

Re-introductions in today's Arabian Peninsula: The first steps for a grander vision?

Mark R. Stanley Price

Abstract. This paper is a personal view, deriving from the knowledge base of the Arabian Peninsula's fauna, the record on re-introduction of Arabian Oryx and Houbara Bustard, and selective conservation actions for the region's species, to propose an ambitious vision for restoring the region's key ecosystems through re-wilding, a holistic approach for biodiversity conservation. It is argued that the need is urgent and the time is right, and that various circumstances and opportunities are now favourable. The prospect is for the Arabian Peninsula to maintain its roles as home to specialised species, to continue to act as a sanctuary and crossroads for species from three major neighbouring biological realms, and to be a potential refuge in the face of climate change.

Key words. challenge, re-wilding, predation, ecosystem processes, attitudes, society.

Introduction

The 2010 Sharjah conference built on the far-sighted initiative of ten years ago to take a systematic approach to making inventories of the fauna of the Arabian Peninsula, as a basis for its rational and planned conservation. The results have been the annual Sharjah workshops in each of the subsequent ten years. The 2010 conference was designed to take the information arising from these workshops “to look forward and to explore how and what has been learned and achieved, and inform and guide future conservation challenges for the Arabian Peninsula.”

Hence, there is reason and justification to be creative about the future, to propose a vision, to challenge conventional thinking in pursuit of effective, lasting conservation of the biodiversity of the Arabian Peninsula. The author's credentials for tackling this subject derive from his being the first Field Manager (1979-1987) of the Sultanate of Oman's project to re-introduce the Arabian Oryx *Oryx leucoryx* to the wild, subsequently founder-chair of the IUCN Species Survival Commission's Re-introduction Specialist Group (RSG), and currently a Conservation Fellow at the Al Ain Wildlife Park and Reserve while leading an RSG activity to develop new IUCN guidelines and policy on the prospects for deliberately moving plants and animals outside their current ranges as a means to avoid the anticipated impacts of climate change or other major disruptions.

Against this background, this paper will present two contradictory observations, followed by a prospect to be avoided, and finally a challenge for biodiversity conservation in the Arabian Peninsula.

Re-introductions in the region, and first observation

As a conservation tool, reintroductions are increasing: between 1998 and 2007 the number of known reintroductions more than doubled (SEDDON et al. 2007). The success rate is also increasing (SOORAE 2008). Nonetheless they remain a relatively rarely used, and costly management option in conservation. Under scenarios of climate change and its impact, there may be considerable scope for more ambitious moves of species, so-called ‘assisted colonization’, to outside current or historical range (HOEGH-GULDBERG et al. 2008).

The states of the Arabian Peninsula have a well-deserved reputation for reintroducing two regional species. The first is the Arabian Oryx. Over the last 30 years, all seven countries of the region have managed this species under conditions ranging from full captivity to unsupported life in the wild, with every degree of management in between. No other antelope species in the world has received so much attention across its entire historical range, and this may be true for all animal species of comparable conservation status. This record gives the region a leadership profile in re-introductions.

Second, institutions in both the Kingdom of Saudi Arabia and Abu Dhabi have successfully bred large numbers of Houbara Bustard *Chlamydotis macqueenii*, for restocking both locally and in parts of the species’ migratory range. A large body of knowledge has accumulated on the species’ ecology, migrations and breeding in the wild (LAWRENCE et al. 2008; COMBREAU et al. 2011).

Both these species are iconic and have great cultural values in the region. The years of research effort and great resource inputs have paid off in terms of the ability to produce large numbers of animals for re-establishment in the wild, while exporting the techniques to other countries.

Knowledge of the regional fauna, and the second observation

The ten years of Sharjah workshops (AL MIDFA et al. 2011) have delivered comprehensive information on the vertebrate biodiversity of the Arabian Peninsula. Fig. 1 shows the size distribution of the 48 indigenous terrestrial mammals. Most species are small in size, reflecting the generally challenging conditions of the region. But, from Fig. 2 it is evident that the largest species are those at greatest risk of extinction. Further to MALLON’s (2011) observation that the regional Red Listings for carnivores are at least two degrees more endangered than each species’ global listing, the obvious inference is that the Arabian Peninsula is at grave risk of losing many of its largest and most striking species.

The three largest carnivores, the Striped Hyaena *Hyaena hyaena sultana*, the Arabian Leopard *Panthera pardus nimr*, and the Arabian Wolf *Canis lupus arabs*, are the most obvious at-risk species. Although unknown at the moment, one can postulate that these forms all exhibit regional, genetic distinctiveness: their extinction would be a loss for global biodiversity.

A challenge for regional biodiversity conservation

The combination within the region of re-introduction track record, knowledge of the local fauna, and the parlous state of many large species in the wild suggests the need for a powerful and urgent vision for biodiversity conservation that must also be compelling to decision-makers and the public.

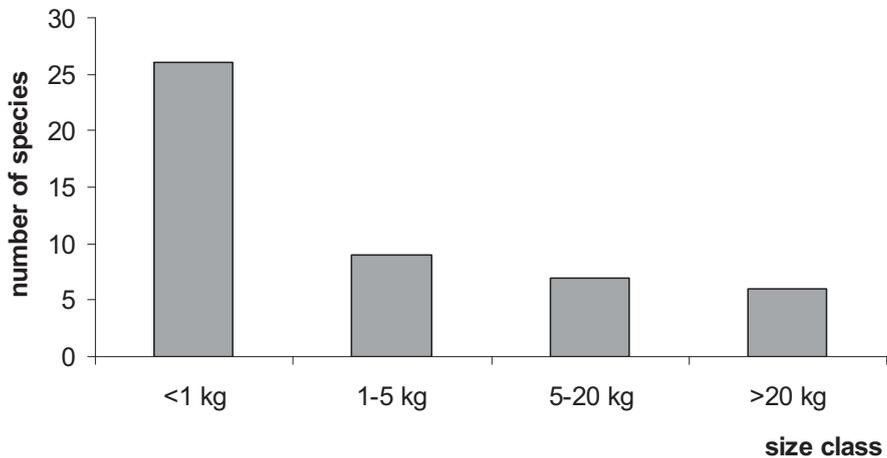


Fig. 1. Size distribution of terrestrial mammals of the Arabian Peninsula (data from Sharjah Conservation Workshops).

A reasonable vision would be to conserve and repair to some recent historical condition representative areas of all the Arabian Peninsula's ecosystems, for the benefits of both man and wildlife. Such a vision offers the opportunity for the region's states to become further pioneers in the concept of ecosystem restoration or re-wilding. Re-wilding is the establishment of species and reassembly of functioning communities, through the restoration of ecosystem processes and connections. This encompasses the broadest definition of biodiversity, in which the focus is on all components of an ecosystem, their functional dependencies and ecological links. This is in contrast to the single-minded re-introduction of one species, though a high profile re-introduction can probably be a very persuasive entry point for re-wilding.

Some issues around re-wilding in the Arabian Peninsula

Public attitudes to wild species, and selectivity

As in any country or region, one can assume that public attitudes towards wildlife are diverse. Yet, the volume of visitors to attractions such as the Sharjah Breeding Centre for Endangered Arabian Wildlife and the Al Ain Wildlife Park and Resort show the appeal of wildlife to the general public. And locally, the region has a high density of living collections of both indigenous and exotic wildlife. Providing for animals under such confined and protective conditions assures the survival of the species, but re-wilding requires a transition to providing the conditions for populations to be self-sufficient in the wild.

There is evidently also selectivity in public attitudes towards species. In the Arabian Peninsula all predators are at risk of lethal persecution irrespective of where they are living or whether they indulge in activities that directly or indirectly damage man's interests. This not a problem confined to the region, for the persecution of predators takes place in the United

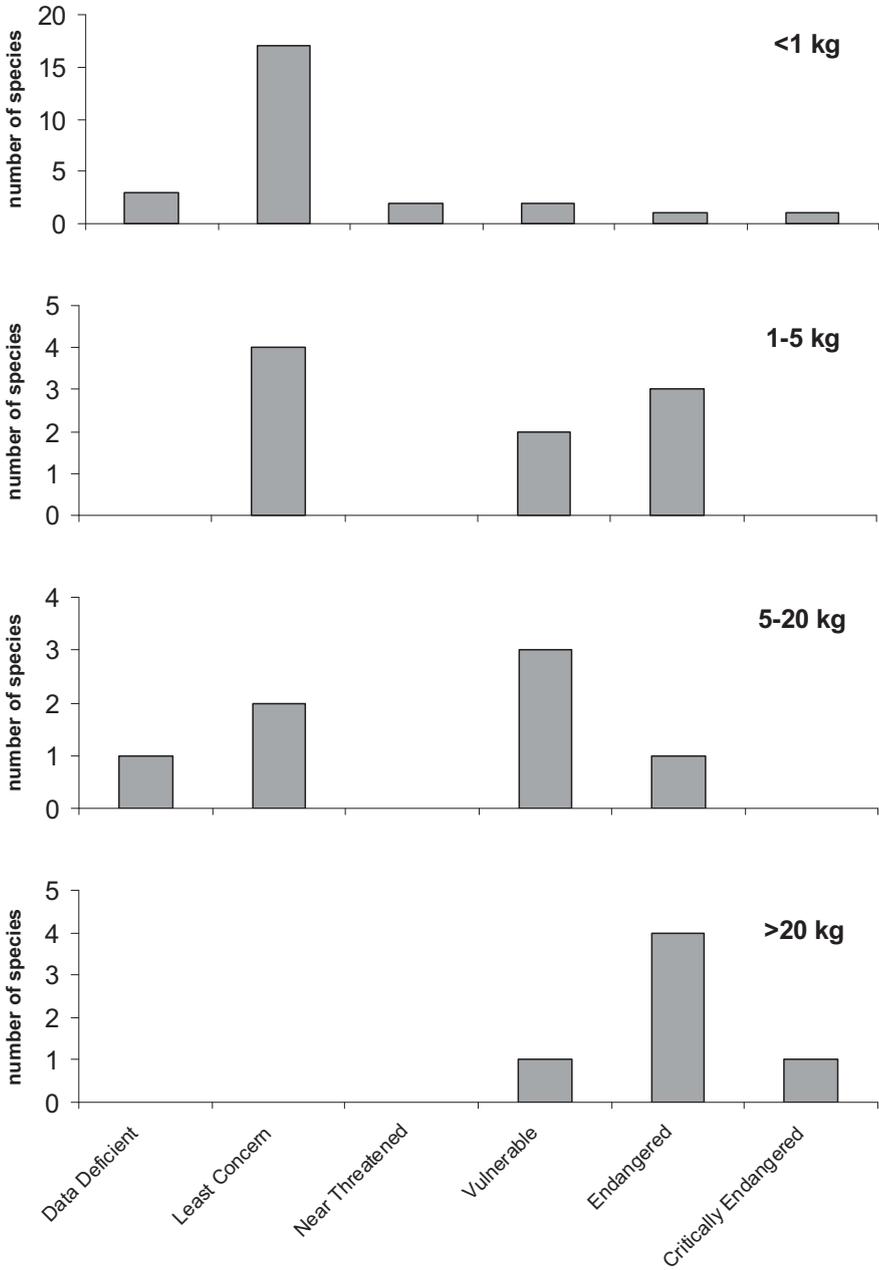


Fig. 2. Number of species and Red List status in four size classes.

Kingdom and USA either on the shallowest pretexts, or through scientific ignorance, or when opportunity presents itself, even if contrary to the law of the land.

While such attitudes to predators are not a new problem in regional conservation, it was admitted that the release of Houbara in the United Arab Emirates (UAE) is an ongoing process to steer response to predation pressure on released birds away from a generalised persecution of predators and towards a limited, targeted control, taking concern of wider conservation objectives (LAWRENCE et al. 2008).

What must be done to demonstrate and have accepted that predation is a natural process and that wild populations need predation for their fitness and evolutionary potential? Biodiversity conservation treats each species objectively and accepts that each has its ecological roles to play in its ecosystem. If an antelope species is successfully restored, but at the same time two predator species are eliminated to avoid the risk of any predation, then that is a net loss of biodiversity.

Fenced enclosures in re-wilding

Experience with re-introduced Arabian Oryx has led to the tentative conclusion that fenced conditions are necessary for any successful re-establishment. This seems paradoxical for in many countries where space is competed for by alternative land uses, protected areas tend to be small and surrounded by other very different land uses and high human densities. This is not, in general, the situation in the Arabian Peninsula, yet it appears that large mammals may soon only persist where open land is relatively inaccessible to human beings, such as the Rub-al-Khali for Oryx and the high mountains for the Arabian Tahr *Hemitragus jayakari* and Nubian Ibex *Capra ibex nubiana*. Despite the large areas potentially available for wildlife in the Arabian Peninsula, the unpredictability of rainfall and the ability of today's motorised pastoralists to respond to fresh rainfalls very swiftly lead to competition between pastoralists and wildlife. If wild species are confined to specific fenced areas, there may soon be problems when rain falls outside the fenced area, and when animal numbers build up to beyond some sustainable number or density inside the fence (e.g. ISLAM et al. 2010).

Fencing solves certain major problems, but it also introduces some further problems of its own; and once fenced, a permanent obligation for maintenance and management of contained populations inside starts at once. On the other hand, fencing can be used creatively in conjunction with smart use of topography. Dghoumes National Park in Tunisia has been repopulated with Scimitar-horned Oryx, *Oryx dammah* (WOODFINE et al. 2009). An area of 800 km² has been fenced on three sides only, with a low range of mountains forming a natural barrier on the fourth side. The needs of the re-introduced Oryx are currently met by the resources of the 800 km², but suitable habitat exists on the farther side of the mountain range, and Oryx have explored there in the first few years after release, but returned. The presumption is that as numbers increase, range extension outside the fenced area will occur naturally, so that the incomplete fence acts as a natural release valve.

Time to restore

Restoring any species depends largely on public support – either for the public to assist or, at least, to give tacit approval. Successful re-introductions in the face of public opposition, even involving large protected areas, may be very prolonged, complex and expensive, exemplified by the return of the Gray Wolf *Canis lupus*, to Idaho, USA (BANGS & SMITH 2008).

If a species has been absent for probably little more than one human generation, it will progressively drop from the cultural heritage and oral traditions of any society. The first Oryx were restored to Oman in 1982, only ten years after they were extirpated there, and 20 years after the World Herd was established to save the species (STANLEY PRICE 1989). To the generation that became wildlife rangers, the Oryx was still part of their childhood memories and the subject of tales and beliefs. Had the extinction interval been much longer, the re-introduction project would have encountered much greater scepticism about the need or value of trying to restore the species.

Opportunities in re-wilding

Secure populations out of the wild as resources not end points

Much of the array of the Arabian Peninsula's plants and animals now exist in secure surroundings of some sort – whether zoological gardens, botanic gardens, wildlife parks or private collections. This is a fine starting point for integrated management between secure out-of-the-wild populations in support of the remnant wild populations, or as resources for establishing new populations in the wild.

Out-of-the-wild populations play essential and unique roles for public awareness and education of biodiversity and the need for its conservation. Further, such populations provide the opportunity for focussed research on the biology and needs of species under conditions that, while artificial, can be controlled compared to those of the wild. But as the conservation strategy of the World Association of Zoos and Aquariums states (WAZA 2005), secure out-of-the-wild populations are not the ultimate aim of species conservation. Ex-situ conservation is neither an end in itself nor an interim stage for species. Given the pressures on biodiversity today, any ex-situ populations must be part of an integrated strategy for conserving any species in its natural habitat.

Response of vegetation inside fenced areas

Although fenced areas for wildlife may have their disadvantages (see above), they also offer at least two major opportunities in the Arabian Peninsula where there are the scope and resources for fencing-off relatively large areas – for example the 2,200 km² Mahazat as-Sayd (OSTROWSKI et al. 1998), and a proposed 2,800 km² Oryx sanctuary in Oman (A. SPALTON, pers. comm.). Given the scale of these areas, it may be possible to include within them small populations of some of the key predators, contributing to their security, while also offering scope for regulation of prey numbers in these fenced reserves.

Second, the response of vegetation in the Arabian Peninsula to being fenced off and given respite from the grazing pressures of domestic livestock can be dramatic recovery (ABUZINADA 2003). Mahazat as-Sayd demonstrates this even when subject to fairly high densities of wild herbivorous species (TREYDTE et al. 2001). There are also other examples of areas that have been fortuitously excluded from livestock that demonstrate the point that much of Arabian Peninsula need not be desertic in the sense of having very little vegetative cover and diversity.

This suggests that the vision for re-wilding the Arabian Peninsula could usefully start with a review describing the vegetation and biodiversity of the region using any historical sources

over the last 150 years, reflecting an era before development of modern infrastructure, vehicles and lifestyles that have now replaced low-density and low-impact pastoral societies.

Lifestyle change and attitudes

It is evident almost throughout the Arabian Peninsula that relatively few of its citizens now depend on livestock and pastoralism for their domestic economies. Urbanisation has intensified and new job opportunities and livelihoods are being created either away from the desert or independent of the desert's natural resources. Hence, the economic case for persecuting predators due to direct loss of livestock is diminishing. There are ways of insuring livestock against predation or compensating their owners after an event, and even more creative ways for avoiding conflict through conservation performance payments (ZABEL & HOLM-MÜLLER 2008). This is a legitimate opportunity for engagement by conservation bodies.

As urbanisation proceeds and lifestyles change further in the region, can conservation help change attitudes towards the desert and its biodiversity? The desert's sparse resources and its climate are often a hostile combination for human welfare and well-being. Understandably, conquering these factors and subduing them have been part of regional culture for millennia – probably since the desert was first occupied by man. But modern technology enables mankind to overcome the desert's adversities. Man should be able now to admire the desert and value it: surely, the desert with its non-living characteristics and specialised biodiversity should be conserved effectively and celebrated as a key element in cultural heritages? Further, there is increasing evidence in western society that alienation from nature can have considerable adverse impacts on human welfare and health (PRETTY 2007). Could regional conservation bodies not be working profitably on promoting societal change in perception and attitudes?

Conclusions

The states of the Arabian Peninsula can build on their record for re-introduction through development of a multi-national vision for re-wilding their key biodiversity areas. There are a number of factors encouraging development of this vision now: many of the region's large animal populations are in dire trouble in the wild, facing extinction; yet, many of the region's species of plants and animals are now represented by secure ex-situ populations that can be resources for integrated management in and out of the wild; re-establishment of species in the wild through new populations is preferable before the species is extinct everywhere in the wild and, if extinction has occurred, then it is important to minimise the period between extinction and re-introduction; suitable habitat, based on adequate vegetation structure and composition, will return naturally from desert areas if these are protected from uncontrolled grazing by livestock, or can be actively restored; finally, there is reason to think that socio-economic conditions and attitudes towards biodiversity in the region should become more favourable for restoration of the biodiversity heritage.

The restoration of the carnivore community will present particular problems, but a useful precedent may exist in the Large Carnivore Initiative for Europe (www.lcie.org), which comprises individual carnivore experts from across 17 European countries. Further, the IUCN's Species Survival Commission is establishing a new committee to promote tools and processes for effective and realistic planning for species conservation.

It is evident that any re-wilding in the Arabian Peninsula will require more than a challenge and technical expertise. There will have to be a strong multi-national vision for the desired state of biodiversity and its conservation, to which all the relevant governments will actively subscribe. This may require an institution or mechanism that will take on responsibility for driving towards this vision, and be held accountable for doing so. Targets will be set and progress monitored, indicating a new era in which conservation is stating its demand. A pre-requisite for such a vision is that it has political support across states; therefore, the results of meetings such as this conference must be transmitted to politicians and decision-makers, and hence beyond Ministries of the Environment. Experience in South Africa shows that new, cross-country initiatives need powerful champions (KNIGHT et al. 2011), and oryx re-introduction in Tunisia is successful largely because this is an objective in that country's National Biodiversity Strategy and Action Plan and consequently has government support from the start (WOODFINE et al. 2009).

In parallel, and supportive of such a vision, is development of an appropriate societal attitude towards biodiversity conservation. The gain from this would be enormous if a country's cultural heritage was accepted as including not just the built environment and works of art but also natural ecosystems and processes. The latter would have to include the existence of predators and their impacts on prey populations, without human value judgements being imposed on natural processes. This would be part of a developing philosophy in which the desert and its associated processes are not to be subjugated at every opportunity, but are valued as part of the cultural heritage, and for providing essential ecosystem services for mankind, for biodiversity is part of a country's healthy infrastructure.

This vision is bold, and may be unfairly general when applied to the region of the Arabian Peninsula as a whole. It is merely proffered as a helpful provocation. If representative areas of Arabian Peninsula's ecosystems can be restored to their condition of only 200 years ago, then the Arabian Peninsula will continue to be home to many regionally-restricted species and forms of great interest and value. In addition, the Arabian Peninsula will continue to provide an essential linkage between its neighbouring realms of the Palaearctic, Afrotropical and Indo-Malay, acting as a crossroads, sanctuary and potential refuge in times of climate change.

This is the positive vision; the alternative, to be deplored, is that inaction or inadequate actions will allow species' extinctions, and then the Arabian Peninsula's magnificent habitats of mountain, desert and coastline will be truly deserted.

References

- ABUZINADA, A. H. (2003): The role of protected areas in conserving biological diversity in the Kingdom of Saudi Arabia. – *Journal of Arid Environments* 54: 39-45.
- BANGS, E. E. & D. W. SMITH (2008): Re-introduction of the gray wolf into Yellowstone National Park and central Idaho, USA. p. 167-171. In: P.S. SOORAE (Ed.), *Global re-introduction perspectives: re-introduction case-studies from around the globe*. – IUCN/SSC Re-introduction Specialist Group, Abu Dhabi, UAE, viii + 284 pp.
- DOLAN, C. J., J. BURGER, C. E. BOCK, J. H. BOCK, D. A. BURNEY, K. J. A. ESTES, D. FOREMAN, P. S. MARTIN, G. W. ROEMER, F. A. SMITH, M. E. SOULÉ & H. W. GREENE (2006): Pleistocene rewilding: An optimistic agenda for twenty-first century conservation. – *American Naturalist*: 168 (5): 1-22.

- HOEGH-GULDBERG, O., L. HUGHES, S. MCINTYRE, D. B. LINDENMAYER, C. PARMESAN, H. P. POSSINGHAM & C. D. THOMAS (2008): Assisted colonization and rapid climate change. – *Science* 321: 345-346.
- ISLAM, M. Z., K. ISMAIL & A. BOUG (2010): Catastrophic die-off of globally threatened Arabian Oryx and Sand Gazelle in the fenced protected area of the arid central Saudi Arabia. – *Journal of Threatened Taxa* 2: 677-684.
- LAWRENCE, M., J. JUDAS & O. COMBREAU (2008): Re-introduction and population re-enforcement of Asian Houbara Bustard in Asia. p. 130-134. In: P. S. SOORAE (Ed.), *Global re-Introduction perspectives: re-introduction case-studies from around the globe*. – IUCN/SSC Re-introduction Specialist Group, Abu Dhabi, UAE, viii + 284 pp.
- OSTROWSKI, S., E. BEDIN, D. M. LENAIN & A. H. ABUZINADA (1998): Ten years of oryx conservation breeding in Saudi Arabia - achievements and regional perspectives. – *Oryx* 32: 209-222.
- PRETTY, J. N. (2007): *The earth only endures*. – Earthscan, London and Sterling VA, 274 pp.
- SEDDON, P. J., D. P. ARMSTRONG & R. F. MALONEY (2007): Developing the science of reintroduction biology. – *Conservation Biology* 21: 303-312.
- SOORAE, P. S. (2008): An overview and analysis of re-introduction project case studies. p. vii-viii. In: P. S. SOORAE (Ed.), *Global re-introduction perspectives: re-introduction case-studies from around the globe*. – IUCN/SSC Re-introduction Specialist Group, Abu Dhabi, UAE, viii + 284 pp.
- STANLEY-PRICE, M. (1989): *Animal re-introductions: the Arabian Oryx in Oman*. – Cambridge University Press, Cambridge (U.K.).
- TREYDTE, A. C., J. B. WILLIAMS, E. BEDIN, S. OSTROWSKI, P. J. SEDDON, E. A. MARCHALL, T. A. WAITE & K. ISMAIL (2001): In the search of the optimal management strategy for Arabian Oryx. – *Animal Conservation* 4: 239-249.
- WAZA (2005): *Building a future for wildlife: the World Association of Zoos and Aquariums conservation strategy*. – Berne.
- WOODFINE T., K. ZAHZAH, A. CHETOUI, T. GILBERT & G. L. D'ALTERIO (2009): Reintroduction of scimitar-horned oryx to Dghoumes National Park, Tunisia. – Report prepared for Direction Générale des Forêts, Tunis.