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MEFRG Objectives:

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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:
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.

Membership:
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.

Photographs:
Front Cover: Captive-bred Gyrfalcon at the IWC breeding facility in Wales (www.falcons.co.uk); the promotion of captive-breeding to supply Gyrfalcons, and other species, for Arabic falconry potentially diminishes the market demand for wild-sourced birds. (© Chris Johnson)

Inside Cover: Saker Falcon wintering at its breeding site on the Qinghai-Tibetan Plateau, a globally important ecoregion for the species (© Ma Ming)

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Editorial

Since the last issue of *Falco* there have been some notable and relevant developments in relation to the Convention on Migratory Species (CMS). A new Memorandum of Understanding (MoU) on African-Eurasian Migratory Birds of Prey was agreed at a meeting held in Abu Dhabi (see News & Announcements section). This important agreement provides a framework that prioritises species and sets out specific activities that should be implemented to benefit their conservation. Given the current global financial crisis and the inevitable impact this will have on international conservation initiatives it is welcome news that the United Arab Emirates also offered to host a coordinating unit for this MoU and also for the region’s dugongs and marine turtles MoU’s.

Following the successful conclusion of this MoU, the ideological differences between countries in implementing such multi-national agreements as CMS and CITES was brought to the fore at the 9th Conference of Parties (CoP) of CMS in Rome in December. This was the result of the Croatian proposal to list the Saker Falcon on Appendix I of CMS, which would have prohibited the sustainable use of wild-sourced birds. Saudi Arabia, with others, opposed the proposal, noting that it was based on insufficient data, whilst Croatia emphasized the listing proposal was accepted by the majority of the CMS Scientific Council and pointed to the precautionary principle in favour of its implementation.

Discussion centred around the argument that a cessation of all legal trade would essentially mean that demand for wild-sourced Saker Falcons for Arabic falconry could only be met through unregulated, illegal trade and that the proposal would hinder plans by Mongolia (the only country currently engaged in CITES regulated export of wild-caught Saker Falcons) and Arabic falconry states to develop a conservation programme based on a falcon harvest from a managed population using artificial nests. The opposing argument was that Saker populations are now so vulnerable, primarily as a result of excessive trapping that a policy of strict protection was required in all states across its global range to prevent its extinction.

During the discussions the UAE offered to organize and host a specialist meeting to bring together experts so that the current status of the Saker Falcon could be assessed and to produce recommendations of conservation actions that can be used to inform policy makers at national, regional and international levels. Furthermore, Saudi Arabia proposed a research programme to investigate the conservation issues affecting the Saker Falcon. Discussions were intense with strongly held views on both sides but in order to foster international cooperation a compromise was reached and Croatia agreed to withdraw their proposal in favour of a strongly worded resolution that was designed to ensure that conservation actions were undertaken as a matter of urgency. This resolution contained a commitment for listing at CMS CoP 10 if the conservation status of the Saker Falcon had not significantly improved by that time (i.e., no longer considered by IUCN as threatened with extinction). The resolution was adopted with a minor amendment and Croatia withdrew its listing proposal.

In the spirit of recognizing the urgency of the situation and the need to have a clear, agreed appraisal of the status of the Saker Falcon, the Environment Agency – Abu Dhabi has organized a specialist Saker meeting to be held in Abu Dhabi on the 5-7 April 2009. The review of the status of Saker Falcons in Europe and Asia in this, and a previous, issue of *Falco* can contribute to these discussions. The prohibition of legal trade does not prevent illegal trade and may even encourage it, as the article in this issue by Lobkov *et al.* on Gyrfalcon smuggling in Kamchatka illustrates. Developing a system so that wild-sourced falcons can be sustainably harvested for Arabic falconry is urgently required before the wild birds, and hence their use in traditional falconry, disappears forever.

Arabic falconers are the most important part of the protection v. utilization debate, and conservation policy cannot be effective without regard to the reality ‘on the ground’ in the Middle East and the Asian range states of the Saker. Unless the Arabic falconers and the passion they feel for the tradition of Arabic falconry is taken into consideration, then all the paper resolutions planted by European protectionists will not take root in the deserts of Arabia.

We have included articles on Houbara Bustards because of their importance to falconry. In Iran and Yemen Houbara populations are threatened. In Iran the high mortality is thought to be due to an increase in poaching. It is interesting that many falconers are more aware that the trade in smuggled Houbara is damaging wild populations and by default, harming their sport. Whether this realisation can be translated into self-will to cease using these birds quickly enough is another matter. The provision of sufficient captive bred Houbara produced locally for training purposes would be a realistic counterbalance to providing an alternative to the use of poached and smuggled birds.

Our veterinary articles focus on a number of topics. Naldo and Samour present a well-illustrated guide to the common endoparasites of falcons that will be a very useful reference for laboratories. An article by Dr Koutsos highlights an easily overlooked consideration for breeding projects - that on the nutrition of the prey used to feed raptors is of critical importance.
Saker Falcon breeding population estimates. Part 2: Asia

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Summary
In this paper I review current knowledge on the status of breeding Saker Falcons in the Asian part of their global breeding range. The species breeds in 10-13 different Asian countries with the greatest densities found in semi-desert, steppe and plateau habitats of Central Asian states (mainly within Kazakhstan, Russia, Mongolia and China). Overall the Asian breeding population is likely to be between 8,000-17,000 pairs, though it is believed to be declining overall. The population estimates for most Asian countries are based on very limited data and it is not possible to assess their accuracy, whilst for the remaining countries we can merely guess at the status of the species. I have reviewed previous population assessments, especially in relation to that made for the IUCN listing of the Saker as Endangered in 2004. Given the logistical problems of obtaining accurate population data for large parts of the Asian breeding range, I suggest that alternative methods such as measures of adult turnover rates and monitoring of constant areas is the best way to assess the population trends of breeding Saker Falcons in Asia. Knowledge of the breeding population status and trends is vital for successful conservation and continued utilisation of the species for falconry.

Introduction
This article follows-on from my previous assessment of the Saker Falcon breeding population in the European part of Eurasia (Dixon, 2007). By far the greater proportion of the global Saker Falcon population breeds in Asia i.e., east of the Ural Mountains, Caspian Sea and Caucasus (Baumgart, 1991). The last major review of the Saker Falcon population in Asia was conducted by BirdLife in 2004 for evaluation of the Saker’s IUCN listing, which resulted in its conservation status being uplisted from ‘Least Concern’ to ‘Endangered’ (BirdLife 2004a; 2004b). For Saker Falcon population estimates and trends in the Asian part of its global breeding range the evaluation relied entirely on data presented in Potapov et al. (2001) and ERWDA (2003), which estimated that there were between 3200-3900 pairs of Sakers breeding in Asia (Table 1).

<table>
<thead>
<tr>
<th>Country</th>
<th>Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Russia</td>
<td>550-700</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>200</td>
</tr>
<tr>
<td>Pakistan</td>
<td>10</td>
</tr>
<tr>
<td>Iran</td>
<td>50</td>
</tr>
<tr>
<td>Iraq</td>
<td>60</td>
</tr>
<tr>
<td>Afghanistan</td>
<td>40</td>
</tr>
<tr>
<td>Uzbekistan</td>
<td>100-150</td>
</tr>
<tr>
<td>Turkmenistan</td>
<td>50</td>
</tr>
<tr>
<td>Kyrgyzstan</td>
<td>150-200</td>
</tr>
<tr>
<td>China</td>
<td>1000-1200</td>
</tr>
<tr>
<td>Mongolia</td>
<td>1000-1200</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3210-3860</strong></td>
</tr>
</tbody>
</table>

Table 1. Population estimates produced by ERWDA (2003) based mainly on presentations reported in Potapov et al., (2001). The Russian total includes 110 bp that were estimated to breed in European part of the country (Galushin et al., 2001).

Using these estimates as the “best available information” for the status of the Saker Falcon in 2004, BirdLife assessors compared these estimates with population estimates for 1990. However, no indication was given for the source of these 1990 data, which included the following estimates: Kazakhstan (1000-3000 bp), Kyrgyzstan (500-600 bp), Turkmenistan (60 bp), Uzbekistan (1000-1500 bp) and Mongolia (2668 bp). The comparison of the ERWDA estimates with these unattributed, earlier population estimates for 1990 was taken as evidence of a massive and rapid population decline, particularly in Central Asian states.

The Asian Population
The Asian range of the Saker Falcon extends across some of the most remote and difficult-to-reach areas of the world, and it includes many countries where there are few ornithologists with the resources necessary to undertake bird surveys (Dixon, 2005). Consequently, Saker breeding population estimates for range countries in Asia are scarce and those that do exist need to be carefully appraised as the estimates may be inaccurate. A population estimate produced by ERWDA (2003) for the whole of the Saker Falcon’s Asian breeding range amounted to only 3,200 – 3,900 breeding pairs at the beginning of the 21st Century. For the same time period, ERWDA (2003) estimated that between 6,825-8,400 Sakers were used annually in Arabic falconry, with juvenile females comprising 77% of birds, adult females 19%, juvenile males 3% and adult males 1% (Table 2). If the average productivity of successful nests is estimated as three chicks then the trapped juvenile birds would represent the progeny of a minimum of 3250-4550 successful breeding pairs, suggesting,
somewhat unrealistically, that virtually every young female Saker Falcon produced each year in Asia is trapped for use in Arabic falconry. Barton (2003) reported that only 2.7% of wild young Saker Falcons implanted with microchips were subsequently detected at falcon hospitals in the UAE i.e., 21/748 (4.4%) juveniles from Kazakhstan and 3/428 (0.7%) juveniles from Mongolia. These two estimates (wild breeding population size and number of falcons trapped) do not sit comfortably together and one, or both, estimates must be inaccurate. The mean estimate of the number of wild Saker Falcons used in Arabic falconry in 2001 produced by ERWDA (2003) represents a significant increase in usage compared with an earlier estimate of 1,500-2,500 Sakers trapped annually in 1990-92 (data in Riddle & Remple, 1994). Both Barton (2000), for the period 1993-98, and ERWDA (2003), for the period 1993-2001, reported a decline in the usage of Sakers in the UAE.

<table>
<thead>
<tr>
<th>Female</th>
<th>Male</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ad</td>
<td>Juv</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>760</td>
<td>3080</td>
</tr>
<tr>
<td>Qatar</td>
<td>190</td>
<td>770</td>
</tr>
<tr>
<td>UAE</td>
<td>143</td>
<td>578</td>
</tr>
<tr>
<td>Bahrain</td>
<td>143</td>
<td>578</td>
</tr>
<tr>
<td>Kuwait</td>
<td>143</td>
<td>578</td>
</tr>
<tr>
<td>Total</td>
<td>1473</td>
<td>5968</td>
</tr>
</tbody>
</table>

Table 2. Estimated number of wild-caught Saker Falcons used in Arabic falconry (using data from ERWDA (2003) and does not include an additional estimate of mortality from trapping).

If we knew the area of origin, the number used and the harvest rate for the wild-sourced Sakers that are used in Arabic falconry, we could gauge the size of the breeding population. Unfortunately, there is no reliable data on the number of wild Saker Falcons used each year, but it is likely to fall within the range of estimates produced previously of 1,500-8,400 birds. The number trapped in the wild is likely to be 5-10% higher because mortality rates are high as the birds are smuggled across international borders. We also do not know the proportion of the wild population that is trapped each year but we do know that this will vary between sexes and age classes. If we assume a 50:50 sex ratio of nestlings implanted with microchips and that 80% of microchip recoveries were of females, then data from Barton (2003) indicates that somewhere between 1-7% of female fledglings are harvested each year. A harvest of 10% to supply 1,200 juvenile females for the Arabic falconry market would indicate a ‘source’ population of ca. 11,500 breeding pairs of Saker Falcons, most of which would breed in Asia. If the number of young female Sakers used in Arabic falconry each year is much higher, as claimed by some authorities, then either (i) the harvest rate is much higher than 10% or (ii) the source breeding population is much larger than ca. 11,500 breeding pairs. It is not possible to determine which is true, but it is clear that the population estimates in Asia do not fit with estimated annual harvesting levels.

**Afghanistan**

There is no good data on the breeding population in Afghanistan. In the first half the 20th Century Sakers apparently bred commonly in the Pamir foothills of northern Afghanistan (Paludan, 1959). The Saker was reported mainly as a wintering and passage bird in the Kabul region in the early 1970’s, though it was thought they also possibly bred in the mountain regions west of the capital (Smith, 1974).

It is likely that Sakers also breed (or used to breed) in regions bordering Turkmenistan and Iran where there are existing breeding populations. Many falcon trappers, often supplying Pakistani dealers, are active in the country, especially in northern, central and eastern Afghanistan.

**China**

The Saker breeds in northern and western China. In Xinjiang, surveys in 2005-06 of the eastern Junggar Basin found Sakers breeding at a low density of 0.09 to 0.21 bp/100 km². Based on the availability of suitable habitat there are probably 250-650 bp in Xinjiang. On the Qinghai-Tibetan Plateau, surveys in 2003-4 and 2007-08 found a large breeding and wintering population. The region covers some 2.5 million km², and a conservative breeding density estimate of 0.1 bp/100 km² (or 1 pair per 1000 km²) gives a population estimate of 2,500 breeding pairs. Sakers also breed in Sichuan, Gansu, Ningxia and Inner Mongolia, and possibly Shaanxi and Heilongjiang. The overall Chinese breeding population is likely to fall within the region of 3,000 to 5,000 breeding pairs.
The Qinghai-Tibetan Plateau is undoubtedly the most important region for the Saker Falcon in China with a large breeding and wintering population. Elsewhere, Sakers breed at low density in the steppe and desert steppe of the autonomous regions of Xinjiang and Inner Mongolia. Though breeding densities are low (except for parts of the Qinghai-Tibetan plateau) the areas are huge (4.8 million km² in Tibet, Qinghai, Xinjiang and Inner Mongolia). In these areas of China the Saker populations are closely-linked to their favoured mammalian prey: Plateau Pika (Qinghai/Tibet), Great Gerbil (Xinjiang) and Brandt’s Vole (Inner Mongolia). Government-sponsored eradication programmes for these ‘agricultural pests’ are carried out in each of the three regions, whilst steppe and plateau habitats are under pressure from various economic and agricultural developments. Further threats to the species include problems with electrocution on power distribution lines and trapping for falconry. Consequently, I believe that the population trend in the country is likely to be declining overall.

India
A rare migrant to the Indian subcontinent between October and April, but with summer sightings in suitable breeding habitat in Ladakh (Naoroji, 2006). The Changthang region of Ladakh is a western extension of the Tibetan Plateau where Sakers have been sighted in summer and other ‘plateau’ raptors, such as Upland Buzzard *Buteo hemilasius*, have been proven to breed; so it is possible a small breeding population exists here.

Iran
Formerly widely distributed as a resident breeding bird throughout much of the country but the breeding range has reportedly contracted markedly in recent years. The species has been extirpated as a breeding bird from the mountains in the centre of the country. In Khorasan province Sakers still breed in reasonable numbers in the mountainous regions bordering Afghanistan and Turkmenistan, where it is unsafe for falcon trappers and poachers to operate. In 1999 ‘reasonable’ numbers still bred in the Hazar Masjed Mountains and in 2003 there was a good breeding population in the rugged plains of Torbet-e Jam in northeastern Iran (M. Hamedi, *In Litt*).

Iraq
The Saker was formerly known mainly as a passage and wintering bird in Iraq, where it was prized for falconry up until the early 20th Century. It was reported to breed in the Jebel Hamrin ranges (Allouse, 1953), which extend along the Iranian border from east of Baghdad to Kirkuk, forming part of the extensive Zagros mountain chain.

Kazakhstan
Karyakin *et al.* (2005c) produced population estimates for western and northern Kazakhstan of 1349-1592 breeding pairs, whilst data from eastern Kazakhstan produced estimates of 80-150 breeding pairs in three surveyed areas (details below).

A 2006 survey for the Central Asian Important Bird Areas Project produced a population estimate of 20-30 bp of Sakers in the Kalba region of East Kazakhstan (Smelansky *et al.*, 2006). In the Pavlodar region, surveys of the forest steppe zone bordering Russia in 2005 and 2007 identified 27 breeding territories with a population estimate of 39-42 pairs in the surveyed area (Karyakin *et al.*, 2005b; Levin *et al.*, 2007). In East Kazakhstan monitoring has recorded a continuing breeding population decline over the period 2000-08 in a study area covering the Tarbagatai and Manrak Mountains and in 2008, there were an estimated 17-67 breeding pairs in the surveyed population (Levin & Dixon, 2008). The same data was used to produce a regional population estimate of 24-131 breeding pairs across eight mountain ranges covering 20,627 km² of Eastern Kazakhstan (Levin, 2008).

In Aqtobe, surveys of the Shagyray Plateau resulted in a population estimate of 6-8 bp in a 150 km² study area (Pazhenkov and Korzhev, 2006). Surveys of the Mugdzhary Mountains, in 2005-06 found evidence of recent breeding by only two pairs of Saker Falcons,
indicating that the species is very rare in this region, which covers 8,900 km² (Karyakin et al., 2007). Surveys of the Aral region estimated a breeding population of 130-245 breeding pairs (Karyakin et al., 2005c). In Qaraghandy, a 2005 survey in the Ulutau region covering 20,000 km² resulted in a population estimate of 28-38 bp centred in the Ulutau Mountains (Karyakin & Barabashin, 2006). In Mangghystau, surveys of the Caspian-Aral region recorded 233 pairs of Sakers in 18 survey plots in 2003-04 (data in Karyakin et al., 2005a).

Given that no data exists for an enormous area of suitable breeding habitat in Kazakhstan, the current breeding population of the country undoubtedly exceeds 2000 breeding pairs. For those areas where there is survey data, there are potential problems associated with the accuracy of the survey estimates due to the large size of the survey areas and with extrapolation of this data to even larger geographical regions. For example a recent paper by Levin (2008), details 19 breeding attempts found during a 36-day survey of 20,627 km² of mountainous terrain in Eastern Kazakhstan (an area the size of Wales). The survey involved checking sites that were known to be formerly occupied by Sakers, but it cannot be regarded as a comprehensive survey covering all breeding pairs of Sakers in this region.

Kyrgyzstan
The Saker was described as abundant in the early 20th century (Sushkin, 1908), but the population reportedly declined during the 1970’s (Varobyor & Shukarov, 1985), such that by the early 1980’s the breeding population of the Issyk-kul depression was given as 12-15 bp (Galushin & Pererva, 1983). In the 1980’s-1990’s a population of 120 individuals was estimated in an area of 6558 km² in the northern Alatoo Mountains, especially in the foothill steppes and mountain meadows (Shukurov & Davlyabekov, 2001). A 1998 survey of 35 known former nesting sites in the Issyk-kul region found only 5 sites occupied and illegal trapping for the falconry trade was identified as the main factor affecting the population (Gott et al., 2000). A wider survey in 1999 located eight nests in the Issyk-kul-Naryn area (Turganbayev et al., 1999), and in 2007 breeding pairs were found in the Alatoo Mountains and remote areas near the Chinese border (M. Andersen, In Litt). The most recent population estimate was of 100-120 bp (Shukurov & Davlyabekov, 2001).

The population estimate is based on very limited field surveys and is essentially little more than an educated guess by researchers who have some experience working on the species in the country. Following independence in the early 1990’s the much diminished breeding population was further affected by falcon trapping involving locals and foreigners (especially from Syria and Pakistan).

Mongolia
The Saker Falcon breeds throughout the whole of Mongolia in mountain, steppe, forest-steppe and desert steppe zones. With over 1,000,000 km² of steppe, desert-steppe and forest steppe in Mongolia (Vostokova & Gunin, 2005), a conservative estimate of 0.2 breeding pairs/100km² produces a population estimate of >2000 bp (or 1 breeding pair/500km² of steppe).

Shagdarsuren et al. (2000) produced annual estimates of the Mongolian breeding population for 1998-2000 of 2823, 2961 and 2224 bp respectively. For the period 1998-2005, Gombobaatar et al. (2007) reported an average annual breeding density of 0.47 bp/100 km² (range 0.13 to 0.97 bp/100 km²) within several study areas of the Mongolian steppe zone. In the steppe zone of central Mongolia the breeding density of Saker Falcons varies spatially in relation to the availability of nest sites and temporally in relation to food supply. In three mountain block survey areas of 36, 236 and 240 km² the combined Saker breeding density in 2006-07 was 5.5 bp/100km² (range 4.2 to 16.7 bp/100 km²; Dixon et al. unpublished data). Elsewhere in central Mongolia, in the 499 km² Khustain Nuru Nature Reserve, where grazing is strictly controlled, there are only three regular breeding pairs of Sakers i.e., 0.6 bp/100km² (D. Usukhjargal).
In a 2005 survey of ca. 1,500 km² of flat steppe habitat four breeding pairs of Sakers were found utilising man-made structures such as buildings for water wells and livestock shelters, giving a breeding density of 0.3 bp/100 km². In my opinion, estimates within the range of 0.1 to 0.3 bp/100 km² are likely to accurately reflect Saker breeding densities in flat steppe habitats. Man-made structures provide nesting sites for Sakers in flat landscapes allowing the species to breed in such habitats (Ellis et al., 1997; Potapov, 1999), though Sakers have been recorded breeding on flat ground (Potapov et al., 2001). In order to estimate the Saker population in the steppe zone of Mongolia, an area of 406,700 km² comprising both flat and hilly landscapes, I have estimated that Sakers breed at a density of 0.2 to 0.5 bp/100 km². For the forest-steppe and desert steppe zones (covering 344,100 and 328,500 km² respectively) the breeding density is likely to be somewhat lower, at an estimated 0.1 to 0.3 bp/100 km². This gives a population estimate of between 1400-4100 breeding pairs.

Young Saker in an old Raven’s nest on an electricity pylon in central Mongolia (© A. Dixon)

Potapov et al., (2002) reported that there was ca. estimated that 1100 Sakers bred on poles of the electricity transmission and distribution network. In the steppe zone in 2006 Sakers were breeding at a density of 5.27 bp/100 km of electricity transmission line (171 km surveyed) and 2.94 bp/100 km of distribution line (102 km surveyed; Dixon et al. unpublished data). There are over 4000 km of electricity transmission lines in central Mongolia, which potentially supports ca. 210 breeding Sakers. The length of electricity distribution lines in central Mongolia is not known, but is estimated to be of approximately the same length as the transmission lines and could possibly support a further 120 breeding pairs. The breeding density of Sakers in the remaining 24,000 km of power line is likely to be lower than that found in the power lines crossing the predominantly flat, steppe landscape of central Mongolia, and I estimate that in Mongolia 400-500 pairs of Saker Falcons breed on electricity power lines.

Combining the breeding density estimates provided above with the estimates for Sakers breeding on power lines I estimate that the Mongolian breeding Saker Falcon population probably lies within the range of 2,000 to 5,000 breeding pairs.

It is not possible to accurately assess recent population trends across the whole of Mongolia, though Gombobaatar et al., (2007) reported a fluctuating but overall stable population for the period 1998-2005. Surveys from 2005-08 indicate a stable breeding population in the central Mongolian steppe (A. Dixon and N. Batbayar, Unpub. Data), whilst an experimental study to artificially increase the breeding population indicates that a large non-breeding population exists in nest-site limited steppe areas (Dixon et al., 2008).

The population estimates of Shagdarsuren et al. (2000) were based on extrapolation from five survey areas totalling 16,948 km² i.e., 1.1% of Mongolia. However, the vast size of the survey areas meant that coverage was incomplete and thus the recorded breeding densities within the survey areas were minimum estimates, averaging 0.2 bp/100 km². The breeding density data presented by Gombobaatar et al. (2007) is derived from the same survey areas reported by Shagdasuren et al. (2000), though the latter authors refrained from using this data to estimate the national breeding population. It is important to note that the selection of these survey areas was not random. In the steppe, desert-steppe and desert zones of Mongolia there are few suitable nesting sites for Sakers away from mountains, thus it is not possible to extrapolate from the breeding densities recorded in mountain areas to much larger landscape regions that include flat or rolling featureless plains. Consequently, I have used density estimates from recent intensive surveys of smaller study areas in central Mongolia that have been scaled-up to produce an overall breeding density estimate for the steppe zone of Mongolia i.e., 0.2 to 0.5 bp/100km². However, the population estimate I have provided is very sensitive.
to the breeding density estimates as a small increase of 0.1 bp/100 km² adds over 1000 breeding pairs of Saker Falcons to the national population estimate!

**Pakistan**
A scarce winter visitor, mainly to the mountains and foothills of Baluchistan and the North West Frontier Provinces (Naoroji, 2006). Possibly breeds (or formerly bred) in the mountainous areas of the North West Frontier Provinces.

**Russian Federation (Asian part)**
In Asiatic Russia the Saker Falcon breeds in the southern Siberian regions of Chelyabinsk, Kurgan, Tumen, Omsk, Novosibirsk, Kemerovo, Krasnoyarsk and Chitinn, the Altai Territory, the Republics of Altay, Tuva, Khakasia and Buryatia. The breeding population of Sakers in these areas was assessed by Karyakin et al. (2004; 2008). The regions of Cheylabinsk to Novosibirsk, covering the border region with Kazakhstan from the Urals and the Ob River, were estimated to support 80-125 breeding pairs, mostly in patches of steppe within pine forests. The Altai-Sayan region was estimated to support a further 1700-2250 breeding pairs, with significant concentrations in the Ubsu-nur and Tuva depressions, and in the Altai Mountains. In Buratia, in the steppes surrounding Lake Baikal, it was estimated that there are a further 135-165 breeding pairs (Karyakin et al., 2006). In south-eastern Siberia the status of the Saker is poorly known though the species probably breeds in southern areas of the Chitinn region bordering Mongolia and in Ussuriland (Kuryukov, 2002). Karyakin (2008) produced a recent population estimate for the whole of Russia of 1854-2542 breeding pairs in 2007, further noting severe declines in European Russia and smaller declines in the main population centre in central Siberia.

The population estimates derived by Karyakin and his co-workers result from field surveys of large study plots across a vast swathe of southern Siberia, from the Urals in the west to Lake Baikal and beyond in the east. The accuracy of the Saker counts within the study plots, which averaged ca. 5000 km² for six of the plots in the Altai-Sayan region, is not known. With such large survey plots and limited time the risk of under-recording must be high. Breeding density measures from the study plots were then extrapolated across a wider area, taking into account the relative proportions of various habitat types. However, when extrapolating over such large areas account must be made for regional variation in breeding densities within similar habitat types. Despite my caveats relating to under-recording and problems of extrapolation, the surveys undertaken by Igor Karyakin and his co-workers represent a phenomenal effort given the size of the Saker breeding range across southern Siberia.

**Tajikistan**
In the first half of the 20th Century the species was recorded breeding at low densities in river valleys and mountain areas in the western half of Tajikistan (Ivanov, 1940). Later reports indicated that the Saker has a widespread distribution over this mountainous country but are generally scarcer in the high Pamirs of the east than in the mountains and river valleys of the west (Abdusalyamov, 1971). In the 1990’s falcon trapping by locals and foreigners (especially Syrian nationals) was widely practiced, mainly targeting autumn passage birds though some young were also taken from nests (M. Roustain, *In litt*).

**Turkmenistan**
An assessment published towards the end of the 20th Century reported that Sakers were widely distributed in the country with the main breeding areas being the mountains and foothills of the Kopet Dag bordering Iran, hills in the central Karakum Desert, the Usturt Plateau, the Badhyz region close to the Afghanistan border and the mountain foothills of the far east, with a population estimate of 150 bp in the late 1990’s (Saparmuradov, 1999). There is not enough data available to assess the accuracy of this population estimate or to determine recent population trends. Uncontrolled trapping for the falconry trade and habitat loss are cited as factors affecting the Saker population in Turkmenistan (Saparmuradov, 1999).

**Uzbekistan**
The Saker is widely distributed across the country, breeding along the southern and eastern escarpments of the Usturt Plateau, the Kyzylkum Desert, the Bukhantau Mountains of central Uzbekistan through the Naratau to the Zarev Mountain ridge in the southeast and in the Talass Mountains of the north east (Mitropolsky et al., 1987). Breeding numbers apparently increase when rodent populations are high and Sakers have bred on electricity pylons since the mid 1970’s in the plains of the Kyzylkum Desert. The breeding population has been estimated as 100-150 bp (Kreuzberg-Mukhina et al., 2001). Following the break-up of the Soviet Union many people resorted to trapping falcons to obtain an income, encouraged by reports of the high prices they fetched, though this high level of indiscriminate trapping had diminished by the late 1990’s (E. Kreuzberg-Mukhina, *In litt*). During the 1990’s many falcon trappers from Pakistan were also active in Uzbekistan (S. Zinovyev & E. Peregonstsev, *In litt*).
Table 3. Asian Saker Falcon population estimates by country (breeding pairs). Population trend data relates to the 15-year period prior to the estimate.

<table>
<thead>
<tr>
<th>Country</th>
<th>Population Estimate</th>
<th>Date of Estimate</th>
<th>Data Quality*</th>
<th>15 Year Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>0-10</td>
<td>2006</td>
<td>D</td>
<td>Unknown</td>
</tr>
<tr>
<td>Iran</td>
<td>10-100</td>
<td>NA</td>
<td>E</td>
<td>Unknown</td>
</tr>
<tr>
<td>Iraq</td>
<td>0-50</td>
<td>NA</td>
<td>E</td>
<td>Unknown</td>
</tr>
<tr>
<td>Kyrgyzstan</td>
<td>100-120</td>
<td>2001</td>
<td>D</td>
<td>Declining</td>
</tr>
<tr>
<td>Uzbekistan</td>
<td>100-150</td>
<td>2000</td>
<td>D</td>
<td>Declining</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>1500-3000</td>
<td>2007</td>
<td>C</td>
<td>Declining</td>
</tr>
<tr>
<td>Turkmenistan</td>
<td>100-150</td>
<td>NA</td>
<td>E</td>
<td>Unknown</td>
</tr>
<tr>
<td>Tajikistan</td>
<td>10-100</td>
<td>NA</td>
<td>E</td>
<td>Unknown</td>
</tr>
<tr>
<td>Afghanistan</td>
<td>10-100</td>
<td>NA</td>
<td>E</td>
<td>Unknown</td>
</tr>
<tr>
<td>Pakistan</td>
<td>0-50</td>
<td>NA</td>
<td>E</td>
<td>Unknown</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>2000-3000</td>
<td>2008</td>
<td>C/D</td>
<td>Stable/Declining</td>
</tr>
<tr>
<td>Mongolia</td>
<td>2000-5000</td>
<td>2008</td>
<td>D</td>
<td>Stable</td>
</tr>
<tr>
<td>China</td>
<td>3000-5000</td>
<td>2008</td>
<td>D</td>
<td>Declining</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>8840-16830</strong></td>
<td><strong>NA</strong></td>
<td><strong>B-D</strong></td>
<td><strong>Declining</strong></td>
</tr>
</tbody>
</table>

* Data quality scores for the population estimates are based on the following criteria: A = excellent, quantitative data available with precision estimates based on comprehensive survey work; B = good, quantitative data available, based on extensive field work; C = medium, quantitative data available, based on limited field work; D = poor; no quantitative data available and limited field surveys; E = No data, guess.

**Discussion**

Our knowledge of Saker Falcon breeding populations in much of Asia is still incomplete; nevertheless current information indicates that the population is much larger than previously thought. This is especially true for Kazakhstan where the population is at least ten times larger than the previous estimate (≥ 2000 cf. 200 bp). This is not due to a massive increase in the population of Kazakhstan in the last seven years, but is the result of an erroneous estimate which stated that “the total population in Kazakhstan is estimated at no more than 150-200 pairs” (Levin, 2001). We know now that in some parts of Kazakhstan the breeding population is stable (e.g., forest steppe of northwest) whereas in other areas it is declining (e.g., eastern Kazakhstan). The highest breeding densities are found in western Kazakhstan but we know nothing of the population trend in this region.

Overall, the 15-year trend data indicates that the Asian Saker Falcon is declining, though evidence for any decline is circumstantial for China, which is potentially the country with largest breeding population. Evidence for a population decline in Russia is based on data from surveys led by Igor Karyakin, who has monitored Sakers across a huge area for over 10 years and is in a unique position to be able to assess the recent population trend of the species. In Mongolia, the breeding population of the central steppe zone is at least stable and is limited by the availability of nest sites, but for other parts of the country there is no good data on the status of the species. We are unlikely to ever get good, accurate population measures with confidence intervals for any Saker populations in Asia (no such estimate is even available for any European country). There is little value in trying to compare a modern, but vague population estimate with an older, even ‘vaguer’ population estimate! We need to look at alternative ways of determining population trends, such as using measures of breeding population turnover rates and/or accurate population monitoring of constant study plots. The establishment of a monitoring system in key areas of the global breeding range is essential if the conservation status of the Saker is to be accurately assessed (for the best use of scarce conservation resources) and if falconers wish to harvest wild-sourced birds in a demonstrably sustainable manner. There are opportunities to support conservation through wise and sustainable use but it requires a change in the mind set of those who seek total protection for the species from exploitation and from those who exploit the wild population with no thought on its impact.

**Note:** A fully referenced version of this article and my previous article on the European Saker population can be found online at www.mefrg.org
Illegal trapping of Gyrfalcons in Kamchatka

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² Kamchatkan Branch of the Pacific Institute of Geography of the Far-Eastern Branch of the Russian Academy of Science, pr. Rybakov 19A, Petropavlovsk-Kamchatskiy, 683024, Russia. E-mail: bird62@rambler.ru
³ Center for Rescue of Rare Birds of Prey, Petropavlovsk-Kamchatskiy, 683024, Russia.

Combined data from Russian federal authorities suggests that from 1991–2006, 234 Gyrfalcons Falco rusticolus were confiscated from illegal trappers in the Kamchatka-Koryakin region. In 1999 the Ministry of Inner Affairs and the Federal Security Service began to locate and arrest Gyrfalcon trappers. Since then more than 30 falcon trappers have been caught and by 2006 at least 20 Gyrfalcons had been confiscated. It is likely that the number of birds seized is only a fraction of the real number of trapped birds since many die when being held in captivity or during transportation, whilst many will go undetected as the trappers devise more elaborate ways to smuggle falcons.

According to current estimates, between tens to hundreds of Gyrfalcons are exported out of Kamchatka annually (Gordienko & Nechitailov, 2000). Gyrfalcons are trapped annually on their autumn migration and in their wintering grounds in Kamchatka. Most end up on international markets for the falconry trade, mainly in Arabic countries where Gyrfalcons are popular among falconers as a hunting species. Russia is considered to be the main source of illegally trapped wild Gyrfalcons (Sorokin, 2005) and we believe the majority of these birds originate from the Kamchatka region.

Female white or pale-coloured Gyrfalcons fetch the highest prices on the black market due to their aesthetic appeal combined with their larger size than males. This specific market demand reflects the type of birds trapped and exported from Kamchatka. Tables 1 and 2 give data of birds confiscated from trappers for the period 1999 – 2006.

<table>
<thead>
<tr>
<th>Year</th>
<th>Gyrfalcons confiscated (Number aged)</th>
<th>Juveniles (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>2 (0)</td>
<td>?</td>
</tr>
<tr>
<td>1995</td>
<td>2 (0)</td>
<td>?</td>
</tr>
<tr>
<td>1999</td>
<td>13 (13)</td>
<td>8 (62)</td>
</tr>
<tr>
<td>2000</td>
<td>36 (36)</td>
<td>29 (81)</td>
</tr>
<tr>
<td>2001</td>
<td>25 (22)</td>
<td>19 (86)</td>
</tr>
<tr>
<td>2002</td>
<td>54 (42)</td>
<td>38 (90)</td>
</tr>
<tr>
<td>2003</td>
<td>19 (17)</td>
<td>17 (100)</td>
</tr>
<tr>
<td>2004</td>
<td>29 (15)</td>
<td>15 (100)</td>
</tr>
<tr>
<td>2005</td>
<td>32 (22)</td>
<td>22 (100)</td>
</tr>
<tr>
<td>2006</td>
<td>22 (22)</td>
<td>20 (91)</td>
</tr>
<tr>
<td>Total</td>
<td>234 (189)</td>
<td>168 (89)</td>
</tr>
</tbody>
</table>


Selectiveness in the trapping of Kamchatkan Gyrfalcons is expressed as the following:

1. Overall 89% of the birds exported by poachers consist of young falcons (Table 1). Since 2003 mostly young birds have been recorded in confiscated Gyrfalcons.
2. 74% of exported Gyrfalcons are female; and 19 of 22 specimens where the colour morph was recorded were white specimens (Table 2).

Many confiscated Gyrfalcons are released back into the wild after confiscation by officials. Some are rehabilitated prior to release by the Centre for the Rescue of Rare Birds of Prey in Kamchatka. Since 2001 the Centre has released 29 Gyrfalcons back into the wild in Kamchatka. Table 3 shows the number of Gyrfalcons released by officials following confiscation, and the number of Gyrfalcons rehabilitated and then released by the Centre.

Illegal trade in Gyrfalcons continues to occur in Kamchatka-Koryakin region. The law is rarely enforced and punishments for poachers often do not outweigh the benefits of participation in this illegal trade. As a result of the ineffectiveness of current...
legislation, we suggest that a legal and regulated sustainable commercial trade in Gyrfalcons is initiated, based on scientific sustainability studies of the current population. In addition we argue that to complement a legal sustainable trade, more efficient measures must be put in place to prevent unregulated illegal trade.

Editors Note: This article was extracted and edited by Luke Halpin from a larger paper published in Russian by Lobkov et al. (2007) and translated by Jevgeni Shergalin.

References


<table>
<thead>
<tr>
<th>Year</th>
<th>Total Gyrfalcons confiscated</th>
<th>No. Females (%)</th>
<th>No. White Morph</th>
<th>No. Grey Morph</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999-2000</td>
<td>33</td>
<td>25 (76)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2001</td>
<td>5</td>
<td>3 (60)</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>2002</td>
<td>13</td>
<td>13 (100)</td>
<td>13</td>
<td>-</td>
</tr>
<tr>
<td>2005</td>
<td>18</td>
<td>10 (56)</td>
<td>6</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>69</td>
<td>51 (74)</td>
<td>19</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 2. Sex and morphological data for confiscated Gyrfalcons where sex was determined (morphological data only relates to females).

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Released just after confiscating</th>
<th>Accepted for rehabilitation</th>
<th>Fate of rehabilitated birds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Released just after confiscating</td>
<td>Accepted for rehabilitation</td>
<td>Total*</td>
</tr>
<tr>
<td>2001</td>
<td>25</td>
<td>22</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>2002</td>
<td>54</td>
<td>42</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>2003</td>
<td>19</td>
<td>17</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>2004</td>
<td>29</td>
<td>15</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2005</td>
<td>32</td>
<td>22</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>2006</td>
<td>22</td>
<td>1</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>181</td>
<td>119</td>
<td>36</td>
<td>40</td>
</tr>
</tbody>
</table>

Table 3. Gyrfalcon release data. * in 2003, 2004 & 2005 an extra 4 birds were delivered to the centre as wounded.
Countdown for the Houbara in Yemen!

Jacky Judas, Mark Lawrence & Olivier Combreau

National Avian Research Center, Po Box 45553, Abu Dhabi – E-mail: jjudas@ead.ae

Historically, Houbara Bustards bred over most of the Arabian Peninsula except the largest desert area of the Khub Al-Khali and the western mountains of Hijaz and Asir. These populations were mainly resident, which didn’t exclude movements of a few hundred kilometers in the Peninsula. In few decades, with the spread of cars, the development of communication, habitat change and the increase of hunting pressure including falconry, Houbara populations were drastically reduced. Resident Arabian Houbara populations persist nowadays in only a few remote areas of Northern Saudi Arabia, West and central Oman, East and North Yemen.


Migrant populations of Houbara breeding in central Asia (mainly in Kazakhstan, China, and Mongolia,) move to Arabia in autumn to spend the winter on the peninsula. They move back to their breeding grounds in spring. These migrant populations do not mix with resident Houbara from Arabia. Genetic analysis of micro-satellites conducted on the variability of 19 loci revealed that the Yemeni population differs from all other Asian populations and has its own genetic characteristics.

The decrease of the Houbara population in Yemen occurred later than in other parts of Arabia, but sharply and rapidly. Following the fall of the communist regime in the late eighties, Yemen opened its border to neighboring countries, and in a few years, the most easily accessible populations were decimated by few falconers. In an effort to save these last resident Houbara populations from Arabia, the National Avian Research Center (NARC), Environment Agency of Abu Dhabi signed an agreement with the Environment Protection Authority of Yemen in 2004 to develop and implement the Houbara conservation strategy. This agreement included: assessing abundance and distribution, studying the main ecological features of these populations (e.g. movements, breeding parameters, and survival rates), initiating a captive breeding program of an Arabian Houbara bloodline and working towards a self-sustaining population through habitat improvement and population reinforcement.

Image 2. Houbara survey in Yemen: questioning local people. © NARC

Surveys initiated in 2002 have been undertaken throughout Yemen by establishing collaborative works with different tribes. Houbara tracks were searched for in the sand, and local people were questioned on their knowledge on Houbara. Unfortunately, the situation turned out far from being positive. From the numerous surveys over 6 years, the total Houbara population in Yemen may range between 60 and 230 individuals, the lowest value probably being closer to reality. Satellite tracking of 10 individuals confirmed the sedentary life of these birds, which usually do not have movements exceeding 200 km. Only one male traveled in late spring 2002 from East Yemen to North-East Oman (800 km), where it spent the summer months before being killed by a hunter. Annual survival rate assessed from satellite tracking is 0.74 and reports of Houbara bustards being killed by poachers or hunters continue. With hardly more than 60 individuals, a high mortality rate, and a suspected low natural breeding success precluding natural population turnover, the Yemeni Houbara population is likely to become extinct in the near future if nothing is done to support its recovery.

NARC is continuing its effort to save the genetic specificity of the Yemeni population through egg collection to increase the captive flock of Yemeni Houbara. Developing cooperation with Oman where genetically related populations might still survive is considered part of this effort. Ultimately, offspring
from Yemeni and Omani Houbara bred in NARC facilities will be used to restock the wild population in the southern part of the Arabian Peninsula.

This program orientation will be pursued for one to two more years. Depending on natural breeding success, the ability to collect viable eggs to increase the captive flock of Yemeni and Omani Houbara, and reintroduction success, the orientation of the program might be reconsidered in accordance with Yemeni authorities. The alternative solution would be the reinforcement with resident Houbara of Pakistani origin, which constitutes the main flock of birds at NARC. Houbara of Pakistani origin were already successfully reintroduced in Saudi Arabia and in the UAE. This would lead to a partial loss of genetic diversity, but it will give a chance to the last Yemeni birds to cross-breed with Pakistani birds, and hence contributing to at least partially keeping the Yemeni bloodline.

To increase the chances of saving the Arabian Houbara from extinction, we urge falconers from all countries to stop hunting Houbara in Yemen, as long as the status of this unique population has not been restored to a level that can sustain hunting. Instead, we suggest contributing to the conservation programs by sending NARC all relevant information about Houbara presence in Yemen. Our ultimate goal is to prevent loss of traditional Arabian falconry by saving its most important quarry.

Acknowledgments
We particularly wish to thank our colleagues Mohammed Al Wahadi, Mohammed Al Baidani, Patrick Paillat and Jassim Al Hamran from NARC – EAD, Omar Ahmed Ba’ashen and Mohammed Juma’an from EPA – Yemen, Mabrook Saleh Mohsen Al Guwaibi, Saleh Ali Nasser Al Nahdi and all other persons who contributed to the fieldwork.

High mortality of Asian Houbara *Chlamydotis macqueenii* in Iran

Jacky Judas, Mark Lawrence and Olivier Combureau

The National Avian Research Center - Environmental Agency of Abu Dhabi (NARC – EAD) is monitoring migrant Houbara populations’ trends through the whole Asian distribution range of the species. Monitoring programs mainly include counts of birds in the field and satellite tracking. Since 1994, an increasing number of satellite transmitters have been deployed yearly to monitor migration routes and survival of the Houbara. Since 2005 up to early 2008, 26 Houbara have been equipped and monitored by Argos satellite-transmitters in Kazakhstan. These Kazakh Houbara might be separated in 3 distinct populations (West, Central and East Kazakhstan) having different breeding and wintering sites and migration pattern.

Houbara from West Kazakhstan on the edge of the Caspian Sea use to winter preferentially in northern Iran and Iraq (15 over 16 for which wintering areas has been identified – 94%, Table 1). Houbara from central Kazakhstan appear to winter preferentially in south Iran (4 over 6, 67%) or east Iran-Afghanistan (2 over 6, 33%).

Before spring migration 2008, 10 only of the 26 Kazakh Houbara were still alive while 15 had died and 1 went missing (this missing bird was captured in Iraq by a poacher, its transmitter was removed prior to release). Mortality was the highest among Houbara from central Kazakhstan (5 out of 7 Houbara, 71%), but was also
high in Houbara from West Kazakhstan (9 out 18, 50%). Four birds died on their breeding site (27% of the sample), 2 died en route (13%) and 9 died on their wintering site (60%). The large majority of the deaths were attributed to hunting including the 4 cases on the breeding ground in Kazakhstan. The largest proportion of deaths occurred in Iran with 7 cases out of 15 (47%) while other cases were distributed equally among other countries.

Number and proportion of death have sharply increased in the 3 last years (from 8% in 2005 to 63% in 2007 - Figure 1).

<table>
<thead>
<tr>
<th>Breeding population in Kazakhstan</th>
<th>Wintering areas</th>
<th>Bedtpakdala (Centre)</th>
<th>East</th>
<th>West</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unknown</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Afghanistan</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>border Iran-Iraq</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>central Iraq</td>
<td></td>
<td></td>
<td>6</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>North Iran</td>
<td></td>
<td>1</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>South Iran</td>
<td></td>
<td>4</td>
<td>1</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>UAE</td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Grand Total</td>
<td></td>
<td></td>
<td>7</td>
<td>1</td>
<td>18</td>
</tr>
</tbody>
</table>

Table 1. Distribution of Kazakh Houbara in winter according to their breeding area.

In the first 2 months of 2008, 6 Houbara disappeared in Iran. GPS data relayed by satellite transmitters clearly indicated the death of 2 of them. For the 4 others, the PTT suddenly stopped sending any data without any previous evidence of PTT malfunction like drop in battery level. This sudden transmitter stops are typical indication of bird being hunted; the transmitter being either destroyed or kept in places where batteries can not charge from sunlight. Houbara hunting parties are now taking place in Iran and strong indications exist that the number of Houbara being poached in Iran prior to being sold on the black market in the Gulf countries for falcon training purpose increased a lot in the last two years.

Among the 26 satellite-tracked Houbara, 17 traveled to or through Iran during the 2007 autumn migration: 7 died and 10 are still alive. Mortality of birds wintering in Iran is much higher than that of Houbara wintering in Iraq or Afghanistan (1 out of 7 and 6 out of 10 respectively). Seven Houbaras just crossed Iran and went to winter in the center of Iraq or near the Iran-Iraq border. Only one of them died. Over the 10 birds (5 males and 5 females) that went to winter in Iran (south of Tehran and south of Kerman), 6 died in the first 2 months of 2008 representing 60% of our sample of birds wintering in Iran. Four of the 5 females died and 2 of the 5 males.

This very high mortality rate, mainly concerning birds of central Kazakhstan, raises serious concern on the rapid effect it might have on the trend of wild migrant populations. Conservation measures should be quickly implemented to decrease and limit the hunting pressure on Houbara Bustards in Iran and address very seriously the growing problem of illegal trade.

Acknowledgments
We particularly wish to thank Mohamed Al Baidani and Samuel Riou for their contribution in capturing and harnessing Houbara, and all other people that have been involved in the field expeditions to Kazakhstan.

Image 2. Wintering habitat of Houbara Bustard in Iran. ©Jacky Judas
Plasma protein electrophoresis in clinically healthy Asian Houbara Bustards (chlamydotis macqueenii) Using high resolution agarose gel Electrophoresis

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Plasma protein electrophoresis is a valuable tool for evaluating health of birds, both in diagnosing disease and clinical monitoring of the avian patient (Werner and Reavill, 1999). It has been shown to be useful for the detection of acute and chronic infectious and inflammatory conditions (Cray and Tatum, 1998; Roman et al., 2005). However, proper interpretation of plasma electrophoresis results requires relevant species-specific reference ranges, due to differences in electrophoretic mobility of plasma proteins between avian species (Archer and Battison, 1997). Additional factors such as sex or age may also affect the blood profile (Cray and Tatum 1998). The objective of this abstract is to provide plasma protein electrophoresis reference values for clinically healthy Asian Houbara bustards (Chlamydotis macqueenii).

Plasma protein electrophoresis was performed at the Dubai Falcon Hospital (DFH, Dubai, United Arab Emirates) on heparinised blood samples collected from 18 adult Asian Houbara bustards. The birds were part of a private collection and had been in captivity for more than 1 year. The Houbara bustards were considered clinically healthy following physical examination. Haematology samples were within the normal ranges (Samour et al., 1994). Parasitology examinations of saline oropharyngeal swabs and faeces were negative. There were 11 male and 7 female birds. The weight of the birds ranged from 1.18 to 2.35 kg in males and 1.03 to 1.58 kg in females.

Protein electrophoresis was carried out on plasma as it is less prone to haemolysis and contains fibrinogen (Cray and Tatum, 1998). Electrophoresis was performed in a SAS 1 unit (Helena, France) with two applications at an electric voltage of 100 V for 18 minutes on a high resolution agarose gel (SAS-1 SP-24 SB) (Helena, France) and stained with a SAS 2 unit (Helena, France). Total protein was determined in an automated chemistry analyser (Mira Plus, Roche, France) by the Biuret method. For the interpretation of the peaks a densitometer software (Platinum, Helena, France) and a photo scanner (Epson 3170) were used. Controls (Kemotool, Helena, France) were run and the values were within the normal ranges. The protein fractions were determined according to the migration pattern of the controls.

All the data was normally distributed and 2-sample t-tests were performed to evaluate any differences between males and females. Reference values for total protein and the plasma protein fractions are presented in Table 1. Healthy Houbara bustards appear to have six major plasma fractions with albumin showing the highest peak. Except for the prealbumin percentage, there were no statistically significant differences between females and males.
### Table 1. Plasma protein electrophoresis concentrations (g/L) and percentages of 18 clinically healthy Houbara bustards. The values are presented as mean +/- standard deviation, range in parenthesis and * represents significant differences between males and females. A:G = albumin : globulin ratio

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Males (n = 11)</th>
<th>Females (n = 7)</th>
<th>Total (n = 18)</th>
</tr>
</thead>
<tbody>
<tr>
<td>conc. (g/L) %</td>
<td>conc. (g/L) %</td>
<td>conc. (g/L) %</td>
<td>conc. (g/L) %</td>
</tr>
<tr>
<td>Total protein</td>
<td>42.68 ± 5.7 (36 - 56) 100</td>
<td>45.29 ± 6.0 (38 - 52) 100</td>
<td>43.70 ± 5.8 (36 - 56) 100</td>
</tr>
<tr>
<td>Prealbumin</td>
<td>8.60 ± 1.3 (7.1 - 11.7)</td>
<td>20.2 ± 1.8 (16.1 - 22.7)</td>
<td>8.18 ± 1.4 (4.9 - 11.7)</td>
</tr>
<tr>
<td>Albumin</td>
<td>14.86 ± 2.0 (12.9 - 20.4)</td>
<td>34.9 ± 2.6 (31.1 - 39.6)</td>
<td>15.02 ± 1.7 (12.9 - 20.4)</td>
</tr>
<tr>
<td>Alpha 1</td>
<td>3.01 ± 1.2 (1.3 - 4.6)</td>
<td>7.06 ± 2.8 (3.5 - 10.0)</td>
<td>3.31 ± 1.3 (1.3 - 5.7)</td>
</tr>
<tr>
<td>Alpha 2</td>
<td>2.56 ± 0.9 (1.7 - 4.5)</td>
<td>5.94 ± 1.7 (4.1 - 9.1)</td>
<td>2.72 ± 1.2 (1.1 - 5.5)</td>
</tr>
<tr>
<td>Beta</td>
<td>7.20 ± 1.6 (5.2 - 10.0)</td>
<td>16.83 ± 2.8 (13.0 - 22.7)</td>
<td>17.46 ± 1.9 (3.8 - 10.6)</td>
</tr>
<tr>
<td>Gamma</td>
<td>6.45 ± 1.6 (4.0 - 9.6)</td>
<td>15.04 ± 3.0 (10.3 - 21.8)</td>
<td>17.12 ± 3.8 (14.2 - 25.3)</td>
</tr>
<tr>
<td>A:G</td>
<td>0.79 ± 0.1 (0.6 - 1.0) n.a.</td>
<td>0.71 ± 0.1 (0.5 - 0.9) n.a.</td>
<td>0.76 ± 0.1 (0.5 - 1.0) n.a.</td>
</tr>
</tbody>
</table>

References

Archer, F.J. and Battison, A.L. 1997. Differences in electrophoresis patterns between plasma albumins of the cokatiel (Nymphicus hollandicus) and the chicken (Gallus gallus domesticus). Avian Pathology 26, 865 - 870.


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### Nutritional considerations on feeding prey items to raptors

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In general, diets that are fed to rodents and other prey items such as chicks and quail are designed to support maximal growth or reproduction, and little attention has been focused on optimizing the nutritional content of the final product (i.e., the prey item) for the predator that will be consuming it. This is a very important consideration when feeding raptors, as the nutrient content of prey items can vary considerably, and will affect the nutritional status of the raptor being fed.

Although the genetics, age, life stage (e.g., reproducing or not), and sex of the prey animal have a major impact on its nutrient composition, many nutrients can be modified in the prey item in response to changing the dietary nutrient level, (Clawson et al., 1991). For example, the lipid content of quail and rats could be increased by feeding those animals higher dietary lipid levels (Clum and Fitzpatrick, 1996). Similarly, in rats, as dietary vitamin E level increased, so did plasma and testes vitamin E level (Bendich et al., 1986). By increasing the level of vitamin E in the prey item, the level of vitamin E in the raptor being fed will also

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increase. Gyr-saker falcon hybrids fed 1-day old chicks had higher plasma α-tocopherol than did birds fed turkey breast meat, and reflects the fact that the 1-day old chicks had higher vitamin E content (~400 IU/kg) than did the turkey breast meat (7.5 IU/kg) (Schink et al., 2008). Similarly, other dietary compounds may be fed at higher levels to increase their concentration in the prey item, such as dietary carotenoids in avian prey items, which may enhance immune function and antioxidant defenses of birds (e.g., (Koutsos et al., 2003)).

A comparison of proximate composition of some prey items and the recommended nutrient intake for slow growing chickens demonstrates that prey items may contain lower nutrient levels than desired to meet the needs of growing birds (Table 1). The nutrient requirements established for poultry reflect the minimal level required to prevent a nutrient deficiency, as opposed to the optimal level required for health, well-being or performance. Additionally, nutrient requirements of raptors may be higher for some nutrients (e.g., protein and amino acids and vitamin E) due to the needs of flight as well as presumably higher stress levels in captivity. Thus, it is likely that the optimal nutrient level to be fed to raptors is higher than poultry minimum requirements.

In summary, when feeding prey items to raptors, it is important to determine the nutrient composition of those prey items. Given the substantial variation in nutrient composition due to diet, it is also important to know that the supplier of those prey items is using a high quality, consistent diet when raising the prey animals. Finally, if the nutrient composition of the prey items is not ideal, they may need to be professionally supplemented, or it may be appropriate to work with the prey supplier to develop a better nutritional program for those prey animals, in order to ensure that your raptors receive the best nutrition.

<table>
<thead>
<tr>
<th>Male and Female</th>
<th>Male</th>
<th>Female</th>
<th>Quail</th>
<th>Rat</th>
<th>Mice</th>
<th>Guinea Pig</th>
<th>NRC slow growing egg-type chickens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture (%)</td>
<td>65.4</td>
<td>66.4</td>
<td>66.7</td>
<td>67.2</td>
<td>68.8</td>
<td>68.8</td>
<td>68.8</td>
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<tr>
<td>Lipid (%)</td>
<td>31.9</td>
<td>38.1</td>
<td>5.4</td>
<td>10.4</td>
<td>46.1</td>
<td>46.1</td>
<td>46.1</td>
</tr>
<tr>
<td>Protein (%)</td>
<td>71.5</td>
<td>66.0</td>
<td>63.3</td>
<td>50.1</td>
<td>7.6</td>
<td>17.0</td>
<td>26.4</td>
</tr>
<tr>
<td>Ash (%)</td>
<td>9.9</td>
<td>7.3</td>
<td>10.4</td>
<td>9.2</td>
<td>9.2</td>
<td>9.2</td>
<td>9.2</td>
</tr>
<tr>
<td>Vit A (IU/kg)</td>
<td>70294</td>
<td>76812</td>
<td>94554</td>
<td>16506</td>
<td>1500</td>
<td>1500</td>
<td>1500</td>
</tr>
<tr>
<td>Vit E (IU/kg)</td>
<td>67</td>
<td>140</td>
<td>73</td>
<td>17</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Ca (%)</td>
<td>3.4</td>
<td>2.7</td>
<td>3.6</td>
<td>3.0</td>
<td>0.7</td>
<td>0.9</td>
<td>13.9</td>
</tr>
<tr>
<td>Cu (mg/kg)</td>
<td>2.6</td>
<td>1.6</td>
<td>4.2</td>
<td>5.6</td>
<td>0.5</td>
<td>4.0</td>
<td>6.2</td>
</tr>
<tr>
<td>Mg (mg/kg)</td>
<td>549.0</td>
<td>328.0</td>
<td>492.1</td>
<td>655.1</td>
<td>600.0</td>
<td>600.0</td>
<td>600.0</td>
</tr>
<tr>
<td>Fe (mg/kg)</td>
<td>74.9</td>
<td>46.9</td>
<td>101.4</td>
<td>56.4</td>
<td>6.0</td>
<td>6.0</td>
<td>9.3</td>
</tr>
<tr>
<td>Mn (mg/kg)</td>
<td>6.4</td>
<td>2.3</td>
<td>5.3</td>
<td>6.6</td>
<td>0.0</td>
<td>30.0</td>
<td>46.6</td>
</tr>
<tr>
<td>Zn (mg/kg)</td>
<td>53.0</td>
<td>30.3</td>
<td>55.8</td>
<td>46.4</td>
<td>54.3</td>
<td>60.3</td>
<td>66.4</td>
</tr>
<tr>
<td>Calculated kcal/kg</td>
<td>5734</td>
<td>4062.5</td>
<td>4742.5</td>
<td>6203</td>
<td>6203</td>
<td>6203</td>
<td></td>
</tr>
</tbody>
</table>

Table 1. Average composition of selected prey items (data adapted from (Clum and Fitzpatrick, 1996)) compared to the NRC recommendations for slow growing egg-type chickens (NRC, 1994). NRC recommendations are for chicks fed 2900 kcal, calculated nutrient levels for higher caloric density diets are also shown. Data in red represent values below the NRC recommendations at 2900 kcal/kg diet.

Radiography and image-intensified fluoroscopy of barium passage through the gastrointestinal tract of falcons

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²Dubai Falcon Hospital, PO Box 23919, Dubai, United Arab Emirates.

Summary
Gastrointestinal contrast studies were performed in 12 clinically healthy falcons (Falco sp.) at Dubai Falcon Hospital using image-intensified fluoroscopy. This study aimed to determine the normal barium gastrointestinal transit times in healthy falcons. Falcons stood on a perch for radiographing. Vento-dorsal radiographs were taken before administration of the contrast medium. Administration of 25 ml/kg of a barium sulphate suspension directly into the crop preceded the collection of radiographs at set intervals. The time of emptying the crop ranged between 0.25 - 8.00 h (hours), median of 0.75 h (95% CI for the median = 0.40 to 5.58 h). Gizzard emptying time range was 1-8 h, median of 2.00 h (95% CI for the median = 1.00 to 8.00 h). Barium was eliminated by 8 h in most of the falcons and was well tolerated with no side effects observed.

Introduction
Diseases involving the GIT are relatively common in raptors (Heidenreich, 1995). Indications for barium follow-through examination include: vomiting and diarrhea that is not responsive to treatment, abnormal survey radiographic findings suggestive of an obstructive pattern, unexplained organ displacement, loss of abdominal detail suggesting perforation, hemorrhagic diarrhea, history of ingestion of foreign material and chronic unexplained weight lost (McMillian, 1994)

Material and Methods
Twelve healthy falcons were admitted for this study (peregrine falcon (Falco peregrinus), saker falcon (F. cherrug), red-naped shaheen (F. pelegrinoides babylonicus), lanner (F. biarmicus), and gyrfalcon-peregrine hybrid falcons (F. rusticolus x F. peregrinus)). Health check included physical examination, weight, fecal samples, and crop swab for parasitology and hematology.

Images were taken with a Premier Mini-C-arm Imaging System (Fluoroscan Imaging Systems Inc., USA). A VD radiograph was taken prior the administration of the contrast medium. Barium sulphate (Opti-up, barium sulfate for suspension, MMI, Southfield, MI, USA) was administered directly into the crop at a dosage of 25 ml/kg. Birds were fasted for 12 hours before treatment. Falcons were trained for falconry, hooded and no medication or anesthetic was administered for the procedures.

The first image was taken at 1-3 minutes after administration of contrast media. This was the time needed to put the hood on the bird, let it settle down and position it for the picture. Durations followed by pictures at 15 and 30 minutes and 1, 2, 4, and 8 hour intervals while the birds stood on a perch. Dorso-ventral and lateral radiographs were taken to determine the exact location of the barium in the GIT. Images were reviewed to determine the duration of the barium in the crop and in the ventriculus. Statistics were carried out in the Medcalc software, Mariakerke, Belgium.

Results
Twelve healthy falcons were used to determine appropriate technique and normal transit times for gastrointestinal contrast studies. Table 1 summarizes the distribution of the birds as to weight, age, sex, and species. Hematology results were within normal ranges for species at DFH. Subclinical parasitic infections were found in four birds (Serratospiculum spp. eggs and Caryospora spp.).

In the first 1-3 minutes, the contrast media was present in crop, gizzard and intestines for 11 of 12 birds in the study, one bird showed a slower passage of contrast medium from the crop to the ventriculus, with a small quantity of barium in the ventriculus and nothing in the intestines. Contraction of the crop were seen and boluses of contrast medium passing through the esophagus towards the proventriculus were easily identified. After 15 minutes barium was present in the cloaca in six of 11 birds; the crop was half full in six birds, with minimal content in four and empty in two falcons. At 30 minutes, barium was present in the cloaca of eight falcons; the crop was half full in four birds, with minimal quantity in three birds and totally empty in five birds. After one hour, there was barium in the cloaca of nine of 12 birds, eight falcons had emptied the crop; only one retained a minor volume of barium and three had a half full crop. At two hours four birds had contrast media in the ventriculus and the crop (one with just a minimum content), all had content in the intestines and 11 of 12 had barium in the cloaca. At four hours all falcons still had barium in the intestines, but five birds had a small quantity. Eleven falcons had contrast media in the cloaca. Three had content in the ventriculus. Only two birds had residual barium in the crop, one of them a very small quantity. At eight hours the intestine was empty in six of the 11, three had a small quantity and three had a large quantity. In one bird barium was totally absent at this time having
passed entirely through the tract. Table 2 summarizes the times and location of the contrast media passing through the GI tract of the birds.

The time of emptying the crop ranged between 0.25-8.00 hours, with a median = 0.75 hours (95% CI for the median = 0.40 to 5.58 hours). Gizzard emptying time range was 1-8 hours, with a median= 2.00 hours (95% CI for the median = 1.00 to 8.00 hours).

Falcons that were stressed after barium administration (i.e. ID 1740) showed a slower passage of contrast medium from the crop to the ventriculus and then through the intestines.

Image 1 shows a sequence of images before the administration of the barium and after administration at 1-3 min, 15 min, 30 min, 1h, 2h, 4h, and 8h in bird ID 1694.

**Discussion**

There is considerable species and individual variation in the emptying time of the avian GIT in barium studies. It depends on the species’ diet, size, and length of the digestive tract, age, nutritional status, pathological conditions, stress, and medications (Tully et al., 2000, McMillian, 1994). A slow or prolonged passage of contrast medium occurs in stressed and sedated or anaesthetized birds (Tully et al., 2000, McMillian, 1994; Krautwald-Junghanns, 1996, and Krautwald-Junghanns et al., 1992). Evaluation of GIT transit time is likely to be best accomplished in a non-anesthetized, non-restrained perching bird (Lennox and Crosta, 2002) as in our study. It was a low stress technique, much easier to follow without the need for anesthesia and with no risk for the falcons.

Our data shows that there is a wide range of transit times in falcons. Two birds presented spots of fresh blood along the barium eliminated in the feces. This could be due to individual characteristics, such as a more delicate mucosa but all birds were fed at the end of the study, ate well and no other side effects were observed. This shows that our dose of barium (25 ml/kg) was safe, but further studies of the effect of barium in falcons are warranted.

Fluoroscopy has a considerable role to play in avian gastrointestinal radiology. The speed of examination and minimal handling lead to a more realistic interpretation of changes in structure and, especially, function of the alimentary tract in disease.

**Acknowledgements**

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**References**


**Table 1.** Distribution of falcons as species, sex, age, and weight in the current study.

<table>
<thead>
<tr>
<th>Id</th>
<th>Species</th>
<th>Latin name</th>
<th>Sex</th>
<th>Age</th>
<th>Weight(g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>402</td>
<td>Gyr-Peregrine</td>
<td><em>F.rusticolus x F. peregrinus</em></td>
<td>F</td>
<td>Y</td>
<td>1290</td>
</tr>
<tr>
<td>461</td>
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<td>Y</td>
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<tr>
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<td>Y</td>
<td>1180</td>
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<tr>
<td>1694</td>
<td>Saker</td>
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<td>M</td>
<td>Y</td>
<td>654</td>
</tr>
<tr>
<td>1708</td>
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<td>Y</td>
<td>480</td>
</tr>
<tr>
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<td><em>F. peregrinus</em></td>
<td>F</td>
<td>A</td>
<td>850</td>
</tr>
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</table>
Table 2. Time and position of the contrast media (barium) in the GI tract of healthy falcons.

<table>
<thead>
<tr>
<th>ID</th>
<th>0 minutes</th>
<th>15 minutes</th>
<th>30 minutes</th>
<th>1 hour</th>
<th>2 hours</th>
<th>4 hours</th>
<th>8 hours</th>
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</thead>
<tbody>
<tr>
<td>402</td>
<td>x x x s x x x</td>
<td>- x x x</td>
<td>- x x x</td>
<td>- x x x</td>
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<td>- x x x</td>
<td>- x x x</td>
<td>- x x x</td>
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</tr>
</tbody>
</table>

X=Presence of barium, x=small quantity of barium present, C=crop, G=gizzard, I=intestines, Cl=cloaca

Table 3. Comparative data of barium GIT tract in falcons, hawks, and Amazon parrots.

<table>
<thead>
<tr>
<th>Time</th>
<th>Falcons (current study)</th>
<th>Hawks</th>
<th>Amazon parrots</th>
</tr>
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<tbody>
<tr>
<td>0 min</td>
<td>Crop</td>
<td>Crop</td>
<td>Crop</td>
</tr>
<tr>
<td>1-3 min</td>
<td>Crop/stomach/intestines</td>
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<tr>
<td>10 min</td>
<td>Crop/stomach/intestines</td>
<td>Crop</td>
<td>Stomach</td>
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<tr>
<td>15 min</td>
<td>Crop/stomach/intestines</td>
<td>Stomach</td>
<td>Stomach</td>
</tr>
<tr>
<td>30 min</td>
<td>Crop/stomach/intestines/cloaca</td>
<td>Small intestine</td>
<td>Small intestine</td>
</tr>
<tr>
<td>1 h</td>
<td>Stomach/intestines/cloaca</td>
<td>Large intestine</td>
<td>Small intestine</td>
</tr>
<tr>
<td>2 h</td>
<td>Intestines/cloaca</td>
<td>Cloaca</td>
<td>Large intestine</td>
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<tr>
<td>4 h</td>
<td>Intestines/cloaca</td>
<td>Cloaca</td>
<td>Cloaca</td>
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<tr>
<td>8 h</td>
<td>Cloaca</td>
<td>Empty</td>
<td>Empty</td>
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</tbody>
</table>

* Romagnana and Love 2000

Image 1. Series of images before the administration of the barium and after administration at a) before administration, b) 1-3 min, c) 15 min, d) 30 min, e) 1h, f) 2hrs, g) 4hrs, and h) 8hrs in a falcon © Celia Garcia-Martinez.
Endoparasites in Falcons in the Middle East

Jesus L. Naldo and Jaime H. Samour

Wrsan, Wildlife Division, Private Management of H.H. Shaikh Sultan bin Zayed Al Nahyan, P.O. Box 77338 Abu Dhabi, UAE

Endoparasites are common findings during clinical examination in falcons. Their clinical significance is not well understood. However, findings of ova in faecal samples do not necessarily relate to disease. Changes in environment or diet could result in severe parasitemia, in particular, in species related conditions like enteritis caused by Caryospora-species infection in peregrine and lanner falcons. In view of this, clinicians must be aware of the different endoparasites present in falcons in the Middle East.

The following are the most common endoparasites encountered in clinical practice:

**Protozoa**

*Caryospora sp.*
- One of the most common protozoan parasites in falcons.
- Transmitted mainly through contaminated food.
- Four different species have been identified, namely, *Caryospora kutzeri*, *Caryospora neofalconis*, *Caryospora megafalconis* and *Caryospora falconis*.
- A previously unidentified species has been tentatively named *Caryospora samouri*. This is the largest of all the species and was originally discovered in saker falcons here in Abu Dhabi in 1998. Recent DNA studies have demonstrated that this is a different species, but its taxonomical position is still under study.
- Clinical signs include reduced appetite, progressive weight loss, diarrhoea and green to dark yellow to pale brown malodorous faeces, sometimes haemorrhagic.

*Trichomonas sp.*
- Common flagellated, highly motile protozoan parasites that infect falcons.
- One of the main causes of morbidity in falcons.
- *Trichomonas gallinae* infects mainly the oropharynx, crop, nasal cavity, infraorbital sinuses, tracheobronchial syrinx and oesophagus.
- Infection acquired mainly by feeding on live or freshly killed domestic pigeons.
- Clinical signs include reduced to total absence of appetite, progressive weight loss and regurgitation.
- Infections characterized by white-yellow caseous nodular lesions.

**Nematodes**

*Serratospiculum sp.*
- Air sac nematode.
- Most common filarial nematode in falcons.
- *Serratospiculum seurati* is the only species identified from this genus to date.
- Transmission is by eating infected beetles.
- Clinical signs include laboured breathing, poor performance during hunting, unable to fly long distances.
- Severe infections can be associated with pneumonia, air sacculitis or early lesions of aspergillosis.

*Capillaria sp.*
- Relatively common nematodes in falcons.
- Detailed identification could not be carried out because of the absence of adult worms in examined falcons.
- Considering the size and morphological characteristics of the ova, we believe these could be *Capillaria falconis*.
- Clinical signs include mild or severe diarrhoea, poor flight performance, difficulty balancing during landing or flying to the lure and unable to fly evenly.
- Inability to fly in severe infection.

*Paraspiralatus sp.* and *Physaloptera sp.*
- Little or nothing is known about the clinical importance of these parasites in falcons.
- First reported in falcons examined in Saudi Arabia.
- The *Paraspiralatus sp.* was identified as *Paraspiralatus sakeri* named after the species where it was found.
- The *Physaloptera* sp. was identified as *Physaloptera alata alata* – found in the upper digestive tract of falcons; worms were originally recovered while washing the stomach of a bird.

**Acanthocephalan**

*Acanthocephalan* sp.
- Relatively common in falcons.
- Detailed identification could not be carried out because of the absence of adult worms in examined falcons.
- Considering the size and morphological characteristics of the ova, we believe these could be *Centrorhynchus globocaudatus*.
- Severe infection can produce diarrhoea and weight loss.

![Figure 2](image)

*Figure 2.* Capillaria sp. (top left), Paraspiralatus sakeri (top right), Physaloptera alata alata (bottom left), Strigea falconis (bottom right).

**Trematodes**

*Strigea* sp.
- Only genus under the group of trematodes found in falcons.
- *Strigea falconis* is the only species found to date.
- Clinical signs include reduced appetite, progressive weight loss, diarrhoea and malodorous green faeces, sometimes haemorrhagic.

**Cestodes**

*Cladotaenia* sp.
- Only genus under the group of cestodes found in falcons.
- Two different species identified are *Cladotaenia globifera* and *Cladotaenia armigera*.
- Clinical signs include reduced appetite, progressive weight loss and presence of fresh blood and/or full or part of parasite in the faeces.

**Further Reading**


Book reviews

Diseases and Medical Management of Houbara Bustards and Other Otididae
By Dr Tom Bailey
ISBN 978-9948-03-562-6

It is de rigeur when reviewing textbooks to criticise. After all, in the majority of reviews, it is the reviewers duty to tell prospective readers why they should buy that particular book over its rivals. This is not the case for this book. It is unique. While bustards are included in Jaime Samour’s excellent “Avian Medicine” they are largely ignored in other texts as the majority of veterinary practitioners in the US and Europe (the major marketing areas for publishers!) will probably never work with them. Therefore this book has no competition and even if very poor the reviewer would have to recommend it! Fortunately this reviewer faces no such dilemma! The book is excellent and contains a vast amount of knowledge on these species.

There were, I thought, grounds for complaint. My main area of interest is the Great Bustard not the Houbara. As I read through the pages I had a growing feeling that this was not a book about bustards but about the Houbara. Yes, I did then read the title! The title beautifully describes the contents of the book yet, even though the vast majority of the book is devoted to the Houbara, there is an awful lot for those working with other bustard species. However, it is still a little sad that the chapters on captive management and breeding couldn’t contain more on the successful Kori breeding programme in the United States or the Little Bustard in France. Minor complaint – the book is large enough already and there are plenty of references to much of this information

The veterinary sections are, again, complete. They contain much in-depth knowledge on the medical problems of these species as well as diagnostic techniques anaesthesia and surgery. This information ranges from the basic through to very advanced. I anticipated a book that would assist an experienced avian veterinarian about to work with novel species. Instead this is a book that will not only do this but will also be eminently suitable for those with little general avian experience and who do not have easy access to other sources of information – ie it will be perfect for use in the field (although a large rucksack will be needed!).

The picture quality is very good and there are plenty of them. I am sure that if I made a huge effort I could unearth many minor criticisms or some facts with which I disagree (this is actually unlikely – the authors have included so much of what is published on bustards that few arguments are not well covered!), however, I do not see the need – it is clearly a labour of love and to nitpick a text that represents huge amounts of work by all authors seems simply unjust.

The book is excellent. It must be indispensable to all working with Houbara – veterinarians, of course, but also biologists and all involved in the captive management, conservation, and field studies of this species. It is also essential for veterinarians, biologists, researchers, and zoological collections working with other bustard species.

It is hard to recommend it for those not directly working with bustards, although it is a well-written and interesting book and, to be honest, it is a book that covers the basics of clinical sampling, anaesthesia, surgery and therapeutic techniques very well. I would, therefore, be very happy to advise any veterinary student or inexperienced avian veterinarian to read it as well even if their primary focus was with other avian species.

Congratulations to Tom and all the authors – this is an impressive work and I know that my copy will be very well-thumbed!

Reviewed by John Chitty BVetMed CertZooMed MRCVS

Copies of Diseases and Medical Management of Houbara Bustards and Other Otididae are available from Tom Bailey. Contact: tom.bailey@dfh.ae
The book consists of 512 pages. Due to the size of the book, it cannot be called a ‘Field Guide’ as such. The name of every bird species is given in English, Latin, Dutch, French, German and Swedish. In addition, a description of each species consists of three headings: subspecies and taxonomy; status and distribution (with a black & white map and breeding distribution). There is an extensive bibliography on pp. 467-498, which includes more than 930 references. The photo section consists of 82 color photos on 16 insertions (32 pages). Many of them are interesting, but this section of the book is not the most impressive by modern standards.

Normally, similar country avifaunas do not include detailed descriptions of all nesting finds, but taking into account that until 1950-1960’s this region was a ‘white spot’ for ornithological knowledge, the coauthors consider it expedient to describe all the most important observations on each species throughout the book. For any other better recorded region such treatment would be questionable, but when we are describing Asia Minor it is an acceptable approach.

The introductory part of the book includes a preface, acknowledgements, comments and remarks on the breeding season (by Peter Castell); modern ornithology in Turkey: reflections and future directions (by Richard F.Porter, Gunesin Aydemir, Bahtiyar Kurt, Guy M.Kirwan and Gernant Magnin); the gaps in our knowledge (by Geoff Welch, Hilary Welch and Sancar Baris); Turkey’s ecoregions: their biodiversity and conservation (by Hilary Welch and Guy M.Kirwan); and an introduction to the species accounts (by Guy M.Kirwan).

The chapter on Falconiformes is on pp. 121-158 and the following falcons are described: Lesser Kestrel, Common Kestrel, Red-footed Falcon, Amur Falcon, Merlin, Eurasian Hobby, Eleonora’s Falcon, Sooty Falcon, Lanner Falcon, Saker Falcon, Peregrine Falcon and Barbary Falcon.

Indexes of scientific names, Turkish common names and English common names make the book considerably easy to navigate.

On the whole this book is a great achievement in the study of birds of the Middle East and it’s nice to know that all this information has now become available globally to all those who are interested. The book is available direct from the publisher (www.acblack.com) and a large number of leading bookshops.

Reviewed by Jevgeni Shergalin.
What’s new in the literature?

In the last issue of *Falco* (32, Autumn 2008) we erroneously omitted the lead author from the following abstract:

Genetic management of reinforcement programs: the case of Houbara Bustards
Lesobre, L., Lacroix, F. and Saint Jalme, M.

This poster and other presentations from the 1st International Wildlife Reintroduction Conference held at Lincoln Park Zoo, Chicago, 15-16 April 2008 can be found at: www.reintroduction.org

Occurrence of mycoplasmas in semen samples of birds of prey

Mycoplasmas are well-known pathogens in a variety of animals. In poultry it is known that some species can be transmitted by semen and infect the uterus of females. As the prevalence of mycoplasmas in birds of prey is very high and artificial insemination is a commonly used technique for reproduction, the possibility of transmission *Mycoplasma* spp. by contaminated semen in birds of prey was investigated. Isolation of mycoplasmas was possible in five out of 32 (15.6%) semen samples of different bird of prey species. Two additional semen samples were positive for mycoplasma DNA using a *Mycoplasma*-genus-specific polymerase chain reaction. The isolation of mycoplasmas from a testicular sample indicates the testis as the possible source of contamination. Sequencing of large parts (>90%) of the 16S rRNA gene of the isolated mycoplasmas suggests that all isolates belong to the same species. Alignment of the sequenced products with the 16S rRNA gene of Mycoplasma species in GenBank demonstrated a similarity of 97% to *Mycoplasma verecundum*, but serological testing by immunobinding assay failed to identify it as such. It is recommended that the semen of donor birds of prey is examined for mycoplasmas before its use in artificial insemination.

Prevalence and clinical signs of avipoxvirus infection in falcons from the Middle East.

The prevalence, cutaneous manifestations and concurrent clinical signs of avipoxvirus infection in 3706 falcons in two Middle Eastern countries are reported. Diagnosis was based on evidence of typical ‘dry’ skin lesions on featherless parts of the body and microscopic detection of Bollinger bodies in epithelial cells. Avipoxvirus was isolated from one representative case. Overall prevalence of cutaneous changes due to avipoxvirus infection did not differ significantly between Kuwait (2.7%) and Dubai (2.3%), although pox lesions were more prevalent on the feet of birds from Kuwait (67.4% vs. 50%) and more common on the eyelids of birds from Dubai (45.6% vs. 30.4%). Foot lesions were always present in birds with multiple infection sites. Some birds from Dubai had severe infection associated with weight loss, anorexia, lethargy, vomiting, central nervous system involvement and ultimately death.

Herpesviral inclusion body disease in owls and falcons is caused by the pigeon herpesvirus (*columbid herpesvirus 1*).

A herpesviral disease of Rock Pigeons (Columba livia), called “inclusion body disease” or “inclusion body hepatitis,” was first described in the 1940s. The disease involves hepatic and splenic necrosis with associated intranuclear inclusion bodies and occurs primarily in young squabs. A similar herpesviral disease occurs in falcons and owls. Serologic and restriction endonuclease digestion studies indicate that herpesviruses from pigeons, falcons, and owls are very closely related and that most reported cases of disease in falcons and owls involve prior documented or possible ingestion of pigeons. These findings led to the hypothesis that an endemic herpesvirus of pigeons may be causing disease in falcons and owls. In order to test this hypothesis, we sequenced a fragment of the herpesviral DNA polymerase gene from naturally infected owls, falcons, and pigeons with inclusion body disease collected between 1991 and 2006. Sequences from all three sources were almost identical, and we therefore propose that the usual agent of inclusion body hepatitis in owls and falcons is *columbid herpesvirus 1*.

Occurrence of mycoplasmas in free-ranging birds of prey in Germany

Mycoplasmas are well-known avian pathogens of poultry and some passerines. Although reported in birds of prey, their role as pathogens is still unclear. Healthy, free-ranging raptor nestlings sampled during a routine ringing (banding) program, and birds of prey from rehabilitation centers, tested positive for *Mycoplasma* spp. by culture and a genus-specific polymerase
chain reaction (PCR). Given the lack of clinical signs and disease, we suggest that mycoplasmas in raptors may be commensal rather than pathogenic. Using immunobinding assay and species-specific PCR tests, *Mycoplasma buteonis*, *M. falconis*, and *M. gypis* were identified; *M. falconis* was only detected in falcons. Additionally, some isolates could not be identified. This is the first report of *Mycoplasma* spp. isolations from Western Marsh Harriers (*Circus aeroginosus*), a Eurasian Hobby (*Falco subbuteo*), and a Barn Owl (*Tyto alba*).

Peregrine Falcon eggs still provide samples for continued monitoring of organochlorine compounds and other contaminants in the environment (© A Dixon)

**Persistent organochlorine compounds in peregrine falcon (*Falco peregrinus*) eggs from South Greenland: Levels and temporal changes between 1986 and 2003**

Vorkamp, K., Thomsen, M., Møller, S., Falk, K. and Sørensen, P. B. (2008)

*Environment International* 35, 336-341

Thirty-seven addled peregrine falcon eggs collected in South Greenland between 1986 and 2003 were analysed for their content of the organochlorine compounds polychlorinated biphenyls (PCBs), dichlorodiphenyl trichloroethane (DDT) and its degradation products, hexachlorocyclohexane (HCH) isomers and hexachlorobenzene (HCB). PCBs and DDT (including metabolites) were by far the most abundant OC groups, with median concentrations of 55 and 40 μg/g lw, respectively. The concentrations were high in an Arctic context, but similar to previously reported levels from Alaska and Norway and slightly lower than concentrations measured in eggs from industrialised regions. Geographical differences may be of importance, considering the migration of peregrine falcons and their prey. ΣHCH and HCB had median concentrations of 0.39 and 0.17 μg/g lw, respectively. On average, DDE accounted for 97% of ΣDDT, but was below critical levels for eggshell thinning. All compound groups showed a weak decreasing trend over the study period, which was statistically significant for HCB and close to being significant for ΣHCH. The weak decrease of ΣPCB and ΣDDT is different from other time trend studies from Greenland, usually showing a more pronounced decrease in the beginning of the study period, followed by a certain stabilisation in recent years.

**Recording detailed raptor behaviour on the wing: The application of accelerometry**


*Comparative Biochemistry and Physiology - Part A: Molecular & Integrative Physiology, Volume 150, Issue 3, Supplement 1, July 2008, Page S72*

Measurement of body movement by accelerometry data loggers is a relatively new technique, which is likely suitable for recording the flight behaviour and associated energy expenditure of large birds. We showcase the potential of accelerometry for these applications by using the technique to compare the flapping and gliding activity of three raptor species. A data logger was deployed on a trained Harris’ hawk (*Parabuteo unicinctus*), tawny eagle (*Aquila rapax*) and Eurasian griffon (*Gyps fulvus*). The resultant acceleration traces provided considerable information about the behaviour of the birds including when they glide and flap and number of wing beats. From these traces, derivations of amount of body movement (measured as overall dynamic body acceleration) enabled comparisons of movement-specific energy expenditure. The logger data appeared to confirm that the Eurasian griffon expended more energy when flying to a small hilltop than the subsequent flight back down. Flying between posts, the Harris’ hawk glided more and apparently expended less energy than the tawny eagle. These preliminary findings indicate that accelerometry loggers have the potential to provide pertinent information on the mechanics and energetics of flight and other avian behaviours in large birds.

**The race to prevent the extinction of South Asian vultures**

Pain, D. J and 25 other authors (2008)

*Bird Conservation International, 18:S30-S48*

*Gyps* vulture populations across the Indian subcontinent collapsed in the 1990s and continue to decline. Repeated population surveys showed that the rate of
decline was so rapid that elevated mortality of adult birds must be a key demographic mechanism. Post mortem examination showed that the majority of dead vultures had visceral gout, due to kidney damage. The realisation that diclofenac, a non-steroidal anti-inflammatory drug potentially nephrotoxic to birds, had become a widely used veterinary medicine led to the identification of diclofenac poisoning as the cause of the decline. Surveys of diclofenac contamination of domestic ungulate carcasses, combined with vulture population modelling, show that the level of contamination is sufficient for it to be the sole cause of the decline. Testing on vultures of meloxicam, an alternative NSAID for livestock treatment, showed that it did not harm them at concentrations likely to be encountered by wild birds and would be a safe replacement for diclofenac. The manufacture of diclofenac for veterinary use has been banned, but its sale has not. Consequently, it may be some years before diclofenac is removed from the vultures’ food supply. In the meantime, captive populations of three vulture species have been established to provide sources of birds for future reintroduction programmes.

Using endogenous and exogenous markers in bird conservation
Keith A. Hobson (2008)
*Bird Conservation International, 18:S174-S199*

Understanding how avian populations are structured spatially and temporally is fundamental to their effective conservation. Protecting migratory species in one jurisdiction or period of the annual cycle may be ineffective if they periodically move to areas where they are not protected or are exposed to factors that limit populations or cause their decline. Unfortunately, for most species, our understanding of connectivity between breeding, wintering or stopover sites during the annual cycle are poorly understood and there is an urgent need to define such connections in order to achieve more effective conservation. This paper provides an overview of the methods used to mark individuals in order to track their movements. Passive exogenous markers such as numbered rings or bands are typically ineffective for most avian species. Active exogenous markers such as satellite tags have provided significant breakthroughs but are still prohibitive financially and still cannot be applied to species under 200g. Endogenous markers such as DNA markers, trace elements and stable isotopes show significant promise as a means of moving forward the field of animal tracking. The advantage of these endogenous approaches is that they depend only on sampling a population once and so are not biased by limitations of mark-recapture methods. Nonetheless, all methods have disadvantages and the path ahead must consider multiple approaches to tracking avian populations.

Example of an “exogenous marker” used in the study of Saker Falcons

*Above: Diagram showing an example set of wing tags (exogenous markers) as used in the study of Saker Falcons in Mongolia. Such markers are important for studies requiring identification of specific individuals. 1. 2mm holes. 2. The main body of the tag, made from nylon mesh coated in coloured PVC fabric. 3. A unique ID number/letter or combination. 4. The coloured strip on one tag corresponds to the main colour of the tag on the opposing wing. Note that if the colour combination is the same for each wing there will not be a coloured strip at the bottom of the tag. (Diagram produced by M. Etheridge).*

*Below: Young Saker Falcon with wing-tags marked as part of a study on post-fledging survival and dispersal in Mongolia (© Gankhuyag Purev-Ochir).*
News and announcements

Safer passage for Migratory Birds of Prey
UNEP/CMS backed agreement to protect migratory birds of prey in Africa and Eurasia
Bon / Abu Dhabi, 23 October 2008

A meeting covered by the UN and the Government of Abu Dhabi, UAE yesterday agreed a new agreement and action plan. 28 countries signed the Memorandum of Understanding (MoU), led by the Minister of Abu Dhabi, H.E. Dr. Rashid Ahmad Bin Fahad, Minister of Environment and Water at an international meeting in Abu Dhabi, hosted by the United Arab Emirates. It will enter into force on 1 November. Negotiations on the Mou began in Scotland, UK twelve months ago. The Governments of the UK and the United Arab Emirates have led the process, working through the UNEP Convention on Migratory Species (CMS). A new CMS coordinating unit will now be established in Abu Dhabi to promote and monitor the new agreement as a UNEP initiative.

The agreement area stretches across more than 130 countries from the African, Afrotropical, Palearctic and Indo-Malayan realms. More than 70 species of migratory birds of prey - Falconiformes, ospreys, eagles and owls - are covered by this conservation instrument. More than 50% of migratory birds of prey have a poor conservation status as a result of habitat loss due to agriculture, forestry, industry and fisheries, collision with power lines, hunting and trapping for falconry as well as poisoning throughout their range. The Memorandum’s objective is to restore the positive conservation status of these bird species.

The countries are committed to protecting the bird species from illegal killing, including poisoning and shooting and unsustainable exploitation. An ecosystem approach to sustainable development and sectoral land use practices will take into account the needs of bird conservation and mitigate effects of habitat loss and fragmentation.

Birds of prey are important indicators of healthy ecosystems. They are at the end of the food chain, which makes them highly vulnerable to environmental changes and increased competition for food. If they disappear from their habitat, this is a clear sign of a disrupted ecosystem. Protecting the Egyptian Vulture is directly linked to human health. Vultures remove carcasses and prevent the outbreak of epidemics. Instead they face high mortality due to poisoned baits meant to kill them and other predators to protect cattle. In addition, they suffer from reduced reproduction due to toxic substances that accumulate in their bodies.

The action plan foresees more research on species ecology and migratory behavior, patterns and routes as well as data analysis. Collective efforts towards monitoring and establishing reliable population trends will reveal the impacts of threats and necessary mitigation actions. Capacity building and training in institutions and local communities by developing knowledge of birds of prey can create acceptance for necessary conservation actions.

Osprey (© Salim Javed)

CMS Executive Secretary Robert Hepworth said: “In addition to finalising the agreement, the meeting unanimously endorsed Abu Dhabi’s offer to host a co-ordinating unit. This is expected to comprise 6 staff and will also cover the CMS Dugong and part of the IOSEA Turtles agreements. This vital new agreement will not only help raptors, which are at top of the food chain, but also other “nomads of the air” throughout their long journeys. We expect the sharp decline of birds of prey to stop and to see their populations eventually recover.

“The establishment of this tri-continental agreement for birds of prey, with a co-ordinating unit in Abu Dhabi, UAE, marks a new era for the Convention. Here in the Gulf, at the crossroads of migration and culture, we have a chance to establish a new UN base for wildlife conservation. The co-ordinating unit for raptors will also promote the CMS dugong and turtles agreements in the Indian Ocean and beyond. We must now seize the opportunity presented to us by the commitment and generosity of the people of Abu Dhabi. “

Professor Colin Galbraith, Chairman of the meeting highlighted the real contribution that this MoU will make to the conservation of birds of prey. He said that joint action between countries is needed, and that CMS is providing leadership in talking real conservation priorities especially to assist these iconic species. It’s truly remarkable to see so many countries signing this milestone agreement in Abu Dhabi and we hope that this is just the beginning of an impressive journey that we have started to protect such fascinating group of birds, said Dr. Salim Javed, Deputy Manager Bird Conservation at the Environment Agency – Abu Dhabi (EAD).
Mr. John Clorley from the Department for Environment, Food and Rural Affairs (DEFRA) said that “this is an excellent outcome for the conservation of migratory birds of prey. I am extremely pleased that the cooperation between DEFRA and the EAD has resulted in the acceptance of the MoU. The offer from UAE to host the co-ordination unit means that action to conserve these birds can now be undertaken across their flyways”.

The UK’s Department of Environment, Food and Rural Affairs is a key partner in this initiative. Nearly 100 participants including government representatives, delegates from range states, scientists and NGOs attended the meeting.

Drugs Firms Told to do More to Prevent Vulture Extinctions

The Indian government has ordered a crackdown on companies selling the drug responsible for the near-extinction of vultures.

A letter from the Drug Controller General of India, Dr Surinder Singh, has warned more than 70 drugs firms not to sell the veterinary form of diclofenac, and to mark human diclofenac containers ‘not for veterinary use’.

In 2004, suspicions that diclofenac was responsible for the catastrophic decline in vulture numbers were confirmed when the drug, present as residues in the carcasses of cattle, was found to cause fatal renal failure in Gyps vultures.

A study led by Dr Vibhu Prakash from the Bombay Natural History Society (BNHS, BirdLife in India), published this April, showed that the population of White-rumped Vultures Gyps bengalensis in India was dropping by more than 40% every year. The species’ numbers have dropped by 99.9% since 1992 to about 11,000, from tens of millions. Populations of Indian Gyps indicus and Slender-billed Gyps tenuirostris vultures have fallen by almost 97 per cent in the same period, to 45,000 and just 1,000 respectively.

Two years ago, following a meeting of the Indian National Board for Wildlife in 2005, chaired by the Prime Minister of India, the manufacture of veterinary diclofenac was outlawed. Now vets are dodging the ban by using the human form of diclofenac for livestock, despite an effective and safe alternative drug being available.

“Dr Nita Shah, Head of the Vulture Advocacy Programme at BNHS said: “This step by the Indian government demonstrates its determination to tackle the vulture crisis and we are very hopeful that other measures will follow.

“Measures that make veterinary and human diclofenac less easy to use are crucial if we are to save these birds. Steps to make meloxicam, which is safe for vultures and just as effective in treating livestock, more widely available are just as important.”

In his letter, Dr Singh said drugs companies should ‘strictly implement’ the ban on veterinary diclofenac and properly label human diclofenac containers and literature. This action would ‘help in saving the vulture population and ecological balance in the animal world’, Dr Singh said.

One major pharmaceutical company, Boehringer Ingelheim, has become the first to support the work of the BNHS and RSPB to protect remaining vultures from poisoning with diclofenac.

Chris Bowden, Head of the RSPB’s Vulture Recovery Programme, said: “Vultures are critical to the way of life for millions of people in India and the contribution from Boehringer Ingelheim is hugely welcome.

“Vultures need immediate action from across the board to stop vets using diclofenac and to support the captive breeding programmes that are so badly needed to prevent the extinction of these fine birds.”

International Fund for Houbara Conservation participates in ADIHEX
United Arab Emirates: 11 October 2008

The International Fund for Houbara Conservation, which is one of the Abu Dhabi governmental initiatives to preserve the future of the Houbara in the wild, as well as keeping alive the tradition of Arab falconry, participated in Abu Dhabi International Hunting and Equestrian Exhibition (ADIHEX) which was held in the capital from October 8 - 11, 2008 at the Abu Dhabi National Exhibition Center.

During the show the Fund promoted its objectives which focus on protecting the Asiatic Houbara whose wild population is crashing sharply due to over-hunting and smuggling, as studies showed that the actual situation of the Houbara population and the levels of hunting and pressure on the species are not sustainable in the long-term. This Fund is to follow the efforts already done by the Abu Dhabi government, through its National Avian Research Center (NARC) in Abu Dhabi and the Emirates Center for Wildlife Propagation (ECWP) in Morocco.
The aim of this organization is to secure a wild population of Houbara that can sustain managed falconry activities in the long term, where four main goals have been identified including conserving the variety and integrity of the Houbara bustard species throughout its range (genetic, behavioural and ecological specificity), manage existing wild Houbara populations to maintain a level compatible with the expectations of the falconers, set up a global management system for Houbara populations and their habitat and increase the wild population of Houbara Bustards through the release of captive-bred birds.

To achieve these goals, the Fund will set a long-term strategy, and conduct studies and scientific research to manage hunting activities wiping out the illegal hunting and trading in wild bustards and promote the implementation of a series of protection procedures in the places they are raised in captivity and releasing areas, as well as participate in international protection activities and take initiatives aiming at protecting bustards and their habitats across the areas where they are spreading. The fund will also develop and implement plans and projects aiming at protecting bustards and maintaining the permanency of Arabian Falconry in the long-term, in addition to cooperate and coordinate its activities with any international organization that is concerned with bustard protection related issues and conserving the Arab heritage of falconry.

It worth noting that NARC, which is one of the main centers of Environment Agency - Abu Dhabi (EAD), is also participating in the Show, where it is presenting its programmes and research development in the field of conserving Houbara and its captive breeding programme. Since it was established in 1989 near the town of Sweihan, NARC took steps to successfully breed increasing numbers of Houbara in captivity, and to expand the Center’s facilities to accommodate the growing size of the breeding flock.

The Center is also pursuing the survey and study of wild Houbara in its range countries across Asia, and the first steps have now been taken in the release of captive bred Houbara from NARC back into the wild. In 2008 NARC has produced 980 Houbara chicks in captivity. The Center planned annual production of 2,000 chicks in 2010.

The ECWP, which is based in Missour, Morocco, is focusing its efforts on implementing an overall conservation strategy aiming to restore and preserve North Africa’s native Houbara Bustard populations. To achieve that far-reaching goal, the ECWP has implemented a multi-disciplinary approach combining fundamental and applied research in such varied areas as ecology, physiology, nutrition and veterinary medicine.

Ten years later, the ECWP has proven its ability to conciliate saving an endangered species with maintaining a cultural heritage, thereby helping to improve knowledge about eastern Morocco’s ecosystems and contributing to their preservation. In 2008, around 8232 chicks were produced and about 6160 Houbara will be released by end of the year.

Falconry Seeks Place in History
Leah Oatway. loatway@thenational.ae
http://www.thenational.ae/article/20080608/NATIONAL/517624923

Falconry enthusiasts are lobbying for the “noble sport” to be awarded similar international status and protection as world treasures such as India’s Taj Mahal, Egypt’s Pyramid Fields and Equador’s Galapagos Islands. A detailed strategy to conserve the traditions of the sport will soon be presented to Unesco, the UN body that helps to conserve mankind’s heritage. The World Heritage list originally consisted only of man-made structures or natural sites, but in 2003 Unesco started a list of “intangible” cultural treasures such as dance, carnival, food and sport.

Mohammed Khalal al Mazrouei, the director general of the Abu Dhabi Authority for Culture and Heritage (ACH), which has been joined in the campaign by the Abu Dhabi Environment Agency, the Emirates Falconers’ Club and the International Association for Falconry, said falconry was “a noble sport that embodies the bond between man and nature”. He added that the sport stretched back millennia and enjoyed a passionate following throughout the region. Recent excavations and research on ancient manuscripts suggest the sport
appeared 12,000 years ago in the Arabian Gulf. It later spread to China, Japan, Korea, Europe and even North America.

Today, the cost of buying a falcon starts at Dh10,000 (US$2,700), although enthusiasts have paid up to Dh1 million for prized specimens. Abdul Rab al Hamiri, who issues falcon “passports” at the Abu Dhabi office of CITES, which regulates the movement of endangered animals, said gaining Unesco status for falconry would help to preserve the region’s culture.

“We encourage this as another positive move forward,” he said. “From the President to the very poor, everyone can enjoy falconry. The people of the UAE love the sport and they spend so much money on it.” He noted that the sport was under pressure from restrictions against moving birds across international borders. Most birds are bought from the UK, USA and Germany, although there are now very successful captive breeding programmes happening in the UAE. It is very much a part of the culture of this region, but as falcons become listed on the CITES appendices, without some kind of protection and thought the sport is likely to die,” said Mr Hamiri.

Falconers at a UNESCO meeting in Paris, France to promote falconry as an Intangible Cultural Heritage © Jevgeni Shergalin

In the past few years, the sport has gained some powerful backers, including Sheikh Mohammed bin Zayed, the Crown Prince of Abu Dhabi, who donated Dh7.5m to the Falconry Heritage Trust. And recently, the National Avian Research Centre said it would release thousands of Houbara Bustards, a species often used during falcon hunting. This followed a successful breeding programme at its Sweihan facility intended to boost the number of birds driven to the edge of extinction by over-hunting. About 12,000 of the birds would be freed in the UAE, Pakistan, Iran and Kazakhstan by 2014. The UAE also plans to open a multimillion-dirham falconry and culture centre within four years that will also showcase Bedouin life. Falconry “is an addiction”, said Richard Ellis, head falconer at Wild Flight in Dubai. “From the moment you train the bird and it soars into the air, it becomes almost an extension of yourself. It’s a very personal, individual experience. It’s just wonderful.”

Kamchatka smugglers caught with Gyrfalcons
Moscow, Russia, 12 November 2008: Traffic police from Milkovo District, Kamchatka, last night stopped a truck carrying 38 illegally captured Gyrfalcons. Gyrfalcons are in high demand for use in falconry, particularly in the Middle East, where birds are offered for large sums of money.

Under Russian law, the possession of a Gyrfalcon from Kamchatka carries a fine of RUB250,000, meaning if convicted, those arrested could face a total fine of RUB9.5 million (USD380,000) plus criminal proceedings. “This is the biggest such case recorded in recent years,” said Alexey Vaisman, Senior Programme Officer with TRAFFIC Europe-Russia, adding that he expected a criminal investigation to reveal where the birds were being taken.

The smugglers claimed to have bought the birds from an unidentified source in the town of Ossora in Karaginsky District in the northern part of Kamchatka. Experts said the collection of a large number of birds would have taken several months, which indicated a highly organized criminal smuggling operation. Enforcement officers and representatives from the Federal Service for Supervision of Natural Resources (Rosprirodnadzor) travelled to Milkovo, about 200 km north of Kamchatka’s capital, Petropavlovsk-Kamchatsky, to carry out further investigations.

Following veterinary inspection, three of the birds were kept for treatment, but the other 35 birds released. According to local ornithologists, as many as 100 Gyrfalcons are smuggled from Kamchatka each year and overall numbers have dwindled from 3,500 to 500 pairs in the region.

The Gyrfalcon is listed in Appendix I of CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora), which prohibits their international trade.

Middle East Falcon Research Group website
www.mefrg.org

We have launched a new website for the Middle East Falcon Research Group (www.mefrg.org). Here you will find general information on falcons as well as details on research and survey work undertaken on behalf of the Environment Agency – Abu Dhabi. You can also download PDF copies of all the previous issues of our Falco newsletter at the site.
رحلة كهربى لبلازما البروتين لحبارى أسيوية (Chlamydosotis macqueenii) الأجزاء العليا للرحلة الكهربى

اس ونجر، سي سيفانو، تي. بلي.

يعتب الرحلة كهربى لبلازما البروتين وسيلة نافعة لتقسيم صحة الطيور، سواء في تشخيص الأمراض أو في المناوبة السريرية للمرضى. تم إنجاز الإجراء في مستشفى دبي للطيور على عينات مماثلة بالهربين جمعت من 18 من طيور الحبارية الأسية. تقدم هذه الخلاصة القصيرة لرحلات الكهربى لبلازما البروتين لطيور حباري أسية (Chlamydosotis macqueenii) صحية سريريا.

الطيفيات الجوية للصقور في الشرق الأوسط

جيبوس/ ناثان و خايمي ه. سموري

يشتهر العثور على الطيفيات الجوية أثناء الفحص السريري للصقور. إن دوالها السريرية ليست مفهومة بشكل جيد إلا أن العثور على البويض في عينات الطيور لا يعتبر بصورة على الأمراض. قد تؤدي الأغراض البيولوجية أو الطبية إلى وجود حالات الطيفيات في الدم وخاصة في الأنواع المرتبطة بظروف التهاب الأوعية الدنج عن الخلايا النشطة. بسريريا في صفر الشاهين والقشر الحدي (البركي). نظرًا لذلك فإن الطيور التي توجد في صفر الشرق الأوسط. تدرج الفيروسات بما من هذه الطيفيات الجوية والعوارض السريرية المرتبطة بوجودها في الصقور.

الصيد غير القانوني بالفخاخ لصقور السنقر في كامتشاتكا

بي. جي. نوركوف، بي. إن. جيراسيوف، بي. غ. جوروفيكر

تشير المعطيات المتنوعة من السجلات الفيدرالية الروسية أنه قد تم في الفترة 1991-2006، مصادرة 234 من صقور السنقر من صيداً خارج غابات في Falco rusticolus (الجر). كان 189 طيرا منها كبير السن ومن تلك كان 168 (91%) يافقة. تم إطلاق أكثر من الطيور المصادرة في جيراسيوف، كامتشاتكا، بينما احتج البعض منها للعذاب في مركز تأهيل قابل إعادة إطالة. ورغم عدم قانونا صيد الطيور الصيد بالفخاخ، إلا أن التاجر يرصف السنقر هو أمر شائع ومثير للجدل. يقترح الملاذ، ان الأجزاء قانونيا مسألة قانونية على الدراسة العلمية الاستدامية لحماية هذه الطيور. مشاركة أفراد فرق البحث إلى جانب الأجزاء القانوني المستدام يجب تطبيق عقوبات صارمة للمهاجمة غير المنصوبة.

التصور الإشعاعي والتقييم التأليفي لصقور البلازما في الفئة المعيوسة المعمول الصقور

سي حزامتان، تي. بي. يلي، بي. دي. سامان

أجريت دراسات التأليفي المعوي على 12 صقراً صحيحاً في مستشفى دبي للصقور باستخدام التصور التأليفي المكثف للتصوير. هذه الدراسة إلى تحديد الأوقات الطبية بالعمر المعيوسة المعنية.
تقديرات التعداد الموتال لصفر الغزال. الجزء 2: أسيا

أندرو بيكسم

أراؤج في هذه المقالة المعلومات المتوقعة عن وضع صفر الغزال في الجزء الآسيوي من المدى العالمي تعود إلى تكاثر النوع في دول آسيا وتوجد أعلى التركيزات في الموانئ بالحملاء والسفن وإهداء الصيد في الأعلى، وهو ما يثير القلق جدًا من ناحية سهولة المهاجرين للاستفادة من هذه الصيد في آسيا، ومعالجة مشكلة جريمة الصيد غير القانوني بشكل جاد

Houbara with a satellite transmitter (Photo: Nick Fox)

العدد العكسي للحباري في اليمن!

جاجي جواد، مارك لورنس، أوليفير كومبيريو

أظهرت أبحاث مستفيضة أجراءاًًا في الأراضي الرطبة في اليمن، مثل تطعيم نباتات أرضية، أن عدد الحباري يرتفع بين 60 و 230 طيارة في اليمن. ومع ذلك، فإن هذا الرقم لا يمثل النزول الفعلي في الحباري. هناك بعض الدراسات متعلقة بالصيد غير القانوني الذي يعرض النباتات للخطر، وتوجد بعض الدراسات التي تشير إلى أعداد الصيد غير القانوني في اليمن. لذا، يجب أن يتم تحقيق الالتفافات المطلوبة لحماية الجمال البيئي. لذا، يجب أن يتم استخدام الابتكارات المتقدمة لحماية النباتات، وتوفير موارد صحية وبيئية لحماية الحباري.

Saker Falcon breeding in a nest built by Ravens in Mongolia (Photo: Tomas Kunca)

معمل وفيات مرتفع للحباري الآسيوي في إيران macqueenii

جاجي جواد، مارك لورنس، أوليفير كومبيريو

اكتشف فريق المركز الوطني للحيوانات العربية - هيئة البيئة أبو طبي - باستخدام جهاز الفحص بالصوت، أن عدد الحباري في المناطق المعترف بها بالحدود الشرقية في إيران يرتفع بشكل كبير. لذا، يجب أن يتم تطبيق الابتكارات المتقدمة لحماية النباتات، وتوفير موارد صحية وبيئية لحماية الحباري. لذا، يجب أن يتم استخدام الابتكارات المتقدمة لحماية النباتات، وتوفير موارد صحية وبيئية لحماية الحباري.

اعترضات غزائية في إطعام الحباري بالفراش

إي. أي. كوشمن

تقول هذه المقالة المحتوى الغذائي والمغذيات المتغيرة القائمة على البحوث والدراسات المستخدمة في تغذية الحباري في المعامل. يشير هذا التحليل إلى أهمية التحفيز الصحي الضيق في النباتات، وتوفير البذور والنباتات الفلاحية في النباتات، وتوفير البذور والنباتات الفلاحية في النباتات، وتطوير البرامج الغذائية الفائقة للمزارعين للعمل مع موزودي الفراش لتطوير برامج غذائية فائقة للمزارعين المنتجة.
القمة الجديد

عُرضت الأمم العربية المتحدة أثناء مناقشات تنظيم واستضافة اجتماع المخاطرين حول موضوع الصحراء والغذاء، ومراجعة توصياتها لتطوير قرارات مستقبلية حول القضايا، بما في ذلك إنشاء نظام دولي لرعاية الطيور. كما أن هناك اقتراحات أخرى لتحسين الوضع الغذائي في بعض الدول العربية، بما في ذلك زيادة الدعم المالي للأسر المحتاجة.

تم تنظيم منتدى دولي حول موضوع الصحراء والغذاء، والذي يهدف إلى تبادل التجارب وتوضيح التوجهات في هذا المجال، وتشجيع التعاون الدولي في هذا الصدد. كما تم عقد لقاءات خصوصية بين الخبراء والفنانين، لمناقشة آراءهم واقتراحاتهم في هذا السياق.

تم إعداد تقرير استثماري حول موضوع الصحراء والغذاء، والذي يشمل تحليلات شاملة واستراتيجيات طويلة الأجل. كما تم أيضاً إعطاء الأولوية لتطوير برامج تعليمية وتدريبية في هذا المجال، لتعزيز الوعي والتوعية.

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