



Wildlife Middle East



©Declan O'Donovan

Wildlife Middle East News is published quarterly. It contains papers, reports, letters and announcements submitted by veterinarians, biologists, conservationists, educators, and other animal care professionals working with captive and free-living wildlife in the Middle East region. Contributions are not refereed, although every effort is made to ensure the information contained within the newsletter is correct, the editors cannot be held responsible for the accuracy of contributions. Opinions expressed within are those of the individual and are not necessarily shared by the editors. Guidelines for authors can be downloaded from www.wmenews.com

NEWS

CONTENTS

- 1.** Editorial.
- 2.** Population biology: the science of population management for captivity, reintroduction, and conservation.
- 3.** Where are we in terms of Arabian oryx conservation?
- 4.** Where are we in terms of Arabian oryx conservation? (Continued)
- 5.** Clinical use of oral antibiotics in zoo-held artiodactylae.
- 6.** Orthopaedic management of a tibial fracture in a juvenile Arabian oryx.
- 7.** Nominated world heritage site in Socotra facing development threats.
- 8.** News and events.
- 9.** News and events. What's new in the literature.

RAKBANK

Simply better شريكك لحياة أفضل

EDITORIAL

Thanks to Rakbank for their continuing support of the newsletter and to our membership who now number more than 5,000. It is a fascinating process of creation to see how each issue of the newsletter turns out from the material the editors amass over 3 months. This last issue of our second year of operation has an ungulate theme, which is no bad thing, because if one thinks about conservation in Arabia, probably the icon that comes to mind is the Arabian oryx. Like all well versed school children, we all know the Arabian oryx story, the rescue of a species from the brink of extinction, the successful breeding in zoos and the release back into the wild. However, the world's favourite conservation success story is perhaps less mission accomplished and possibly more mission impossible than we might have believed.

In this issue, we include a series of important articles on the care and management of ungulates in the Middle East. Two papers by veterinary colleagues show us how modern veterinary intervention can help both an individual animal that has suffered the misfortune of a broken leg, or in the treatment of large herds of ungulates that have been afflicted with deadly diseases. In this age where many species have been exterminated from the wild and captive populations have been founded by a few individuals, the need for genetic management is crucial and Colleen Lynch summarises the importance population management for wildlife managers.

Maartin Strauss reviews 'where we are in terms of Arabian oryx conservation' and his conclusions are important and insightful, not only for oryx, but for the conservation of every species and habitat on the Arabian peninsula. Important problems identified by Maartin that are worth reiterating and commenting on in this editorial include:

- There are a large number of oryx (for oryx replace with any species) in captive collections in the Middle East that are maintained with no genetic management and consequently are of dubious value.
- The lack of priority given by national and regional governments to conservation –highlighted by the fact that there is little long term commitment, little funding, very few laws and no enforcement, or penalties. This means that the sectors of society doing the damage, be they development companies or young men with guns or falcons, just do not take conservation seriously.
- The absence of local, talented young professionals in the field of biology and conservation biology throughout the region. Where are the Nationals protesting outside development sites as beloved bits of desert or beach are bulldozed? Where is the commitment by those in power to protect unspoilt areas of desert, mountain and coast as National Parks so that the natural beauty of Arabia may continue to be enjoyed by both the inhabitants of the region and visiting tourists in the future?

There is a clear need for the collections in the region to work more closely together

WILDLIFE MIDDLE EAST NEWS OBJECTIVES

- Raising awareness of environmental and conservation issues affecting wildlife in the Middle East.
- Distributing information to enable better management healthcare and welfare of wildlife.
- Providing a central contact point for practical advice and information on wildlife management in the region.

and WME News supports the idea promoted by Mark Craig in Volume 1, Issue 2 of our newsletter, to initiate a Middle East Zoological Association. We also feel that there should be greater emphasis on regional training programmes to promote better management of captive and free-living wildlife. This is necessary to ensure that there will be a well trained and motivated pool of local talent to care for the wildlife in the future.

Similar issues were also highlighted at the recent Annual Conservation Workshop for the Fauna of Arabia held at the Breeding Centre for Endangered Arabian Wildlife (BCEAW) in Sharjah, UAE. As part of this workshop some common regional issues surfaced, including the need for high-level political support and interagency involvements at all stages of protected area creation and management; the importance of law enforcement; and the critical need to engage meaningfully with local communities.

Finally, how about some high profile awards to reward those organisations and individuals who are making a commitment to conservation in the region?

NEWSLETTER EDITORIAL TEAM

Tom Bailey, BSc, BVSc, MRCVS, Cert Zoo Med, MSc (Wild Animal Health), PhD, Dip ECAMS, Falcon and Wildlife Veterinarian, Dubai Falcon Hospital, PO Box 23919, Dubai, United Arab Emirates.

Declan O'Donovan, Dip.H.Ed., B.Sc., M.Sc. (Conservation Biology) CBiol, MIBiol, Director of Wildlife Services, Wadi Al Safa Wildlife Centre, PO Box 27875, Dubai, United Arab Emirates.

Chris Lloyd, BVSc, MRCVS, Cert Zoo Med, MSc (Wild Animal Health), Medical Director, Nad Al Shiba Vet Hospital, PO Box 116345, Dubai, United Arab Emirates.

Theri Bailey, BSc, MSc, Cert Ed FE, FRGS, Adjunct Instructor in Environmental Science, Zayed University, Dubai, United Arab Emirates.

POPULATION BIOLOGY: THE SCIENCE OF POPULATION MANAGEMENT FOR CAPTIVITY, REINTRODUCTION, AND CONSERVATION

Colleen Lynch

University of South Dakota, Department of Biology, Vermillion, South Dakota 57069 USA, colleen.lynch@usd.edu

Population Biology and Conservation

Captive populations, as well as wild populations requiring conservation action, are typically small. As a result, biological and logistical challenges to their successful management exist. Small populations experience high levels of demographic stochasticity (random variation in individual reproduction, mortality, and sex ratio) and deleterious genetic effects, which combine to greatly enhance extinction risk. As genetic effects influence reproduction and mortality rates, populations decline further and demographic stochasticity increases. These declines lead to smaller populations and increased inbreeding and loss of gene diversity. Genetic and demographic effects are therefore highly synergistic. Populations of sizes less than 200 are generally considered to be especially susceptible to synergistic dynamics of demographic and genetic risk.

Through the application of standardized methods for population management, these potentially detrimental demographic and genetic effects can be mitigated, and optimal management strategies for captive populations can be devised. Examples of such strategies include those employed by the Species Survival Plan[®] (SSP) of the Association of Zoos and Aquariums and the EEP of European Association of Zoos and Aquariums.

The goals of these programs include rapid growth of founding populations to achieve demographically stable populations at program carrying capacities, creation of stable age structures, and limiting extinction risk. Management strives to maintain the genetic variation present in the founder stock to the greatest extent possible, avoiding loss of heterozygosity due to genetic drift and inbreeding, and thus maintaining adaptive potential in populations. These populations are managed both for genetic health in captivity and as genetic reservoirs in the event of future reintroductions to wild populations.

To ensure the suitability of these captive populations as genetic reservoirs, management goals also include avoidance of artificial selection, including both the unintentional selection of animals with characteristics "well-suited" to captivity, and the intentional selection for or against specific traits. The role of selection in captive populations is poorly understood and maintaining maximum genetic variation is therefore prioritized over selection for or against specific traits.

Data for Population Management

A prerequisite to the development of a population management plan is the compilation and maintenance of a studbook. This is a computerized database of parentage information and life history events (births, deaths, transfers, etc.) for individuals within the population from the time of population founding to the present. Data entered into the studbook should be as complete as possible, but unknown or missing data is to be expected. "Analytical studbooks" incorporating potential or assumed values for missing information can be created and evaluated.

2005 EEP Cheetah Age Pyramid

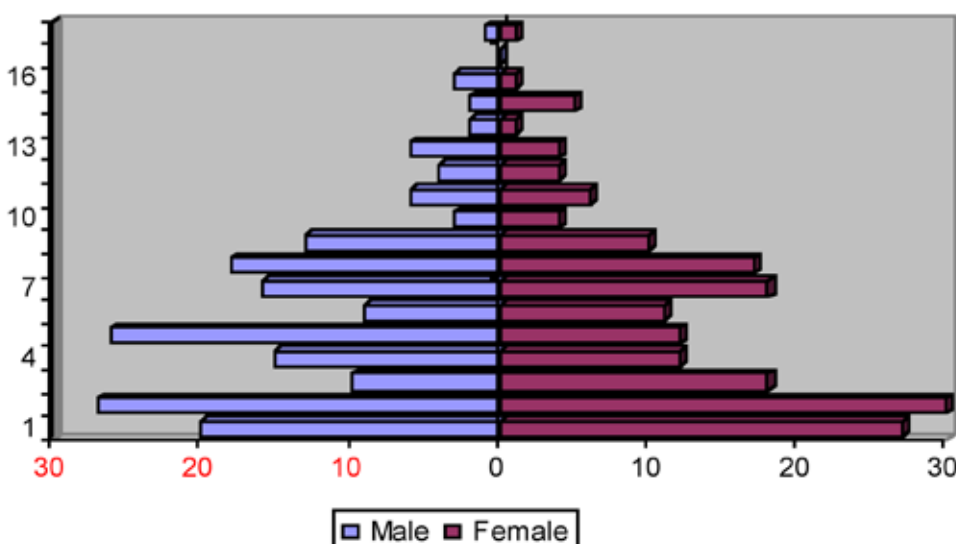


Figure 1. Example of an age pyramid from European Endangered Species Programme for cheetahs generated from the SPARKS collection management software.

Population Status

Once compiled, studbooks can be analyzed using a variety of software tools. Demographic evaluations of age-structure, population growth rates, and population vital rates (fecundity and mortality) are conducted. Genetic parameters including gene diversity, kinship, and inbreeding are calculated. Studbook analysis is used to examine population history, evaluate current population status, and predict future population status under varying management conditions. Analyses are conducted as part of informed population management planning resulting in specimen-by-specimen recommendations for breeding and non-breeding individuals.

Population Management Plans

Population biologists create population management plans suited to needs of specific programs. These needs vary from the creation of breeding and transfer recommendations for individual animals to overall strategies for long-term management of healthy populations in captivity and the wild. Captive populations may be managed to supply specimens for exhibit facilities, provide redundancy for endangered wild populations, or to supply in situ conservation plans. Plans include designating animals for breeding, holding, or release. They may include the transfer of individuals between holding facilities or between captive and monitored/managed wild populations through meta-population analysis. Plans are also able to address the special needs of conservation programs by creating genetically informed evacuation strategies for breeding facilities, and nest/den protection prioritizations for monitored wild populations.

In the selection of individuals for conservation programs such as reintroductions, it is critical that the genetic and demographic integrity of the source population be maintained. Indiscriminately selecting animals for reintroductions can have serious genetic and demographic effects, such as skewed founder representation or loss of founder lines, and destabilization of age structure through over-harvest of targeted age classes. Selection of animals for reintroduction must consider the maintenance of the remaining captive population's ability to serve its conservation role into the future, for the perceived extent of the program.

Conclusion

Whatever their role, captive populations must themselves be stable and secure, being managed for demographic and genetic health, to support these functions. Mean kinship management strategies are generally employed, though they may be customized to meet specific program needs. Monogamous, polygamous, and colonial breeders can all be accommodated. Using this strategy, populations can be managed to maintain at carrying capacity or to supply surplus individuals for reintroduction or for export to other managed programs.

WHERE ARE WE IN TERMS OF ARABIAN ORYX CONSERVATION?

Maartin Strauss

Nature Conservation, Department of Environmental Sciences, University of South Africa, strauwm@unisa.ac.za

Introduction

The people of Arabia remain fascinated by the Arabian oryx because of its seemingly uncanny ability to survive in one of the harshest desert environments on the planet. Elsewhere, this desert ungulate similarly intrigues people, in part also due to the fact that they were brought back to the deserts of Arabia following extinction in the wild in 1972.

But where are we in terms of Arabian oryx conservation today, 45 years after “Operation Oryx” and 25 years since the first Arabian oryx reintroduction into the wild? Moreover, which pertinent decisions do we need to take to facilitate the survival of the Arabian oryx in these and other reintroduction sites over the next 50 years and more?

Reintroduction sites

Reintroduction is defined as “the intentional movement of an organism into a part of its native, historic range from which it disappeared due to either human disturbance or catastrophe.” This article deals with three Arabian oryx reintroductions in the Arabian Peninsula, notably into the unfenced Arabian Oryx Sanctuary of Oman and Saudi Arabia’s Mahazat As-Sayd and ‘Uruq Bani Ma’arid Protected Areas. In each of these reintroductions the explicit aim was the establishment of a viable, self-sustainable population in natural Arabian oryx habitat.

While various successes have been achieved along the way, and while a lot has been learnt about reintroduction procedures and oryx biology, things have, however, not been going according to plan with regards to regional Arabian oryx conservation. This is despite the fact that awareness about oryx conservation among the Arabian public is undoubtedly higher today than at any time during the previous 45 years.

Arabian Oryx Sanctuary (33 920 km²)

At one time a major conservation success story, the more recent history of this oryx population has been less encouraging. Today the population consists of an estimated 60-70 male oryx while significant numbers of female oryx have been absent in the wild for almost a decade now. However, the fact that approximately 100 females are being held in captivity suggests that this population could in future be re-established again. Moreover, definite

steps have been taken to increase - and thereby ensure - the future security of this oryx population.

During August 2007, however, the Arabian Oryx Sanctuary, and therefore also regional conservation efforts, suffered further setbacks when it was decided to decrease the size of the sanctuary by 90%. This, in turn, resulted in the United Nations Educational, Scientific and Cultural Organization (UNESCO) removing the Arabian Oryx Sanctuary from its list of World Heritage Sites – the first time ever that this has happened in the history of UNESCO. The World Heritage Site Committee was quite clear with regards to the reasons for its unprecedented decision by stating: “After extensive consultation with the State Party, the Committee felt that the unilateral reduction in the size of the Sanctuary and plans to proceed with hydrocarbon prospection would destroy the value and integrity of the property, which is also home to other endangered species including, the Arabian Gazelle and houbara bustard” (UNESCO Press Release No.2007-82).

Mahazat As-Sayd Protected Area (2 244 km²)

Currently this population of more than 850 animals is the only viable, self-sustainable Arabian oryx population in the peninsula. However, an earlier population model suggested that the success of this population in combination with the fenced nature of the area could be its downfall over the long term. Variability in rainfall and the resulting periodic food shortages could lead to large-scale population fluctuations and even extinction. Food shortages have already occurred within the area during some years with relatively large numbers of animals dying as a result. However, due to the



Figure 1. Despite recent setbacks, wild oryx herds could again become a common site in the Arabian Oryx Sanctuary of Oman (© Maartin Strauss).

WHERE ARE WE IN TERMS OF ARABIAN ORYX CONSERVATION? ...Continue

variability of the environment in the peninsula it seems highly unlikely that Arabian oryx ever occurred in stable, high-density populations over any significant time period. This is in stark contrast to the situation that is being advocated for the area. Management suggestions - such as the annual removal of "surplus" animals to keep the population at a relatively stable level or the construction of waterholes to try and sustain animals through drought periods - could have far reaching effects for the oryx population and the entire protected area.

'Uruq Bani Ma'arid Protected Area (12 500 km²)

The population in this unfenced area persists 12 years later because of frequent supplementary releases. Of the three protected areas considered, this undoubtedly has the harshest climate, and at last count this population was estimated at ≤ 150 animals - less than the total number of animals released into the area to date. It seems plausible that this population might not be able to become self-sustainable over the long-term and that it might have to be managed as part of a larger Saudi Arabian meta-population.

Each of these reintroduced populations faces serious challenges that need to be addressed to ensure long-term survival. It is imperative to realise that each population has to be managed to a greater or lesser extent to ensure long-term survival. Imaginative ways of making use of relatively large numbers of surplus animals need to be investigated as a matter of urgency.

The future

But what else can be done, considering all that has been previously? It is worth reiterating that the existence of a species recovery plan is not an end in itself; the performance and shortcomings of programmes should be assessed regularly. Without goals and targets to be achieved - and the regular review of these - little progress will be made. Also of particular importance is clarifying the role of private collections in the various conservation strategies. A recent estimate puts the total number of oryx in the region at 8,000 animals - the majority of which are in captivity. Unfortunately however, there is a general lack of genetic management in many of the captive populations, which implies that these animals are of dubious conservation value.

It is therefore estimated that a maximum of 20% of all the oryx in the peninsula are currently of known conservation value. Those collections that can potentially contribute to conservation needs to be identified and breeding management plans should be agreed upon, implemented and adhered to. It is therefore encouraging to note that the Coordinating Committee for the Conservation of the Arabian



Figure 2. Oryx in 'Uruq Bani Ma'arid are subjected to highly variable environmental conditions and a long-term metapopulation management approach could help ensure population persistence (© Maartin Strauss).

Oryx (CCCAO), formed in 1999, has recently again initiated regional meetings to try and find ways of addressing these issues. It is essential, however, that these gatherings result in concrete and measurable conservation action.

Although progress have been made over the last 45 years, the 2001 consensus reached by regional biologists, administrators and other stakeholders that the status of the Arabian oryx should be changed from "endangered" to "vulnerable", has been premature and over-optimistic. There are still considerable problems to overcome to ensure the future survival of the Arabian oryx in the deserts of Arabia. These are made all the more difficult by the rampant economic development that has again commenced in the region. Recently Saudi Arabia's Minister of Economy and Planning announced: "By 2009, we intend to eradicate poverty from the country" (Arab News, Wednesday 25 April 2005). This is highly commendable but it should proceed in conjunction with the other Millennium Development Goals, including environmental sustainability and everything that it entails.

Ensuring the survival of the Arabian oryx and other species/ecosystems in the region is too important a task to delegate to conservation organisations only. There is a need for conservation to become a priority area for both national and regional governments; something that has unfortunately been lacking to a large extent. There are cascading effects in operation here: if governments don't take conservation seriously, as indicated by long-term commitment, sufficient funding and stringent laws and penalties (amongst other things) to back-up their conservation organisations, some sectors of society won't take it seriously either. Moreover, conservation organisations and governments need to sell conservation locally; grabbing the attention of the people of Arabia will facilitate successful, sustainable conservation. This could be done in any number of ways and it is important that due attention is given to attracting local, talented, young professionals into biology in general and into conservation biology in particular. This is something that remains lacking across much of the region.

While admitting the serious conservation challenges that remain, significant progress has been made since 1972. However, a lot more needs to be done in the populations already established, captive populations and possibly additional reintroduction sites to ensure the long-term survival of the Arabian oryx in the region.

A longer, fully referenced version of this contribution is available on the WME website.

Maartin Strauss is a wildlife biologist with extensive experience in the Middle East, having worked on reintroduction projects in both the Sultanate of Oman and Saudi Arabia. The opinions expressed here are his own and do not necessarily reflect those of his previous employers in either of these countries.

CLINICAL USE OF ORAL ANTIBIOTICS IN ZOO-HELD ARTIODACTYLAE

BOUTS T.¹, FURNISS G., FURNISS A.

¹Zoological Society London, ZSL Whipsnade Zoo, Whipsnade, Beds. LU6 2LF, UK; tim.bouts@zsl.org

The use of oral antibiotics in ruminants is limited by the detrimental effects of these drugs on the gastro-intestinal tract. However, in large herds of free ranging hoofstock it may be the only practical way to administer antibiotics. This paper describes the practical use of oral antibiotics in the face of some infectious diseases.

Case 1. An increase in mortality occurred in a herd of 7000 free ranging Rhim gazelles (*Gazella subgutturosa marica*) in the UAE. Post-mortem revealed ruminal bloat and generalized haemorrhagic gastro-enteritis. Laboratory diagnosis confirmed *Clostridium perfringens* (direct smears and toxins found) enterotoxaemia and coli septicaemia. As this disease process was considered multifactorial, dietary and management changes designed to reduce stress were implemented. All animals were treated with amoxicillin powder (Amoxicillin 100%®, Bloom Pharma, Egypt) at 10 mg/kg once daily for 5 days. The amoxicillin powder was mixed manually in the pellets with vegetable oil. Amoxicillin was chosen empirically for *Clostridium* and based on laboratory sensitivity for *E.coli*. Diarrhoea cases decreased during treatment and mortality went back to zero 4 days after ceasing treatment. Management changes and improvement in weather may also have contributed a great deal to the recovery of the gazelles.

Case 2. A group of Rhim gazelles in the UAE suffered abnormally high infant mortality and post-mortem showed all lambs had empty stomachs. An increase in female mortality 3 days later was caused by *Staphylococcus* mastitis. It was thought there may be a high incidence of subclinical mastitis in the herd affecting dams' milk production. A 5-day treatment with trimethoprim (6 mg/kg B.W.) and sulphamonomethoxime (20 mg/kg B.W.) powder (Tromexin®, Invesa, Spain) was manually mixed in a reduced amount of pellets with vegetable oil. Lamb mortalities decreased drastically and routine post-mortems did not show any further mastitis cases or gastro-intestinal problems. The same treatment protocol was used in a group of Sable antelope (n = 15) (*Hippotragus niger*) and Isfahan sheep (n = 250) (*Ovis gmelini isfahanica*) to effectively treat coccidiosis.

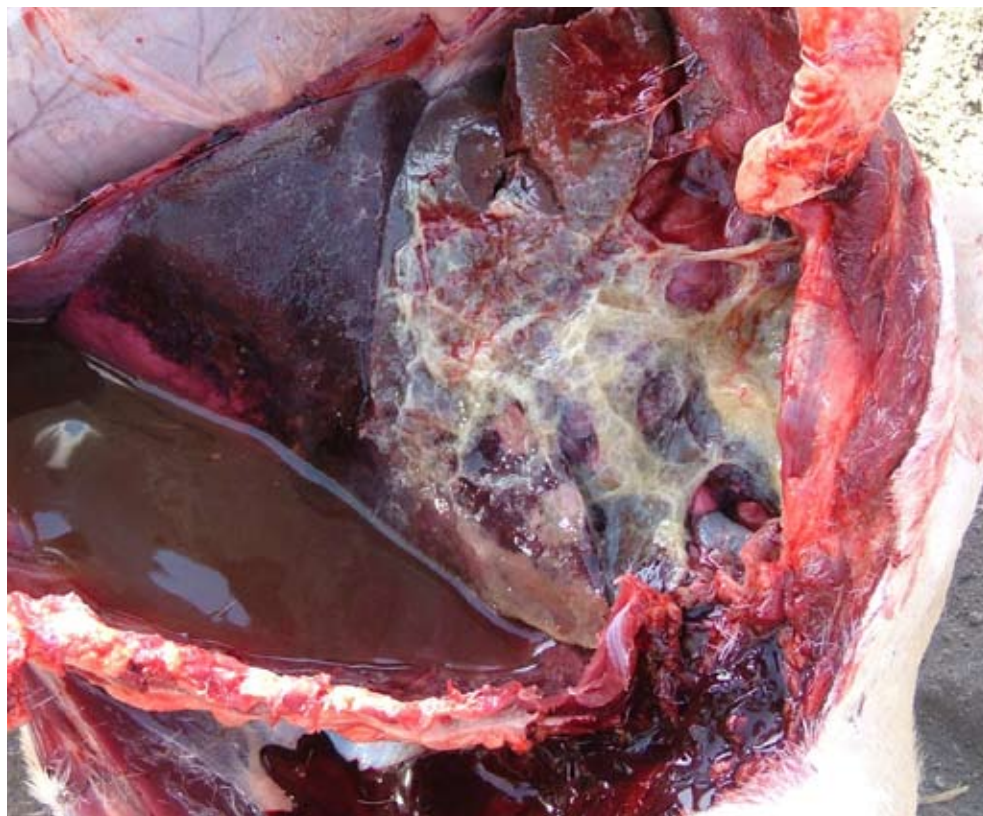


Figure 1. Thoracic cavity of a rhim gazelle with contagious caprine pleuro-pneumonia showing hepatisation of the lung, red brown fluid in the thoracic cavity and the severe fibrinous pleuritis (©Tim Bouts).

Case 3 A group of rhim gazelles (n=10000) and 3,000 dumani gazelles (*Gazella gazella cora*) in the UAE showed sudden increased mortality with acute respiratory signs. Post-mortem revealed hepatisation of the lungs, red brown pleural fluid and severe fibrinous pleuritis (Figure 1). Contagious Caprine Pleuro Pneumonia (CCPP) was confirmed by laboratory testing. Treatment of CCPP can lead to carrier animals so the authors were reluctant to treat but the high mortalities and the lack of other control measures at the time, like vaccination, prompted treatment. Enrofloxacin solution (Enrofloxacin 10%®, Science laboratories, Iran) (15 mg/kg B.W.) was started orally in drinking water for 5 days. Mortality only dropped temporarily after treatment so was changed to doxycycline powder (Doxycyclin 50%®, Al Effat trading, Egypt) (10 mg/kg) once daily for 7 days mixed in the pellets. Doxycycline was chosen based on the reported use of the drug in ruminants at San Diego Zoo (Sudderland, 2007, unpublished data). Furthermore, doxycycline is used in fowl for Mycoplasma treatment. There was again a temporary improvement. No gastro-intestinal problems were recorded. A combination of doxycycline powder (Doxycyclin 50%®, Al Effat trading, Egypt) (10 mg/kg B.W.) and tylosin powder (Tylosin 100%®, Bloom pharma, Egypt) (10 mg/kg) was given in feed once daily for 14 days. The tylosin was added, solely based on its action against Mycoplasma. Mortalities dropped within 24 hours and were acceptable on the third day of treatment.

Results and discussion

In all cases oral medication was the only possible treatment method because of the large enclosures and herd size. Food treatment was preferable to water treatment as the dosage could be calculated more easily and feed uptake was easier to monitor. Also, desert species do not drink large amounts of water. In two out of three cases, the antibiotics had a beneficial effect on the herd health, while in one case, the management changes might have been more important than the actual antibiotic treatment. Furthermore, all antibiotics used had no or minimal gastro-intestinal side effects. The authors feel that oral antibiotics at the dosages used in these cases could be a safe alternative for treating large herds of ruminants in zoos and wildlife parks. However, since there is always a risk involved in giving oral antibiotics to ruminants, it is recommended that laboratory confirmation of the disease agent and sensitivity testing should be carried out prior to selection of therapeutic agent.

ORTHOPAEDIC MANAGEMENT OF A TIBIAL FRACTURE IN A JUVENILE ARABIAN ORYX (*ORYX LEUCORYX*)

Samour, J. and J.L. Naldo

Wildlife Division, Wrsan, P.O. Box 77338, Abu Dhabi, United Arab Emirates

The Arabian oryx (*Oryx leucoryx*), widely known as Wadehi by Bedouins of the Arabian peninsula, became officially extinct in 1972 when the last known surviving specimen was exterminated in the Jiddat Al Harasis in Oman (Henderson, 1974). Fortunately, conservation projects were established throughout the Middle East with the aim of breeding this species in captivity for future reintroduction programmes. Currently, there are five reintroduced populations in four different countries all under different degrees of protection (Harding *et al*, 2007). This species is also widely kept in private collections throughout the region.

HH Sheikh Sultan bin Zayed Al Nahyan created a wildlife sanctuary at Wrsan, Ajban, Abu Dhabi, approximately 15 years ago. The collection includes a large number of Arabian oryx. The current number in the collection is 310 individuals.

In mid January 2008, a juvenile male Arabian oryx (3 - 4 weeks old) weighing 13.4 kg was found in its enclosure recumbent and unable to stand. The oryx was anaesthetised with isoflurane in oxygen for further examination. A survey latero-lateral radiograph showed a closed low energy midshaft oblique fracture of the left tibia (Fig. 1). Ungulates, but in particular males, sustaining fractures on the hind limbs are very commonly euthanased as the management of similar fractures can be cumbersome and the prognosis reserved or poor. Similar fractures of the ulna and radius in smaller ungulates (e.g. *Gazella g. cora*) have been repaired successfully at our facility using external skeletal fixators types 1 and 2, but we have never previously attempted to repair fractures on the hind limb of a larger species.

The fracture was reduced under anaesthesia and was immobilised by the placement of two 5/64" positive profile threaded pins on the proximal and distal fragments and tie-in using a bar and clamps. A topical agent to promote healing was placed around the pins on a dry dressing and the whole surgical site covered using a flexible conforming bandage. The post-operative treatment included 1ml of a non-steroidal analgesic and anti-inflammatory agent IM, SID for three days and 3ml of a long-acting antibiotic IM. The oryx was offered 150 ml of a home made milk substitute four times a day, but also had access to fresh hay and a proprietary pelletised feed formulated for oryx ad libitum. Immediately after surgery the oryx was able to stand and started placing some weight on the affected leg. Human contact was subsequently kept to a minimum.

Six days after surgery the oryx was found holding the leg up and not been able to place any weight on it. A close examination and a follow up radiograph revealed that the proximal pin on the proximal



Figure 3. Oryx calf with external fixator device.

fragment had become loose causing a displacement of the fragments. The other three pins were holding firmly. The loose pin was removed and replaced about 10mm proximally from the original insertion site. In addition, an extra pin was placed proximally to this pin in order to provide extra strength. The conforming bandage was replaced this time using a thermoplastic tape firmly anchored around the bar and clamps providing a reinforcement to the external skeletal fixator. A follow up survey radiograph obtained after the second procedure showed a near-perfect alignment of the bone fragments and abundant callous formation around the fracture site (Fig. 2). As in other similar cases healing was completed in three weeks. However, the thermoplastic casting was first removed and then the pins were gradually removed to transfer pressure to the newly healed fracture site over a period of two weeks. The oryx recovered uneventfully showing no signs of lameness. The oryx was placed together with other young newly weaned oryx to avoid imprinting and will be gradually introduced to one of the herds maintained at Wrsan.

This report demonstrates that it is possible to repair fractures of the hind limb in juvenile ungulates using external skeletal fixators as described in domestic species (Egger, 1993). Careful post-operative care together with the necessary behavioural considerations would allow fracture repair in juvenile ungulates and the subsequent integration with breeding companions. Similar techniques can probably be adapted to repair similar fractures in sub-adult and even adult individuals.

Acknowledgments: The authors thank the staff of the Veterinary Science Department, Wildlife Division at Wrsan for their help. A longer, fully referenced version of this contribution is available on the WME website.



Figure 1. Latero-lateral radiograph of the left tibia of a juvenile male Arabian oryx (*Oryx leucoryx*) showing a closed low energy midshaft oblique fracture. Note the growth plates typical of a growing ungulate.

Figure 2. Latero-lateral radiograph of the same specimen one week after the second surgery. Note the three positive profile threaded pins in the proximal fragment and the two pins in the distal fragment. There is radiological evidence of callous formation around the fracture line.

NOMINATED WORLD HERITAGE SITE FACING DEVELOPMENT THREATS

BirdLife News Alert, Tue Feb 12 12:00:00 2008. HYPERLINK <http://www.birdlife.org/news/news/2008/02/socotra.html> <http://www.birdlife.org/news/news/2008/02/socotra.html>

Socotra is a spectacular group of remote Yemen islands in the Arabian Sea. With a long history of isolation the archipelago possesses a high level of endemism (species found nowhere else in the world), with over 300 unique plants, 21 reptiles and over 60 endemic butterflies and moths. The uniqueness of Socotra's avifauna is also impressive with at least eight endemic species. Additionally, 12 species occur that are classified as threatened and 24 occur in internationally significant numbers. The islands' population of the Endangered Egyptian Vulture *Neophron percnopterus* is in excess of 1,000 individuals, probably the highest concentration in the world.

The archipelago is also of international importance for its breeding seabirds. Ten species breed, two species of which (Jouanin's Petrel *Bulweria fallax* and Socotra Cormorant *Phalacrocorax nigrogularis*) are classified as globally threatened. All this makes these islands globally important for birds. In view of this amazing richness in biodiversity Socotra has been nominated for the prestigious accolade of a World Heritage Site.

"We are so proud that our wonderful island of Socotra has been nominated as a World Heritage Site because of its unique biodiversity", says Abdul-Rahman Al-Eryani, Yemen's Minister of Water and Environment. The Minister was also excited by Socotra's Detwah Lagoon becoming Yemen's first Ramsar site following the country's recent accession to the Ramsar Convention.

However, sensitive and ecologically important areas of Socotra are currently threatened by uncontrolled development, in particular the proposal to construct a new road system. The scale and construction of many new roads is inappropriate, given the sensitive nature of the Socotran ecosystem. If these roads are built they will seriously impact on the island's wildlife and especially its unique plants and birds. Nineteen bird species of conservation concern could be affected because of the likely destruction of their breeding habitat and nest sites. These include Jouanin's Petrel, Island Cisticola *Cisticola haesitatus*, Socotra Warbler *Incana incana*, Socotra Starling *Onychognathus frater*, Socotra Sunbird *Nectarinia balfouri*, Golden-winged Grosbeak *Rhynchostruthus socotranus* and Socotra Bunting *Emberiza socotrana*.



Figure 1. Dragons Blood Trees in the Haggier foothills (©Richard Porter).

"It is essential that this proposed road building programme is examined carefully by the Yemen Government before it seriously affects Socotra's fragile and internationally renowned environment", says Richard Porter, one of the authors of a report on the roads recently sent to the President of Yemen by BirdLife International and the Royal Botanic Garden Edinburgh. "The people of Socotra certainly need some essential roads. However they also need to preserve their unique environment, as it is certainly their most important economic asset. A sound balance between development and biodiversity conservation is therefore critical for the appropriate development of the island", said Malek Abdulaziz, Programme Manager for the Socotra Conservation and Development Programme.

BirdLife is calling on the government of Yemen to build only essential roads that are beneficial for local communities, in a way that is sensitive to the environment. In addition, the cost saving would be enormous, allowing much needed small-scale local development, and there would not be the serious impact on wildlife and the island's increasingly important eco-tourism. "It would be a global tragedy if this programme were to affect Socotra's chances of becoming a World Heritage Site", says Porter.



Figure 2. Socotra Golden-winged Grosbeak on Croton (©Richard Porter).



Figure 3. One of the badly landscaped roads on Socotra.

News and events

9TH CONSERVATION WORKSHOP FOR THE FAUNA OF ARABIA: PROTECTED AREA SYSTEMS IN THE ARABIAN PENINSULA

Philip Seddon

Department of Zoology, University of Otago, PO Box 56, Dunedin, New Zealand, Email: philip.seddon@stonebow.otago.ac.nz

Since its inception 9 years ago, a central theme and concern reached at the end of each successive workshop suggested the need for protected area planning and management. This was an important unifying theme for species conservation in the region. The interest generated by discussions in 2007 made it clear that the 9th workshop in 2008 continued the focus on protected areas, while a series of parallel workshop sessions evaluated for the first time the status of the region's snakes to progress the taxonomic theme.

The general theme of the core workshop was the evaluation and development of protected areas networks in the countries of the Arabian Peninsula. Four core objectives were identified, each one forming a sub-theme for the workshop: (1) to review the current status of protected areas and protected area systems in the Arabian Peninsula; (2) to undertake a formal evaluation of protected area management effectiveness; (3) to identify priority sites for the development of Transfrontier Conservation Areas (TFCAs), and (4) to raise awareness of the implications of global climate on species conservation and protected area creation and management in the region.

Review of regional protected area status

Reports were presented for Jordan, Saudi Arabia, Yemen, Oman, Kuwait and UAE. Some common issues emerged, including the need for high-level political support and interagency involvements at all stages of protected area creation and management; the value of making linkages with appropriate and sustainable commercial activities; the importance of law enforcement; and the critical need to engage meaningfully with local communities.

Evaluation of protected area management effectiveness

Working groups applied the WWF Rapid Assessment and Prioritization of Protected Area Management questionnaire (an evaluation tool which has been implemented in over 20 countries and for more than 850 protected areas globally) to selected sites throughout the Arabian Peninsula. By examining sites in Jordan, Saudi Arabia, Yemen, Oman, and UAE, there was excellent regional, institutional and ecosystem coverage. Some key points emerged from the analysis of the outputs of the questionnaire. Currently the region's protected areas face a number of environmental pressures, including overgrazing, wood-cutting, poaching, and other forms of unsustainable resource use. However, the future threats will probably come primarily from development that is incompatible with protected area conservation objectives.

Region	Partners	Focal species	Ecosystem
Rub' al Khali	UAE, KSA, Oman	Arabian oryx	Desert
Arabian Gulf	Kuwait, Bahrain, UAE, Qatar, KSA	Dugong	Marine
Hawf region	Yemen, Oman	Arabian leopard	Montane

Table 1. Proposed priority sites for the development of Transfrontier Conservation Areas

Prioritization of transfrontier conservation areas

In a series of open discussions and working group sessions delegates suggested three sites (Table 1) in which the ecological needs of high-profile charismatic species encompass key habitats and ecological processes, providing natural and ecologically meaningful cross-boundary linkages.

Overview of the implications of climate change predictions

As the predictive models of global climate change are refined, it has become apparent that under most scenarios there are significant climatic changes forecast for the Arabian Peninsula. Over the entire region temperatures will increase, extreme weather events will become more frequent, and for all but the southeastern areas, rainfall will decrease.

A full report on this part of the 9th Annual Conservation Workshop which was held at the Breeding Centre for Endangered Arabian Wildlife in Sharjah, UAE in February 2008 can be downloaded from www.wmnews.com.

Plans are already underway for the 2009 meeting, where the intention is to mark the 10th anniversary of this important workshop series. Suggestions for themes or topics for guest speaker presentations are welcomed and should be sent to Jane Edmonds at email: breeding@epaa-shj.gov.ae



Dr Mohammed Shobrak, one of the workshop delegates from the Kingdom of Saudi Arabia

News and events

Peter Phelan Obituary

Peter Phelan made an impact on many people in his short life. He spent his last decade of in the United Arab Emirates. He joined the newly-fledged team at the Breeding Centre for Endangered Arabian Wildlife when the company was still in its teething stages. Here he worked as a researcher, conducting field surveys and an intensive study on the behavior and movements of Gordon's wild cats. Later, he joined the Mammal Department, taking charge of rodents and other small mammals.

He will be missed for his spontaneity and enthusiasm when tackling a new project, and his refusal to succumb to the inevitable pessimistic comments of his colleagues. There was never a project too challenging for him to attempt, and the same applied to the mundane routine work, with which he always remained energetic.

Good times won't be forgotten by those who shared them with Peter, whether it was trying to make a fire out of damp wood in the Musandam Mountains with the assistance of a map book and cooking oil, or running around the desert at night catching jerboas or geckos. The hundreds of stories that all his friends have to tell will surely keep Peter's memory alive for a very long time.

Mostly, his friends and colleagues will miss him for his fundamental decency. There would never be an inappropriate time to call Peter for help, because he would always be willing and never complain. Many were the times that he would be woken in the early hours of the morning to tow somebody out of the desert, or to assist with a sick animal. Our social events and barbeques will never be the same without Peter, but at least he left behind a long list of fun times that we can repeat to each other, in happy reflection, in those times when the conversation goes quiet.



What's new in the literature

Ofner, W., Bailey, T., O'Donovan, D., Wernery, U., and Zachariah, R. (2007) Absence of antibodies against *Brucella* sp. in different species of semi-free ranging Bovidae in Dubai, United Arab Emirates. *Vet Med Austria*. 94: 180-183.

A full version is available for download as a PDF at the wmenews website.

Mohammed OB, Omer SA, Sandouka MA. The efficacy of ivermectin and levamisole against natural *Nematodirus spathiger* infection in the Arabian sand gazelle (*Gazella subgutturosa marica*) and the Arabian mountain gazelle (*Gazella gazella*) in Saudi Arabia. *Vet Parasitol*. 2007 ;150(1-2):170-3.

Bazargani TT, Hallan JA, Nabian S, Rahbari S. Sarcoptic mange of gazelle (*Gazella subgutturosa*) and its medical importance in Iran. *Parasitol Res*. 2007 Nov;101(6):1517-20.

Snakes of Arabia: A Field Guide to the Snakes of the Arabian Peninsula and its Shores

Published by Motivate Publishing:
ISBN 978 1 86063 239 6

This extremely useful field guide is astonishingly the first of its kind for the region and fills a much needed gap in the market. It covers snakes inhabiting Saudi Arabia, Oman, U.A.E, Yemen, Qatar and Bahrain. The author, Damien Egan, is a well respected regional expert in this field and his abundant knowledge of Arabian snakes species is presented in a logical and easily referenced format. Each snake is described both photographically and through illustrations with supplementary information provided to enable identification based on multiple criteria. Details are given on typical body, head and eye shape, colour, habitat preferences and geographical distribution as well as some basic scale counting information. For each species, other possible species of confusion are listed. In addition to the user friendly identification guide, this book provides information on the environments in which snakes are found in Arabia, adaptations of snakes to the Arabian environment and how to deal with venomous snake bites. This book is very well presented and as a field guide will prove invaluable for both week end campers and animal professionals alike.

Chris Lloyd

