a sugar molecule which envelops the itraconazole molecule. This improves absorption by the intestines and thereby enhances bioavailability. This is possibly a contributing factor to the high rate of full cure seen with the use of Fungitraxx®.



In Red-Tailed Hawks itraconazole has been found to be safe. Effective blood and tissue levels have been reached by once a day dosing of 10 mg per kilogram body weight (this is the same dose as used in the Fungitraxx® field study).

Itraconazole has good effectivity and few side effects. Most of the side effects are dose related and consist of nausea and vomiting. These side effects are reversible when lowering the dose.

Long-term treatment is often necessary because of the extensive spread of the fungal infection, and of the indirect mode of action of the antifungal drugs.

### Nebulisation

Different medications are used by nebulization. With this method it is a necessity to provide droplets smaller than 3 micrometres to reach the lungs and air sacs. Larger particles will be deposited onto nasal and oropharyngeal mucosal surfaces and in the trachea, and won't reach the lower airways. Used as sole treatment, nebulisation is unlikely to provide a full cure, since most cases of aspergillosis have spread to several internal organs next to the respiratory tract. Medication administered by nebulisation will not penetrate large granulomas deep enough to cause significant damage to the fungal growth.

Next to the known antifungal drugs a product called F10 is used with apparent beneficial effect. This product contains Benzalkolium Chloride and Polyhexanide, these are antiseptic agents which damage the fungal cell wall. Unfortunately, very few studies have been conducted to examine the clinical effectivity of this product in treating avian *Aspergillus* infections. Nebulisation of medications can be used as a complementary therapy in the treatment of aspergillosis.

### Intravenous administration

Amphotericin B can be used as an intravenous drug. This is an antifungal drug with a cidal action, meaning it kills the fungus. There have been seen serious side effects after administration of this drug. This, combined with the inconvenience of repeated intravenous injections, is a severe disadvantage as a therapy for aspergillosis in avian patients.

### Surgery

In case of large granulomas, especially located in trachea or syrinx, surgical removal can be helpful in curing the bird. Large granulomas in air sacs can be partially removed by endoscopy, contributing to better penetration of antifungal drugs. It will however always be necessary to have a surgical procedure be followed by treatment with systemic antifungal drugs.

### Prognosis

In case of acute aspergillosis the prognosis is usually very poor. Chronic aspergillosis can be cured completely, but may take a very long time. Especially in case of large granulomas, oral administration of antifungal drugs may need to be administered 6-8 months. Repeated endoscopic inspections are paramount to track the development of the disease, and to prevent premature cessation of therapy.



**Picture 8** shows an encapsulated granuloma in the air sac. Lesions like these are very difficult to reach by antifungal drugs, and these lesions will take a long time to be completely resolved.

### Prevention

Aspergillosis is found in captive birds of prey in larger incidence than reported in their wild congeners. There may be several factors contributing to this difference. Spore load in the environment is likely to be more prominent in an enclosure than in the natural environment of wild birds. Especially damp bedding and/or nests may contain large numbers of fungal spores (and other pathogens such as bacteria, moulds and parasites). Therefore, in the prevention of aspergillosis it is extremely important to have good hygienic protocols. There are several cleaning products on the market which will eliminate *Aspergillus* spores. Care should be taken when treating the enclosures to make sure the disinfectants pose no threat to the birds.

Another factor contributing to the development of aspergillosis in captive birds of prey are external stressors that compromise immune function. Aspergillosis is often seen in birds after a period of travel, it is one of the main illnesses seen in newly imported or exported birds. Also, the period prior to the hunting season, when birds of prey are forced to lose weight, is a known stressor that increases the chances of developing aspergillosis.

Vitamin deficiencies, especially vitamin A, is suspected to cause a higher sensitivity to respiratory infections. Vitamin A is needed for optimal mucosal integrity, deficiencies of this vitamin are likely to diminish the natural defence strategies of the mucosa. Optimal nutrition is therefore very important in preventing *Aspergillus* infections.

When confronted with a less than optimal situation and/or events, such as a parasite load, traumatic injuries, and others, vigilance is needed to prevent concurrent aspergillosis to develop.

Corticosteroids are pharmaceuticals that dramatically compromise immune function and should be used in birds only with the utmost care, and preferably be avoided altogether.

There have been some studies about vaccination against *Aspergillus*, but so far no vaccination for practical use is available. Further studies are needed to determine the value of this form of preventive medicine.

Prophylactic treatment with antifungal drugs is suggested to have beneficial effects in diminishing the chances of developing aspergillosis. This could be used in periods known to compromise immune function.

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## Falconry equipment and folk ornamentation of Kazakh eagle masters in the Altai region of Mongolia

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### Introduction

Kazakh eagle masters in the Altai region of Western Mongolia adorn their captive Golden Eagles with personally decorated equipment. At festivals and ceremonies falconry equipment is not only practical, but becomes a platform for artistic expression with the development of locally specific ornamentations. Kazakh artistic crafts are simple, but nevertheless can be impressively elaborate and indigenous. This short article presents the ethnic art of falconry equipment in contemporary Altaic Kazakhs. In general, falconry/hawking are thought of belonging to “male affairs” emphasising masculinity. However, falconry equipment shows some coactions of both men and women to produce equipment in order to adorn both captive eagles and the masters themselves.

All pictures in this article were taken by the author in Bayan-Ölgii Province, Western Mongolia. Mostly chance finds at the eagle-master's house in Sagsai District, or at the Golden Eagle Festivals in 2011, 2012 and 2013.



**Figure 1.** A riveted hood at the festival

## Metal and Leather Works

Metal and leather are the principal materials used in making falconry equipment. Cow leather is essential material for hoods, gauntlets and jesses, but nowadays these items are often bought at market. Even old leather boots and jackets can also be used as a source for leather.

Metal and leather combination works are well expressed in hood (*tomoga*) making. Masters provide special decorative hoods for use at the festival (Figure 1).

Jesses (*ayak bau*) are also important items of falconry equipment exhibiting fabulous artistic representation in eagles. Figure 2 shows where part of an anklet is decorated with silver rivet ornaments, which also provide protective strength for the surface of the leather.



**Figure 3.** Traditional rivet designs and the pattern iron pedestal



**Figure 2.** A set of jesses with silver rivets

Nowadays, local metallurgy is no longer as popular as it has been in the past. Previously, all falconry equipment was produced by the eagle owners themselves. However, at present, only one herdsman in Sagsai, Mr. S. Komash, can produce classically designed falconry equipment with rivet ornamentations. He can also produce horse shoes and bridles (Figure 4), so that local people sometimes request his products, mainly by bartering exchange with livestock.

**Figure 4.** A saddle produced by Mr. Komash, Sagsai

Rivet ornaments represent an eagle owners' individuality. Once, masters could recognize a region and even individual craftsmen from a glance at a pattern and design of hoods. For instance, a decorative hood with rivet ornamentation is one of characteristics of masters from Altai. A variety of rivet patterns can be found in designs (Figure 3), being commonly used for both falconry equipment and horse bridles. Most rivets are made from silver but occasionally copper or steel is used for ornamental rivets; they can be cast, but more commonly they are fashioned in a forge. Copper work needs some metallurgical skills to mould it.



## Wooden and Painting Works

Wood is not readily available in Sagsai and needs to be obtained from other regions at relatively high cost. Timber from pine (*Pinus spp.*) and poplar (*Populus spp.*) mainly are used for making arm braces, feeding bowls and perches.

Arm braces (*baldak*) are made from poplar wood ordinarily, but sometimes from ibex horn with fabulous decoration on the surface of the pillar (Figure 5). The twisted pillar design is one of the common traditional styles (Figure 5).



**Figure 5.** A arm brace made from ibex horn (above), and traditional twisted design (below)

Mr. Esentai, the experienced furniture craftsman in Sagsai created a set of beautiful lacquer-painted arm braces and a feeding bowl (*saptu ayak*) (Figure 6). The young master Jensbek exchanged this set of arm brace and feeding bowl for one sheep in 2009. A feeding bowl (*saptu ayak*) is normally directly hollowed from wood. Some of them are carefully painted and lacquered to resist water.



**Figure 6.** A set of feeding bowls and arm brace produced by skilled furniture master, Mr. Esentai, Sagsai.

Artistic works on the eagle's perch (*tugur*) is now hardly found. Normally, eagle masters use old river-worn timber, stone or an old tyre for a perch. In contrast, a unique fox shaped perch at the provincial museum is an elaborate piece of work (Figure 7).



**Figure 7.** A fox-shaped perch at the provincial museum

## Sewing Works

Women's hand sewn works are also combined with equipment. Gauntlets (*bialai*) represent a combination of male and female work in which the arm hole is adorned with embroidery (Figure 8).



**Figure 8.** Gauntlets with embroidery adornment

A feeding pouch (*jem karta*) is women's excellent work for a falconer (Figure 9). This is designed with two separate rooms inside. One is for meat and the other is for a feeding tube etc. The surface is also decorated by traditional embroidery. At the festival, falconers also put some celebrated medals on here.



**Figure 9.** A food pouch by female handiwork

Decoration on traditional falconer's trousers made of mutton leather is mostly the work of women with embroidery around the legs (Figure 10).



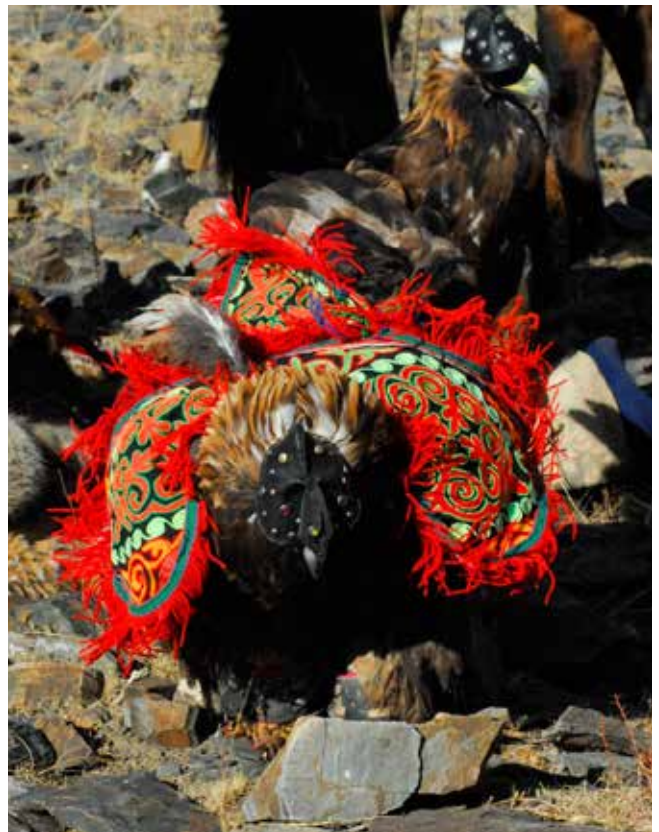
**Figure 10.** Hunting trousers with embroidery adornment

Old wall-hanging tapestry (*tus kiiz*) (Figure 11) is cut and reused for decoration.



**Figure 11.** An old wall-hanging tapestry (*tus kiiz*)

Occasionally, eagles are also decorated with embroidery cloth (Figure 12). The idea is the same as horse and camel ornamentation at the festival.



**Figure 12.** An eagle's costume

## Conclusion

As is seen, falconry equipment is an essential platform for local artistic representation by Altaic Kazakhs. It includes cross-gender craftworks both by male wood and metal crafts, and female handiworks for soft furnishings. The decline of the eagle falconry tradition will threaten not only falconry practice itself, but also the artistic decoration on falconry equipment, which only survives among Altaic Kazakhs in Mongolia.

# International falcon project work undertaken in 2014 for the Environment Agency-Abu Dhabi

### Andrew Dixon

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### Introduction

International Wildlife Consultants Ltd. (IWC; Director: Dr. Nick Fox), undertakes falcon research and conservation management projects on behalf of the Environment Agency-Abu Dhabi (EAD). The IWC research team comprises Dr. Andrew Dixon (Head of Research), Dr. Lutfur Rahman (Research Biologist) and Nicola Dixon (School Links Coordinator) who implement the EAD projects by working with specialists in partner organizations. Work in 2014 focused on Saker Falcons, Peregrines and Gyrfalcons, with fieldwork undertaken in five countries: Mongolia, China, Russia, Kazakhstan and Bulgaria with a parallel genetics project investigating the genome and population genetics of each species.

### Saker Falcon research and conservation management in Mongolia

*Research Partner: Nyambayar Batbayar (Director Wildlife Science and Conservation Center; WSCC), Batbayar Galtbalt (Mongolian Project Leader), Batmunkh Davaasuren & Batbayar Bold (Project Assistants), Sarangerel Ichinkhorloo (School Links Assistant).*

### Artificial Nest Project

In 2010 we completed the erection of 5,250 artificial nests across 20 districts of central Mongolia. The aim of erecting the artificial nests was to create a new and easily monitored breeding population of Saker Falcons that could potentially be used to underpin a sustainable harvest for falconry. Currently, our project teams monitor the artificial nests to obtain data on occupancy and breeding success, and to collect samples and mark birds in order to estimate survival and dispersal rates. International field assistants involved in this survey work in 2014 were Eeva Vinnal (Estonia) and Fernando de Antonio (Spain).

In 2014 we recorded 766 Saker Falcon nests, which had a nest survival probability of 81% to fledging and produced an average of 3.7 chicks per successful nest. We estimate that Saker Falcons breeding in the artificial nests produced 2,322 fledgling (95% CI = 2,228 to 2,404 fledglings). In total we marked 2,494 Saker Falcon nestlings with rings and/or microchips. In addition we recorded 1,343 Common Kestrels, 466 Upland Buzzards, 402 Ravens and an Eagle Owl breeding in the artificial nests.

At the start of the breeding season 80% of the available artificial nests were occupied by breeding raptors and by the end of the season in July 2014 a total of 3,553 artificial nests were still standing. Since 2010,





1,697 nests have been removed, broken or fallen over. Artificial nests are taken to sell as scrap, bolts holding barrels to the poles are removed to use on motorbikes and both the barrels and poles are taken to be used as building materials. Others fall over due to soil erosion or are pushed over by livestock, and some barrels break off the posts in strong winds.

### Electrocution of birds of prey

Electrocution is major cause of mortality to Saker Falcons and other birds of prey in Mongolia. Working in conjunction with engineer Batkhoo Sugarsaikhan of the Eastern Energy Company, we implemented a 12-month experiment to test different mitigation measures on a 56 km long 15kV power line running between the districts of Uulbayan and Munkhkhaan in Sukhbaatar province. We tested new pin-insulator mounts and insulation covers for the live cables at the 1<sup>st</sup> phase on the top of the poles, and perch deflector brushes, rotating mirrors and live cable insulation covers on the 2<sup>nd</sup> and 3<sup>rd</sup> phases attached to crossarms. Our results showed that both mitigation methods used at the top of the pole were effective at reducing electrocution rates. On the crossarms, brush deflectors were ineffective but rotating mirrors and insulation covers reduced electrocution rates. These results indicate that the relatively inexpensive application of new mounts for pin insulators at the top of poles coupled with appropriately positioned deflectors on crossarms can significantly reduce electrocution of birds of prey.

Survey work at the Uulbayan-Munkhkhaan line and widescale surveys of other similar 15 kV lines across Mongolia revealed that electrocution rates of Saker Falcons varied both in time and place. The highest electrocution rates occurred in open landscapes with abundant rodents, where we estimate that along a



typical 52 km distribution line 168 Saker Falcons (95% CI = 31-311) are electrocuted per year. Similar lines crossing areas with relatively few rodents will kill far fewer Saker Falcons, with an estimated 6 individuals

(95% CI = 0-19) electrocuted per year. Mortality levels due to electrocution are extremely high in Mongolia with at least 65 dangerous lines in the country killing an estimated 4,116 individuals (90% CI = 713-7,951 birds). In order to assess what impact this level of mortality may have on the Saker population it is necessary to know something about the age and sex of the birds killed. Based on 384 fresh carcasses collected during our study of the Uulbayan-Munkhkhaan line we were able to determine that over half of the Sakers were juveniles electrocuted in the same year they hatched, 36-41% were killed in the year after they hatched and 5-10% were adults. We undertook detailed dissection of these birds in order to determine the sex, reproductive status and general health condition of the birds at the time of death. The dissection and health screening work was overseen by a wildlife veterinarian, Janelle Ward (New Zealand), and a veterinary assistant, Narea Marin (Spain).

An international conference was held at the Festival of Falconry in Abu Dhabi, UAE on 11 December 2014 to highlight the issue of raptor electrocution in Mongolia and discuss potential solutions to the problem. Delegates included representatives from the Mongolian government, Mongolian electricity companies, Megawatt Ltd. (Hungary), the International Association of Falconry and the Convention of Migratory Species (CMS). The participants of the meeting produced a resolution that has been delivered to the relevant ministers in Mongolia.

### School Links Programme

The School Links Programme was established as a form of community outreach within the Mongolian Artificial Nest Project to teach local children why five thousand artificial nests were erected in their local district. Educational resources on falcons, falconry and conservation were provided to teach students about the project. Mongolian schools were selected from each of the 20 districts with artificial nests, with the aim of linking each of them with an international school by the end of 2015.

The School Links Programme currently links thirty eight schools in eight different countries, aiming to give students an introduction to falconry and widen their knowledge of worldwide falcon conservation. New educational resources are being written on migration, reintroduction of falcons, electrocution of raptors and food chains. International link schools are located in Mongolia (21), USA (6), UK (4), UAE (3), Netherlands (1), Slovakia (1), Malta (1) and South Africa (1).

The programme is open to schools in all countries and aimed at students aged 9 to 14. Schools are asked to identify a link class to learn about the programme

in depth and write to students in their link school. Five students from each linked school are selected to become pen pals, creating an introduction letter which is translated and sent via email. The School Links Programme website has been established [www.schoollinksprogramme.org](http://www.schoollinksprogramme.org) and school blogs have been created between twinned schools, which are accessible only in school time and only visible to the students and teachers with access to the blog.

We are extremely grateful to the falconers around the world who are giving their time and expertise to help schools and teachers deliver the school links programme. Falconers currently involved in the programme support teachers by visiting schools with their falcon or hawk. Falconers can help deliver the educational resources, show falconry equipment, explain how a bird is trained, give a brief history of falconry in their country and give falconry displays. We have found that this programme is more successful if a local falconer is involved and encourage more falconers to join the project.

A calendar has been produced and distributed in Mongolia using some of the 123 paintings and drawings sent to us by children in the school links programme.



### Reintroduction of the Saker Falcon in Bulgaria

Research Partners and organizations: Ivailo Klisurov (Manager), Darren Weeks (Aviculturist) - Wildlife Rehabilitation and Breeding Center 'Green Balkans' and Dimitar Ragyov (Project Co-ordinator) - Institute of Biological and Ecological Research, Bulgarian Academy of Sciences (IBER).

A further pilot release of three captive-bred Saker Falcons took place from a tree-hack site near Kotel, Sliven province. Three chicks (2 males and a female) entered the hack on 22 May when they were aged 28-30 days old. Both males were fitted with satellite transmitters ten days later and they left the hack between 05-08 June when they were 42-47 days old. One tagged male dispersed from the hack area after just five days, travelling 210 km in 56 hours to reach the Marmara region of Turkey. This bird stopped transmitting on 19 June, indicating it survived just two weeks after leaving the hack. The location was visited on 27 July and the carcass of the bird was found below a dangerous low-voltage line; it had been electrocuted. This is the third confirmed case of electrocution for Sakers released as part of our pilot studies. The second tagged male also dispersed from the hack area just five days after fledging, travelling 120 km east in 48 hours to reach the Black Sea coast before returning to Sliven province where it stopped transmitting on 18 June, indicating it too survived less than two weeks after leaving the hack. The untagged female stayed in the hack area for 22 days before dispersal.

One of the birds released near Stara Zagora in 2013 established a wintering range ca. 50 km east of the hack site, before wandering more widely across Stara Zagora and Sliven provinces in March 2014 and eventually departing from Bulgaria on 20 April. The bird moved north to Ukraine establishing a summering range in Kherson province. By the 20 September 2014 it had begun its movement back to Bulgaria, arriving back in Stara Zagora province six days later where it currently remains.

At the Green Balkans Wildlife Rehabilitation and Breeding Center the project currently has nine pairs of Saker Falcons and a single male, with facilities to hold up to 12 breeding pairs. The aim is to produce ca. 20 chicks per year for a full-scale 5-year release programme over the period 2015-19.



## Research on Peregrine Falcons and Gyrfalcons in Northern Eurasia

*Research Partners and organizations: Dr. Aleksandr and Vasily Sokolov (Inst. Plant & Animal Ecology, Ural Branch, Russian Academy of Sciences), Dr. Sergey Ganusevich (ANO Wild Animal Rescue Centre, Moscow) and Drs. Rob Thomas and Jez Smith (Cardiff University/Eco-explore).*

Fieldwork to study the movements of Peregrines breeding in Arctic Eurasia was completed in 2013, nevertheless birds with satellite-received transmitters continue to send signals and work is underway to analyse the large amount of location data generated. During 2014 we tracked 15 Peregrines, and by the end of the year nine were still sending signals; two tagged in the Lena Delta in 2010, three tagged on the Popigai River, eastern Taimyr in 2011 and four tagged on the lower Kolyma River in 2013. Analysis of the satellite-tracking data is being undertaken by researchers at Cardiff University.

In 2014 we began fieldwork to collect DNA from Eurasian Gyrfalcons for a genomic analysis, with blood samples obtained from two broods on the Kola Peninsula. An exploratory survey was undertaken on the Yamal Peninsula to identify breeding sites for future sampling work; four nesting sites were located.

## Land management and Saker Falcon conservation on the Qinghai-Tibetan plateau, China

*Research Partner and organization: Prof. Xiangjiang Zhan (Institute of Zoology, Beijing, Chinese Academy of Science).*

The Qinghai-Tibetan Plateau is the single most important bioregion for Saker Falcons, covering 2.5 million square kilometres; it supports up to half the world population during winter. The reason why this bioregion supports so many Sakers is because there is an abundant supply of food in the form of Plateau Pikas *Ochotona curzoniae*. These widespread small mammals are diurnally active throughout winter on the alpine grasslands of the plateau. However, they are considered a pest and are blamed for degrading the quality of grasslands, causing soil erosion by their burrowing activity and acting as vectors for diseases. Consequently, their population is subject to control by the local authorities. Rodent Control Stations are established at county level across the plateau, and each station implements a programme for managing the Plateau Pika population. This can take the form of lethal control, typically using Botulinum-coated seeds as bait, and more recently by contraceptive control administered via genetically-modified viruses. However, the Plateau Pika is not just a pest, it is a 'keystone species', supporting populations of other animals that either eat them or utilize their burrows. So, alternative control

measures include vegetation management, usually by controlling livestock grazing intensity and biological control by raptors.

The biological control of Plateau Pika is implemented by Rodent Control Stations by erecting perches and nesting platforms in grasslands. The idea being that these perches and nest sites will increase the number of birds of prey in the grassland and thus increase predation levels on Plateau Pikas. The technique has been widely adopted across many counties on the Qinghai-Tibetan Plateau. In Madoi county (an area slightly larger than Wales) over 6,000 perches and nesting platforms have been erected in the alpine grasslands, whilst in Serxu county ca. 4,500 have been erected. Across the plateau tens of thousands of these perches and nesting platforms have been erected.

The Rodent Control Station at Madoi undertook a survey of 60 perches and nesting platforms on 25/26 April 2012, and found that 32% of perches had pellet evidence below to show they had been used by birds of prey and 18% of nesting platforms held nests (Photograph 1). In early July 2014 we checked 718 nesting platforms in Madoi and Serxu counties, 55% of which were occupied by breeding birds of prey and we estimated that in these two counties alone the artificial nests supported 192 breeding pairs of Saker Falcons (95% CI: 93-291 pairs). In addition, Saker Falcons were found breeding in nests built by Upland Buzzards on electricity transmission lines, where none were found during a previous survey in 2007.



**Photograph 1.** Saker Falcon perched on a 'lotus flower' design nesting platform in Madoi County, Qinghai. Such sites need to be occupied by nest building species i.e. Upland Buzzards, before they can be utilized by Saker Falcons.



In order to determine if we could improve occupancy rates of artificial nest sites we set up trials of Mongolian-style nesting barrels with the Rodent Control Stations in Madoi County, Qinghai and Zoige County, Sichuan. In each region we erected 25 nesting barrels and these sites will be monitored over the coming years with occupancy rates and breeding success compared to the existing basket-style artificial nest platforms. Ultimately, we aim to establish grids of artificial nests in order to assess the efficacy of using birds of prey to limit Plateau Pika populations.

Another aspect of our future research programme on the Qinghai-Tibetan plateau is to examine how resident Saker Falcons and winter immigrants from northern breeding population distribute themselves across the plateau in winter. A better understanding of what factors limit both breeding and wintering populations on the plateau will help us determine the best strategy for managing and conserving Saker Falcons not just in China but also in Mongolia, where most of the wintering birds come from.

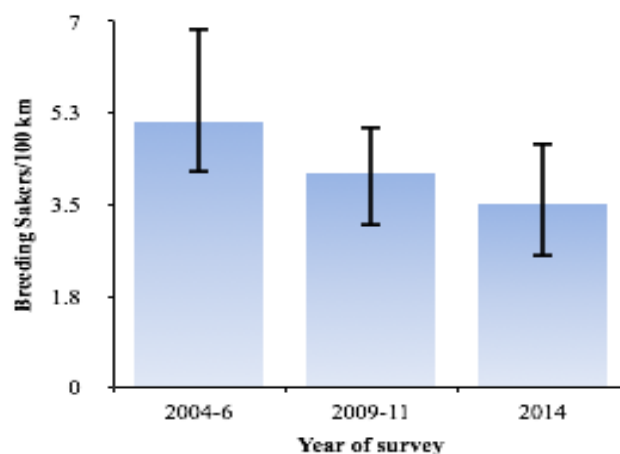
### Saker Falcon conservation in Kazakhstan

*Research Partners and organizations: Dr. Anatoliy Levin (Kazecoprojekt).*

Preparatory work for a potential project on Saker Falcons in Kazakhstan was undertaken in March, with a visit to the semi-desert and steppe surrounding Lake Balkash. Survey work of breeding Saker Falcons on power lines was hampered by deep snow lying unusually late in

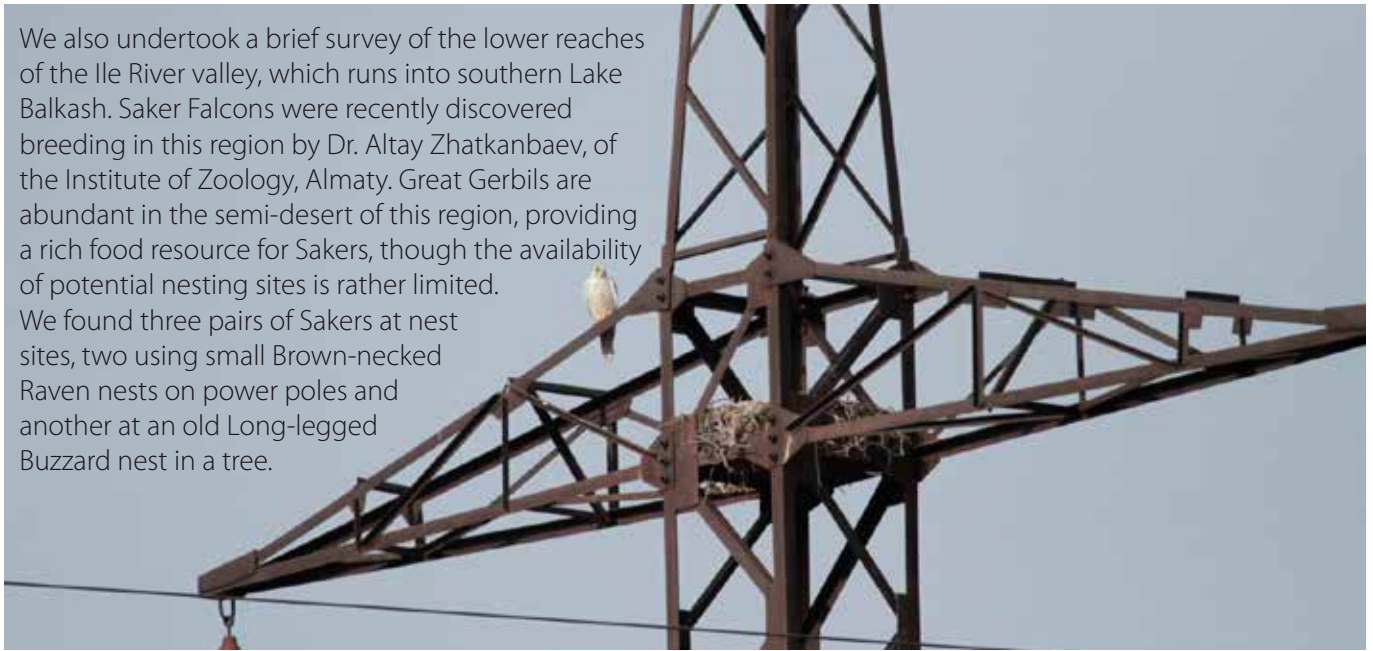
the spring, but nonetheless seven transmission lines extending over 465 km in the eastern Betpakdala were checked; we found 21 breeding pairs of Saker Falcons. Compared to previous surveys the breeding density of Sakers has continued to decline, though the difference across survey periods is not statistically significant (Figure 1).

Removal of stick nests during insulator renovation was undoubtedly a factor reducing breeding density at two of the lines surveyed, but there was also evidence of falcon trapping in the region with two desiccated noose pigeons found hanging from pylons, and a number of wooden 'barak' perches were still present having been fixed to transmission poles by falcon trappers.



**Figure 1.** Breeding density of Saker Falcons at electricity transmission lines in the Betpakdala semi-desert. Bars show mean density per 100 km of power line with SE.

We also undertook a brief survey of the lower reaches of the Ile River valley, which runs into southern Lake Balkash. Saker Falcons were recently discovered breeding in this region by Dr. Altay Zhatkanbaev, of the Institute of Zoology, Almaty. Great Gerbils are abundant in the semi-desert of this region, providing a rich food resource for Sakers, though the availability of potential nesting sites is rather limited. We found three pairs of Sakers at nest sites, two using small Brown-necked Raven nests on power poles and another at an old Long-legged Buzzard nest in a tree.



### Genetic research on falcons

Research Partners and organizations: Prof. Mike Bruford (School of Biological Sciences, Cardiff University, UK) and Prof. Xiangjiang Zhan (Institute of Zoology, Beijing, Chinese Academy of Science).

We used single nucleotide polymorphisms (SNPs) to study the population genetics of Saker Falcons and utilized the recently sequenced Saker genome to determine the position of each SNP within genes. SNPs in exonic coding regions of genes consistently revealed two genetic clusters from our global population samples, distinguishing individuals from the Qinghai-Tibetan Plateau from other populations in Europe and Central Asia. It is likely that this differentiation is due to selection. Furthermore, the westernmost populations of central Europe showed evidence of demographic isolation.

Work started on sequencing the Gyrfalcon genome using blood from a wild-caught bird of Russian origin that had been confiscated in Abu Dhabi. The whole genome sequence will complement those already obtained for Saker and Peregrine. During the year scientists at Cardiff University and the Chinese Academy of Sciences also re-sequenced the genomes of 30 Peregrines from three population regions in western, central and eastern Arctic Eurasia corresponding to the named subspecies *peregrinus*, *calidus* and *japonensis* respectively.

The genome sequence of Peregrine has also been used in a large collaborative project in order to construct a 'Tree of Life' of birds. The results of this consortium project were published in a special issue of *Science* at the end of the year: see Zhang *et al.* 2014. Comparative genomics reveals insights into avian genome evolution and adaptation. *Science* 346: 1311-1320 and Jarvis *et al.*

2014. Whole-genome analyses resolve early branches in the tree of life of modern birds. *Science* 346: 1320-1331.

In October, Batbayar Galtbalt (Mongolian Saker Project leader) visited Cardiff University for 10 weeks to undertake a study to determine if the pattern on moulted primary feathers could be used to identify individual Saker Falcons across years. This study was partly supported by an early career grant from the British Ornithologists' Union and involves quantifying pattern variation in feathers from birds with known identity; the identity being confirmed by microsatellite genotyping.

### Publications in 2014



Zhan, X., Dixon, A., Batbayar, N., Bragin, E., Ayas, Z., Deutchova, L., Chavko, J., Domashevsky, S., Dorosencu, A., Bagyura, J., Gombobaatar, S., Grlica, I.D., Levin, A., Milobog, Y., Ming, M., Prommer, M., Purev-Ochir, G., Ragyov, D., Tsurkanu, V., Vetrov, V., Zubkov, N. and Bruford, M.W. 2014. Exonic versus intronic SNPs: contrasting roles in revealing the population genetic

differentiation of a widespread bird species. *Heredity* 114: 1-9.

Sokolov, V., Lecomte, N., Sokolov, A., Rahman, M.L. and Dixon, A. 2014. Site fidelity and home range variation during the breeding season of peregrine falcons (*Falco peregrinus*) in Yamal, Russia. *Polar Biology* 37: 1621-1631.

Rahman, M.L., Purev-Ochir, G., Etheridge, M., Batbayar, N. and Dixon, A. 2014. The potential use of artificial nests for the management and sustainable utilization of saker falcons (*Falco cherrug*). *Journal of Ornithology* 155: 649-656.

Ragyov D., Biserkov V., Gradev G., Ivanov I., Stoyanov E., Stoyanov G., Domuschiev D. and Dixon A. 2014. Past and Present Status of the Saker Falcon, *Falco cherrug* (Aves: Falconidae) in Bulgaria. *Acta Zoologica Bulgarica* 66: 299-308

### The carnivorous parrot: falcons find their place in the avian tree of life

An international effort to sequence the genomes of 45 avian species has yielded the most reliable tree of life for birds to date. This new avian family tree helps to clarify how modern birds emerged rapidly from a mass extinction event that wiped out all of the dinosaurs approximately 66 million years ago.

It reveals how some of the earliest bird species diverged, answering many long-standing questions about the common ancestor of birds, crocodilians, and dinosaurs and shedding new light on the evolution of avian sex chromosomes, vocal learning in both birds and humans, and the process that led to birds losing their teeth.

The project strengthens the theory of a “big bang” for bird evolution during the 10 to 15 million years that followed the dinosaurs’ extinction at the Cretaceous-Paleogene Boundary. It also suggests that the earliest common ancestor of land birds, which include parrots and songbirds as well as hawks and eagles, was an apex predator.

The study included the genome information of the Peregrine Falcon, the sequencing of which was an initiative of the Environment Agency-Abu Dhabi (see Zhan *et al.* 2013. *Nature Genetics* 45: 563–566). The inclusion of the Peregrine in this study has confirmed previous work that suggested falcons were not closely related to other birds of prey such as hawks and eagles (Hackett *et al.* 2008. *Science* 320: 1763–1768). In fact falcons are more closely related to parrots and songbirds. The sequence for dropping feathers during wing-moult is similar in parrots and falcons but in no other order of birds, suggesting that this is a shared ancestral character (Pyle. 2013. *Condor* 115: 593–602).

This massive comparative genomics project, which needed several supercomputers to process all its data, took more than four years and involved hundreds of scientists from about 80 institutions in 20 different countries. The researchers produced eight papers in the 12 December 2013 issue of *Science*, with many others published elsewhere.

Links to all of the reports related to this avian genome package can be found at <http://www.sciencemag.org/content/346/6215/1308>.



*Who's a pretty bird?*

#### **Falcon Hospital a major tourist attraction in Abu Dhabi**

The Abu Dhabi Falcon Hospital has become a major tourist attraction where around 9,000 birds, worth up to \$1 million, get treated every year. The hospital, which includes an intensive care unit, quarantine centre and air-conditioned rooms, is considered the world's largest falcon hospital.

The hospital, which opened in 1999, has treated over 67,000 birds since it first opened its doors, not only from the United Arab Emirates, but also from the surrounding Gulf region, including Saudi Arabia, Qatar and Kuwait.

The Abu Dhabi Falcon hospital is also working to release falcons back into their natural wild habitat. In 1999 the Environment Agency-Abu Dhabi created the Sheikh Zayed Falcon Release program in order to increase the wild falcon population. Under the directive, the hospital rehabilitates certain types of wild falcons who had previously been used for falconry to follow their natural migratory route. So far more than 1,300 falcons have been released back into their original habitats in Pakistan, Iran or Kazakhstan.

<http://www.dailymail.co.uk/news/article-2954823/The-Abu-Dhabi-Falcon-hospital-largest-kind.html#ixzz3SIV0cboP>

### Individual improvements and selective mortality shape lifelong migratory performance

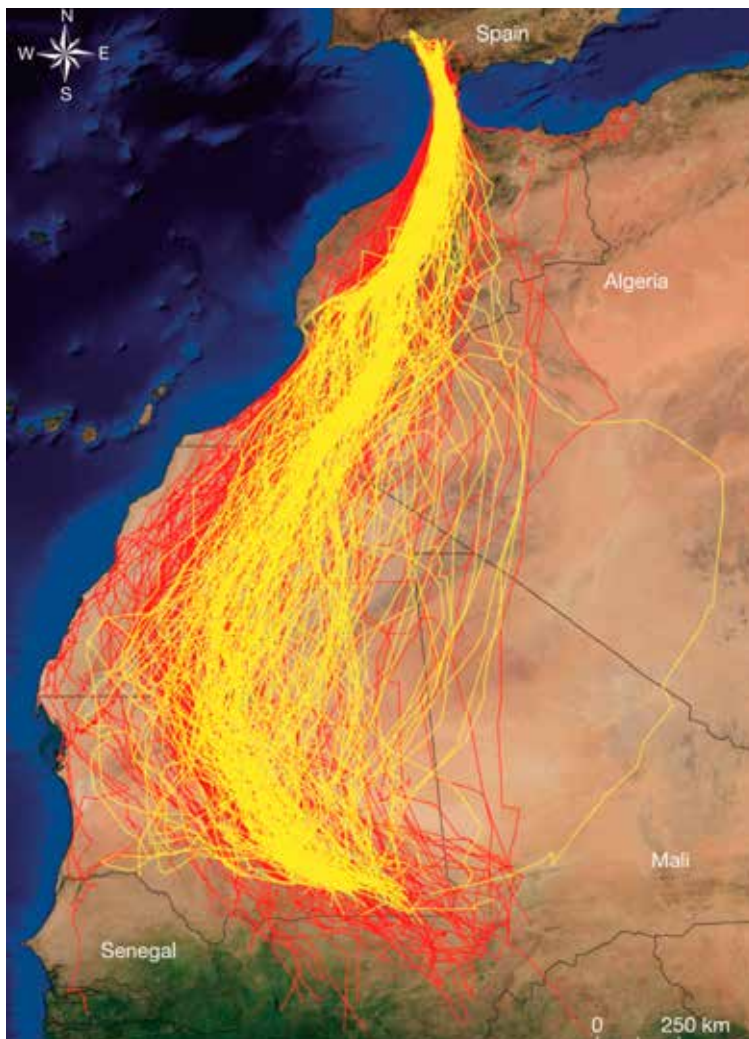
Sergio F, A Tanferna, R De Stephanis, LL Jiménez, J Blas, G Tavecchia, D Preatoni and F Hiraldo

2014. *Nature* 515: 410–413

Billions of organisms, from bacteria to humans, migrate each year and research on their migration biology is expanding rapidly through ever more sophisticated remote sensing technologies. However, little is known about how migratory performance develops through life for any organism. To date, age variation has been almost systematically simplified into a dichotomous comparison between recently born juveniles at their first migration versus adults of unknown age. These comparisons have regularly highlighted better migratory performance by adults compared with juveniles, but it is unknown whether such variation is gradual or abrupt and whether it is driven by improvements within the individual, by selective mortality of poor performers, or both.

Here we exploit the opportunity offered by long-term monitoring of individuals through Global Positioning System (GPS) satellite tracking to combine within-individual and cross-sectional data on 364 migration episodes from 92 individuals of a raptorial bird, aged 1–27 years old. We show that the development of migratory behaviour follows a consistent trajectory, more gradual and prolonged than previously appreciated, and that this is promoted by both individual improvements and selective mortality, mainly operating in early life and during the pre-breeding migration. Individuals of different age used different travelling tactics and varied in their ability to exploit tailwinds or to cope with wind drift. All individuals seemed aligned along a race with their contemporary peers, whose outcome was largely determined by the ability to depart early, affecting their subsequent recruitment, reproduction and survival.

Understanding how climate change and human action can affect the migration of younger animals may be the key to managing and forecasting the declines of many threatened migrants.



Migration routes of black kites born in Doñana National Park, southwestern Spain. Pre-breeding tracks are shown in red and post-breeding tracks in yellow.

<http://www.nature.com/nature/journal/v515/n7527/full/nature13696.html>

### NMR-Metabolomics Study on Falcons Affected by Aspergillosis

Pappalardo L, PA Hojjemberg, I Pelczer and TA Bailey

2014. *Current Metabolomics* 2: 155-161

Respiratory diseases are a common cause of morbidity and mortality in raptors. Among these diseases, aspergillosis is one of the most important causes of mortality of falcons in the Middle East. Falcon blood (plasma) has been investigated for the first time by <sup>1</sup>H-NMR spectroscopy and multivariate statistics in order to identify and comparatively characterize the metabolic profile of aspergillosis. Clear differences exist between the profiles of healthy and diseased subjects and lead to clean clustering in statistics. Analysis of the orthogonal projection to latent structure

discriminant analysis (O-PLS-DA) coefficient plots and statistical total correlation spectroscopy (STOCSY) traces helps to identify significant components that define the separation. We have observed that 3-hydroxybutyrate is greatly increased in the diseased cohort, among a variety of other metabolic differences. Also, there is a distinctively different behavior of the very low density (VLDL) and low density lipids/lipoproteins (LDL); the heavier lipid subfractions are significantly diminished in the sick subjects. These findings serve as the first step towards developing a possible test for early diagnosis and may provide a better understanding of the underlying biochemistry of this disease.

### Site fidelity and home range variation during the breeding season of peregrine falcons (*Falco peregrinus*) in Yamal, Russia

Sokolov V, N Lecomte, A Sokolov, ML Rahman and A Dixon 2014. *Polar Biology* 37: 1621–1631

Many different ecological factors affecting the size, use, and spatial configuration of home ranges have been investigated, yet the chronology of the breeding cycle has been relatively understudied. Here, we studied peregrine falcons (*Falco peregrinus*) to describe variation in home range within and between breeding seasons in the Yamal peninsula, a region of the Russian Arctic with a high breeding density of peregrines. We used satellite telemetry to investigate variation in home range at different stages of the breeding cycle during three breeding seasons (2009–2011).

We fitted Argos satellite transmitters to 10 breeding peregrines (nine females and one male) and two male fledglings. All breeding females showed fidelity to the region of the southwestern Yamal peninsula, but they were not necessarily faithful to their specific breeding ranges with 33% dispersing to new ranges up to 40 km away. The population of peregrines in our study area was relatively synchronous in their breeding chronology, with clutches initiated in close synchrony in early June despite the birds arriving on their breeding ranges ca. 3 weeks earlier. The average home range size for breeding females was 98 km<sup>2</sup> (95% Maximum Convex Polygon). Over the breeding season, the home range area utilized by females increased

in the late nestling period and again after the chicks fledged. Expansion of the home range coincided with changes in behavior associated with parental care, resulting in greater activity and more time spent away from the nest area when the female began hunting to provision nestlings and fledglings.





تركز العمل في 2014 على الصقر الحر (الغزال) وصقر الشاهين وصقر الجير (السنقر) في أعمال ميدانية أجريت في 5 دول هي منغوليا والصين وروسيا وكازاخستان وبلغاريا، ومشروع جيني مواز يبحث في الجينوم والجينات لمجموعات كل نوع.

**بحوث الصقر الحر وإدارة الصون في منغوليا:** سجلنا 766 صقرا حراً تتكاثر في الأعشاش الاصطناعية في منغوليا، والتي بلغ احتمال البقاء على الحياة مرحلة التريش 81% منها، وبمعدل 3.7 فرخا لكل عش ناجح. نقدر أن أعداد الصقر الحر المتكاثر في الأعشاش الاصطناعية قد أنتجت 2,322 فرخا بلغ مرحلة التريش (مجال الثقة 95% = 2,228 إلى 2,404 فرخا تريش). قمنا بوسم 2,494 من صغار الصقر الحر بالحلقات أو الرقائق الإلكترونية. قمنا، إضافة لما سبق، بتسجيل 1,343 عوسقا عاديا، و466 عقاب مرتفعات، و402 غرابا، وبوما صقريا تتكاثر جميعها في الأعشاش الاصطناعية. برز الصقور الكهربائي كسبب رئيس لنفوق الصقر الحر وغيره من الجوارح في منغوليا. حدثت أعلى معدلات الصقور الكهربائي في مساحات الأرض المفتوحة الوفيرة بالقوارض. كانت معدلات الموت بالصقور الكهربائي مرتفعة للغاية في منغوليا حيث يتسبب 65 خط كهرباء خطير في البلاد في قتل ما يقدر بـ 4,116 صقرا حرا في كل عام. قمنا لمدة 12 شهرا بتطبيق تجربة لاختبار تدابير التخفيف المختلفة على خط الطاقة في مقاطعة سخباتار. دلت نتائجنا أن هذا التخفيف المنخفض التكلفة يمكن أن يقلل صقور الجوارح بشكل كبير. أنشأ برنامج الروابط المدرسية لرفع وعي السكان المحليين بمشروع الأعشاش الاصطناعية. ترتبط برنامج الروابط المدرسية حاليا ثلاثين مدرسة في ثمان دول مختلفة، ويهدف لإعطاء الطلاب تعريفا بالصقور وتوسيعا لمعارفهم في الصون العالمي للصقور. توجد المدارس المرتبطة في الولايات المتحدة (6)، والمملكة المتحدة (4)، والإمارات العربية المتحدة (3)، وهولندا (1)، وسلوفاكيا (1)، ومالطا (1) وجنوب أفريقيا (1).

**إعادة نشر الصقر الحر في بلغاريا:** جرت عملية تجريبية إضافية لإطلاق ثلاثة صقور أكثر في الأسر قرب مواقع تدريب شجرية قرب كوتل، في مقاطعة سليفن. أقام أحد الطيور التي أطلقت في ستارا زاجورا في عام 2013 لنفسه مجالا شتويا على مسافة تقارب 50 كلم من موقع التدريب. كان الطير قد أقام لبعض الوقت بالتصنيف في مقاطعة خرسون في أوكرانيا ولكنه عاد إلى بلغاريا في شتاء 2015/2014 حيث بقيم حتى الآن. يوجد الآن 9 أزواج من الصقر الحر وذكر واحد في مشروع مركز منظمة البلقان الأخضر لتأهيل وإكثار الحياة الفطرية، الذي يضم مرافق لاحتواء 12 زوجا متكاثرا. الهدف هو إنتاج قرابة 20 فرخا في العام في برنامج إطلاق شامل يستمر لخمس سنوات 2015-2019.

**أبحاث في صقور الشاهين والجير في شمال يوراسيا:** اكتملت الأبحاث الميدانية لدراسات تحركات صقور الشاهين المتكاثر في يوراسيا القطبية في 2013. قمنا في 2014 بتتبع 15 صقر شاهين، وكانت 9 منها ما زالت ترسل الإشارات في نهاية العام، تم تثبيت مرسلات على طيرين في دلنا لينا في 2010، وثلاثة طيور عند نهر بوبيجاي في شرق تايمير، وأربعة طيور عند أسفل نهر كوليمان في 2013. يجري حاليا تحليل بيانات التتبع بالأقمار الصناعية من قبل باحثين في جامعة كارديف. بدأنا في 2014 بأعمال ميدانية لجمع الحامض النووي من صقور الجير اليوراسية لتحليل الجينوم.

**إدارة الأراضي وصون الصقر الحر في هضبة شينجهاي-التبتية:** هضبة شينجهاي-التبتية هي الإقليم الحيوي الأهم للصقر الحر، وتأتي ما يصل إلى نصف أعداده في العالم خلال فصل الشتاء. يعود سبب احتضان هذا الإقليم الحيوي لهذا العدد الكبير من طيور الصقر الحر إلى وفرة المواد الغذائية في شكل حيوان البيكا. أقيمت عدة محطات للتحكم بالقوارض على مستوى المقاطعات عبر الهضبة، وتنفذ كل محطة برنامجا لإدارة أعداد البيكا في الهضبة. يتم التحكم الحيوي بحيوان البيكا بإقامة شرفات ومنصات للتعشيش في الأراضي العشبية. تم تطبيق هذا الأسلوب بشكل واسع عبر عدة مقاطعات في هضبة شينجهاي-التبتية. أقيمت عشرات الآلاف من هذه الشرفات والمنصات على امتداد الهضبة. قمنا بفحص 718 من منصات التعشيش في مقاطعتي مادوي وسريكسو، ووجدنا أن 55% منها تحتلها الطيور الجارحة، ونقدر أن الأعشاش الصناعية في هاتين المقاطعتين لوحدهما تدعم 192 زوجا متكاثرا من الصقر الحر. وجدنا، إضافة إلى ذلك، أن طيور الصقر الحر تتكاثر في أعشاش بنتها عقبان المرتفعات على خطوط نقل الكهرباء. أجرينا تجارب، بهدف تحديد ما إذا كان بإمكاننا تحسين نسبة الإشغال، وذلك بإقامة براميل تكاثر على الطراز المنغولي قرب محطات للتحكم بالقوارض في مقاطعات مادوي وشينجهاي وزوجي. قمنا 25 برميل تعشيش في كل منطقة منها.

**صون الصقر الحر في كازاخستان:** أجريت الأعمال التحضيرية لمشروع محتمل للصقر الحر سيقام في كازاخستان في شهر مارس، وذلك بزيارة للمناطق شبه الصحراوية والسهوب المحيطة بحيرة بالكاش، حيث أظهرت المقارنة باستطلاعات سابقة تناقصا في كثافة تزواج طيور الصقر الحر. قد يكون لإزالة أعشاش العصي أثر لذلك التناقص بالتأكيد، ولكن كان هناك أدلة أيضا على صيد الصقر بالفخاخ في هذه المنطقة.

**الأبحاث الجينية على الصقور:** درسنا المؤشرات الجينية لأعداد الصقر الحر ووجدنا أن أفرادا منها في هضبة شينجهاي-التبتية يتميزون عن المجموعات الأخرى في أوروبا ووسط آسيا. إضافة إلى ذلك فإن المجموعات المقيمة في أقصى الطرف الغربي في وسط أوروبا تظهر أدلة على العزلة الديموغرافية. بدأ العمل في دراسة التسلسل-النووي لجينوم صقور الجير، وقمنا بإعادة دراسة التسلسل الجيني لـ 30 من صقور الشاهين من ثلاثة مناطق للمجموعات في المناطق الغربية والوسطى والشرقية ليوراسيا القطبية المقابلة على التوالي لأعداد تحت-أنواع مسماة وهي شاهين البيريجرينس *peregrinus* وشاهين الكاليدس *calidus* وشاهين السلالة اليابانية *japonensis*. استخدم التسلسل النووي للجينوم لصقور الشاهين في مشروع "شجرة الحياة" للطيور.

## معدات الصقارة والزينة الشعبية لكبار صيادو النور في المجتمع الكرخي الألفي في غرب منغوليا

تاكويما سوما

يزين كبار صيادو النور في المجتمع الكرخي الألفي في منغوليا نورهم الذهبية بمعدات صقارة خاصة لكل منها، وهي إضافة لكونها عملية فإنها تمثل شكلا من أشكال التعبير الفني المحدد للمناطق المحلية. المعادن والجلود هي المواد الأكثر استخداما في صنع معدات الصقارة وتستخدم بشكل خاص في صنع البراقع. يمكن لكبار الصيادين من نظرة سريعة نمط وتصميم البرقع تمييز المنطقة، بل والحرفي المعين الذي صنعه. الأربطة (السبوق) هي من البنود الهامة في المعدات التي تزين بأشكال فنية. يمكن مشاهدة العديد من أشكال البرشام (الدوار) في التصاميم إذ تستخدم في معدات الصقارة وفي أجمة الخيل. تصنع معظم البراشم من الفضة ولكنها تصنع أيضا من النحاس أو الصلب. أما المسند (الشدة) المستخدم لدعم النور فيصنع في العادة من خشب الحور لكنه يصنع أحيانا من قرن الوعل بتصاميم رائعة على السطح. أما القفازات (الدسوس) فتمثل مزيجا من العمل اليدوي للرجال والنساء لتزيين القماش بالتطريز. يمكن مشاهدة التطريز البالغ الدقة أيضا في مخلاة الطعام وعلى السراويل الجلدية. تزين النور أحيانا بأقمشة مطرزة. معدات الصقارة هي مجال ضروري لتمثيل التعبير الفني المحلي في الثقافة الكرخية الألفية. إن التراجع في تقاليد صقارة النور لا يهدد الصقارة فحسب، بل وفنون التزيين للمعدات أيضا.

## عدوى داء الرشاشيات في الطيور الجارحة

أ. أوارنيي ور. جيريتس

داء الرشاشيات Aspergillosis هو المرض المعدي الأكثر شيوعا في الطيور الجارحة الأسيرة، وتتسبب به فطريات من نوع الرشاشيات *Aspergillus*. الجهاز الأكثر شيوعا لوجود داء الرشاشيات هو الجهاز التنفسي لأنه ينمو في بيئات غنية بالأكسجين، ويشكل هيكل خيطية تغطي الأسطح. عند تكاثره، تتشكل بويغات صغيرة تطير في الهواء. استنشاق البويغات التي يحملها الهواء هو الطريقة الرئيسية لانتقال العدوى. تلتصق بويغات الرشاشيات بالبطانة المخاطية لأقنية الجهاز التنفسي وتبدأ في التكاثر. من المعروف أن بعض المواد الجرثومية التي تفرزها الرشاشيات تقمع نظام المناعة، مما يهيئ الطير المريض للإصابة بحالات مرضية أخرى. هناك عدة طرق لتشخيص داء الرشاشيات: تحاليل الدم والتطير المجهرية. يوصى بالجمع بين تقنيات التشخيص لتلافي الوصول لتشخيص غير صحيح. يمكن لمعالجة هذا المرض أن تكون عملية صعبة وطويلة الأجل. تستخدم الأدوية المضادة للفطريات وكذلك مجموعات مختلفة من الأدوية، ولكل منها طريقة عمل خاصة بها. هناك تنوع في طرق تقديم الأدوية المختلفة: عن طريق الفم وبالإرذاذ وبالحقن الوريدي وبالجراحة. في الحالات الحادة للإصابة تكون تقديرات الشفاء سيئة في العادة. يمكن الشفاء تماما من داء الرشاشيات المزمن وكذلك يستغرق وقتا طويلا للعلاج. للوقاية من داء الرشاشيات فإن من المهم للغاية استخدام بروتوكولات صحية جيدة. يوجد العديد من منتجات التنظيف التي تقضي على البويغات في الأسواق. هناك عوامل تسهم في الإصابة بالداء ومنها الضغوط الخارجية، منها على سبيل المثال بعد فترة من السفر أو عند إجبار الطيور على إنقاص وزنها.

## تهريب الصقور والحبارى في إيران

أريا شفانبيور، وسيد باباك موسوي، وبهزاد فاتحينيا

في أوائل خريف كل عام تبدأ عمليات الصيد غير المشروع للصقور بالفخاخ في أنحاء عديدة في إيران. يمتد موسم الصيد بالفخاخ من أواخر سبتمبر إلى أواخر الشتاء، ويبلغ ذروته في الخريف. الأهداف الرئيسية لهذه العمليات هي الصقر الحر (الغزال)، وصقر الشاهين، وصقر الشاهين البربري (المغربي) لتهريبها إلى دول الخليج كالمملكة العربية السعودية والإمارات العربية المتحدة وعمان والبحرين. بسبب أعداد الصقر الحر في إيران المنخفضة للغاية في الوقت الراهن، فإن معظم الصقور التي تصاد في إيران هي صقر الشاهين وصقر الشاهين البربري. لكن طيور الصقر الحر تشكل جزءا كبيرا من الصقور التي تصاد بالفخاخ خارج البلاد وتهرب عبر الحدود. اكتشفت إحدى أكبر شحنات الصقور في نوفمبر 2014 حين أوقف المسؤولون سفينة إيرانية في بحر عُمان وهي في طريقها من ميناء جيواني في الباكستان إلى البحرين. عثر عند تفتيش السفينة على 142 صقرا و240 طير حبارى. أطلقت الطيور في مقاطعات وسط وجنوب إيران. تقدم بعض الإرشادات والتوصيات لمنع صيد وتهريب الطيور الجارحة

## كلمة العدد

أي المهندسين والمدراء التنفيذيين لشركات توزيع الكهرباء الذين يفوضون ويقيمون الخطوط الجديدة للطاقة. نأمل أن مبادرة التواصل المباشر مع شركات الطاقة كما شهدناها في مهرجان البيرزة سوف تؤدي إلى تغييرات حقيقية على أرض الواقع من خلال تطبيق الأعمال العلاجية للحد من خطر الصعق الكهربائي على الطيور الجارحة.

تواجه الصقور العديد من التهديدات في كل أنحاء الأرض، يرتبط بعضها ارتباطاً مباشراً بالصقارة والاتجار الذي يدفعه الطلب في دول الخليج. في هذا السياق، في هذا العدد، يقدم لنا أريا شفاينبير وزملائه نظرة في عمليات صيادو الفخاخ والمهربين في إيران. إن الكثير من الجهود الخيرة الذي يقوم بها الصقارون لصون ورعاية الصقور تقوضه مثل هذه الأنشطة الشائنة، وتقع على كافة الصقارين مسؤولية القضاء على هذه الوصمة السيئة على صورة ونزاهة الصقارة.

لقد أدت التطورات في علاج الحالات الصحية لطيور الصقارة، كداء الرشاشيات *aspergillosis* مثلاً، إلى تحسينات في رعايتها وفرص بقائها حية في الأسر. يقدم لنا خبراء من شركة "أفيميدكال" *Avimedical* الهولندية في هذا العدد مقالا يركز على الداء، بما في ذلك تشخيصه وعلاجه والوقاية منه. سعدنا في *فالكو* بتلقي عدة مقالات في الماضي من د. سوما تتعلق بدراسته الإثنوغرافية في غرب منغوليا، وها يقدم لنا تفاصيل الأعمال الفني والحرف اليدوية المرتبطة بالتحف والأثاث المستخدم في الصيد بالنسور في كازاخستان.

أندرو ديكسون

المحرر، نشرة *فالكو*

لقد أتيت للكثير من قراء *فالكو* فرصة حضور مهرجان الصداقة الدولي الثالث للبيزرة (الصقارة) الذي أقيم في أبو ظبي برعاية كريمة من صاحب السمو الشيخ خليفة بن زايد آل نهيان رئيس الدولة، واستضافه منتجع الفرسان الرياضي الدولي في الفترة 11-13 ديسمبر 2014، وحضور مخيم الصقارين الصحراوي الذي سبقه من 7-9 ديسمبر في المنطقة الغربية. هدفت مهرجان الصداقة الدولي الثالث للبيزرة، إضافة إلى كونه احتفالاً بالصقارة وإضافتها في قائمة اليونسكو التمثيلية للتراث الثقافي غير المادي للبشرية، إلى "تقديم منصة مناسبة للتبادل والحوار بين المهتمين بالصقارة من شعوب ومنظمات وأفراد، وذلك بهدف دعم وحماية وتطوير هذا التراث" و"تأكيد دور إمارة أبوظبي والإمارات العربية المتحدة في حماية البيئة وإنماء استدامتها".

اتساقاً مع هذه الأهداف، أقيم اجتماع في منتجع الفرسان للنظر في قضية صعق الطيور الجارحة بالكهرباء في منغوليا. كانت مشاريع هيئة البيئة - أبوظبي لأبحاث وإدارة صون الصقر الحر (الغزال) في منغوليا قد حددت الصعق كسبب رئيس لنفوق النوع هناك، إذ تموت الآلاف بهذه الطريقة كل عام ومعها الكثير من الجوارح كالصقور الحوامة والعقبان (للمزيد من المعلومات أنظر المقال في ص 16). خاطب الاجتماع أفراداً رئيسيين في شركات الطاقة والحكومة لاطلاعهم على حجم مشكلة الصعق الكهربائي وطرق معالجتها. كان المنتدى مفيداً للباحثين وصانعي السياسات لأن يسمعون مباشرة من مدراء شركات الطاقة التنفيذيين ومهندسيها. كان هناك إجماع في نهاية الاجتماع على أن هناك مشكلة خطيرة يجب حلها، ووفق على نص القرار التالي لتقديمه لحكومة منغوليا:

إن مؤتمر مهرجان الصداقة الدولي الثالث للبيزرة (1) يشجع حكومة منغوليا على تطوير وسن قوانين تنظيمية وغيرها من التدابير، بما في ذلك المعايير، لضمان أن تكون جميع خطوط الكهرباء الجديدة آمنة للطيور الجارحة، (2) بحث حكومة منغوليا على تسهيل التخفيف على البنية التحتية القائمة لتوزيع الكهرباء من أجل الحد من حالات صعق الطيور الجارحة بالكهرباء، (3) يطلب إعادة انعقاد مجموعة العمل على الصعق بالكهرباء التي أسستها وزارة البيئة والتنمية الخضراء وذلك من أجل إنتاج توجيهات واضحة، باللغة المنغولية، عن بنية تحتية للطاقة آمنة للطيور وخيارات التخفيف، (4) يوصي بشدة أن يتم تخصيص الموارد التقنية والمالية الكافية لتطوير ونشر خطوط كهرباء جديدة آمنة للطيور الجارحة، وإيلاء الاعتبار الواجب إلى إمكانية الاستفادة من الدخل من التجارة الدولية في الصقر الحر من أجل تمويل التخفيف ومعالجة خطوط الكهرباء الخطرة القائمة.

الصعق الكهربائي للطيور الجارحة ليس قضية جديدة ولا ينحصر في منغوليا فقط. إلا أن الحلول البسيطة نسبياً، وبعد مرور عقود، لم تطبق بشكل واسع، بل إن المزيد من خطوط الطاقة الخطرة ما زالت تقام. أن هذا الوضع يبرز فشل الاتصال من قبل العاملين في الصون - ذلك لأننا لم نتواصل بشكل كاف مع أولئك الذين بيدهم صنع الفرق



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