FALCO

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To provide:

A central body for the co-ordination of research activities related to falcons and falconry.
A common forum for the exchange of information and for promoting collaborative research programmes.

To promote:

Research on health and disease in falcons, falcon moulting in the Middle East, falcon nutrition, domestic breeding.
Field studies on falcon migration, taxonomy, morphometrics, reproductive biology and behaviour.
Improved management conditions for captive falcons through educational awareness programmes.
Greater understanding of falconry as a part of Arab cultural heritage.

To hold:

nd International workshops and conferences on veterinary aspects, falcon biology topics, falconry and conservation issues.

To publish:

Papers on aspects of falcon conservation, falcons and falconry.
A biannual newsletter/journal containing contributions on medical, biological and conservation topics of common interest, new developments and recent medical advances.

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Membership is open to any veterinary surgeon, biologist, conservationist or falconer working in the Middle East or any other person interested and contributing in the fields of medical, biological and conservation aspects of falcons and falconry worldwide.

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Previous issues of **FALCO** as well as instructions for authors can be downloaded from:
http://www.falcons.co.uk/default.asp?id=131

also see new Saker Conservation information portal:
www.savethesaker.com

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Editorial

At the time of going to press we heard the sad news of the passing away of His Highness Shaikh Maktoum Bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai. As a co-owner of Dubai's Godolphin stables he was best known internationally for his interest in horse racing, but he was also a great friend of falconry in the region.

Avian influenza or bird flu is probably the biggest issue to affect falconry in the Middle East this season. The Environment Agency of Abu Dhabi (formerly ERWDA) has coordinated the "The National Committee for Emergency Response to Bird Flu" and produced an Action Plan for the United Arab Emirates (http://www.ead.ae). These actions by the UAE authorities are commendable, because within the Middle East region some countries appear less prepared.

In November, ProMED-mail, an internet based discussion program of the International Society for Infectious Diseases (http://www.isid.org), reported two cases of avian influenza caused by the deadly H5 strain in unspecified wild birds in Kuwait. However, these cases were regarded as "suspected", because no further details or confirmation from a recognized reference laboratory were made available to the Office International des Epizooties (OIE), the officially recognised international organisation that reports notifiable veterinary diseases (http://www.oie.int). In early December, ProMED-mail reported avian influenza in Libya, although the authorities there contradicted local press reports and denied the disease had occurred. In December the H5N1 strain of avian influenza was isolated in a saker falcon that died in a Falcon Hospital in Riyadh, Saudi Arabia (see the letters to Falco section). Interestingly, despite confirmation of the strain from a German reference laboratory the authorities in Saudi Arabia have not reported this case to the OIE. The lack of transparency and openness in disease reporting in the region is unlikely to be helpful in the control of this disease and should concern those tasked with keeping notifiable diseases out of the region.

Movement restrictions on the importation of wild caught birds, including houbara bustards and falcons, have been implemented by regional governments. It might have been expected that this season, with wild bird imports "theoretically" banned, with well publicized bird flu public information campaigns by the media, with the ready availability of large numbers of high quality healthy captive bred falcons and with the ability to mass-produce houbara bustards in captivity for training, that the trade in wild bustards and wild falcons might have diminished. It has been disappointing to hear reports that wild-caught birds were still being bought into the region. As we go to press, Turkey has just confirmed the first human deaths caused by avian flu that have occured outside Asia. Falconers and veterinarians must work together to keep this potentially devastating disease out of the region. Consequently, in this issue of Falco we have an article and two letters on avian flu and it can be seen that this is a topic that stimulates differences in opinion.

In our editorial for the last issue of Falco we mentioned the Review of Significant Trade in Saker Falcons that is being undertaken by the CITES, and hopefully there will be some further news to report from the 22nd meeting of the CITES Animals Committee in Peru in July 2006. This trade review process is concerned primarily with recommendations for governing a legal trade in Saker Falcons, but it has been recognized for a long time that the trade in falcons for falconry also involves considerable illicit trade. Concerns about this illicit trade led to calls for the establishment of a task force to examine law enforcement related issues. Consequently, the CITES Falcon Enforcement Task Force was established, comprising enforcement officials from those countries most affected by illicit trade in falcons. The CITES Falcon Enforcement Task Force was charged with organizing a meeting to establish a network of officials that would be responsible exchanging information to facilitate the detection of illicit trade incidents. The UAE hosted the first meeting of the CITES Falcon Enforcement Task Force in November 2005 (see News and Announcements section). Now CITES has two parallel processes running, the review of legal trade of Saker Falcons and the task force investigating illicit trade in all falcons. Given that a major concern with the current legal trade in wild caught Saker Falcons is the lack of transparency in the process and the suspicion that it is open to abuse by corrupt government officials it will be interesting to see if the remit of the new task force will also cover this aspect of illicit trade.

Thanks to a kind donation by Dr. Dan Brimm and Lisa Jerez we are able to provide Arabic translations of articles and the editorial as part of our commitment to expanding our readership. We extend our thanks to Dr. Monif Al Rashidi for his interesting contribution from Saudi Arabia, we need more articles from our Arabic readers, and appeal to our Arabic colleagues, scientists, veterinarians or falconers, to contribute in future issues of Falco. This is your region and your opinions matter. Saker Falcons breeding in both Asia and Europe can pass through or spend the winter in the Middle East, consequently breeding populations of this species, wherever they occur in the world fall within our sphere of interest. In this issue, Dimitar Ragyov and Vesselina Shishkova report on the population trend of the Saker Falcon in Bulgaria over the last century. This study forms part of a project to develop a network of researchers to get a better understanding of the status of the species in southeast Europe and Turkey, a region with little detailed information on Saker Falcons. We also wish to thank Jevgeni Shergalin (International Wildlife Consultants Ltd) for identifying interesting material for inclusion in this issue.

Editorial update on 29/1/6 at the time of going to press

At the time of sending Falco to press regional newspapers in the Middle East (Emirates Today, Sunday 29th 2006) reported that 37 falcons were culled in a Falcon Hospital in Riyadh, Saudi Arabia because of an outbreak of H5 influenza. The fact that the Saudi authorities are now acting to deal with this H5 outbreak is a step in the right direction, although many questions remain on why the response was delayed for so long.

The Saker Falcon in Bulgaria: Past, Present and Future

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Summary
Widespread and numerous in the past, the Saker Falcon in Bulgaria is presently on the edge of extinction. The species' population collapsed between 1930 and 1960 under the influence of the following factors: habitat loss; decrease of European Souslik; pesticide and fertilizer use; poaching (shooting) and use of poison baits. Another factor presently having a strong negative influence is nest robbery.

In 2006 the Bulgarian Academy of Science (BAS) and International Wildlife Consultants Ltd. (IWC Ltd) with the financial contribution of the Environmental Agency of Abu Dhabi (EAD) will initiate a research and conservation project "Saker Falcon in Bulgaria and Southeast Europe". The main objective of the project is to stop the decline in Saker population in the region.

Introduction
Geographically Bulgaria is close to the westernmost limit of the Saker Falcon (*Falco cherrug*) distribution range. Located on the Balkan Peninsula in SE Europe, the country has a varied relief and a wide range of habitats, including steppe, old natural forests, rocky massifs and high mountain meadows (over 2500 m). The lowest part of the country is the Black Sea coast and the highest point is "Musala" peak at an altitude of 2925 m.

The distribution ranges of Saker, Lanner (*Falco biarmicus*) and Peregrine Falcons (*Falco peregrinus*) overlap in Bulgaria. The Gyrfalcon (*Falco rusticolus*) was a very rare, accidental winter visitor in the past, whilst Barbary Falcon (*Falco pelegrinoides*) is mentioned in the literature as "probable" species in the country (Nankinov, 1992) but there is no certain record available. All the large falcons within the territory of Bulgaria are rare species with serious threats to the survival of their populations.

Past status
Saker Falcon population decline in Bulgaria
Numerous and widespread in the past, the Saker Falcon is presently on the edge of extinction in Bulgaria. At the end of 19th Century and the beginning of the 20th Century, according to different authors the Saker is described as: "very common species. More than five nests found in a few days only" (Elwes & Buckley 1870 *in* Michev & Petrov, 1985); "frequently seen in the forests of Dobrudja" (Sintenis, 1877 *in* Michev & Petrov, 1985); "besides Black Kite and Marsh Harrier, the Saker is the most widespread bird of prey species in Dobrudza and is abundant around the Danube marshes and hill forests" (Floericke, 1918); "common breeder around Danube river" (Patev, 1950). Based on these statements, we consider that at the beginning of the 20th Century at least 2000 pairs of Saker Falcons inhabited the Bulgarian territory.

Nowadays estimates of Saker Falcon numbers are: 2–6 pairs (Burfield & van Bommel, 2004), 4-10 pairs (Birds Of Prey Protection Society, 2005) and 8-12 pairs (Nankinov *et al.*, 2004)

Many of the causal factors for the population decline are similar to those operating elsewhere in the world range of the Saker Falcon, but some factors are specific to Bulgaria. There are two important events in Bulgaria's contemporary history, World War II and the change of regime in 1989. These events not only affected the political situation but also drastically changed the economy of the country, the lifestyle of the people and inevitably had a significant influence on wildlife as well.

Agricultural practices were altered after World War II in that pastoralism declined rapidly and 'high farming' started. The existing Saker hunting habitats (i.e., wide open spaces with low grass cover) were either left uncultivated so that the wild grasses grew tall, reducing the availability of ground dwelling prey for Sakers, or they were replaced by massive agricultural monocultures. Intensive agriculture is associated with the mass extermination of rodents, including Sousliks (*Spermophilus citellus*), an important prey species for Saker Falcons. Pesticides and fertilizers were extensively used in intensive agricultural systems during the decade 1970-80. Their effect on wildlife was significant and numerous wild animals were found dead after these chemicals were applied using aircraft.

The widespread use of poison baits against predatory animals (mainly strychnine) took place between 1930-70, and during this period the terms "harmful mammals" and "harmful birds" came into fashion. Almost all birds of prey, crows and predatory mammals were considered harmful for the "socialist people's agriculture" and therefore they were poisoned or shot at every opportunity. There has even been a further increase in the shooting of birds of prey since 1980 as hunters in Bulgaria had a legal duty to kill birds of prey. As a result of these factors, sometime in the period 1930-60 the Saker Falcon population in Bulgaria collapsed.

Negative Factor	1930's	1940's	1950's	1960's	1970's	1980's	1990's
Pesticides and fertilisers					*Yes*		
Shooting			*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Habitat loss			*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Decline of Sousliks			*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Poison baits	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*		
Nest robbery and trapping						*Yes*	*Yes*

Table 1. The timing of negative influences affecting Saker Falcons in Bulgaria during seven decades from the 1930's to the 1990's. The table shows the period with the most intensive influence of each negative factor.

Unfortunately, there is no published data to gauge the significance of the different causal factors individually or to quantify the extent of the decline at different times over this 30-year period.

The change in the ruling regime in 1989 resulted in the opening of Bulgaria's borders and an increase in all aspects of international trade, including the legal and illicit trade in falcons. Even though some trapping and nest robbery existed before the change in regime, where it is reported that approximately ten groups of falcon poachers operated on the Balkan Peninsula (Schegilman, 1983 *in* Michev & Petrov, 1985), nest robbery (of both eggs and chicks) and trapping have further increased since 1989. It is believed that illegal trapping has disrupted the sex ratio of the small remaining Saker Falcon population in Bulgaria, either because females are more easily caught or because trappers prefer them, with more males than females reported in the former breeding ranges.

In addition to the negative factors listed in Table 1., there are probably three more casual factors for Saker Falcon population decline in Bulgaria i.e., electrocution caused by power transmission and distribution lines, human disturbance of nesting sites and trapping of birds outside Bulgaria for falconry i.e., during migration and when wintering in other countries. These two factors have probably become more of a problem in recent decades but no doubt they also existed throughout the years in the past but their intensity and effect on the Bulgarian population is unknown.
Over the last 25 years we better quantitative data on the Saker Falcon population in Bulgaria (Table 2), though the accuracy of each individual study is not known. If these estimates are broadly reliable, the data shown in Table 2 indicates that there has been a further dramatic reduction in the breeding population at the beginning of the 21st Century. This much-diminished population is now also affected by intrinsic factors in addition to extrinsic environmental and anthropogenic influences. In addition to unbalanced sex ratios, the Bulgarian Saker Falcon population is now influenced by problems caused by restricted breeding dispersion and low breeding density i.e., the country currently has a small, fragmented and isolated breeding population that is consequently vulnerable to extinction.

Date	Estimate (bp)	Source
<1985	<15	Michev (1985)
1985	20-40	Michev &Petrov (1985)
1990	30-50	Simeonov *et al.* (1990)
1997	30-40	Kostadinova (1997)
1998	40-50	Stoyanov & Kuzmanov (1998)
2004	8-12 4-10	Nanikov *et al.* (2004) BPPS (2005)
2005	2	Domuschiev *et al.* (in press)

Table 2. Recent estimates of the Saker Falcon population (breeding pairs; bp) in Bulgaria

Current status

Actions for Saker Falcon conservation in Bulgaria
The following actions related to Saker falcon conservation have been so far undertaken in Bulgaria:

- The species is protected by the Nature Protection Law *since 1962*
- Cessation of strychnine use against mammal predators *since 1965*
- Cessation of organochlorine pesticide use *since 1967*
- The species is included and categorised as Endangered in the Red Data Book of Bulgaria and is to be uplisted as Critically Threatened in the forthcoming issue of this book.
- Nature conservation project established by BSPB (Bulgarian Society for the Protection of Birds/ BirdLife Bulgaria) for guarding of birds of prey nests *since 1997*
- Nature conservation project established by BPPS (Birds of Prey Protection Society, Bulgaria) for guarding of birds of prey nests *since 2002*. This project is aimed at nest guarding raptor nests that are known to have been robbed in previous years (mainly Saker Falcon nests) and also wider monitoring of Saker Falcon nest outcomes.
- Preparation of National Action Plan for the species by BPPS *since February 2004* and is currently ongoing.
- Protected by The Biodiversity Act of Bulgaria; Appendix 2 and 3 *since 2002*.

- Inclusion of some Saker Falcon breeding sites into a network of protected areas such as Nature Parks, Nature Reserves, Important Bird Areas (IBA's) and the Natura 2000 network of sites.
- Activities undertaken by BPPS, BSPB, the police and Ministry of Environment and Water (MoEW) targeted at preventing nest robbery and trapping.
- The current Hunting Law in Bulgaria forbids hunting with Saker Falcons and other birds of prey.

Despite of the presence of these national laws and the implementation of the specific actions detailed above, the population decline has not been reversed and the currently the population is close to extinction in the country.

Ecology of the Saker Falcon in Bulgaria
The ecology of the species in Bulgaria is not studied well and to date no specific ecological study has been undertaken in the country. Data on the species has obtained incidentally through other projects and field activities; consequently the available data is scarce and non-systematic.

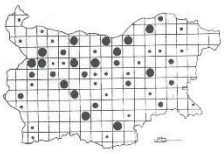

Figure 2. Saker Falcon distribution range in Bulgaria (reproduced from Stoyanov & Kouzmanov 1998). The breeding sites are shown in 25x25 km squares. Large dots = *Proven breeding*, medium dots = *Probable breeding* and small dots = *Possible breeding*.

Breeding distribution
In the past the Saker Falcon was regarded as a widespread and very common species over the entire Bulgarian territory (especially the northern regions and the plains around Danube River). In more recent times (15-20 years ago) it was still widespread but with diminished numbers. Nowadays it has a fragmented distribution range and has already disappeared from most of its traditional breeding sites (Domuschiev *et al.* 2005). Stoyanov and Kouzmanov (1998) have prepared the most recent and complete map of the Saker Falcon distribution range in Bulgaria (reproduced in Figure 2). It must be noted that this map presents the historical distribution of the Saker Falcon since the early 20th Century and has been compiled from published data since 1918, and not simply from the recent published data of Bulgarian ornithologists and the personal data of the authors. Consequently, some of the breeding areas shown on this map were no longer extant when it was compiled in 1998. The breeding distribution of the Saker Falcon in Bulgaria is thought by many researchers to be closely related to the distribution of its main prey, the European Souslik.

Altitudinal distribution
In the past the species was more numerous in the lower part of the country (within the altitudinal range 0 to 500 m). Unfortunately this also is the region with greatest human presence and anthropogenic pressure. Saker Falcons have largely disappeared from these regions and most of the recent breeding records relate to high mountains or inaccessible rocky places with low levels of human disturbance (Figures 3 and 4).

Habitat selection
Saker Falcons nest in trees or on rocks close to two main types habitat in Bulgaria: (i) wetlands such as rivers, bogs, marshes, swamps, fens, peat lands and (ii) open areas such as grasslands or agricultural fields. Michev and Petrov (1985) found 13 Saker nests, nine (69%) of which were on rocks and four (31%) were in trees. Stoyanov and Kouzmanov (1998) found 15 nests, 11 (73%) of which were on rocks and four (27%) were in trees. According to them nesting on electric pylons is possible recently. Outside the breeding season, all types of habitats are used during migration and wintering.

Diet
The European Souslik is the main prey species taken by Saker Falcons during the nestling period of the breeding cycle. Nevertheless, Saker Falcons also feed on other small mammals (rodents) and small to medium sized birds such as pigeons, crows and small passerines. However, a detailed study on the diet of the Saker Falcon has never been conducted in Bulgaria.

Breeding biology
The Saker Falcon occupies its breeding territory at the end of February and beginning of March (Domuschiev *et al.* 2005). For regions lower than 1000 m above sea level it lays eggs in the middle of March and the chicks fledge from the nest at the end of June. At altitudes above 1000 m, Saker Falcons lay their eggs at end of March and the chicks fledge in late June or early July (Stoyanov & Kouzmanov, 1998). The typical incubation period is *ca.* 30 days, with clutch sizes ranging from 2-6 eggs (normally 3-5). The chicks leave the nest after *ca.* 40-45 days (Domuschiev *et al.*, 2005). The breeding success of Bulgarian pairs is very low; usually eggs are laid and incubation is observed but later the nest is abandoned although the adult birds remain in the area. In majority of the cases the failure is caused by human intervention (Stoyanov

Figure 3. Typical upland breeding site of the Saker Falcon in the Stara Planina range in central Bulgaria

& Kouzmanov, 1998). The last recorded breeding successes were in 1997 when a pair fledged two chicks (Stoyanov, 2001), in 2003 when a juvenile was seen on the 12th June and in 2005 when a pair with fledged a single chick (Domuschiev *et al.*, 2005). Breeding failure can also result from natural causes such as the destruction of nests by intensive rains and rock falls in spring, or from sudden low temperatures and snowfalls in period March-May. Adverse weather conditions can affect Souslik populations as well, resulting in reduced food availability and subsequent nest failure (Stoyanov & Kouzmanov 1998).

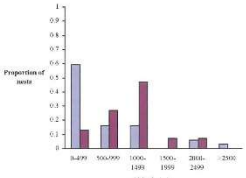

Figure 4. Vertical distribution of Saker Falcon nest sites in Bulgaria: data from Michev & Petrov (1985; blue columns, N = 32 nests) and Stoyanov & Kouzmanov (1998; purple columns, N = 15 nests)

Migration
Saker Falcons are regular visitors to Bulgaria during the post-breeding migration period (August to October), and can be encountered across the entire country but especially along the Black Sea coast and its large wetlands with concentrations of waterbirds. Probably most of the Sakers observed in Bulgaria during the late summer and autumn period are juveniles from Ukraine, Moldova and Hungary. It is not known for certain if Bulgarian birds (adults and/or juveniles) migrate in the autumn and, if they do, where they go. Certainly, Saker Falcons are very rare in Bulgaria in the winter period from January to February. According to Stoyanov & Kouzmanov (1998), depending on the prevailing weather conditions many pairs stay in the area of their breeding sites (even at altitudes up to 1500 m) during the winter period from November to February. At high altitudes above 1500 m pairs tend to leave their breeding ranges, possibly moving to lower lying plains or visiting places with concentrations of birds on a regular basis. What this most likely signifies is that some of the Bulgarian breeding birds are resident and others are migratory, though the extent of these migratory movements is not known.

Relationship between Saker Falcons and other birds
In Bulgaria Saker Falcons preferentially nest in the existing nests of other bird species, though in very rare instances the clutch is laid on a bare rock ledge. Host species for nests located in trees are: Hooded Crow (*Corvus cornix*), Common Buzzard (*Buteo buteo*), Goshawk (*Accipiter gentilis*) and herons. Host species for nests located on rocks are Raven (*Corvus corax*)

and other raptors, typically Long-legged Buzzard (*Buteo rufinus*) and Golden Eagle (*Aquila chrysaetos*) (Stoyanov & Kouzmanov, 1998; Domuschiev *et al.*, 2005; Michev & Petrov, 1985)

Future

Presently the Bulgarian Academy of Science together with International Wildlife Consultants Ltd., on behalf of the Environment Agency of Abu Dhabi (AED) is establishing a research and conservation programme on the Saker Falcon in Bulgaria, with a view to developing a network of studies across southeast Europe and Turkey. The main objective for the project is to identify the main causal factors in the demise of the Saker Falcon population in the region and to implement management procedures to halt and reverse this process. Specific objectives for 2006 are:

- Collecting and analysing breeding and ecological information on the species
- Developing measures for Saker Falcon conservation and management in Bulgaria
- Improving breeding success of the existing pairs of Saker Falcons in Bulgaria
- The creation of a network of teams and partnerships between organizations to work on Saker Falcon conservation projects in southeast Europe and Turkey

The project will include workshops for discussion about Saker Falcon conservation problems in the region. Organizations from Bulgaria and other countries of southeast Europe will take part in these meetings in order to develop an inter-country network of researchers across the region. Fieldwork in Bulgaria during 2006 will involve systematic surveys for Saker Falcon nesting sites in order to get a better estimate of population size as well as nest site monitoring and guarding of nests (including the use of video cameras) in order to preserve the nest from robbery and to collect biological data from the breeding period. To date a national Saker Falcon project has never been implemented in Bulgaria.

We intend to start better coordination in Saker Falcon conservation and management work by supporting the establishment of a trained research team. Better knowledge on the breeding ecology and population threats facing Saker Falcons in Bulgaria is expected by the end of the year. We hope to expand our research and conservation actions in the adjacent countries in the course of next years with the help of local partner organizations.

Acknowledgements

The data about Saker ecology in Bulgaria is obtained by publication research. The most important and valuable sources are the ones by Georgi Stoyanov, Dobromir Domuschiev, Dr. Tanju Michev and Dr. Ceno Petrov. We want to express our sincere gratitude for their experience and knowledge.

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An Ecological Study on Hunting Falcon Species and their Protection in Saudi Arabia

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Figure 1.

Summary

Falconry is a widespread sport and hobby within Saudi Arabia. Four species of falcons are used for hunting in Saudi Arabia: Saker Falcon (*Falco cherrug*), Peregrine Falcon (*Falco peregrinus*), Lanner Falcon (*Falco biarmicus*) and Barbary Falcon (*Falco pelegrinoides*). This study was conducted from October 2001 until December 2003. Field surveys and questionnaires were used to (i) identify the geographical distribution of the four hunting falcon species in Saudi Arabia, (ii) to define their natural habitats, (iii) the timing of their breeding, migration and moulting seasons. I also propose methods for the protection of these important species in Saudi Arabia.

Introduction

Four falcon species are used for hunting in Saudi Arabia: Saker Falcon (*Falco cherrug*), Peregrine Falcon (*Falco peregrinus*), Lanner Falcon (*Falco biarmicus*) and Barbary Falcon (*Falco pelegrinoides*). Falconry is one of the most common known traditions for the people of Arabian Peninsula. It has been known for its importance to nomads (Bedouins) because it provided food for them. Different people – high or even lower ranks - used falcons for different purposes such as a hunting sport, luxury or as a lovely hobby.

Although falconry is a lovely hobby, a falconer needs to have some characteristics for doing such a job such as a sufficient experience and money. The cost of money can vary from one falcon to another according to the external appearance and its ability to hunt .The Saker Falcon is considered as the best one. The Peregrine Falcon comes in the second rank, then follows Lanner Falcon and Barbary Falcon.

Methods

This study was conducted from October 2001 until December 2003 and resulted in a thesis submitted in partial fulfilment of the requirements for an MSc degree at the Department of Biological Sciences, Faculty of Science, King Abdul-Aziz University, Jeddah.

I studied the breeding behaviour of a pair of Barbary Falcons nesting in the Jabal Al-Khitam, Madinah District.

I recorded the weight (g), wing length (mm), tail length (mm) and tarsus length (mm) for captive specimens of the four falcon species studied. I did not separate biometric data between sexes in order to avoid making any wrong allocation of sex because I did not have more sufficient information to distinguish between male and female.

Data on the timing of moult was obtained from records of captive birds only, with exception of the Barbary Falcon, which was studied both in the wild and in captivity.

Questionnaires were sent to falconers requesting information on:- Why do you use falconry? How long have you been using falconry? How many falcons do you have? What is the longest period of time you kept a falcon? How many falcons did you hunt by yourself? Do you agree or disagree on the following: one of the reasons of decreasing the number falcons is keeping a falcon for a long time, the high cost of falcons and the increasing number of hunters of falcons.

Results

Distribution of falcon species in Saudi Arabia:

The two migratory species covered in this study, namely Peregrine Falcon and Saker Falcon, occurred during autumn migration in many habitats whenever their favoured prey was available. However, their distribution is concentrated along the Red Sea coast in the west of the country. Their autumn migration season started from September and lasted until December, with the peak period of migration taking place in October. Adult Peregrine Falcons arrived earlier than immature birds, whilst for Saker Falcons the reverse was true and immature birds reached Saudi Arabia before adults.

Species		Weight (g)	Wing Length (mm)	Tail Length (mm)	Tarsus Length (mm)
Saker Falcon	*Mean*	986.9	398.9	219.3	54.5
	Range	650 – 1230	345 – 440	170 – 260	45 – 65
	N	54	55	58	55
Peregrine Falcon	*Mean*	803.9	344.8	168.6	53.9
	Range	480 – 1105	310 – 380	120 – 210	40 – 60
	N	17	22	21	22
Lanner Falcon	*Mean*	635.2	351.8	191.7	51.8
	Range	413 – 825	320 – 390	140 – 230	40 – 65
	N	44	44	47	44
Barbary Falcon (male)	*Mean*	396.7	246.7	126.7	40.0
	Range	390 – 400	210 – 270	115 – 145	35 – 45
	N	3	3	3	3
Barbary Falcon (female)	*Mean*	608.5	320.2	157.0	51.3
	Range	480 – 775	300 – 380	140 – 180	35 – 60
	N	32	31	33	33

Table 1. Biometric data for four species of hunting falcon in Saudi Arabia.

Two resident falcon species were defined in this study namely Barbary Falcon and Lanner Falcon. Their favoured natural habitats are in rugged mountainous regions with numerous rocky cliffs. Barbary Falcons tend to breed at higher elevations than Lanner Falcons, with the former being found from 1,000m to 1,500m and the latter from 700m to 1,000m. Whilst nesting in the mountains these falcons often hunt elsewhere and Barbary Falcons occurred primarily in wadis with trees and shrubs, whilst Lanner Falcons favoured open areas around their mountain nesting sites.

Breeding biology of the Barbary Falcon:

The Barbary Falcon eyrie was found in the upper half of non-vertical, sloping rocky crags with an area of *ca.* 100 m². The nest scrape was made in soft sand on a rock crevice and regularly used perch rocks were located to the left and right of the nest at a distance of 30 to 40m. Nest defence, pair bonding, courtship and mating was observed during this study.

In 2003, a clutch of eggs was laid by the end of February and hatching was recorded on the 25th March. During incubation the male was solely responsible for hunting, obtaining prey for himself and his mate. Though the male may participate in incubation for one hour to an hour and quarter, once or twice a day. The female stayed at the nest with nestlings during the first week after hatching whilst the male continued to hunt for all the food. During the second week after hatching the female ventured from the nest area and participated in hunting for food for the nestlings. Chicks were covered with downy feathers from hatching, until three weeks old. Growth is rapid and the quills of primary wing feathers begin to appear on about ten days. Chicks began to move their wings about three weeks after hatching and they were observed flying after they were 35 - 40 days old.

Hunting and food of Barbary Falcon:

From several observation of Barbary Falcon feeding behaviour, two hunting techniques were noticed. The first involved perching on a rocky observation point close to the eyrie and waiting for the prey species to pass by and then diving off their perch to catch it. This hunting method was observed in the hunting of pigeon *Columba livia*, Swallow *Hirundo rustica* and House Martin *Delichon urbica*. The second method involved flying away from the vicinity of the eyrie to searching for prey over large areas and long distances.

During my observations I collected 40 regurgitated pellets, which contained mostly the feather remains of birds, mammal hairs and insect material.

Biometric data for hunting falcons:

Biometric data for the four hunting falcon species is given in Table 1. For Saker Falcons, Peregrine Falcons and Lanner Falcons the biometric data for males and females has been combined.

Moulting Period:

The moulting season of primary wing feathers of Saker Falcon, Lanner Falcon, and Barbary Falcon started in March and continued through until October, whilst the main period of moult was observed in August and September. The moulting season of primary wing feathers of Peregrine Falcon started later than in the other three species, commencing in July.

The moulting season of tail feathers of Saker Falcon and Lanner Falcon started from April until October, while tail moult in the Barbary Falcon started in May and continued until October. The main period of tail moult for these species was observed in August and September.

Questionnaires to falconers:

The are two reasons why people wish to obtain hunting falcons in Saudi Arabia, one is to participate in the sport

Figure 2. Jabal Al-Khitam, Madinah District

of falconry sport and the other is to make money by selling falcons. The respondents to the questionnaires felt that the current decrease in the number of wild falcons in Saudi Arabia might be caused by several factors. Respondents indicated that there are too many "falcon trappers", which are driven by the high value of falcons, whilst others felt the decline might be a result of people keeping falcons in captivity for long periods, rather than releasing them after the hunting season as was traditionally practiced. Falconers and trappers had some positive ideas as to measures that could be implemented to halt the continued decline in the number of falcons in Arabia, which included the introduction of identification cards for falcons and falconers, defining the period of keeping falcons in captivity, defining the value of hunting falcon in Saudi Riyals, the establishment of centres for captive breeding of falcons and clubs for falconers.

Discussion

Conservation and protection methods:

The problem of the declining falcon population in Saudi Arabia can be resolved by cooperation between people in the falconry business and the government, in order to produce a joint plan to address this problem. Recommendations include, increasing public awareness of the problem, particularly with those who possess falcons, and to introduce the importance of falconry to public via magazines and television media. It would be beneficial if the monetary value of hunting falcons were defined.

Increasing the numbers of captive-bred hunting falcons available might reduce the demand for wild falcons. This could be achieved though the establishment of falcon breeding centres specifically producing birds for the falconry market. In conjunction laws could be passed either preventing or regulating the capture of wild falcons. Such changes would be facilitated by better organisation of the sport of falconry and new laws relating to hunting with falcons. Falconers should be encouraged to take part in organised falcon releasing programs, and to release their wild-caught falcons after the end of the hunting season as was traditionally practiced. In this respect, there should be laws defining the period when wild-caught falcons can be kept in captivity.

As well as protection of the falcons, it is also vital that any conservation programme includes some form of protection for the traditional falconry quarry species. This could be done by establishing protected areas to increasing the numbers of important species such as Houbara Bustard *Chlamydotis macqueenii*, Stone Curlew *Burhinus oedicnemus* and Arabian Hare *Lepus arabicus*.

Figure 3. Barbary Falcon nestling with two unhatched eggs

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Amyloidosis – An Emerging Disease in Hunting Falcons in the Middle East

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Summary

Since amyloidosis is an increasing problem in hunting falcons in the UAE a retrospective study was performed on 266 liver biopsies and samples from 961 falcon necropsies carried out at the CVRL over the last decade. Amyloidosis was confirmed in 213 (22.2 %) of the 961 necropsied falcons. Thirty six percent of these cases were Gyr falcons, 29 % were Gyr hybrids, 21 % were Peregrine falcons, 9 % were Saker falcons and 5 % were other or unknown species. Nearly three quarters of all amyloid cases were observed in the last 5 years. The liver was the most affected organ with amyloid deposits in 86.4% of the cases. Amyloid was found also in kidney (61 %), spleen (42 %), pancreas (7%) and adrenal glands (11.7%). Renal medullary amyloidosis was observed in 77 cases associated with visceral gout. Amyloid was confirmed in 32.3 % of the liver biopsies.

Introduction

Amyloidosis is an increasing problem not only in humans (Linke, 1984;1985), but also in zoological species (Zschiesche and Linke, 1986; 1989; Shaw et al., 1987; Zschiesche and Jakob, 1989; Landmann et al.,1996), and in hunting falcons in the UAE (McKinney, 2002; Hampel 2004). Therefore, a retrospective study was performed on 266 liver biopsies and 961 falcon necropsies carried out at the CVRL over the last decade.

Over the last five years a change in falcon species used for falconry in the Middle East has been reported by Fox (1999) and Barton (1999), and this was also apparent from our study. More captive bred Gyr falcons (*Falco rusticolus*) and Gyr-hybrids are used instead of wild caught Peregrine falcons (*F. peregrinus*) and Saker falcons (*F. cherrug*). This change will undoubtly have a positive impact on the population of wild falcons. However, Gyr falcons and their hybrids managed in captivity appear to be more susceptible to amyloidosis than other falcon species.

Materials and Methods

A total of 961 falcon carcasses were submitted for necropsy to CVRL between 1994 and 2004. Organ samples from all cases were taken for histopathological and microbiological investigations, using routine methods. When amyloidosis was suspected organs were stained with H & E and with Congo red. Liver biopsies, collected from 266 sick falcons since 2002, were also included in this study.

Statistical analyses were performed using commercial software (SPPS). The animals were grouped according to species, and the paired T-test was used to compare species distribution and amyloid incidence, as well as amyloid-incidence in necropsies and biopsies. The Chi-squared-test was used to compare species distribution and amyloid incidence before and after the year 2000.

Results

Of the total number of falcons included in the study, 213 (22.2%) were Gyr falcons, 276 (28.7%) were Gyr-hybrids, 241 (25.1%) were Peregrines, 155 (16.1%) were Sakers and 76 (7.9%) were of other (Kestrel, Barbary and Lanner falcon) or unknown species (Figure 1). Statistical analyses demonstrated that Gyr falcons and Gyr-hybrids were significantly (Chi-squared-test, $p<0.001$) over-represented by numbers since the year 2001 compared with the other species.

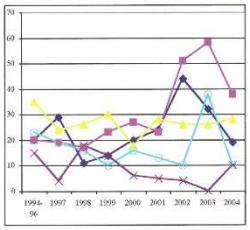

Figure 1. The change in species distribution of 961 falcons submitted for necropsy over a ten -year period (1994 to 2004). Key: ♦ = Pure Gyrfalcon, ■ = Gyrfalcon hybrid. ▲ = Peregrine, ○ = Saker Falcon, × = others/unknown

Amyloidosis was confirmed in 213 (22.2 %) of the 961 necropsied falcons. Thirty six percent of these cases were Gyr falcons, 29 % were Gyr hybrids, 21 % were Peregrine falcons, 9 % were Saker falcons and 5 % were other or unknown species (Figure 2). Concerning the occurrence of amyloidosis, statistical analysis demonstrated that Gyr falcons, Gyr-hybrids and Peregrines are significantly (Chi-squared-test, $p<0.001$) over-represented compared with other species.

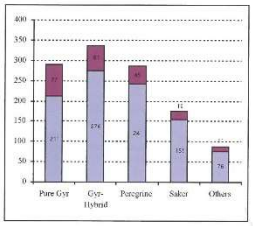

Figure 2. Species distribution of amyloidosis in falcons submitted for post-mortem examination.
Key: ■ = Amyloid, ■ = No Amyloid.

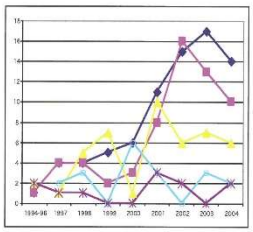

Figure 3. Species distribution of 213 falcons with amyloidosis from 1994 to 2004.
Key: ♦ = Pure Gyrfalcon, ■ = Gyrfalcon hybrid, ▲ = Peregrine, ○ = Saker Falcon, × = others/unknown

Nearly three quarters of all amyloid cases were observed in the last 5 years (164 of 213 cases; Figure 3). During this time period amyloidosis was diagnosed in 45.3 % of Gyrfalcons (63 of 139), in 25.4 % of Gyr hybrids (50 of 197), in 23.8 % of Peregrine Falcons (30 of 126), and only in 16.1 % of Saker Falcons (14 of 87). The total increase of amyloidosis was significant (Chi-squared-test, $p<0.001$) after the year 2000 compared to the previous years, mainly due to the increase in numbers of Gyrfalcons, Gyr hybrids and Peregrine Falcons.

The liver was the most affected organ with amyloid deposits in 184 out of the 213 (86.4%) cases (Figure 4). Amyloid was found also in kidney (61 %), spleen (42 %), pancreas (7%) and adrenal glands (11.7%). Renal medullary amyloidosis was observed in 77 cases associated with visceral gout (Figure 5), often (34 cases) without amyloid deposits in other organs.

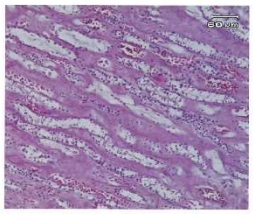

Figure 5. Visceral gout in association with renal medullar amyloidosis: above) whitish serosa on heart and liver due to gout; below) amyloid deposits in the renal medullary interstitium.

Disease	Percentage of amyloid cases
Bumble foot	15 %
Aspergillosis	10 %
Coccidiosis	9 %
Mycobacteriosis	5 %
Pox	5 %
Other infections*	9 %

* coccidiosis, clostridiosis, trichomonosis

Table 1. Systemic amyloidosis was often linked to other diseases. Occurrence of other diseases in falcons with amyloidosis.

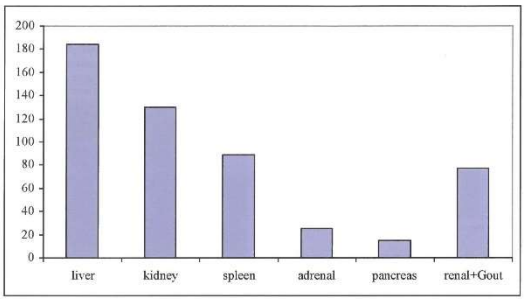

Figure 4. Distribution of amyloid deposits in organs from falcons with amyloidosis.

Amyloid was confirmed in 86 out of 266 (32.3 %) liver biopsies (Figure. 6). The species distribution was different from the necropsy-results with 45.8 % amyloid positive Saker falcon samples. This may be because biopsies were only collected by clinicians from birds suspicious for any hepatopathy.

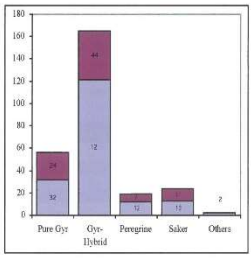

Figure 6. Prevalence of amyloidosis in 266 liver biopsies collected from falcons.
Key: ■ = Amyloid, ■ = No Amyloid.

Conclusions

Amyloidosis is an increasing problem in hunting falcons in the UAE (McKinney, 2002) affecting mainly Gyr and Gyr hybrid falcons. Our retrospective study confirmed the change in falcon species used for falconry in the Middle East, already reported by Fox (1999) and Barton (1999). Captive bred pure Gyr falcons and Gyr-hybrids, as well as Peregrine falcons appear to be more susceptible to amyloidosis than other falcon species. Most amyloid cases were observed in the last 5 years, mainly due to the increase of amyloidosis in pure Gyr falcons, Gyr hybrids and Peregrine falcons.

Since AA-amyloidosis was confirmed in these cases (Hampel et al., 2004), an elevation of serum Amyloid-A (SAA) due to chronic infectious disease is most probably the main cause of falcon amyloidosis. Infectious agents may trigger amyloidosis. However, an underlying genetic predisposition may also play a role. Over the 5 last years we have found less fatalities caused by infectious diseases, but more fatalities due to amyloidosis (Gierse, 2001).

Two forms of amyloidosis need to be distinguished, the systemic form where the liver is the main target organ and the renal form that appears to be linked with gout. It is worthwhile mentioning, that there seems to be a link between renal amyloidosis and visceral gout, a disease of raptors that has traditionally been linked to water and food consumption (Heidenreich, 1995).

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Imping of Birds of Prey

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Summary

Good condition of flight feathers is essential to ensure the peak hunting performance of birds of prey and is equally important for both captive and wild birds. This article is a brief illustrated introduction to the methods used for imping feathers. While the pictures focus on birds of prey the methods demonstrated can be used in most avian species and could be carried out by any falconer, aviculturist or wildlife rehabilitator.

Introduction

Good condition of flight feathers is essential to ensure the peak hunting performance of birds of prey and is equally important for both captive and wild birds. Techniques for the repair, or "imping", of feathers have been in existence for many hundreds of years and allow us to return a bird to full flight until such time as the repaired feathers moult out.

This article is a brief illustrated introduction to the methods used for imping feathers. While the pictures focus on birds of prey the methods demonstrated can be used in most avian species and could be carried out by any falconer, aviculturist or wildlife rehabilitator. It should be mentioned that all but the most minor repairs will require the bird to be immobilized and this is best achieved under anaesthesia supervised by veterinary personnel.

Primary wing feathers are numbered from 1-10 usually counted from the leading edge. It is important you replace the feather with another of the corresponding number. For this reason it is useful to keep a feather bank of either moulted feathers or the wings and tails of dead birds. The latter are especially good for imping because they have kept the curve of a normal wing and they are easy to number correctly. The tail is numbered 1-6 left and right from the center feather. The person performing the imping must be familiar with the normal length and rotational alignment of feathers in an undamaged wing. The importance of this cannot be underestimated.

Depending on the severity of the damage feathers must either be repaired or replaced.

Indications for replacement of feathers

- If the feather is broken and a part of the feather is missing, or it is broken but will not last with supports alone.
- To provide support for new growing feathers.

Broken feathers should be repaired as soon as they are detected, since one broken feather will leave a gap and the surrounding feathers will break more easily.

Method for feather replacement

Corresponding feathers from the same or donor bird of roughly the same species and size must be located (Figs 1 and 2). If the feather is broken distal to its insertion in the wing the procedure can be performed as follows:

The damaged feather shaft is generally trimmed to the level of the distal umbilicus. This is usually a couple of centimeters distal to the insertion in the wing (for larger falcons). The feather shaft is hollow at this level (Fig 4). The replacement feather is measured and cut to length (Fig 3) using the remaining feathers or opposite wing/ tail as a guide. In cases where all primary or tail feathers require replacing use another bird or wing from a dead bird to ensure the relative feather lengths are correct. A strong, sharp cutting tool is vital when cutting feathers to ensure the shaft is cut cleanly without crushing the shaft. The author favours nail clippers for large dogs.

Once the feathers have been trimmed, a bamboo stick is shaped to the correct length and diameter so that it fits tightly into the shaft of the original and donor feather but does not crack the shaft. Bamboo is commonly used as an implant for imping because of its flexibility. When fitting the implant you can either whittle down a stick that is slightly wider than the hole in the feather shaft, or thicken a slightly narrower stick with superglue and powder. It should be noted that the internal shape of the feather shaft is not always circular. If the shaft of the feather cracks during splint placement (Fig 5) the crack can be closed by tying a dental floss around the feather at the split and reinforcing this with superglue. Once the implant has been trimmed to size, position the new feather (without using glue) and mark the feather stump and replacement feather by placing a line along the shaft and across the join using a fine indelible pen. This mark is used so the feather can be repositioned perfectly after glue has been applied.

Use cardboard or x-ray film to isolate the feather to be glued. This protects the surrounding feathers when positioning and gluing (see pictures). The implant is first glued into the donor feather and then into the remaining feather stub. A fast setting epoxy (5 min setting) is good to use here, because it gives time to correct the position of the feather afterwards. Superglue won't leave much time to correct any mistakes. Excess glue is removed with paper towel and talcum powder is applied to prevent the surrounding feathers sticking together (Fig 6).

Method for feather repair / reinforcement

Feathers, which are bent but not broken can be straightened out by holding them briefly over steam from boiling water, it makes the keratin structures in the feather shaft straighten out and return the feather to its normal position. Dipping the feathers into boiling water is not recommended as this tends to make feathers brittle over time if this procedure is repeated.

A feather which is just partly broken or bent but is still intact (Fig 7), can be supported using the methods described below. Often these techniques allow a feather to last until the next moult.

Usually the break will occur on the ventral surface of the feather, as this is weaker than the dorsal surface. The point of the break /bend is identified and a longitudinal incision is made using a scalpel along the ventral surface of the feather shaft. This extends 5 mm in either direction from the break. (Fig 8). It may be beneficial to straighten the bent feather using steam before attempting to reinforce the break. This incision in the feather is then held open with the help of a pointed tool or needle and superglue is used to fill the incision (Fig 9). The feather shaft is held together using artery forceps or small pliers until the glue is dry (Fig 10). Excess glue can be absorbed with talcum powder and / or filed away using nail files (Fig 11).

Extra support can be provided by grafting a section of feather shaft over the break (Fig 11). The graft should be taken from a donor feather at the same level as the break and from the stronger dorsal part of the feather shaft. The surface of the feather shaft around the break is filed slightly to improve glue adhesion. The graft should be trimmed to be flat and thin at the ends and again glued and filed when placed over the break, to avoid the bird removing it when preening the feather later (Fig 12). The graft can be also be strengthened by tying a knot of dental floss around the feather below and above the break.

Supports can also be made from flexible carbon fiber splints, which are glued on both sides of the break on the feather with strong but flexible glue.

A feather which is accidentally pulled out and the whole feather shaft completely removed, is in our experience best left alone to re-grow by it self if possible.

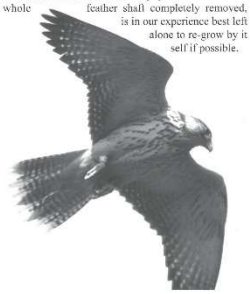

Figure 1.

Figure 2.

Figure 3.

Figure 4.

Figure 5.

Figure 6.

Figure 7.

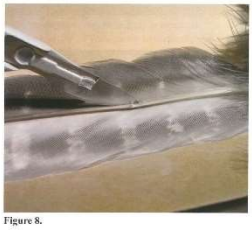

Figure 8.

Figure 9.

Figure 10.

Figure 11.

Figure 12.

Prevalence of Aspergillosis in Newly Purchased Falcons in Dubai

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Summary

Aspergillosis is a major cause of mortality in gyr hybrid falcons in the UAE. One hundred and seventy three falcons were examined at the Al Wasl Veterinary Clinic between September and November 2004. Aspergillosis was diagnosed in 18% of gyr x peregrine falcon hybrid females and 25.5 % of the gyr x peregrine males. Falcons bred and reared in the UAE, appear to have a much higher prevalence of aspergillosis than recently imported falcons from Europe.

Introduction

Each year a large number of falcons are brought to Dubai for the purpose of falconry. Aspergillosis is a serious problem in falcons in the United Arab Emirates (UAE) and is a major cause of mortality in gyrfalcon hybrid falcons. It is a complex disease influenced by:

- Hreed predisposition: gyrfalcons are more susceptible.
- Stress: lowers immune response e.g. heat stress, fear, excessive weight reduction.
- Number of fungal spores in the air that the bird is breathing.

In the UAE, the stress of prolonged flying in the extremely hot and humid environment may predispose young locally bred falcons to aspergillosis. New falcons are shipped to UAE from a variety of sources and kept at holding facilities for several days or weeks, until a prospective buyer arranges a veterinary check. This period is extremely stressful for the falcons that are not trained and have been recently taken from free flight 'hacking' aviaries. It is now common practice for falconers to obtain veterinary opinion prior to purchase primarily to assess if aspergillosis is present. Aspergillosis is the most common reason for failure of the pre-purchase examination in this centre.

Diagnosis of early aspergillosis cases is based on endoscopic examination of the caudal thoracic airsacs and the external appearance of the lungs and ostia. Pulmonary aspergillosis is commonly seen in new falcons. In these cases active aspergillomas are seen in the lung ostia as it enters the caudal thoracic airsac.

The prognosis for advanced cases is poor, but early diagnosis and prompt treatment can result in a return to normal health.

With new falcons, endoscopic detection of an early infection usually occurs before any clinical signs, radiographic or blood abnormalities are evident, although in more advanced cases a reduction in appetite, slight weight loss and a loss of stamina are noted. The prognosis of early stage aspergillosis is generally good following therapy, but it requires the falcon to be rested and maintained on a high plane of nutrition. In practical terms this means a cessation or delay in the training process.

Records of the Wildlife Protection Office from September to October 2004 were analysed to identify:

- Species presented for pre-purchase endoscopy.
- Prevalence of aspergillosis in relation to falcon category (species, sex).
- Prevalence of aspergillosis in relation to source of falcon i.e. reared in UAE or in Europe/North America.

The examination involves endoscopic examination of the caudal thoracic airsacs ventral lungs and lung ostia for evidence of granulomas, exudates and adhesions. All falcons were also blood sampled for routine haematology and plasma biochemistry analysis. A total of 173 captive–bred falcons were examined. All were approximately six months of age. They were being purchased for the falconry season, and were untrained prior to examination. Endoscopic images were recorded using an AIDA software system with a camera head (Karl Storz GmbH & Co; Germany) A 2.7 mm endoscope with trocar and sleeve with a biopsy channel was used (Karl Storz GmbH & Co;). Biopsy of suspected lesions were obtained using a cup flexible biopsy forceps (Karl Storz GmbH & Co;) and innoculated onto Sabourad's agar (Merck; Germany) and incubated aerobically at 30ºC for five days. The majority of *Aspergillus* cases had lesions in the lung ostia, which carries a less favourable prognosis than cases where lesions were located in the distal caudal thoracic air sac (McKinney, unpublished observations).

Results

Of the 173 falcons examined, 133 were normal and 40 had endoscopic evidence of aspergillosis. The majority of birds (87.8 %) were gyr x peregrine hybrid falcons (63% females and 24.8% males). This reflects the preference of the local falconers and may be unique to this hospital.

Aspergillosis was diagnosed in 18% of gyr x peregrine falcon hybrid females and 25.5 % of the gyr x peregrine males (Table 1)

Falcon category	Prevalence of aspergillosis %	Proportion of total % (n=173)
Gyr x peregrine female	18.3	63
Gyr x peregrine male	25.5	24.8
Gyrfalcon female	27.2	6.4
Peregrine female	50	3.5
Gyr x saker female	75	2.3

Table 1. Prevalence of aspergilloisis in relation to falcon species and sex.

A high prevalence of aspergilloisis was found in gyr x saker hybrids (75%), peregrine falcons (50%) and gyrfalcons (27%) but the total numbers involved were small and statistical evaluation of the results was not performed.

The source of falcons was determined by leg band identification. This may not be accurate as some falcons are double rung at source, with the original breeder rings being removed when they are imported. The UAE banded birds comprised 13.8% of the total number of falcons examined birds examined, yet they had a high prevalence of aspergillosis (50%), compared to the prevalence of 17% in birds from German breeder 1 (Table 2). Further statistical studies are indicated to assess the relationship between origin of falcons ie falcons reared in UAE, and prevalence of aspergillosis.

Falcon source	Aspergillosis prevalence (%)
United Arab Emirates	50
Belgium /Germany breeders	31
United States of America	30
German breeder 1	17
United Kingdom breeders	13.3
Denmark	1.45
Canada	0

Table 2. Aspergillosis prevalence in relation to source of falcon.

Are captive-bred gyrfalcons reared in UAE more susceptible to aspergillosis?

The clients at this particular veterinary hospital do not favour falcons bred in the UAE, because they have been kept in flight aviaries during the very warm summer months.

Some of the USA origin cases were imported as chicks for hacking projects in Dubai. These were hacked during the extremely hot summer months under similar conditions to the UAE bred falcons, before undergoing a pre-purchase examination.

More research is indicated into the epidemiology of aspergillosis in falcons used in the UAE for falconry.

Specific areas of interest for falcon clinicians include:

- Duration the falcon was kept in UAE before endoscopic examination.
- Species susceptibility.
- Effects of prophylactic medication.

The results of this study are unique and may differ from findings at other hospitals due to the selective nature of the falconers with regard to species, sex and origin of the birds.

Falcons bred and reared in the UAE, appear to have a much higher prevalence of aspergillosis than recently imported falcons from Europe and further research is indicated to understand the problems associated with rearing gyrfalcon hybrids in the extreme conditions of the UAE.

Recommended reading

Cooper, J. E. 2002. Methods of investigation and treatment. In: Birds of Prey. Health and Disease. Blackwell Science. Pp. 58-60.

Forbes, N. A. 1996. Respiratory problems. BSAVA Manual of raptors, pigeons and waterfowl. British Small Animal Veterinary Association Ltd. UK. Pp. 180-188.

Heidenreich, M. 1997. Birds of Prey : Medicine and management. Blackwell Science Ltd. Oxford. UK. Pp. 125-128.

Redig, P. 2000. Fungal diseases : Aspergillosis. In: Samour, J (ed). Avian Medicine. Mosby. Pp. 275-286.

Letters:

The use of avian influenza vaccines in falcons

Dear Colleagues,

There has been considerable interest in the use of avian influenza vaccines in falcons in the United Arab Emirates. Many veterinary centres are using the Intervet H5N2 vaccine on captive falcons. There is now a proposal to use a 'Chinese H5N1 vaccine' in falcons in the United Arab Emirates. The use of avian influenza vaccines in falcons raises a number of issues. I feel it is important to highlight specific concerns to stimulate debate, with the aim of reaching a consensus among clinicians involved in the UAE falconry scene.

Questions:

- Has the vaccine any side effects when used in falcons, for example does it reduce flying performance or does it stimulate amyloidogenesis in gyr hybrids?
- The H5N2 vaccine has been used on valuable birds of a variety of species. Not all species respond to the vaccine. Do falcons respond to vaccination? Does the H5N2 vaccine offer effective protection against H5N1 or does it induce partial protection allowing amplification of the virus?
- Only a few cases of H5N1 have been documented in raptors, are they naturally resistant to clinical disease? Avian influenza (H5N1) is important because it affects humans. Eradication of the disease is preferable if possible. Falcons are expensive, but I am confident that the Shaikhs buying the falcons consider their people more important than the falcons and would cull infected falcons. If falcons cost the same as chickens would they be vaccinated?
- Would it be prudent to conduct a serological survey on falcons to assess previous exposure to H5N1?
- Reference laboratories should be able to differentiate antibody titres between vaccinated falcons and those that have been naturally exposed to the virus. Can this testing be performed routinely in the United Arab Emirates? The current blood screening tests used at UAE Ministry of Animal Wealth quarantine facilities cannot do this, which calls into question the efficacy of quarantine facilities for falcons. Until laboratories in the Middle East are equipped to differentiate between falcons that have been exposed to infection, as opposed to falcons that have been vaccinated, the international movement of falcons is compromised.

My view is that because H5N1 has not been detected in UAE there is no need for widespread vaccination of falcons. I would support a vaccination trial on a controlled, isolated, experimental group of falcons, which would provide information on the efficacy and safety aspects of vaccination.

The use of unlicensed avian influenza vaccines may have legal and international implications. I would urge clinicians to obtain permission from the government veterinary authorities, before these vaccines are used.

I trust this letter stimulates discussion on the topic and also helps clinicians develop an agreed protocol towards Avian Influenza vaccination in falcons in the Emirates.

Peter McKinney. MBV MRCVS CertZooMed
Australian Raptor Conservation Trust

Editors note:

There are many different opinions on the issue of vaccination of falcons against avian influenza. We hope to report some of the serology results from vaccinated falcons in the next issue of Falco.

Avian influenza in Saudi falcons

Dear Sir,

I am writing to inform you that we had the first confirmed case of avian influenza subtype H5N1 in Saudi Arabia. This was a Saker Falcon (*Falco cherrug*) that had been in the country for the past 2 years. The bird arrived for a general check up with a history of anorexia of two days and passing green faecal. We conducted a complete check up on the bird including physical examination, endoscopy of the upper GIT, radiographs and haematology. The bird was diagnosed undergoing an acute viral infection (Newcastle disease was assumed at the time) as suggested by the haematology results, clinical signs and medical history.

The falcon was placed in an isolation room, but died overnight. The following day the falcon underwent a full post-mortem examination. Tissues were collected, both fresh and frozen. Samples were sent to the CVRL in Dubai for virus isolation. A few days later it was confirmed that the falcon had died of avian influenza and samples were sent to the national avian influenza reference laboratory in Germany for further testing.

The sample tested positive for H5N1.

The case has been reported to the Saudi authorities who are responsible for reporting notifiable diseases to the Office International des Epizooties and World Health Organisation.

I advise my colleagues working in falcon hospitals in the region to be very vigilant and to implement strict biosecurity programmes at their premises, particularly with any wild caught birds coming from influenza 'hotspots'.

Dr Jaime Samour

News and Announcements

Ministry bans treatment of illegally imported falcons

(15/11/2005, The Emirates News Agency, WAM)

Saeed Mohammed Al Raqbani, Minister of Agriculture and Fisheries issued a decision here (UAE) yesterday banning the treatment illegally imported falcons at veterinary clinics in the country. "With effect from today, falcons whose owners will not provide documents proving legal entry of their falcons into the country will not be treated at Veterinary clinics", said the decision. Clinics or vets who will not abide by the decision will face legal action, the decision added. The move is a precautionary measure to ward off the threat of bird flu.

UAE hosting CITES Falcon Enforcement Task Force

Information from http://www.uaefalconer.com

The United Arab Emirates hosted the CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) Falcon Enforcement Task Force which been held in Al Raha Beach Hotel in Abu Dhabi from 21st to 23rd November 2005.

The main objective of the meeting was to discus illicit trade in falcons by identifying the main problems in controlling the trade in falcons for falconry by studying seizures that have been made in member countries territories since 2000 in order to identify smuggling methods, routes, means of transport, characteristics of the illicit trade and, if possible, the identities of those involved. The meeting also prepared relevant guidance to assist Parties in combating illicit trade. The analysis of the information will also be shared with ICPO-Interpol and the World Customs Organization.

Aside from an analysis of the information, participants had been encouraged after the meeting to take note of illicit trade affecting their territories and to commit to making follow-up investigations, where appropriate. In the meeting, participants established a network of contacts among task force members for the rapid exchange of information regarding future seizures of illicitly-traded falcons and for the coordination of investigations. They also agreed undertake to act as links between the Task Force and other Parties and non-Parties affected by illicit trade in falcons, since it will not be possible to invite all such States to the meeting. Participants consequently, agreed upon some form of geographical or sub-regional representation to provide coverage for networking.

The meeting was attended by the CITES Management Authorities or other competent authorities of Canada, China, India, Kuwait, Qatar, Kazakhstan, Kyrgyzstan, Mongolia, the Russian Federation and the United Kingdom. The first day of the meeting inaugurated by H.E. Majid Al Mansouri, Secretary General , Environment Agency - Abu Dhabi followed by remarks presented by Jonathan G. Barzdo, Chief, Convention Support Unit, CITES Secretariat. Mr. John M. Sellar, Anti-smuggling, Fraud and Organized Crime, CITES Secretariat, spoke on "The history of CITES Enforcement Task Forces and a description of the aims of the Falcon Enforcement Task Force", in addition the CITES authorities of the United Arab Emirates will present an "Introduction to the history of falconry and current trade in falcons for falconry", including an explanation of the falcon 'passport' scheme. The illegal trade in wildlife, with an emphasis on falcons, will be also highlighted by the CITES Secretariat.

Country reports, providing details of illegal trade in falcons and seizure information since 2000 were presented in the second day; this included Canada, China, Kazakhstan, Kyrgyzstan, Mongolia, Russian Federation, United Arab Emirates and United Kingdom of Great Britain and Northern Ireland. These country's reports, reviewed in the afternoon sessions, to identify illegal harvest methods, smuggling routes, smuggling techniques (forms of transport, concealment techniques, types of couriers, etc. modus operandi associated with dealers, places associated with dealers, transactions, etc., final destinations and markets, prices paid (poacher to final consumer) and individuals known to be involved.

On Wednesday, participants collated information from previous days and prepare summaries of each of the eight subject areas. They will also discuss how this information can best be disseminated and used to aid national law enforcement, target those involved, combat illegal harvest of falcons, increase border controls and combat smuggling, combat illegal trade (in countries of origin, transit and destination) Draft relevant Alert or other bulletin prepared where distribution and recipients will be agreed. They will also discuss whether there is potential to conduct immediate follow-up on any of the seizures or cases and decide how this can be achieved, in addition they will review draft identification material prepared by Canadian Wildlife Service.

Strategy for future exchanges of information, cooperation and coordination of investigations also disused and focal points for countries/agencies and best means of communication will be agreed. They will also decide upon role of other relevant organizations and non-governmental organizations. Finally, participants also identified any further actions that require to be taken to improve implementation of the Convention regarding the trade in falcons for falconry and in eliminating illicit trade in these species

Avian influenza in falcons: Saudi Arabia

Information from a ProMED-mail post

http://www.promedmail.org.

ProMED-mail is a program of the International Society for Infectious Diseases http://www.isid.org.

The 1st confirmed case of avian influenza subtype H5N1 in Saudi Arabia (earlier than January 2006, probably in December 2005) involved a Saker Falcon (Falco cherrug) that had been in the country for the past two years. It had a history of anorexia, for two days, and passing green faeces. The falcon died overnight. A few days later, it was confirmed that the falcon had died of avian influenza and had tested positive for H5N1. The virus might have been introduced from illegally imported falcons from China and Mongolia early in the season. The authorities were updated at a later date.

This information provides the background to the decision of the Saudi authorities to carry out tests in the involved falcon centre in Riyadh and, subsequent to obtaining several positive H5 results, to cull (all?) 37 falcons therein.

These unofficial but reliable data should be brought to the attention of all those involved in the maintenance, handling and healthcare of falcons and other captive birds in the Middle East and elsewhere. Hopefully, it will help in enhancing the alertness of authorities responsible for control upon international trade in avian species, with special attention to captive birds. Earlier H5N1 incidents related to such trade have been recorded in Taiwan, Belgium, the UK and probably elsewhere.

Saker Falcon in Southeast Europe: Research and Conservation.

A workshop meeting in Sofia, Bulgaria from 27th to 28th February 2006.

A workshop meeting hosted by the Central Laboratory of General Ecology, Bulgarian Academy of Sciences was attended by delegates from several countries in southeast Europe (including Croatia, Macedonia, Bulgaria, Moldova, Romania, Ukraine and Turkey). The meeting was funded by the EAD as part of a project to survey Saker Falcons in Bulgaria (see p. 4 of this issue for more details).

One of the intended outcomes of this meeting was to develop co-operation and greater understanding among researchers studying Saker Falcons both in Europe and elsewhere. To further this objective a web forum is to be established in order to develop a network of researchers across the region of SE Europe, which will enable the co-ordination of studies and better promote funding opportunities for Saker studies.

What's new in the literature

Treatment of bilateral corneal ulceration in a Peregrine Falcon (*Falco peregrinus*) using 360 degree conjunctival flaps.
Park, F.J. & Gill, JH. *Australian Veterinary Journal 83. 2005. 547- 549.*
A wild Peregrine Falcon (*Falco peregrimus*) was presented with extensive bilateral fluorescein positive corneal damage. Local therapy and bilateral tarsorrhaphies resulted in slow improvement over 5 weeks. When bilateral 360 degree conjunctival flaps were used subsequently, healing proceeded more rapidly over the next 8 weeks. Although bulbar conjunctival flaps have been reported as difficult in birds due to their small size and relatively immobile bulbar conjunctiva, 360 degree conjunctival flaps made from palpebral rather than bulbar conjunctiva were found to be technically feasible in a larger bird species such as the Peregrine Falcon.

Characterization of a new species of adenovirus in falcons.
Schrenzel, M., Oaks, J.L., Rotstein, D., Maalouf, G., Snook, E., Sandfort, C. & Rideout, B. *Journal of Clinical Microbiology 43. 2005. 3402- 3413.*
In 1996, a disease outbreak occurred at a captive breeding facility in Idaho, causing anorexia, dehydration, and diarrhea or sudden death in 72 of 110 Northern aplomado falcons (*Falco femoralis septentrionalis*) from 9 to 35 days of age and in 6 of 102 peregrine falcons (*Falco peregrinus*) from 14 to 25 days of age. Sixty-two Northern aplomado and six peregrine falcons died. Epidemiologic analyses indicated a point source epizootic, horizontal transmission, and increased relative risk associated with cross-species brooding of eggs. Primary lesions in affected birds were inclusion body hepatitis, splenomegaly, and enteritis. The etiology in all mortalities was determined by molecular analyses to be a new species of adenovirus distantly related to the group I avian viruses, serotypes 1 and 4, Aviadenovirus. In situ hybridization and PCR demonstrated that the virus was epitheliotropic and lymphotropic and that infection was systemic in the majority of animals. Adeno-associated virus was also detected by PCR in most affected falcons, but no other infectious agents or predisposing factors were found in any birds. Subsequent to the 1996 epizootic, a similar disease caused by the same adenovirus was found over a 5-year period in orange-breasted falcons (*Falco deiroleucus*), teita falcons (*Falco fasciinucha*), a merlin (*Falco columbarius*), a Vanuatu peregrine falcon (*Falco peregrimus nesiotes*), and gyrfalcon X peregrine falcon hybrids (*Falco rusticolus/peregrinus*) that died in Wyoming, Oklahoma, Minnesota, and California. These findings indicate that this newly recognized adenovirus is widespread in western and midwestern North America and can be a primary pathogen in different falcon species.

Isolation and epidemiology of falcon adenovirus.
Oaks, J.L., Schrenzel, M., Rideout, B. & Sandfort, C. *Journal of Clinical Microbiology 43. 2005. 3414-3420.*
An adenovirus was detected by electron microscopy in tissues from falcons that died during an outbreak of inclusion body hepatitis and enteritis that affected neonatal Northern aplomado (*Falco femoralis septentrionalis*) and peregrine (*Falco peregrinus anatum*) falcons. Molecular characterization has identified the falcon virus as a new member of the aviadenovirus group (M. Schrenzel, J. L. Oaks, D. Rotstein, G. Maalouf, E. Snook, C. Sandfort, and B. Rideout, J. Clin. Microbiol. 43:3402-3413, 2005). In this study, the virus was successfully isolated and propagated in peregrine falcon embryo fibroblasts, in which it caused visible and reproducible cytopathology. Testing for serum neutralizing antibodies found that infection with this virus was limited almost exclusively to falcons. Serology also found that wild and captive peregrine falcons had high seropositivity rates of 80% and 100%, respectively, although clinical disease was rarely reported in this species. These data implicate peregrine falcons as the natural host and primary reservoir for the virus. Other species of North American falcons, including aplomado falcons, had lower seropositivity rates of 43 to 57%. Falcon species of tropical and/or island origin were uniformly seronegative, although deaths among adults of these species have been described, suggesting they are highly susceptible. Chickens and quail were uniformly seronegative and not susceptible to infection, indicating that fowl were not the source of infection. Based on the information from this study, the primary control of falcon adenovirus infections should be based on segregation of carrier and susceptible falcon species.

Salmonella isolates from wild birds and mammals in the Basque Country (Spain).
Millan, J., Aduriz, G., Moreno, B., Juste, R.A. & Barral, M. *Revue Scientifique et Technique-Office International des Epizooties 23. 2004. 905-911.*
The authors investigated the prevalence of *Salmonella* spp. in 205 wild birds and mammals belonging to 45 species during the years 2001 and 2002 in the Basque Country (Spain). Salmonella was isolated from 16 (7.8%) animals. The prevalence was 8.5% (7/82) in birds, and 7.2% (9/123) in mammals. Nine serotypes, all of them belonging to the species *Salmonella enterica*, were identified: two isolates of *Typhimurium* (from 1/3 griffon vultures [*Gyps fulvus*], and 1/5 sparrowhawks [*Accipiter nisus*]); one of 6,14: z4, z23: (subsp. houtenae, 1/1 common kestrel [*Falco tinnunculus*]); one of Muenchen (1/1 captive Harris's hawk [*Parabuteo unicinctus*]); two of Enteritidis (1/5 tawny owls [*Strix aluco*], and 1/14 foxes [*Vulpes vulpes*]); one of Give, Newport und Umbilo and one untyped isolate (4/22 badgers [*Meles meles*]); two of Worthington and one of 38:l,v:z35 (subsp. *arizonae*, 3/40 wild boars [*Sus scrofa*]); and three other untyped isolates (1/1 northern fulmar [*Fulmarus glacialis*], 1/11 buzzards [*Buteo buteo*], ¼ genets [*Genetta genetta*]). Salmonella isolation was never associated with macroscopic or microscopic lesions. The results of this study confirm the importance of wildlife as a Salmonella reservoir and as a potential risk for humans and livestock.

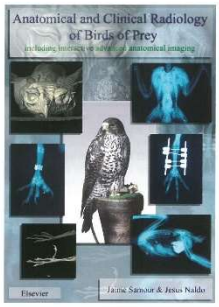
Plasma B-esterase activities in European raptors.
Roy, C., Grolleau, G., Charmoulaud, S. & Riviere, J.L. *Journal of Wildlife Diseases 41. 2005. 184-208.*
B-esterases are serine hydrolases composed of cholinesterases, including acetylcholinesterase (AChE) and butyrylcholinesterase (BChE), and carboxylesterase (CbE). These esterases, found in blood plasma, are inhibited by organophosphorus (OP) and carbamate (CB) insecticides and can be used as nondestructive biomarkers of exposure to anticholinesterase insecticides. Furthermore, B-esterases are involved in detoxification of these insecticides. In order to establish the level of these enzymes and to have reference values for their normal activities, total plasma cholinesterase (ChE), AChE and BchE activities, and plasma CbE activity were determined in 729 European raptors representing 20 species, four families, and two orders. The diurnal families of the falconiforme order were represented by Accipitridae and Falconidae and the nocturnal families of the Strigiforme order by Tytonidae and Strigidae. Intraspecies differences in cholinesterase activities according to sex and/or age were investigated in buzzards (*Buteo buteo*), sparrowhawks (*Accipiter nisus*), kestrels (*Falco tinnunculus*), barn owls (*Tyto alba*), and tawny owls (*Strix aluco*). Sex-related differences affecting ChE and AchE activities were observed in young kestrels (2-3-mo-old) and age-related differences in kestrels (ChE and AChE), sparrowhawks (AChE), and tawny owls (ChE, AChE, and BChE). The interspecies analysis yielded a negative correlation between ChE activity and body mass taking into account the relative contribution of AChE and BChE to ChE activity, with the exception of the honey buzzard (*Pernis apivorus*). The lowest ChE activities were found in the two largest species, Bonelli's eagle (*Hieraaetus fasciatus*) and Egyptian vulture (*Neophron percnopterus*) belonging to the Accipitridae family. The highest ChE activities were found in the relatively small species belonging to the Tytonidae and Strigidae families and in honey buzzard of the Accipitridae family. Species of the Accipitridae, Tytonidae, and Strigidae families were characterized by a BChE contribution that dominated the total ChE activity, while in the species of the Falconidae family, AChE activity dominated. With the exception of the barn owl, CbE activity (eserine-insensitive alpha-naphthyl acetate esterase [alpha-NAE] activity) in all species was almost absent or very low. The values obtained in this study for ChE, AChE, and BChE activities and the AChE:BChE ratios for buzzard, kestrel, barn owl, and tawny owl provide a good estimate of the normal values in free-living individuals of these European species. They can be used as a baseline to evaluate the effect of anticholinesterase insecticides in the field.

Suggestion's to optimize recovery and release while minimizing the disease risks associated with raptor rehabilitation.
Zsivanovits, H.P. & Forbes, N.A. *Journal of Wildlife Rehabilitation 27. 2004. 4-15.*
When considering disease control, rehabilitation facilities must work on three distinct levels: individual patient care, welfare and disease control within the facility, and environmental care. When wild injured raptors are presented to rehabilitation facilities the severity of existing injuries must be triaged, assessing the bird's potential for rehabilitation. Measures to identify underlying disease and to prevent the spread of infection or contamination within a facility and, in due course, back into the natural environment are crucial. Quarantine and screening are the first line of defense. Strict compartmentalization of captive birds, disinfection, and sanitation are as important in disease control as the design of aviaries and pest control. A management plan should include preventive care programs and a detailed record-keeping system. Minimizing stress contributes to a well-functioning immune system. A species-appropriate, balanced diet must be offered to avoid nutritional deficiencies.

Houbara Population Estimates in Punjab, Pakistan (November 2000).
Nadeem, M.S., Maan, M.A., Mahmood, T. & Ikram, R.M. *Berkut. 14 (1). 2005. 71-75.*
In Punjab the total wintering habitat of Houbara Bustard is 32,300 km2. Surveys for Houbara population in

Punjab were conducted in November 2000. Population was estimated about 4,729 birds with overall density of 0.150 ± 0.007 ind./km2. In Rajanpur 426, in Thal 662 and in Cholistan 3,644 Houbara were estimated. Sand dunes and vegetation cover were identified as important factor to make precise and accurate estimates, assuming random distribution of sand dunes ($P = 1.0$), the visibility of each transect under study was variable. With increase in sand dunes and vegetation cover the probability of sighting Houbara was decreased. [English]. Key words: Houbara Bustard, Chlamydotis undulata, Pakistan, wintering, number, conservation. Address: M.S. Nadeem, Biochemistry Department, Hazara University, Mansehra, NWFP, Pakistan. e-mail: sajid_nm2003@yahoo.co.uk.

Raptors, tradition and powerlines in southern Central Asia.
Orden C. van & Paklina N.V. *De Takkeling 9. 2001. 227-234.*
During visits to eastern Kazakhstan, the abundant use of feathers of owls, mostly Eagle Owls Bubo bubo, was found to be characteristic of the region. Tufts of feathers are placed in strategic places, such as bedrooms and cradles, or are used as an amulet. Hats, caps and bonnets worn during festivals and ceremonial gatherings were adorned with tufts of (eagle) owl feathers taken from breast and mantle. In the absence of owl feathers, feathers of birds of prey were used. The feathers are thought to be reincarnations of guardian spirits with sacred powers. The massive use of such feathers resulted in widespread elimination of Eagle Owls in large parts of Kazakhstan. However, in recent years the local tribes explore the antiquated powerlines, where large numbers of birds of prey and owls are being electrocuted, thus providing easy access to feathers used for ornamentation. In the village of Orlovka, eastern Kazakhstan, the chief showed a collection of 14 Steppe Eagles Aquila nipalensis, 4 Imperial Eagles A. heliaca, 3 Golden Eagles A. chrysaetos, 6 Steppe Buzzards Buteo buteo vulpinus, 5 Upland Buzzards B. hemilasius, 2 Saker Falcons Falco cherrug and 4 Eagle Owls Bubo bubo, all found beneath powerlines between Orlovka and Ust-Kamenogorsk. This selection is just the tip of the iceberg, because similar powerlines are in use all over southern Central Asia. Electrocuted birds are nowadays the main source of feathers used for traditional wear and amulets.
Contact: C. van O: Doelenstraat 14, 1601 GL Enkhuizen. Email: paklina@planet.nl; N. P.: Institute of Animal Ecology, Russian Academy of Sciences, Aviamotornaia 15, kv 2, 111020 Moscow, Russia. Email: paklina@hotmail.com.



Anatomical and Clinical Radiology of Birds of Prey: including interactive advanced anatomical imaging.
Jaime Samour MVZ, PhD, Dipl ECAMS and Jesus Naldo DVM.
Elsevier Ltd, Oxford, UK. Date of publication August 2006. Price GBP 85.00.

Anatomical and Clinical Radiology of Birds of Prey is a comprehensive atlas of the normal radiographic anatomy of raptors including the saker falcon, gyr falcon, common barn owl, Eurasian eagle owl, northern goshawk, red kite, Eurasian honey buzzard, palm nut vulture and steppe eagle.

Anatomical and Clinical Radiology of Birds of Prey also describes the clinical and pathological conditions that are commonly encountered in birds of prey. What makes this atlas unique is that a coloured photograph of a particular clinical condition (e.g., bumblefoot) or a photograph taken during a post-mortem examination is presented together with the radiograph.

Radiographic procedures such as positioning techniques, contrast radiography and magnification radiography are also presented in this atlas. Anatomical and Clinical Radiology of Birds of Prey also contains a chapter on advanced clinical anatomy imaging that include ultrasonography, computed axial tomography and magnetic resonance imaging. This chapter and the related interactive DVD enclosed in this book aim to be learning tools for those who want to acquire a basic knowledge of veterinary digital imaging in the field of avian medicine.

Highly illustrated with over 70 color photographs, 290 radiographs and 120 line illustrations. Anatomical and Clinical Radiology of Birds of Prey will be of great use to avian veterinarians, zoo veterinarians, rehabilitators, academicians, students and others interested in raptor anatomy and medicine.
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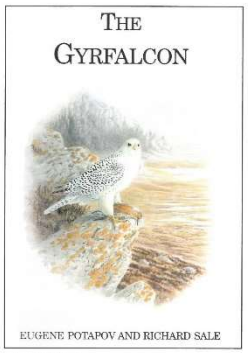

The Gyrfalcon
Eugene Potapov and Richard Sale
ISBN 0-300-10778-1 (published 2005 in the United Kingdom by T & AD Poyser, an imprint of A&C Black Publishers Ltd., and in the United States by Yale University Press)

This book is the first monograph on one of the most beautiful and admired birds in the world. The Gyrfalcon is the world's largest and most powerful falcon - a truly awe-inspiring bird which inhabits the ferociously inhospitable Arctic taiga, from Greenland and Iceland right across Siberia and northern Canada. Its plumage varies from a dark mottled grey to pure white - the white birds in particular are coveted by birders and falconers. Like other titles in the series, it covers all aspects of the species' biology, taxonomy, distribution, status and historical associations with mankind. The result is an exhaustively researched and enthrallingly readable biography of a spectacular bird, illustrated throughout with photographs and line drawings.

Photographs from the field

This amazing sequence of photographs showing Saker Falcons copulating was obtained by Gombobaatar Sundev in Mongolia during April 2005.

صقر الشروقي *(Falco cherrug)* في بلغاريا: الماضي والحاضر والمستقبل

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مختصر

بعدأن كان متواجدا بأعداد كبيرة وبشكل واسع في الماضي، بات صقر الشروقي في بلغاريا على وشك الانقراض. وقد تدهورت أعداده بين عامي 1930 و1960 تحت تأثير العوامل التالية: فقدان الموطن؛ تناقص أعداد سنجاب السوسليك الأوربي؛ استخدام الأسمدة والمبيدات؛ الصيد غير القانوني (إطلاق النار) واستخدام طعوم مسمومة. وهناك الآن عامل آخر ذو تأثير سلبي قوي وهو سرقة الأعشاش. ستطلق الأكاديمية البلغارية للعلوم (BAS) و مؤسسة استشاريي الحياة البرية الدولية المحدودة (IWC) بدعم مالي من هيئة البيئة بأبو ظبي (EAD) مشروعا للأبحاث والمحافظة باسم "الصقر الشروقي في بلغاريا وجنوب شرق أوربا". ويهدف المشروع بصورة أساسية إلى إيقاف التدهور في أعداد الصقر الشروقي في المنطقة.

دراسة بيئية عن فصائل الصقور الصيّادة وحمايتها في المملكة العربية السعودية

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مختصر

الصيد بالصقور هي رياضة وهواية واسعة الانتشار في المملكة العربية السعودية. تستخدم أربعة أنواع من الصقور للصيد في السعودية وهي: صقر الشروقي (الغزل) *Falco cherrug*، وصقر الشاهين *Falco peregrinus*، و الصقر الحر *Falco biarmicus*، وصقر الشاهين المغربي *Falco pelegrinoides*. أجريت هذه الدراسة في الفترة من أكتوبر 2001 إلى ديسمبر (كانون ثاني) 2003. وقد استخدمت الدراسات الميدانية واستمارات الاستفسار لأغراض: (1) تحديد التوزيع الجغرافي لأنواع صقور الصيد الأربعة في العربية السعودية، (2) تحديد موائلها الطبيعية، (3) توقيت تكاثرها وهجرتها واستبدال ريشها. كما اقترح وسائلا لحماية هذه الفصائل الهامة في المملكة العربية السعودية.

Saker Falcon nestlings, China
(Dimitar Ragyov) 2005

افتتاحية

بينما كان هذا المقال في طريقه للنشر وصلنا النبأ الحزين بانتقال سمو الشيخ مكتوم بن راشد المكتوم، نائب رئيس دولة الإمارات المتحدة ورئيس وزرائها وحاكم دبي إلى رحمة الله. وإن كان المرحوم قد اشتهر باهتمامه بمسابقات الخيول عبر اشتراكه في ملكية إسطبلات جودولفين، إلا أنه كان أيضا من أعظم أصدقاء رياضة الصقور في المنطقة.

تعتبر إتفلونزا الطيور من أهم الأمور التي تؤثر في رياضة الصقور في الشرق الأوسط هذا الموسم. وقد قامت هيئة البيئة – أبو ظبي (المعروفة سابقا باسم ERWDA) بتنسيق إنشاء "اللجنة الوطنية للتصدي الطارئ لإتفلونزا الطيور" و أصدرت خطة عمل للإمارات العربية المتحدة (http://www.cad.ac). إن هذه الإجراءات من قبل سلطات أ.ع.م. جديرة بالإعجاب حيث أن بعض دول منطقة الشرق الأوسط تبدو أقل استعدادا.

أظهر تقرير لـ ProMED-mail، وهو موقع مناقشة تابع للمنظمة الدولية للأمراض المعدية (http://www.isid.org) حدوث حالتين من إتفلونزا الطيور نائتين عن سلالة "إتش 5" القاتلة في طيور برية غير محددة في الكويت. ولكن هاتين الحالتين تعتبران "مشتبه بهما" بسبب عدم تقديم أية تفاصيل أو تأكيد إضافية من مختبر مرجعي معترف به إلى المكتب الدولي للأوبئة الحيوانية (OIE)، المنظمة الدولية المعترف بها التي تقدم التقارير عن الأمراض الحيوانية التي ينبغي إعلانها (http://www.oie.int). وقد أشار تقرير من ProMED-mail في أوائل ديسمبر (كانون الأول) عن ظهور إتفلونزا الطيور في ڤيتنام، رغم أن السلطات هناك قد عارضت التقارير الصحفية المحلية وأنكرت وقوع المرض. ثم في ديسمبر (كانون الأول) عزل سلالة "إتش 5 إن 1" من صقر شروقي نفق في مستشفى الصقور في الرياض، المملكة العربية السعودية (يرجى مراجعة الرسائل الموجهة في قسم فالكو Falco). ومن المثير للاهتمام، ورغم تأكيد هذه السلالة من مختبر مرجعي ألماني، أن السلطات في العربية السعودية لم تبلغ تلك الحالة إلى المكتب الدولي للأوبئة الحيوانية (OIE). إن قلة الشفافية والافتقاد في الإبلاغ عن الأمراض في المنطقة لن يساعد في التحكم بهذا المرض ويجب أن يثير قلق أولئك المكلفين بتسجيل الأمراض التي ينبغي إعلانها من المنطقة.

قامت حكومات المنطقة بفرض قيود على حركة استيراد الطيور التي تصاد في البرية بما في ذلك طيور الحبارى والصقور. وقد كان من المتوقع في هذا الموسم، وفي ضوء المنع "النظري" لاستيراد الطيور البرية، والمعلومات المنشورة على العموم في وسائل الإعلام عن إتفلونزا الطيور، وتوفر لعدد كبير من الصقور الصحية ذات الجودة العالية المنتجة في الأسر، وإمكانية الإنتاج الوفير لطيور الحبارى للتدريب، أن نرى تضاءلا في الاتجار بالحبارى والصقور البرية. ولذا كان من المخيب للآمال أن نسلم التقارير التي تفيد باستمرار شراء الطيور التي اصطيدت في البرية في المنطقة. وبينما كنا نستعد لنشر هذا العدد أكدت تركيا وقوع أول وفيات بشرية سببتها إتفلونزا الطيور خارج آسيا. إن على الصقارين والمهتمين بالبيطرة العمل سويا لإبقاء هذا المرض ذي الآثار المدمرة المحتملة خارج المنطقة. وعليه، فقد ضمنا هذا العدد من "فالكو" (Falco) مقالا ورسالتين عن موضوع إتفلونزا الطيور بشكل يتيح حفز الاختلاف في الرأي.

في افتتاحية عددنا الأخير من فالكو ذكرنا المراجعة الذي تتولاها "منظمة الاتجار الدولي بأنواع النباتات والحيوانات المهددة بالانقراض (CITES) " في الاتجار الرئيسي في صقور الشروقي (الغزال)، والأمل في الحصول على آراء إضافية في الاجتماع الثاني والعشرين للجنة الحيوان التي ستنعقد في البيرو في يوليو 2006. وتتعلق إجراءات مراجعة الاتجار هذه بشكل رئيسي بالتوصيات التي تحكم الاتجار القانوني في صقور الشروقي، ولكن من المعروف لوقت طويل أن الاتجار بالصقور للصيد بالصقور يتضمن قدرا لا يستهان به من التجارة غير الشرعية. وقد أدت المخاوف من هذا الاتجار غير القانوني إلى تصاعد الدعوات لإنشاء لجنة عمل لتدقيق المواضيع المتعلقة بتطبيق القوانين. وبناء عليه فقد تم إنشاء لجنة عمل CITES لتطبيق قوانين الصقور، والتي تتألف من الموظفين المكلفين بتطبيق القوانين في الدول الأكثر تأثرا بالتجارة غير الشرعية في الصقور. استضافت إ.ع.م. أول اجتماع للجنة عمل CITES لتطبيق قوانين الصقور في نوفمبر 2005 (انظر قسم *الأخبار والإعلانات*). إن لدى CITES الآن إجراءان متوازيان يعملان في نفس الوقت هما مراجعة الاتجار الشرعي في صقور الباز، ولجنة العمل التي تحقق في التجارة غير الشرعية في كافة الصقور. وحيث أن هناك قلق شديد فيما يتعلق بالاتجار القانوني في صقور الشروقي التي تصاد في البرية وهو قلة شفافية الإجراءات والشك بأنها مفتوحة لسوء الاستخدام من قبل موظفي حكومة فاسدين، فإنه سيكون من المهم ملاحظة ما إذا كانت إحالة لجنة العمل الجديدة ستشمل الاتجار غير القانوني أيضا.

زرع ريش الأجنحة في الطيور الجارحة

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مختصر

تعتبر جودة ريش الطيران في الطيور الجارحة ضرورية لضمان أفضل أداء في الصيد، وتتساوى أهميتها في الطيور المستأنسة والبرية. تقدم هذه المقالة مقدمة مصوّرة للأساليب المستخدمة في زرع الريش. وبينما تركز الصور على الطيور الجارحة فإنه يمكن استخدام الأساليب الموضحة لمعظم الفصائل الطيارة، ويمكن أن يقوم بها أي صقار أو مرب للطيور أو من يعمل في إعادة تأهيل الحياة البرية.

التشار أسبرجيلوس (Aspergillosis) في الصقور المشتراة حديثا في دبي

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مختصر

يعتبر أسبرجيلوس **(Aspergillosis)** سبب رئيسي في نفوق صقور السنقر المهجنة في الإمارات العربية المتحدة. تم فحص 173 صقرا في مستشفى الوصل البيطري بين سبتمبر ونوفمبر 2004. وتم تشخيص أسبرجيلوس في 18% من إناث صقور سنقر X شاهين المهجنة وفي 25,5% من ذكور صقور سنقر X شاهين المهجنة. ويبدو أن الصقور التي ولّدت وربيت في الإمارات العربية المتحدة هي أكثر عرضة لأسبرجيلوس من الصقور المستوردة حديثا من أوربا.

أميلويدوسس (Amyloidosis) - مرض جديد يظهر في صقور الصيد في الشرق الأوسط

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مختصر

بما أن أميلويدوسس يعتبر مشكلة متزايدة في صقور الصيد في الإمارات العربية المتحدة، فقد تم إجراء دراسات استعادية على عينات مجهرية لـ 266 كبدا وعينات من 961 تشريحا لصقور متوفاة في المختبر المركزي للبحث البيطري خلال العقد الماضي. وقد تأكد وجود الأميلويدوسس في 213 أي 22,2% من الصقور النافقة، كان 36% منها من صقور السنقر، و29% من السنقر المهجن، و21% من الشاهين، و9% من الشروقي، و5% من فصائل غير محددة. وشوهدت ثلاثة أرباع حالات الأميلويد في السنوات الخمسة الفائتة. وقد كان الكبد أكثر الأعضاء تأثرا بترسبات الأميلويد في 84% من الحالات. وقد عثر على الأميلويد في الكلى (61%)، والطحال (42%)، والبنكرياس (7%)، والغدد الكظرية (11,7 %). ولوحظ الأميلويد في النسيج الكلوي في 77 حالة مرتبطة بنقرس الأحشاء. وقد تم تأكيد الأميلويد في 32,3% من عينات الكبد المهجرية.

بفضل التبرع الكريم للدكتور دان بريم وليسا جيريز سيكون بوسعنا تقديم ترجمة عربية للمقالات والافتتاحيات كجزء من التزامنا بتوسعة قاعدة قرائنا. نقدم شكرنا للدكتور منيف الرشيدي لمساهمته القيمة من المملكة العربية السعودية، ونحن بحاجة إلى المزيد من المقالات من قرائنا العرب، ونرجو من الزملاء والعلماء والبيطريون والصقارين العرب لتزويدنا بمشاركاتهم لأعداد فالكو القادمة. إن هذه هي منطقتكم ولأرائكم الكثير من الأهمية. إن عمليات توالد صقور الشروقي في أوربا وآسيا يمكن أن تمر من خلال الشرق الأوسط أو أن تقضي فصل الشتاء فيها، وعليه فإن المجموعات المولدة من هذه الفصائل، أيا كان موقعها في العالم، تقع ضمن مجال اهتمامنا. يقدم ديميتار راجيوف وڤسيلينا شيشكوفا تقريرا عن اتجاهات أعداد صقور الشروقي في بلغاريا عبر القرن الماضي. وتشكل هذه الدراسة جزءا من مشروع لتطوير شبكة من الباحثين للحصول على فهم أحسن لوضع الفصائل في جنوب شرق أوربا وتركيا، وهي منطقة لا يتوفر إلا القليل من المعلومات عن صقر الشروقي فيها. هذا ونود أن نشكر فجيني شيرجالين (من مؤسسة استشاريي الحياة البرية الدولية المحدودة) لتحديده مواد ذات أهمية لتضمينها في هذا العدد.

ملحق لمقالنا الافتتاحي بتاريخ 2006/1/29 في وقت إرسال العدد للطبع

– الأحد Emirates Today/1/29ينما كان عدد فالكو مثالا للنشر، أعلنت عدة صحف في الشرق الأوسط (كمجلة 2006) عن إعدام 37 صقرا في مستشفى الصقور بالرياض، بالمملكة العربية السعودية، بعد تفشي لأنفلونزا من نوع إتش 5. إن قيام السلطات السعودية الآن بالتصدي لهذا التفشي لـ إتش 5 هو خطوة في الاتجاه الصحيح، وذلك رغم بقاء بعض التساؤلات عن سبب تأخر رد الفعل لفترة طويلة.