



# Falco

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Compiled and distributed by Merle M. Apo- MEFRG Administrative assistant

## The Middle East Falcon Research Group

The Middle East Falcon Research Group is managed by the Veterinary Science Department in association with the Falcon Management and Research Centre of the Environmental Research and Wildlife Development Agency, Abu Dhabi, United Arab Emirates.

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### Editorial note

Falco, the newsletter of the Middle East Falcon Research Group, is published quarterly and contains papers, reports, letters and announcements sent by members. However, the contributions included in Falco are not refereed. Although, every effort is made to ensure that the information provided is correct, the Chairman and the Administrative Assistant cannot accept responsibility for the accuracy of contributions. The opinions expressed in the contributions submitted are those of the individual writer and are not necessarily shared by the Middle East Falcon Research Group or the Environmental Research and Wildlife Development Agency.

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## Letter from the Chairman's office

Dr. Jaime Samour, Head of Veterinary Science, Environmental Research and Wildlife Development Agency, P. O. Box 45553, Abu Dhabi, United Arab Emirates.

This issue of Falco brings together a series of outstanding contributions from both the medical and conservation fields. We are always pleased to see reports of ongoing clinical activities and research programmes, but we are also delighted with the conservation-in-action project in Pakistan concerning the welfare of trapped falcons. We would like to see more collaborative programmes between different institutions addressing the roots of the problems. Alone we can not stop altogether the trapping and trade of falcons, but we can help in several ways, by improving the conditions in which these falcons are kept and by increasing awareness amongst trappers of the need to preserve free-living falcon populations as a natural resource.

From our humble beginnings, members of the Middle East Falcon Research Group have achieved so much in a relatively short time. More individuals are working together now than we were three years ago. In this respect, the Group is now well-established as a credible, dynamic and active group of professionals.

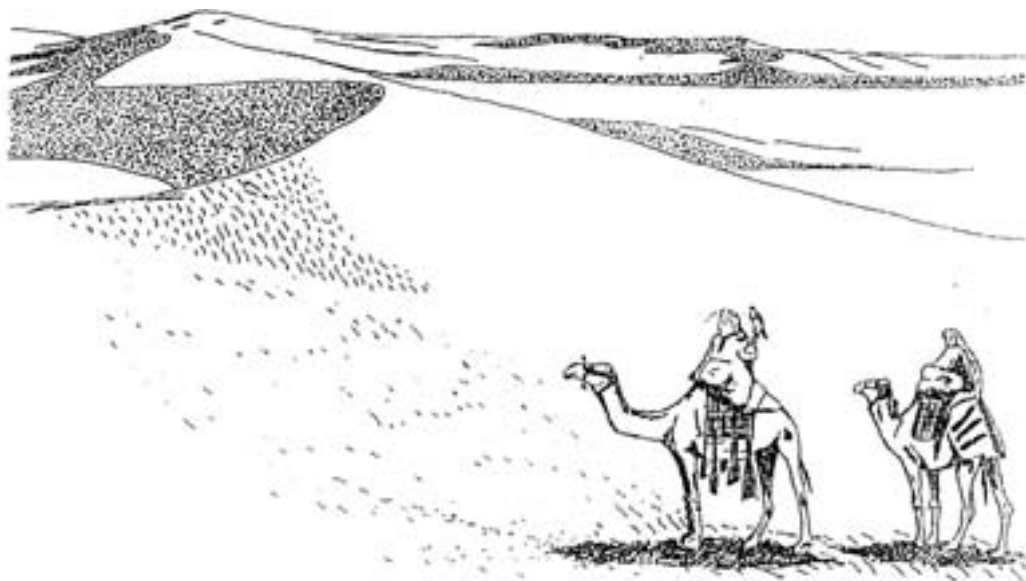
Through Falco, the Group, intends to disseminate information and to share the

experience mainly amongst the handful of individuals working with falcons in the Middle East. However, we have now over 150 members scattered all over the world and there appears to be no end to the continuous number of requests from individuals to join the Group.

Nevertheless, we have to work together in order to achieve common goals. There is so much to be done and so very few of us working in this field. Therefore, the interaction between professionals from different disciplines becomes an integral part of our work. We have long standing medical and conservation problems in the Middle East, but we will never solve them by working independently. The world is full of similar examples and we could not be so presumptuous as to consider ourselves an exception.

Please keep sending your contributions and participating in our technical and scientific activities. You do not have to be a top expert in one subject in order to help. Write to us, share your ideas with us and contribute to increase our bank of knowledge on falcons and falconry.

**The Group belongs to you all and only your active contribution can make a difference.**



## Back to the wild, Zayed orders third release of falcons

Report by: Mrs. Theri Bailey, Environmental Research and Wildlife Development Agency,  
P.O. Box 45553, Abu Dhabi, United Arab Emirates

**For the third successive year, the UAE President's programme for the release of falcons continued. In previous years the release took place in the mountains of Pakistan, but this year the release site was the Central Asian state of Kyrgyzstan and in cooperation with the Kyrgyzstan Ministry of Environment and Protection. The programme was organised under the aegis of the Environmental Research and Wildlife Development Agency (ERWDA), the Abu Dhabi Falcon Research Hospital and the Falcon Foundation International (Pakistan).**



Picture of H.E. Mr. T. Kulumbayev, Deputy Minister of Environment releasing a saker falcon assisted by Mr. Khalifa Saif Al Qumzi, ERWDA's Manager of Falcons.

The 59 falcons released, 24 peregrines and 35 saker, all bred in the wild, had previously been used by President Sheikh Zayed for falconry during the winter months. Sheikh Zayed continues the traditional practice of releasing most of his falcons at the end of each season. As a keen supporter of wildlife and conservation, the UAE President now insists that the annual release programme should be designed in such a way as to provide as much scientific data as possible, in the hope that this will help scientists to learn as much as possible about migration routes and the re-integration of the falcons into the wild.

As the Patron of the Environmental Research and Wildlife Development Agency and the UAE Chief of Staff, H.H. Sheikh Mohammed bin Zayed Al Nahyan, notes:

*'For centuries, falcons and falconry have played an essential part in our culture and heritage. In today's world, when wildlife everywhere is under pressure, it is only through research and conservation programmes like this, conducted in collaboration with scientists and research and conservation institutions in other countries, that we can aspire to preserve both falcons in the wild and their place in our culture.'*

### **Falcons fitted with satellite transmitters.**

Four of the fifty-nine released falcons, three peregrines and one saker, were fitted with small satellite transmitters, often called PTTs (Platform Terminal Transponders). This will allow their movements to be tracked over the next four or five months until the batteries run down. This was the first time that satellite transmitters were placed on peregrine falcons during the Sheikh Zayed release programme. As the conventional transmitters, which weigh 35g, are too heavy for most peregrine falcons, a new transmitter weighing only 20 g had been specially designed by Microwave Inc (USA) for the release.

Commenting on the break-through technology, Dr. Fred Launay, one of ERWDA's researcher's supervising the programme said:

*'Satellite transmitters are always getting smaller. The new 20g version is allowing us to track peregrines without hindering them when they fly and hunt.'*

Last year the results from the satellite tracking of five of the falcons were encouraging. Ten days after the release, two of the birds had travelled over 1,000 kilometres across the Himalayas and Karakorams into western China and eastern Kirghizistan. One bird then travelled northwards into western China and was still moving until late April, when the transmitter apparently ceased functioning. The second bird continued moving northwards and reached southern Russia, before going back south west to Kazakhstan. It had covered more than 5,000 kilometres from its starting point until the batteries in the transmitter ran out in September 1996. The last data from the bird's transmitter, showed that it had settled down in the Semipalatinsk area of northern Kazakhstan.

### **1995 and 1996 falcon releases**

The first release programme organised for President Sheikh Zayed's falcons took place in April 1995, when a total of 107 falcons were released in the Kharan District of Pakistan's western province of Baluchistan.

Last year's release, involving 65 sakers and 20 peregrines, took place in mid April in the Gilgit District of Pakistan's Northern Areas, a remote and little developed area where three of the world's highest mountain ranges, the Himalayas, the Karakorams and the Hindu

Kush, meet.

### **Preparations for 1997 falcon release**

As in previous years, this year's release in Kyrgyzstan was designed to ensure that the released falcons had the best possible chance of survival in the wild. All were given a complete physical examination and a battery of veterinary and laboratory tests.

In addition, one of the most important parts of any release programme is the choice of the release site. In deciding upon the Issyk-kul lake region of Kyrgyzstan, the team planning the release took several factors into consideration. Firstly, the area is used as a migration route by saker and peregrine falcons moving northwards in the spring towards breeding grounds in central Asia and is itself a potential breeding ground.

Another consideration was the availability of water and prey species for the released birds. Falcons, although used to catch houbara and other large prey for falconry, primarily feed upon small rodents, small birds and other terrestrial animals in the wild. In the Issyk-kul lake region many rodents and birds such as the chukka partridge, pigeons, pheasants, and ducks were available as prey for the falcons. Finally, the area was chosen because it suffers little human disturbance and pressure.

Preparations for the release programme began before the end of the annual hunting season, with the choice of the birds to be released. These were then placed in tightly controlled isolation for a period of one month at the Abu Dhabi Falcon Research Hospital, so that they could be checked for the presence of any bacterial infection and parasites. Veterinary assistance was provided by the Central Veterinary Research Laboratory in Dubai, while blood samples were also taken from each bird to carry out full virological studies so as to ensure that none were infected with viruses. Only birds found to be completely free of infection were included in the final release programme, to guarantee that there was no chance of infecting the wild falcon population.

To facilitate subsequent identification, in the case of recapture or being found dead, a micro-chip known as a PIT (Passive Induced Transponder), and weighing about 0.1 grams, was implanted under the skin of each falcon.

Carrying a special identification number, the micro-chip can be detected by passing a special machine over the falcon.

Besides the PIT, each falcon was also fitted with a numbered ring (band) on its leg. Provided by the Environmental Research and Wildlife Development Agency as part of the Emirates Bird Ringing Scheme, each ring has a number and the ERWDA address in Abu Dhabi, so that anyone catching a bird in the wild or finding one dead can report the discovery. Following the 1995 release in Baluchistan, four birds with rings were subsequently reported or re-captured, a relatively small percentage, but well above the international average for ringing recoveries, and an indication of the scientific value of the ringing scheme.

Each bird was then provided with several weeks' of daily exercise, to prepare them for release in as fit a condition as possible, while they were also fed specially to increase their weight, and thus improve their chances of survival during the crucial first two weeks of re-adaptation to life in the wild.

Finally, in collaboration with the UAE Ministry of Agriculture and Fisheries and the Kyrgyzstan Ministry of Environment and Protection, the appropriate certificates from the Convention on International Trade in Endangered Species of Flora and Fauna (CITES) were obtained to permit the birds to be exported from the Emirates and to be imported into Kyrgyzstan.

#### **Falcons released**

With the preparations complete, the falcons were flown from the UAE to Kyrgyzstan's Issyk lake shore on the 28th of April. The release commenced the following morning when 40 falcons were released in pairs. On the second day the remaining 19 falcons were released.

Some were released during the heat of the day, when rising atmospheric currents

(thermals) gave them the opportunity to rise quickly to a height sufficient to permit them to begin moving north, while others were released in the river valleys where sufficient food was available. Each bird was also fed with a meal of quail prior to release. The researchers were pleased so see that all the falcons flew strongly and several were seen chasing pigeons soon after their release.

#### **Results so far of 1997 falcon release**

To date all four of the satellite tagged falcons are still alive and in the vicinity of the release site. With data from the satellite transmitters due to continue to be collected for several months, it is still too early to determine the full success of the 1997 falcon release programme in scientific terms. Preliminary indications, however, are that valuable new information will be collected on migration patterns of saker falcons, while the released birds will also, of course, provide a valuable addition of numbers to the existing wild population.

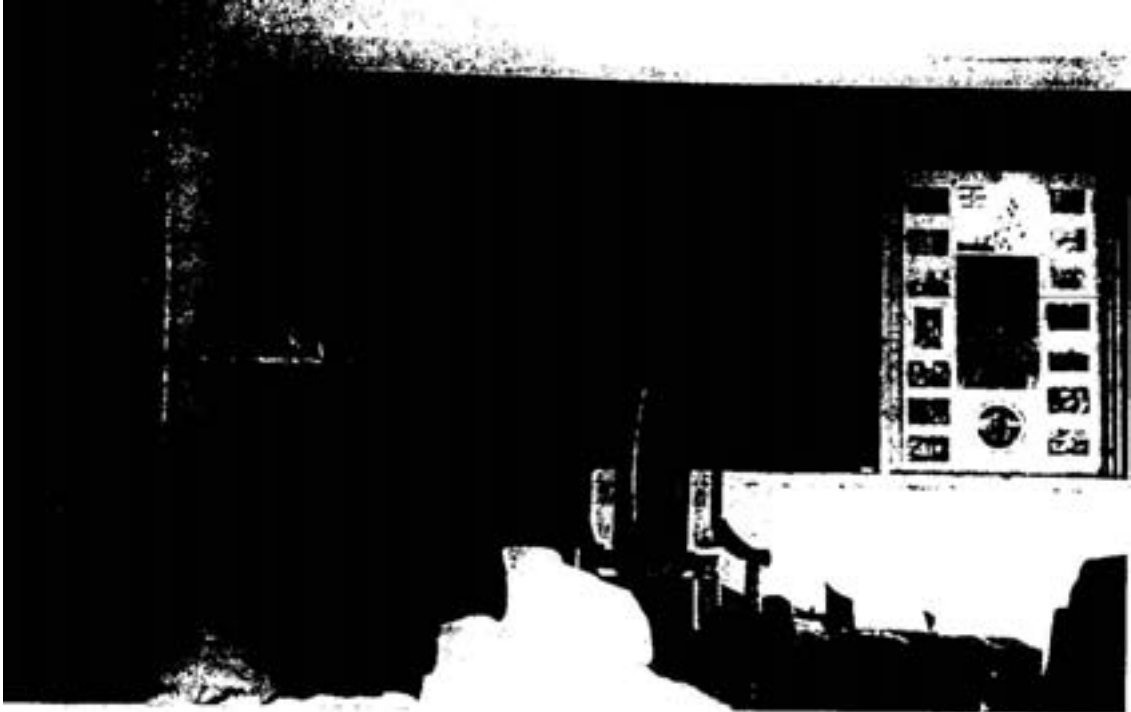
Commenting on this year's programme, H.H. Sheikh Mohammed bin Zayed Al Nahyan, stated:

*"In the last two year, we have made a start in investigating, in a scientific manner, the capacity of saker and peregrine falcons to re-adapt to life in the wild. This year, the programme has further developed, and initial indications are that we have made substantial progress both in our ability to prepare birds for release and in our ability to begin to understand more about their movements. As the programme continues in the years ahead, I am confident that it will make a major contribution to scientific knowledge about these falcons."*

**Issued on behalf of the Sheikh Zayed Falcon Release Project by the Environmental Research and Wildlife Development Agency.**

**The health and welfare of trapped falcons in Pakistan: Recommendations for collaboration between the Environmental Research and Wildlife Development Agency and the Falcon Foundation International, Pakistan.**

Report by: Mr. Tom Bailey and Dr. Nick Fox, Environmental Research and Wildlife Development Agency, PO Box 45553, Abu Dhabi, United Arab Emirates.



Dr. Nick Fox, Director of the Falcon Programme, ERWDA and Brigadier Mukhtar, Director of Falcon Foundation International, in one of the workshops

Between the 25th and 28th of February we attended two workshops organised by the Falcon Foundation International (FFI), Pakistan at Yazman Mundi and Fort Abbas, Punjab, Pakistan. We met the trappers in these areas, introduced them to the work of the FFI and ERWDA and learned more at first hand about falcon trapping.

At each location the following talks were given;

**Introduction**

Brigadier Mukhtar Ahmed

**Falcon Programme of the National Avian Research Center**

Dr. Nick Fox

**Trapping problems of falcons**

Dr. Nisrullah

**Conservation of birds of prey**

Dr. Ifshah

**Health problems of trapped birds**

Mr. Tom Bailey and Dr. Arshad Toosy

**Discussion and feedback from the trappers**

The talks by Nick and me were translated into the local language. Sixty first aid kits for falcons were distributed to the trappers after a demonstration of how to use them on a white-eyed buzzard that had been provided by one of the trappers. The bird was released at the end of the course. A total of 60 kits were distributed. A one page summary of the contents of each kit and how to use it in English and Urdu had been prepared and was also included in each kit.

Approximately 20-30 trappers attended the workshops at Yazman Mundi and 70-80 at Fort Abbas. A full report on these workshops has been written by Colonel Mushtak from the FFI and the purpose of this report is to present some recommendations for future collaboration of the FFI and ERWDA aimed at improving the welfare and health of trapped falcons. As a result of the workshops the trappers set up local

organisations which can be used by the FFI and ERWDA for future collaboration.

The most important health-related problems in trapped falcons are:

- Traumatic injuries related to trapping, particularly to the feet.
- Infected traumatic injuries.
- Deaths during transport - many trappers admitted there was a problem transporting birds, which are 'bound' during transport and large numbers die.
- Feeding related deaths - poor quality and often decomposed meat is fed and the birds get enteritis and die rapidly.
- Starvation because large numbers of birds are kept in single, small pens where there is food competition and the weaker birds die.
- Traumatic injuries in birds like lugger falcons which are kept in large groups in poorly designed aviaries.
- Newcastle disease
- Avian pox
- Trichomoniasis
- Bacterial enteritis
- Aspergillosis
- Upper respiratory tract infection
- Conjunctivitis/eye problems related to the seeling of eyelids.

Many trappers considered that most deaths occurred after they had sold them to the dealers in Peshawar or Karachi. However one trappers admitted to losing 150 out of 200 lugger falcons that he was keeping.

### **Recommendations**

Basic local workshops would improve the management and treatment of the falcons by the trappers. A more advanced workshop could train staff of the FFI. Ideally this should be done before the next season so that staff are fully prepared.

The problems with the falcons are similar to those that occur to trapped houbara bustards for which recommendations are being prepared in another report by Tom Bailey and Olivier Combreau. If ERWDA commits itself to these projects it is probable that the work for the two projects could be combined in August-September 1997.

The workshop could cover the following areas which could be adapted depending on the background of the people to be involved.

#### **Management of captive falcons**

Housing.

Feeding.

Capture, handling and transporting.

#### **Veterinary care of captive bustards**

Clinical records.

Common diseases of houbara.

Supportive care and emergency medicine of the sick bird.

Preventive medicine.

Chemical restraint.

Health screening.

#### **Technical support**

If we are to proceed with these workshops, ERWDA could assist with the following:

- Literature.
- Slides sets in English/Urdu so that the FFI staff can continue this work.
- Training video.
- Provision of falcon first aid kits to be distributed to trappers.

#### **2. Clinical service**

Following each workshop, once the trust of the trappers or dealers is established, a veterinarian could visit the places where they keep the falcons, provide practical advice, and offer a service to examine birds, e.g. give them a series of standard treatments including anthelmintics and vaccinations etc. This would also give us feedback for future efforts.

## Dubai Falcon Hospital news 1995 - 1996

Report by: Dr. Nigel Barton, Dr. David Remple and Mrs. Cheryl Remple, P.O. Box 23919, Dubai Falcon Hospital, Dubai, United Arab Emirates

The Dubai Falcon Hospital reached a significant milestone this season with the 10,000th falcon crossing the doorstep. Since initiating the use of PIT's (Passive Induce responders) in 1988 we have records for 11,100 implanted falcons, the majority of which were implanted at the Dubai Falcon Hospital. Occasionally falcons are brought from Abu Dhabi or Al Ain which already have PIT's. All of the implanted falcons have a complete vaccination record resulting in a significant decrease in any falcon presenting with Newcastle virus in the Dubai region. We use a commercial poultry vaccine and have had no outbreaks in our vaccinated falcons.

Many years of constant and frustrating educational awareness is obviously paying dividends. A large number of falconers bring falcons for pre-purchase examinations, immediately upon purchase they return for vaccination and implant and subsequent to this they return for booster vaccinations. The number of new falcons seen during the '95 - '96 season decreased slightly from the previous year although the total number of falcons seen (new falcons and previously implanted ones) remained almost constant over the past 3 years. At least 500 falcons were kept over the summer, a similar figure to last year. From preliminary data for the '96 - '97 season, the number of new falcons has once again increased. The most significant change is the total number of patients visits. In the '93 - '94 season (June '93 -

May '94), 2333 falcons were brought to the hospital with a total of 4184 visits, in '94 - 95 a similar number of falcons accounted for 4541 visits and in the 95' - 96 season 2230 falcons made up a total of 5023 visits. The hospital continues to be busier every each year and the data for the '96 - '97' season will be available soon. It will be interesting to see if these trends continue and we will report in a future newsletter.

Peregrines are once again on the increase and '95 - '96 saw 45% sakers and 40 % peregrines compare to 62% and 32% in '93 - '94 and 52% and 36% in '94 - '95. The number of juvenile female sakers was 150 less than '94 - '95 and only half of the number brought in '93 - 94. The other saker age and sex categories remained about the same. The increase in peregrines was largely due to the higher number of juvenile male peregrines being purchased (trapped?). For practical purposes (except for stone curlew hunting) it is the females which are of interest. Juvenile female sakers comprised 28% of the new birds, juvenile female peregrines 22%. About 6% of the new falcons were gyr and gyr hybrids, a proportion which is steadily increasing. Barbary falcons are still popular despite rarely being used for falconry and lanners and luggers continue to be bought in the souk (market).

Species	Saker		Peregrine	
	male	female	male	female
<b>Adult</b>	12 (0.7)	222 (13.1)	18 (1.1)	69 (4.1)
<b>Juvenile</b>	53 (3.1)	473 (27.8)	222 (13.1)	367 (21.6)
Barbary falcons		60 (3.5)		
Gyrs and gyr hybrids		106 (6.2)		
Lanners & Luggers		51 (3)		
Others		47 (2.8)		

*Note: Values in parentheses are a percentage of the new birds*

See table in Newsletter 1 and 3 for comparison to 1993 - 1994 and 1994 - 1996



## ***Entamoeba anatis* infection in captive saker falcons**

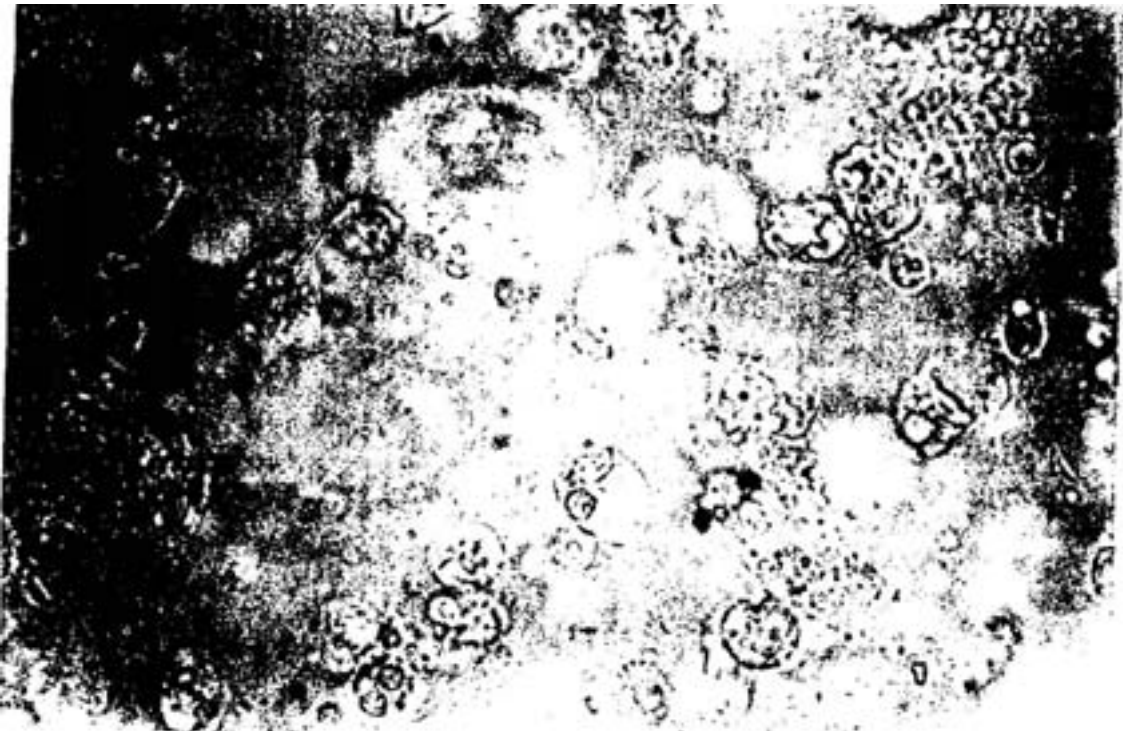
Report by: Mr. Christudas Silvanose, Environmental Research and Wildlife Development Agency, P.O. Box 45553, Abu Dhabi, United Arab Emirates.

*Entamoeba anatis* is a protozoan parasite, belonging to the *E. histolytica* group that causes oro-pharyngeal diseases in birds. *E. anatis* infections in captive birds are usually due to mismanagement. The clinical signs of infected birds vary according to the level of parasitemia and duration of infection. Inflammatory changes and discharge are common when the parasitemia is high. Inflammatory changes may include exfoliation of epithelial cells and WBC in the oropharynx.

In March 1997, the Microbiology Research Laboratory of the Environmental Research and Wildlife Development Agency, United Arab Emirates, received oro-pharyngeal samples from saker falcons kept in the quarantine station for health assessment.

Among these, one bird had a yellowish discharge in the mouth. This bird was infected with *E. anatis* and *E. gallinarum*. *E. anatis* is a pathogenic protozoan and *E. gallinarum* is considered as a non pathogenic *Amoeba* sp.

In this case, normal enterobacteriaceae flora was suppressed and infected with *Pseudomonas diminuta*. In most of the *Amoeba* sp. or *Trichomonas* sp. infected cases, if the parasitemia is high, secondary infections are common due to the normal bacterial flora suppression. As a result of normal microflora suppression, *Staphylococcus* sp. or *Pseudomonas* sp. infections or environmental bacteria contamination commonly occurs in such cases. Metronidazole tablet 50 mg per kg given for five (5) days was found effective against *E. anatis* infection.



An oro-pharyngeal smear showing inflammatory cells and trophozoites of *E. anatis*.

## **Salmonella infections in captive falcons**

Very little is known about bacterial infections in captive falcons in the U.A.E. Salmonella infections are occasionally reported in birds of prey, but very little is known about the pathogenicity of *Salmonella* sp. organisms in falcons. Different *Salmonella* serovars have been isolated from the cloacal swabs from healthy falconiform birds, and only one report exists where *S. typhimurium* might have been

involved in the death of a captive peregrine falcon.

Over the last two years the CVRL has experienced an increase of Salmonella infections in falcons, the significant of which is currently investigated.

#### Salmonella strains isolated from falcons during 1996 - 1997

Microbank No	Diagnostic No	Species	Organs	Serovars
262	445.3.96	Peregrine	Liver & spleen	<i>Salmonella typhimurium</i>
263	445.2.96	Peregrine	Intestine	<i>Salmonella typhimurium</i>
266	540.2.96	Peregrine	Liver & spleen	<i>Salmonella hadar</i>
267	540.2.96	Peregrine	Intestine	<i>Salmonella typhimurium</i>
316	941.96	Peregrine	Liver & spleen	<i>Salmonella typhimurium</i>
320	962.10.96	Falcon	Faeces	<i>Salmonella typhimurium</i>
321	962.15.96	Falcon	Faeces	<i>Salmonella typhimurium</i>
322	962.20.96	Falcon	Faeces	<i>Salmonella typhimurium</i>
354	1490.8.96	Falcon	Cloacal swab	<i>Salmonella typhimurium</i>
355	1490.10.96	Falcon	Cloacal swab	<i>Salmonella hadar</i>
356	1490.29.96	Falcon	Cloacal swab	<i>Salmonella hadar</i>
380	262.97	Peregrine	Liver, spleen & intestine	<i>Salmonella typhimurium</i>
381	284.97	Peregrine	Intestine	<i>Salmonella typhimurium</i>
382	278.97	Peregrine	Intestine	<i>Salmonella typhimurium</i>

#### Useful Tip

Salmonellosis usually occurs when falcons are fed on infected pigeons and quails. Fortunately, there is treatment for salmonellosis, but the success of this is directly related to how promptly affected birds are treated by a qualified veterinarian.

#### Chlamydiosis in captive falcons

*Chlamydia* organisms are obligate intracellular Gram negative bacteria. The genus *Chlamydia* contains 4 known species: namely *Chlamydia trachomatis*, *Chlamydia psittaci*, *Chlamydia pneumoniae* and *Chlamydia pecorum*.

Chlamydiosis caused by *Chlamydia psittaci*, is a serious health concern for various types of animals, including birds and their owners. Disease occurs as an inapparent, subacute, peracute, acute and chronic infection.

Currently there are three main diagnostic methods used for the detection of chlamydial antigen in clinical specimens. Firstly, by isolation in cell culture, secondly, by direct staining techniques, using fluorescein labelled monoclonal antibody and thirdly, by amplified enzyme immunoassay (ELISA), which determines the presence of the lipopolysaccharide antigen.

The test kit used in our laboratory is the DAKO IDEIA *Chlamydia* Elisa test kit. This enzyme immunoassay uses a genus specific monoclonal antibody, which detects free *Chlamydia* lipopolysaccharide as well as lipopolysaccharide present in elementary bodies, which may fail to react in other test systems. This test has a very high sensitivity and specificity at the range of 96.3% and 93.6% respectively.

Testing in the laboratory is done by using swabs taken from the following sites: trachea, eye, cloaca and from the surface of the liver and spleen which are collected from live and dead birds, respectively. All swabs are stored in specific transport medium which maintains the viability of the bacteria. Positive results are then confirmed using the so called "confirmatory ELISA".

During the year 1996, ninety eight swabs were tested for *Chlamydia*, the results of which are seen in Table 1.

TABLE 1: *Chlamydia* results of 98 swabs from different avian species, taken from different locations.

Species	Total swabs test	Positive cases
Falcon	78	16
Parrot	5	2
Houbara	6	2
Pigeon	2	2
Others	7	0
<b>Total</b>	<b>98</b>	<b>22</b>

\*\* Others: Kori bustards, stone curlews

Most of the falcons which tested positive were reported to show poor flight performance, lack of appetite, and fatigue. No other symptoms were seen. With early diagnosis

and adequate antibacterial treatment, birds made a complete recovery and showed a strong flight performance.

#### **Useful Tip**

Chlamydiosis is transmissible to humans. Man can contract the disease by aerosols or by exposure to contaminated dust and by direct contact with infected birds within enclosed quarters.

#### **Practical veterinary tips during moulting**

In Arab falconry practices, the moulting period, is the most inactive period for falcons and falconers alike! After the last hunting trip of the season, the falcons are placed into rooms to begin moulting and the falconers go back to live their normal lives. Yet, this is also the time of the year when falconers have very little or nothing to do with the falcons. As

a general rule, during the moulting period, falcons in the Middle East are looked after by servants with little or no knowledge of issues related to the husbandry and health of captive falcons. Therefore, this is the time of the year when falcons are at greatest danger of acquiring diseases and when falcons are most neglected.

The following guidelines are basic medical routines to be considered prior the beginning of the moulting period.

- Take all the falcons to a veterinarian for a **full** medical check-up.
- Administer routinely a suitable powder or spray for **external** parasites. Ask your veterinarian for advice.
- Administer a suitable antiparasitic preparation to falcons that are found to be positive to **internal** parasites. Your veterinarian will be able to advice.
- **Trim** the **claws** of all the falcons. Sharp pointed claws are not necessary during moulting and may cause an accident that could result in **bumblefoot**.



*At the end of a tiring day,  
the falcon shuts its eyes,  
fold its wings  
and rests.....*

*Yehya Bader*

## The hospitalisation of birds of prey

Report by: Professor John E. Cooper, University of Kent, Canterbury, Kent CT2 7NJ, United Kingdom.

### Introduction

This paper covers the admittance of sick birds or injured raptors (falconiform birds of prey) to a veterinary hospital and their maintenance there, prior to release or return to their owner.

Birds that are hospitalised may be a) wild bird casualties, b) falconers' birds trained for hunting, or c) raptors that are kept in captivity for other purposes - for example, from zoological or private collections, the management of which may be different from those used for falconry. Some aspects of hospitalisation are similar for all three groups but there can be important differences relating to the susceptibility of casualties, especially accipiters ("short winged hawks") to stress.

Hospitalisations will be considered under the following headings:

- 1) accommodation
- 2) diet
- 3) treatment and care

### Accommodation

The importance of having appropriate hospitalisation facilities for has long been recognised (Cooper: 1985). In the past, veterinarians usually accommodated sick and injured birds in kennels and cat cages that had not been designed for birds of prey. These structures can certainly be commissioned in an emergency, but are far from satisfactory; here the importance of designing and using purpose-built hospital facilities is emphasised.

When a raptor is first presented for veterinary attention and hospitalisation, it has usually been transported to the practice in a box or cage. Sometimes it has to remain in this for a period until clinical evaluation can be carried out and the bird is properly housed. In such an instance, cardboard boxes are often best. They enable the raptor to be kept in the dark, which will reduce its activity, and the box can be destroyed after use. Whatever sort of container is used, it should be such a size that the bird can stand without touching the sides or top. The box should be dark, with ventilation holes low in the walls.

Subsequently, insofar as specific housing is concerned, there are three main types of hospital facility that are likely to be needed for the care and treatment of raptors:

1. Small quarters where individual birds can be tended ("cages")
2. Larger holding quarters when raptors can recover, while still receiving treatment, but also begin to exercise and gain some independence.
3. Extensive flight pens where patients, particularly those that have suffered impairment of flight have room to fly and to recuperate and, in the case of casualties, to be prepared for return to the wild.

The above three categories of accommodation were discussed in some detail by Olsen (1990). Although Olsen referred specifically to sick and injured wild (free-living) birds, much of his information is also relevant to captive, hospitalised, raptors.

Some general rules apply to facilities. First, the raptor needs to feel secure. This can be achieved in a variety of ways and will depend upon the bird's origin, its species, the presenting clinical signs and other factors. Particularly important points are that the raptor 1) is not exposed to potentially adverse stimuli from more than one direction and 2) does not feel threatened by close proximity to humans, dogs, cats and other birds. Accommodation should therefore provide cover - usually on the three sides and can be positioned so that there is reasonable (preferably the "fright") distance between the bird and hospital staff or visitors. One easy way of achieving the latter is to have individual quarters in an elevated position so that the bird is both distanced from, and looking down on, passers-by (Redig: 1996); alternatively one can minimise the problem proximity by providing cover between the bird and humans - for example, by putting a cloth over part of the cage front or by installing natural or artificial vegetation. The disadvantage of such methods is that the bird is not readily visible - regular patient observation is essential when dealing with raptors (see later) - while vegetation in a small quarters can both damage the bird and hamper handling. An important rule with all accommodation is to avoid, as far

as possible, the use of wire netting: this can cause severe damage to raptors. If wire has to be used, it should be of the plastic-coated variety. Doors and windows are best covered with vertical bars (dowels).

Subdued lighting helps to calm diurnal raptors but must be sufficient to permit feeding. A dimmer switch for the room, operable from both outside and inside, is recommended: the light intensity can be varied as necessary.

Loud noises and sudden movements should be avoided: doors must be closed quietly and staff should be trained to carry out tasks slowly and to show sensitivity to the needs of the patient.

Perching, usually at an elevated location, is an important part of the behavioural repertoire of most raptors and probably contribute to the well-being and recovery of patients. Therefore, if a hospitalised bird of prey is capable of perching, it should be provided with an appropriate structure on which to do this. A "perch" can range from a brick in the cage (enabling a debilitated bird to raise itself a few centimetres above its surroundings), through standard falconry "furniture" such as blocks, ring/bow and screen perches, to the provision of vegetation, including branches.

General considerations also include a temperature control - sick birds need to be kept warm {25 - 35°C} and central temperature control may be advisable - and b) the provision of the water (usually primarily for bathing, sometimes for drinking).

The monitoring of hospitalised raptors is important. At the very least, this should involve the use of two-way mirrors and "peep holes" for observation, preferably with a wide-angle lens viewer set in the door or windows. Ideally a closed-circuit television monitor should be available.

Quarters for individual raptors ("cages") are best if purpose-built, but can also be modified from kennels or cages. Preferably all cages should be in one special room, with controlled lighting and temperature.

Large holding pens are, by definition, more extensive than cages. They should not be too large or a bird can build up speed (in flight) and damage itself: this danger can also be minimised by installing perches near the ends of the pens. They can consist of a room or be a

modest-sized aviary (situated indoors or outdoors), with appropriate hessian or other lining walls. They should control lighting and temperature.

Flight pens are generally (not always) located out-of-doors and incorporate a range of perches and other structures. Height is usually an important factor. Exposure to environmental light cycles and fluctuating temperatures is normal.

## **Diet**

Diets for hospitalised birds will range from whole or chopped dead animals to liquidised foods, the latter being used to sick patients that are undergoing intensive care. Basic guidelines for feeding hospitalised raptors are that the food should be a) of high quality and from a reliable source, in order to minimise the risk of introducing pathogens - non-avian items, such as laboratory mice, have much to commend them (Cooper: 1985) b) properly stored, preferably frozen c) presented hygienically. Small birds will require a higher proportion of their body weight per day than will large birds: hawk weighing 150 grams may take 20-25% of its body weight.

Special care is needed for raptors that are in (low) condition - usually casualties or badly managed falconers' birds. They may require treatment of "sour crop" - removal of crop contents and administration of fluids and steroids in order to counter endotoxin - and tube-feeding.

## **Treatment**

Specific treatment of the hospitalised raptor will be dictated by its clinical history and other factors. However, certain points are likely to be pertinent to most, if not all cases. These include i) the need to be able to handle and restrain birds for examination, investigation or therapy - necessitating properly trained staff and appropriate equipment, such as gloves and hoods, ii) use of optimum instruments and drugs including anaesthetic agents and iii) prompt and regular attention to supportive care, including metabolic management, analgesia (Murray: 1994).

Other important considerations when hospitalising raptors include 1) prevention of the introduction or spread of infectious diseases, including zoonoses - necessitating careful

design of facilities (Redig: 1996) and health monitoring of incoming birds (Cooper: 1985; Cooper and Greenwood: 1981), 2) health and safety precautions for staff and 3) rigorous record keeping.

The successful hospitalisation of birds of prey is rapidly becoming a specialised subject and many patients are being saved that might otherwise have died. The emphasis throughout must be on reducing stressors and providing optimum care. It is, perhaps, no coincidence that in earlier days falconers referred to the "hawk house" and "hawk furniture" when discussing the accommodation of their charges: the terms are a reminder of the need to offer these birds optimum conditions, especially when they are sick or injured.

#### Acknowledgements

I am grateful to Martin Lawton, FRCVS for his assistance in the production of this paper.

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### **Falconry: Slovakia in focus** **Contribution of Dr. Josef Misko**

Slovakia is a small country in the heart of Europe, which rose from the Czech and Slovak Federative Republic (Czechoslovakia) after its division in 1992.

Falconry, as a method of hunting with birds of prey, was known to the Slavs tribes, living on the region of today's Slovakia five or six centuries A.C. and also by Hungars, settling on the same area four centuries later. During the Middle Ages the practice of falconry was very popular but disappeared almost entirely due to the advent of modern hunting weapons.

The first falconry organisation in Slovakia was created in Bratislava city in 1971, called Slovensky Klub Sokoliarov (Slovakian Falconry Club). Today there about two hundred members. Most of them fly goshawks (*Accipiter gentilis*), which were not under protection until 1994. To date, it is prohibited to trap all kinds of raptors from the wild for the purpose of falconry. The only way birds of prey can be

obtained for falconry is to purchase captive bred birds.

There are also numerous Slovakian falconers who fly falcons, particularly peregrines and sakers, but only a few of them are bred every year. The best breeding success with these species has been achieved by the Avian Study Center of the Faculty of Veterinary Medicine. The Center concentrates especially on breeding European sakers (*Falco cherrug danubialis*) nesting in Southern Slovakia. Artificially reared young are placed into nests of free-living pairs to increase the number of birds in the wild population. However, most of the young sakers are stolen and sold in foreign countries. For example, in 1992, nineteen saker falcons were confiscated from breeding centers in Germany. These birds were returned back and released in Slovakia.

In this respect one can say, that today's most important task of falconry is not just to

hunt with raptors, but also to save endangered species for the next generations.

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## Letters to the editor

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Dear Editor

The 1996 hunting season has been an exciting time for me. My new post with H.H. Gen. Sh. Mohammed bin Rashid Al Maktoum has been stimulating. I have now, for the first time, monitored the progress of new falcons from day one of the training process to their performance in the hunt. Only by doing this can one understand the bond between falconer and falcon. Each case becomes special and it becomes more difficult to remain emotionally detached. I would like to take this opportunity to thank H.H. Gen. Sh. Mohammed Bin Rashid and also Rashid, Sheba, Ahmed and Obaid, for making it possible to share the hunting experience.

This season has seen the gyr hybrids popularity soar! Although we have some problems initially, in general, they have had less problem than I would have seen with wild-caught falcons.

**Newcastle Disease:** The incidence of NDV in falcons has decreased this season, in my view due to the protection afforded by the NDV vaccine provided by the Central Veterinary Research Laboratory, Dubai. Many of the pigeons used in the training of the falcons harbour NDV but, to date, I have seen no cases in falcons which have had the full vaccination.



Dear Editor

Falcon pox or "Jidri" is a significant problem in falcons in the Arabian Gulf area. Immature falcons being exposed to the virus for the first time are, in our experience, the hardest hit. The virus is transmitted from bird to bird via a blood-sucking anthropoid vector such as mosquito. In some regions, mosquitoes may be the only significant means of transmission since the disease shows a seasonal incidence that

**Apergillosis:** This is still a major problem for falcons, not only in the Middle East, but all over the world. We are fortunate that we now have convinced most falconers of the benefits of diagnostic laparoscopy. Early aspergillus cases i.e. before weight loss and respiratory distress has developed, respond well to therapy, although a lot depends on the training regime used by the falconer. More advanced cases are rarely cured and, although they may survive with therapy, they rarely return to hunting standard.

I am interested in the role of electrolyte imbalances in the development of renal disease and would appreciate the views other members of the Middle East Falcon Research Group on this topic.

I would like to thank the staff of the CVRL for their help during the season especially Dr. Ali Ridha and Professor Ullie Wernery. I also extend my thanks to Dr. Collins and all my former colleagues at the Veterinary Hospital Dubai for their support and patience during the last four years.

**Mr. Peter McKinney MRCVS**  
Dubai, U.A.E.



coincides perfectly well with the mosquito season.

The virus cannot penetrate intact in to the skin thereby needing to be introduced through a break in the epithelium. A mosquito carrying pox virus introduces the virus into the dermis and subcutis where some virus replication occurs. For this inoculation site, a first or primary verifier occurs and the virus then is seeded in the liver and bone marrow. In these organs, major viral replication occurs.



This secondary verifier, resulting from organ replication, determines the severity of the disease: little replication gives mild disease while large replication induces severe disease. Therefore, immunosuppression also plays a role in determining the severity of disease.

The point of all this is that a vaccine virus behaves non-pathogenically with little to no secondary replication. These strains cause only local, abortive disease at the inoculation site.

The virus is extremely resistant in nature and can survive up to 1 1/2 years in soil and pox encrustation's (scabs). The avian virus, genus - *Avipoxvirus* comprised of many species, each affecting different avian hosts.

Some of these species serologically cross react with others. Most are host specific.

There are 3 species related to falcon pox: pigeon pox, fowl pox and turkey pox.

Falcon pox cross reacts with pigeon pox but not vice versa: falcon ↔ pigeon. Fowl pox and falcon pox cross react: falcon ↔ fowlpox (but are not heterologous). Falco pox and turkey pox cross react AND are heterologous: falcon ↔ turkey. This means that turkey pox is the only commercial vaccine that 'should' provide full protection against falcon pox without causing full blown disease.

Regarding control of disease, Dr. Helga Gerlach states that recovery from disease confers 8 months protection in most Avian species. We have found at the Dubai Falcon Hospital over the last 14 years that any falcon recovering from pox appears to have a life - long immunity . We never seen birds get it twice.

However, vaccination does not appear to give the same lasting protection. Again Gerlach states a vaccinated bird could only expect to be protected for about three months. We have seen many birds vaccinated with a heterologous turkey pox vaccine go on and

develop pox later due to vaccine failure or short lived immunity. Again, once they recover from field pox, they seem immune for life.

We agree with Gerlach; "for control vaccination is the best tool" but only with proven vaccines. There is no reason to try heterologous vaccines because of the high capacity for genetic recombination in birds already incubating the field virus. The same reasoning would apply for MLV vaccine strains.

We have not vaccinated against pox at the Dubai Falcon Hospital for the last three years and as a result, we have noticed a distinct DROP in the number of pox cases. We are using a heterologous pox turkey vaccine, the best commercial vaccine available against falcon pox at Dr. Gerlach's recommendation, while other hospitals have used pigeons pox with very little to no result. We felt many of our falcons were protected throughout the mosquito season, but half lost their short term immunity. There was no way to measure this as immunity to pox is primarily cell-mediated. What we did notice is that when birds were vaccinated close to the mosquito season, many would go on to develop severe, fulminating disease. We felt that this was most likely the result of recombinant viral disease. This necessitated vaccinating birds well outside the mosquito season to avoid this problem. Yet often the immunity was too short lived to protect through the season. Again the point is by eliminating our falcon pox vaccination program we saw less falcon pox and a significant reduction in the severity of disease. Dr. Riddle at the Abu Dhabi Falcon Research Hospital has not vaccinated pox for two years now and claims the same results.

Some statistics to support our hypothesis:

1993/94	1482 vaccination given	161 cases of pox
1996/97	none given	38 cases of pox

In 1993/94, 11% of vaccinated birds contracted pox, that being 6.9% of birds seen. In 1996/97, 0.015% of birds seen had pox.

Of note is the fact that 68% of the birds with pox were treated only once, while 16% were treated twice and 2% were treated three or more times. Our records also indicated that these birds were suffering from other

diseases (aspergillosis) suggesting immunosuppression.

**Dr. David Remple**, Director, Dubai Falcon Hospital, Dubai, United Arab Emirates

### Clipped wings

Extract from: *Tabloid, Gulf News, March 24, 1997*

The magnificent falcons are rapidly disappearing from the skies of China due to the ever increasing demand for this bird of prey as an expensive pet for clients around the world. Although falcon trading is highly illegal, smugglers can make a huge profits, and they have been known to sell the birds for an incredible \$50,000 on the black market.



Saker falcon

The falcon's habitat is in the North West region of China and farmers who live in this area are taught at a young age how to capture and tame these birds. They used to be caught for entertainment but the rise in demand has led it to become a highly profitable business. The farmers can make easy money catching the birds, which helps alleviate their poverty. Even though the hunting of falcons has been made illegal it is still very difficult to stop it happening especially when the rewards can be so high.

The birds are often drugged and hidden in TV sets or radios and flown to the markets, obviously many of them die before they are even sold. This tireless line of trade has put the falcon on the endangered list and conservationists are working around the clock to try to trap the smugglers. In 1995, the Chinese Forest Police arrested 925 poachers and rescued more than 400 hundred birds. However with this being, for some the only way a farmer can feed his family, the trade is likely to continue and the number of falcons will decrease even more.

### FALCO CONTRIBUTIONS

The Middle East Falcon Research Group would like to thank the following contributors to the 9th Edition of FALCO : Mr. Tom Bailey, Dr. Nick Fox, Dr. Nigel Barton, Dr. David Remple, Mrs. Cheryl Remple, Professor Ullie Wernery, Professor John Cooper, Mr. Christudas Silvanose, Ms. Reena Zachariah, Ms. Sunita Joseph, Mr. Peter Mckinney, Dr. Josef Misko, Dr. Jess Naldo, and Mrs. Theri Bailey.

FALCO would like to invite members to write accounts communicating your experience and sharing your expertise with others. It can be just an idea, a proposal, a summary of activities or an observation. We also have included in this issue **Falconry, Country in focus**, where we will feature different countries practising falconry. You may send an article and photograph about falconry in your own country and we will publish the information for the readers of FALCO.

## Announcements

The Dubai Falcon Hospital is now screening applicants for **VETERINARY INTERNS POSITION** for the peak season next year. The hospital in the previous years accommodated and trained veterinary interns for three months.

Any graduate veterinarian or latter term veterinary student wishing to take part in this programme should contact

Mrs. Cheryl Remple  
Dubai Falcon Hospital  
P.O. Box 23919, Dubai,  
U.A.E.

## Dates for your diary

### Hawk Migration Association of North America: Conference VIII "Raptors and the West"

**June 12 - 15 1997**  
Snowbird, Utah



**Contact:**

Hawk Watch International  
Program Committee  
P.O. Box 660, Salt Lake City,  
UT 84110,  
Phone: 801 - 524-8511,  
Fax : 801 - 524 - 8520

### Association of Avian Veterinarians Annual Conference and Expo

**9th - 13th September 1997**  
Reno, Nevada, USA

**Advancing and promoting avian medicine  
and stewardship**



Center for Wildlife Education  
Georgia Southern University,

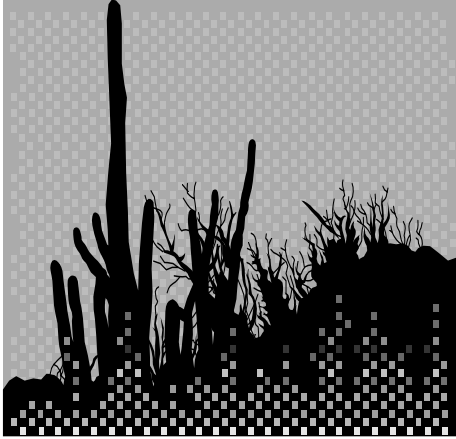
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## Annual Conference of the Australian Chapter of the Association of Avian Veterinarians (AAV)

September 25 - 27, 1997  
Perth, Western Australia



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URL: [http:// numbat.murdoch.edu.au/bird/aav](http://numbat.murdoch.edu.au/bird/aav)

## World Association of Wildlife Veterinarians (WAWV) 7th International Theriological Congress

6th - 12th September 1997  
Acapulco, Mexico



WAWV will be sponsoring a symposium on  
“Veterinarians in Conservation Biology” at the  
7th International Theriological Congress (7ITC)

at Acapulco, Mexico. Dr A.W. English,  
Treasurer of WAWV, is acting as convener for  
this important gathering of wildlife people,  
together with a Mexican colleague who is  
acting as co-convener. The symposium will be a  
major component of the 7ITC Programme  
aiming especially on highlighting the various  
roles of veterinarians in conservation biology.

For further information please contact:

Dr. A.W. English  
University of Sydney, Department of Animal  
Health, Private Mailbag 3, Camden NSW 2579,  
Australia.  
Fax: + - 46 - 552931

## Books

### Handbook of Bustard Haematology By J. H. Samour, T.A. Bailey, J.C. Howlett, J. Naldo and M. A. D’Aloia

This handbook intends to combine the practicalities of a manual and of an atlas by including haematological techniques and photographic identification of blood cells in a single volume. The first section describes, step

by step, the methods used in the laboratory of the National Avian Research Center, including the formulae for the preparation of working solutions and stains. The photographic atlas illustrate normal red cells, white cells and

thrombocytes and includes some of the most common haemopathological responses and haemoparasites in bustards.

The Handbook of Bustard Haematology by J.H. Samour, T.A. Bailey, J.C. Howlett, J. Naldo and M-A. D'Aloia is available at the Environmental Research and Wildlife Development Agency for Dhs. 55.00 (Draft check in U.A.E. dirhams made payable to National Avian Research Center).

## **Status and Conservation of the Breeding Birds of the United Arab Emirates**

by Simon Aspinall

### **A book sponsored by NARC and ADNOC**

A new book about the country's birds, entitled the "Status and Conservation of the Breeding Birds of the United Arab Emirates", has recently been published. The book was written by Simon Aspinall, Senior Ornithologist of the Abu Dhabi based National Avian Research Center and pulls together, for the first time, the results of many years of professional and amateur efforts to map the distribution and to provide population estimates of the breeding birdlife of the entire country. Over one hundred species of bird have now been found nesting in the UAE. The publication of the book was made possible by the generous financial support of the Abu Dhabi National Oil Company (ADNOC).

### **Foreword by H.H. Sheikh Mohammed bin Zayed Al Nahyan**

The foreword to the book has been written by H.H. Sheikh Mohammed bin Zayed Al Nahyan who writes that;

*"The outstanding international importance of the UAE for both breeding and visiting birds has only been realised in the last few years, particularly since the establishment of NARC, an organisation of which I am proud to be associated."*

H.H. Sheikh Mohammed goes on to say that the citizens of the UAE should take pride in their wildlife and have good reason to be thankful for its bountiful nature. He concludes;

*"Ensuring a future for wildlife in our changing country is a challenge we have to meet and there can be no room for complacency. This book is an important and timely work produced to help meet the challenge and I laud its message wholeheartedly."*

### **A book that will appeal to the general public, interested amateurs and professional researchers**

For each bird species the book describes its UAE distribution, naming important sites and outlining the threats to their well-being. The book is not only intended as a popular reference work but also as a blueprint for the conservation of the country's avifauna. Over 50 colour photographs enrich the text and show the diversity of species to be found here (the quality of the photographs is unsurpassed). The book is expected to have wide appeal to the general public, interested amateurs and professional researchers alike.

### **The UAE is home to the endemic *kalbaensis* subspecies of white-collared kingfisher**

As a result of research for the book many startling facts have emerged. Fresh surveys of Abu Dhabi islands, in particular, showed the UAE to support the only Arabian Gulf colonies of red-billed tropicbird and sooty gull, over 95% of the osprey population of the Gulf and internationally important populations of crab plover, Socotra cormorant, sooty falcon and five species of tern. The endemic *kalbaensis* subspecies of white-collared kingfisher, completely confined to the UAE mangroves (at Khor Kalba) and with a total population of only 44 pairs, is one of the world's rarest birds.

### **An emphasis on conservation**

The emphasis of the book is towards conservation, having been written with the intention that it is used as something of a manual. Some urgency is clearly needed and the author is quick to stress what actions should be taken to conserve each and every species. Twenty three of these have been singled out as being of particular priority. The variety of threats to the survival of the different species

makes for some sombre reading but the overriding message is that, with prompt action, the situation is not irredeemable. Part of the book is given over to mapping out potential wildlife reserves.

### **Hobby Publications**

This book is a companion volume to the widely acclaimed standard work 'The Birds of the United Arab Emirates' by Colin Richardson and was produced by the same specialist publishing house namely Hobby Publications, itself a name synonymous with design and production of high quality natural history books.

The book is available from all good bookshops, including Magrudy's in Dubai and at all Spinneys outlets in the UAE and it can be bought directly from the Center, price Dhs. 110.

**For further information please contact:**

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## **Desert Ecology of Abu Dhabi**

Edited by Patrick Osborne

The National Avian Research Center, which is now a part of the newly established Environmental Research and Wildlife Development Agency (ERWDA), has just published its book 'The Desert Ecology of Abu Dhabi'. This book is based on the first couple of years of the Center's ecological survey work and provides the first comprehensive review of the wildlife and ecology of the deserts of Abu Dhabi. There is no doubt that this book will become the baseline for future research work in the country, and will also be required reading for anyone with a general interest in desert natural history.

Within the book, the wildlife and habitats found in Abu Dhabi's deserts are illustrated with over 100 colour photographs, and ecological data are clearly presented with the help of colour maps and diagrams. The following sections are covered in the book:

- Geology - how the present landscape and landforms of Abu Dhabi were shaped by past climate and changing sea levels.
- Climate - the present-day conditions that limit life in the desert
- Plants - the plant associations found in the desert and how they may be managed and altered through irrigation, grazing and topsoiling

Birds - winter bird communities, breeding species and their ecological requirements. A separate chapter is devoted to the houbara bustard the favoured quarry of Arab falconers.

- Reptiles - a systematic list of all recorded species with notes on their ecology.
- Mammals - annotated check-lists of both known and suspected species occurring in Abu Dhabi's desert with notes on their conservation.
- Invertebrates - an overview of the species recorded and those that probably await discovery in this poorly known environment.

The book is retailing for 120 Dhs and can be bought directly from the Center.

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## The Middle East Falcon Research Group

The Middle East Falcon Research Group (MEFRG) intends to bring together experts in falcons and falconry, veterinary surgeons, falcon biologists and conservationists working in the Middle East and other professionals interested in falcons and falconry from around the world.

The main objectives of the MEFRG are:

### 1.- To provide

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

### 2.- To promote

- Research on health and diseases in falcons, falcon moulting patterns in the Middle East and falcon nutrition, captive breeding programmes and semen cryopreservation and artificial insemination.
- Field studies on falcon migration, taxonomy, morphometrics, reproductive biology, nutritional ecology and behaviour.
- Improved management conditions of captive falcons through educational awareness programmes.
- A better understanding of falconry as part of the Arab cultural heritage.

### 3.- To hold

- Regional workshops on veterinary medical aspects, falcon biology topics, falconry and conservation issues.
- International Conference on veterinary medical aspects, falcon biology topics, falconry and conservation issues.
- It is envisaged to publish the papers and posters presented at the conference in the form of proceedings.

### 4.- To publish

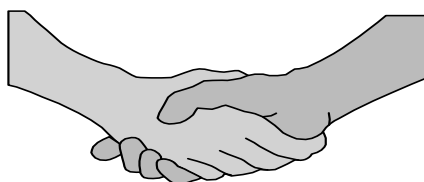
- Joint papers on aspects concerning falcons and falconry.
- A quarterly newsletter containing contributions on medical, biological and conservation topics of common interest, new developments and recent medical advances.

### - Membership

Any veterinary surgeon, biologist, conservationist or falconer working in the Middle East or any other person interested in medical, biological and conservation aspects of falcons and falconry from around the world

### For further information please contact:

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**A great deal of our success depends upon the professional cooperation between all members**