



# FALCO

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## His Highness Sheikh Zayed bin Sultan Al Nahyan

Just as *Falco* was going to press we heard the sad news of the passing of His Highness Sheikh Zayed bin Sultan Al Nahyan, who was a firm supporter of the Middle East Falcon Research Group. A legend in his own lifetime, Sheikh Zayed saw the transition from an impoverished desert country to an oil-rich, technologically advanced one. Through all this, he never forgot his Bedouin roots and his beloved falcons. What better way to remember him than to quote from his Foreword in the *Global Strategy Plan for the Conservation of Falcon and Houbara Resources*:

*'The traditional sport of falconry was passed down to us from our fathers, from a time when we were close to nature and life was more simple. It is a constant reminder to us of the forces of nature, of the inter-relationships between living things and the land they share, and of our own dependence on nature. Falconry depends on healthy populations of the quarry, such as the Houbara, and they in turn depend on the continuing health of their breeding and wintering grounds. Falconers thus have a concern for natural habitats and for the sustainable use of resources.'*

*During my own lifetime I have seen many remarkable changes and achievements occur in the Middle East. Oil has brought immense benefits for the welfare of our people. But progress can also pose problems for nature – pollution of land and sea, unwanted development and spoiling of natural areas, and disturbance of quiet places which once gave refuge to wildlife. Some of the prey species have suffered from loss of habitat, and from persecution or over-hunting. It is important for us to take steps to turn the tide before it is too late, in order to safeguard the future.*

*All of us share a common goal: the sustainable, balanced use of resources. We wish to leave the Earth as good, or better, than we found it.'*

Falconry and falcon research has lost a Friend in Sheikh Zayed.

disappeared from the forests along the Urals and Emba rivers, where it was numerous (Dementiev and Gladkov 1951). The Sakers of the Mugodzhary range had a similar fate, despite the fact that in 1940-50s it was considered as the only tree-less area with breeding sakers (Dementiev and Gladkov 1951). It is worth noting that the catastrophic decline was experienced by a population that is truly migratory, and thus are more susceptible to various threats. Also it is possible to hypothesise that the Sakers were badly influenced by overgrowing of the steppe and desert plants reacting to lack of grazing. The latter happened in large areas as a reaction of the collapse of animal husbandry in Kazakhstan in 90s. The collapse made the border between steppe and semi-desert biome to shift far south. Tall grass is also susceptible to fires and re-emergence of pyrogenic communities resulting in a decline of the sousliks and gerbils – the food base of the Saker. Indirectly this hypothesis could be supported by the fact that in low-grazing areas the numbers of Steppe and Imperial Eagles is lower than in the high-grazing areas.

So, internationally the problem is illegal smuggling; domestically, changes of traditional grazing levels. If the first problem has been addressed by the International bodies such as CITES and is recognised by the Kazakhstan Government, the second problem is not recognised and is largely unsolved.

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# Diagnostic Investigation of Vulture Mortality: The Anti-inflammatory Drug Diclofenac is Associated with Visceral Gout

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Since 2000, white-backed vultures (*Gyps bengalensis*) in the Punjab Province of Pakistan have experienced significant population declines due to high mortality rates associated with the clinical syndrome of

visceral gout (Gilbert et al., 2004; Gilbert et al., 2002). Histopathology has shown that the visceral gout is due to acute kidney failure in which the lesions were primarily characterized as severe, acute tubular necrosis, with minimal inflammatory infiltrates. These lesions are most compatible with an acute toxic etiology.

Toxicologic investigations ruled out toxic levels of heavy metals known to be associated with renal failure in birds, including cadmium, lead and mercury (Furness, 1996; Pain 1996; Thompson 1996). Although not classically recognized as nephrotoxic, toxic or deficient levels of other heavy metals, including arsenic, copper, iron, manganese, molybdenum and zinc also were not detected. Similarly, there was no evidence of acute intoxication by organophosphate, carbamate, or organochlorine pesticides. Virus isolation results were negative. Molecular biology (PCR) studies for avian influenza and infectious bronchitis virus, two viruses recognized as renal pathogens in poultry (Swayne 1994; Ziegler 2002) were negative.

With the exclusion of known causes of renal disease and/or acute death in birds, the studies were directed at novel toxins. Since the primary food source for the vultures in Pakistan are domestic livestock, we



hypothesized that veterinary drugs used to treat these livestock may be associated with kidney disease in the vultures. Surveys of regional veterinarians and veterinary drug retailers identified the non-steroidal anti-inflammatory drug diclofenac (Todd 1988) as a drug that was commonly used, absorbed orally and known to be nephrotoxic in other birds or mammals (Murray 1993). In addition, other related anti-inflammatory drugs such as indomethacin and flunixin have been shown to cause renal failure and visceral gout in other bird species (Nys 1983; Paul-Murphy 2001).

Kidney samples from 23 vultures with renal failure and 13 vultures without renal failure (control birds which were known to have died of other causes such as trauma, lead poisoning and intestinal foreign bodies) were tested by high performance liquid chromatography and mass spectroscopy for residues of diclofenac. All of the renal failure cases were positive for diclofenac, while none of the non-renal failure cases had diclofenac residues (Oaks 2004a; 2004b). To verify the toxicity of diclofenac for white-backed vultures, two non-releasable juvenile vultures were orally administered 2.5 mg/kg of veterinary diclofenac (the standard veterinary dose recommended for mammals) and two were administered 0.25 mg/kg. Both of the high dose birds and one of the low dose vultures died with visceral gout and the same histologic lesions as the field cases within 58 hours post-administration (Oaks 2004a; 2004b). These data and experiments strongly implicate diclofenac as the cause of renal failure and the population decline of white-backed vultures in Pakistan. Similar findings have also been recently reported from India (Schultz 2004), indicating that diclofenac is also responsible for the decline of vultures in this country as well.

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Photo: Martin Gilbert

