

Conserving the Hidden Nature: An Overview on Conservation Efforts in United Arab Emirates (UAE)

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Authors' contributions

This work was carried out in collaboration between all authors. Authors UHG and AM designed the study, wrote the protocol, interpreted the data, anchored the field study, gathered the initial data and performed preliminary data analysis. Authors UHG and MR managed the literature searches, whereas author UHG produced the initial draft and perform final manuscript data analysis. Author AM edited and reviewed the initial draft and produced final manuscript. Author MR managed logistics and resources to execute field work. All authors read and approved the final manuscript

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ABSTRACT

The aim of the study is to document the threats faced by reptiles with other species in UAE and the conservation efforts done by Barari Forest Management (BFM). The study was conducted by reviewing the factors affecting the existing wildlife in 34 different sites under Barari Forest Management in the Emirate of Abu Dhabi, United Arab Emirates from March to July, 2014. The data was collected using a combination of methods which included participatory observations and group discussions with local community including the residents, farmers, foresters, wildlife rangers / staff and field workers. The findings/ results of the study indicate that the major threats faced by existing herpeto-fauna and other associated wildlife in the study area were off road driving (25%) followed by desert safari (19%), human habitation (16%), illegal poaching (13%), human interaction (11%), habitat degradation (9%) and disturbance (7%). Majority of people (44.80%) believed that off road driving and desert safari are the most common threats to these reptiles and other wildlife, whereas 32.20% people thought that human interference and illegal poaching are the main cause

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of threats to reptiles and mammals, while 23% people didn't know about the threats to herpetofauna. According to our findings 89.20% people liked wildlife including reptiles and mammals whereas, 10.80% respondents were indecisive and did not show much interest.

Keywords: Conservation; reptiles; protected areas; fauna of UAE; threats.

1. INTRODUCTION

Protecting wildlife for our future generations will require bold and strategic conservation efforts in every region. Habitat loss, climate change, poaching and pollution paint a bleak picture for threatened and endangered species around the world. The loss of a single species is a tragic event and yet we lose an estimated 10,000 species to extinction every year throughout the world [1]. Well-known endangered animals in the UAE include national symbols like the Dugongs, Arabian tahr, Arabian oryx, Sand gazelle, Arabian mountain gazelle, Arabian leopard, Arabian sand cat and Houbara bustard. There are, however, countless other undiscovered species threatened to extinction without our knowledge. Species extinctions not only throw ecosystems out of balance but can impact our food chain, economy and eliminate potential scientific and medical breakthroughs [2].

As all species in an ecosystem are linked to each other, one way or another, the elimination of just one can impose drastic and irrevocable effects on those remaining. Five mass extinctions are known till date, yet some scientists believe, we are on verge of sixth extinction due to manmade catastrophes. Factors pushing this mass extinction are the legal and illegal trade in at-risk species, habitat destruction due to over exploitation by humans and a series of climate changes caused by human interventions disturbing the balance of nature. Species require a prolonged exposure to such stimuli to adapt accordingly and unfortunately, above mentioned changes are occurring way beyond adaptability period of almost all [2,3].

UAE hosts a unique and remarkably adapted fauna and flora. Fifteen protected areas have been declared officially in UAE. Six of them are terrestrials and seven marine areas. These Protected Areas stretch over 4406 Km². In addition, 46 protected areas have been unofficially declared in UAE; according to the ecosystem, 32 are terrestrials and 14 are marines [4].

1.1 Conservation Efforts for the Survival of Wildlife in UAE

Without suitable habitat, the vital animal populations cannot be established. Wildlife Management Department (BFM) is working in line with the vision to provide sustainable habitats to species being conserved. The Department planned and executed various conservation projects for the protection and propagation of endangered fauna of UAE. Moreover, it has successfully bridged the in-situ and ex-situ conservation practices to attain viable populations of critically threatened species. Over 63,000 individuals of 25 different species are being managed throughout the country from east to west [Map.1; 5]; with a variable topographic features and vegetation in 34 different natural wildlife areas (Table 1). Some of the managed species are regional symbol and fall under various categories of IUCN Red list (e.g. endangered, critically endangered and extinct in wild) [5]. The department is managing 12 different IUCN red listed ungulate species including 07 Vulnerable (VU), 01 Near threatened (NT), 01 Extinct in the wild (EW) and 03 Least Concern (LC) species [3]. These include Scimitar-horned oryx (*Oryx dammah*), Arabian oryx (*Oryx leucoryx*), Black buck (*Antelope cervicapra*), Goitered gazelle (*Gazella subgutturosa*), Mountain gazelle (*Gazella gazella*), Urial (*Ovis vignei*), Fallow deer (*Dama dama*), Esfahan mouflon (*Ovis orientalis*), Barbary sheep (*Ammotragus lervia*), Nubian ibex (*Capra nubiana*), Nilgai (*Boselaphus tragocamelus*) and Common eland (*Tragelaphus oryx*). The wildlife sites also include planted forests for enrichment of habitat as strategy to combat desertification. The dominant vegetation managed by Barari includes *Accacia* spp., *Conocarpus lancifolius* and *Prosopis cineraria* [5].

There are only few studies on the conservation of hidden miniatures; the reptiles of UAE. Not much evident information depicts the threats, species diversity and distribution of reptilian fauna in the country along with a lack of information on effects of conservation efforts on this animal group due to establishment of a network of

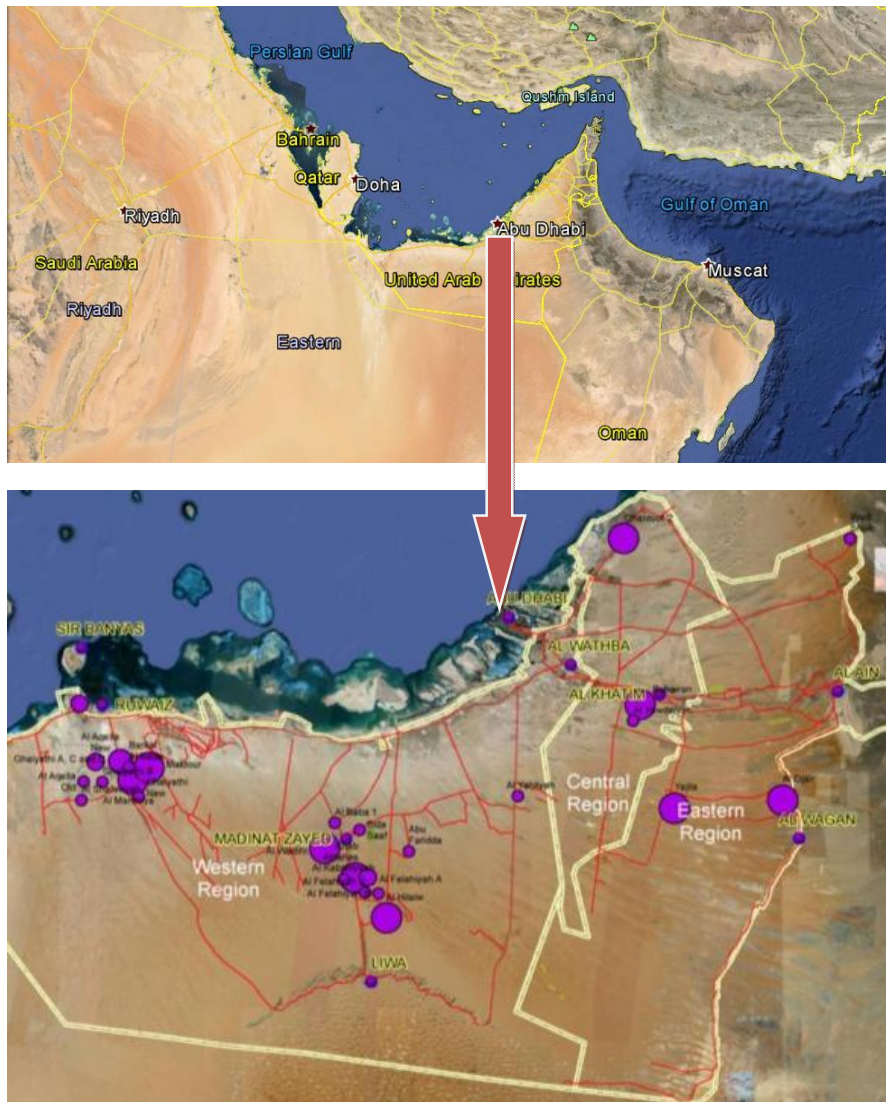
protected areas within the emirate of Abu Dhabi. The objective of this article is to assess the threats to reptiles and the positive effects of protected area network on the population of reptilian fauna of the UAE.

2. MATERIALS AND METHODS

A total of 102 random surveys were conducted in the protected wildlife forests managed by BFM in the Emirates of Abu Dhabi. During each survey habitat was searched for reptilian fauna by walking in open transects. Specimens were captured and were released after photography.

There was no fixed number of photographs and mostly depended on good angle for identification. Field identification guides were used to identify the species.

The status of herpeto-fauna was assessed through a questionnaire survey by interviewing residents of the area, farmers, field workers, foresters and biologists. A total of 110 people were interviewed and the shared information was recorded on a predetermined questionnaires. The information was then compiled and interpreted for various threats to the survival of these hidden jewels of nature.



Map 1. Distribution of animals in Barari's care [5]

Table 1. Existing animal types in different wildlife sites under Barari Wildlife Management

No	Site Name	Types of animals present
1	Al Yaeela	Eland, Scimitar Oryx, Black Buck, Sand Gazelle and Urial Sheep
2	Al Ujair	Arabian Oryx and Mountain Gazelle
3	Wadi Shuib	Sand Gazelle
4	Al Wadihi	Arabian Oryx, Sand Gazelle and Mountain Gazelle
5	Al Baba 1	Sand Gazelle
6	Khub Aldhs	Sand Gazelle
7	Hezam Zaid	Sand Gazelle and Arabian Oryx
8	Bida Saif	Mountain Gazelle
9	Al Flahia A	Sand Gazelle
10	Al Flahia B	Sand Gazelle and Mountain Gazelle
11	Al Flahia 0	Sand Gazelle and Mountain Gazelle
12	Al Kabshia	Sand Gazelle, Arabian Oryx and Mountain Gazelle
13	abu Frida	Sand Gazelle
14	Al Yahalia	Sand Gazelle and Mountain Gazelle
15	Al Hiliwa	Sand Gazelle and Scimitar Oryx
16	Al KhariJa	Sand Gazelle
17	Al Midoor	Mountain Gazelle
18	Barakit Al Nada	Sand Gazelle and Mountain Gazelle
19	Al Rakeeb	Sand Gazelle
20	Al Markhia	Sand Gazelle
21	Ghayathy New	Mountain Gazelle
22	Ghayathy A-C-D	Sand Gazelle
23	Ghayathy B	Sand Gazelle
24	Jabal Al Dhana	Urial Sheep and Mountain Gazelle
25	Al Akilla New	Sand Gazelle
26	Al Sila	Sand Gazelle
27	Bida Haza	Sand Gazelle
28	Al Akillah Old	Sand Gazelle
29	West Ghayathi	Sand Gazelle
30	Al Shahriah 1, 2, 3	Sand Gazelle
31	Ghantout 1, 2	Sand Gazelle, Arabian Oryx, Mountain Gazelle, Esfahan Moflon, Barbary Sheep, Fallow Deer and Nilgai
32	Al Yadoi'ah	Mountain Gazelle
33	Buhairan	Sand Gazelle, Mountain Gazelle, Arabian Oryx and Fallow Deer
34	Al Maqam	Sand Gazelle, Mountain Gazelle and Urial Sheep

3. RESULTS AND DISCUSSION

Conservation of threatened species requires a sound management approach envisioned with sustainable use and ecological balance. Department developed and implemented an action plan, supported by relevant standard operating procedures, addressing various aspects of management such as; species aspects, behavior and habitat enrichment, species and habitat rehabilitation, ex-situ conservation and in-situ conservation, genetic diversity and breeding programs etc. These strategies had enhanced the growth rate of native species to +100.86% whereas for the exotic species the growth rate was +1.48% [4,5].

Anthropogenic factors pose serious threat to many wild species especially through habitat destruction. During habitat destruction, larger mammals and birds tend to migrate to more

suitable habitats nearby, but most of the herpetofauna is dragged towards the brink of extinction [4]. Major threats faced by existing herpetofauna and other associated wildlife were off road driving (25%) followed by Desert safari (19%), human habitation (16%), illegal poaching (13%), human interference (11%), habitat degradation (9%) and disturbance (7%). About 44.80% people believed that off road driving and desert safari were the major threats to reptiles and other wildlife in UAE, whereas (32.20%) people thought that human interference and illegal poaching were the main cause of threats to reptiles and mammals (Fig. 1). On the other hand 23% people did not know about the cause of threats to wildlife. According to our findings (89.20%) people liked wildlife including reptiles and mammals whereas, 6.80% disliked and 4% people gave no response (Fig. 2). Where the wildlife sites to some extent helped in conservation of the targeted species, these

miniatures and jewels of the deserts of UAE also got a buffer zone for survival from man-made catastrophes [6].

About eleven species of reptiles were captured / photographed and identified in mentioned 34 wildlife sites during 2014 as per Table 2. Among them, about 63% (n = 7) were the Least Concern, 27% (n = 3) were yet not evaluated by the IUCN whereas 10% (n = 01) were the Vulnerable [4]. There was variability in the occurrence and distribution of species in wildlife sites. In other parts of UAE, most of these species were facing serious threats due to habitat destruction, poaching and other anthropogenic factors [7]. In our recent surveys during 2014, regarding the Spiny tail lizard (*Uromastyx aegyptia microlepis*) population, we estimated a population (n=102) in 17 out of total

34 wildlife sites, over an area of 163.555 Km². The number of spiny-tailed lizard is believed to be declining due to habitat exploitation and development within their occurrence range. Spiny tailed lizard is protected by law in UAE, and its trade is banned under the Convention on International Trade in Endangered Species of Flora and Fauna (CITES) [2]. In line with its conservation policies, Barari Wildlife Management department introduced some individuals of threatened *Uromastyx aegyptia microlepis* into its protected area system; for their conservation and propagation. This was the first step towards the conservation of *Uromastyx aegyptia microlepis* in UAE [6,7]. Barari's managed areas are sacred place for these unseen jewels, where they have the opportunity to thrive and propagate and to be witnessed by our future generations.

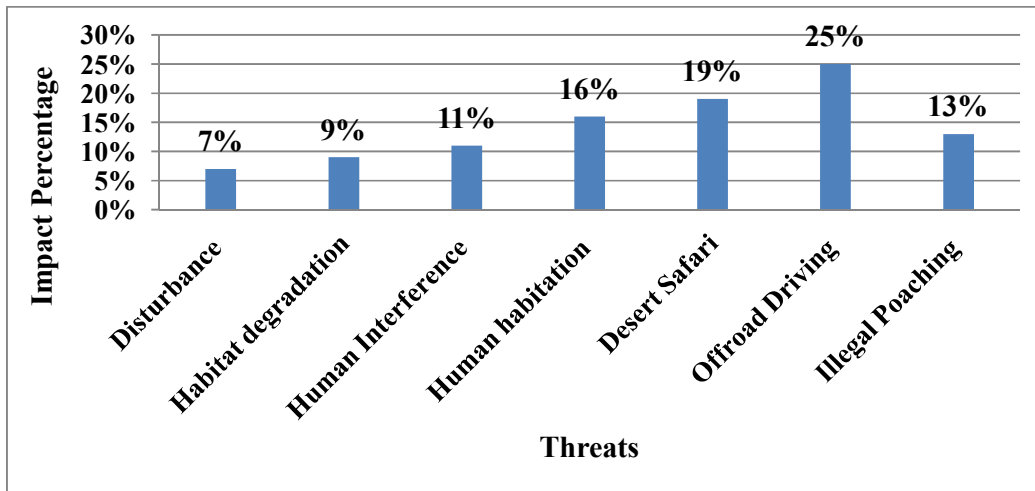


Fig. 1. Factors affecting the survival of herpetofauna

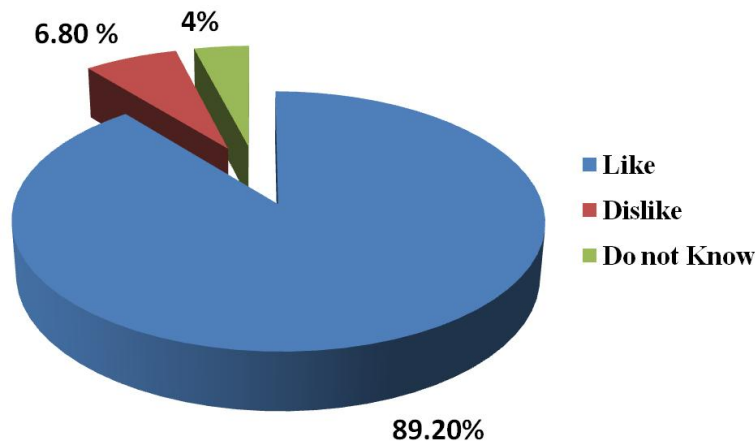


Fig. 2. Percentage Response by the people towards wildlife

Table 2. Reptilian fauna in areas under Barari Wildlife Department

Sl. No.	Species	Scientific name	Family	Order	IUCN status
1.	Sind saw-scaled viper	<i>Echis carinatus sochureki</i>	Viperidae	Squamata	NE
2.	Arabian sand boa	<i>Eryx jayakari</i>	Boidae	Squamata	LC
3.	Arabian horned viper	<i>Cerastes gasperettii</i>	Viperidae	Squamata	LC
4.	Schokari sand racer	<i>Psammophis schokari</i>	Colubridae	Squamata	NE
5.	Eastern sand fish	<i>Scincus mitranus</i>	Scincidae	Squamata	LC
6.	False cobra/Hooded malpolon	<i>Malpolon moilensis</i>	Colubridae	Squamata	NE
7.	Schmidt's fringe-toed lizard	<i>Acanthodactylus schmidti</i>	Lacertidae	Squamata	LC
8.	Hadhramaut sand lizard	<i>Mesalina adramitana</i>	Lacertidae	Squamata	LC
9.	Spiny tailed lizard	<i>Uromastix aegyptia microlepis</i>	Agamidae	Squamata	VU
10.	Arabian toad headed agama	<i>Phrynocephalus arabicus</i>	Agamidae	Squamata	LC
11.	Middle eastern short fingered gecko	<i>Stenodactylus doriae</i>	Gekkonidae	Squamata	LC

Keys= NE=Not evaluated, LC=Least concern, VU= Vulnerable

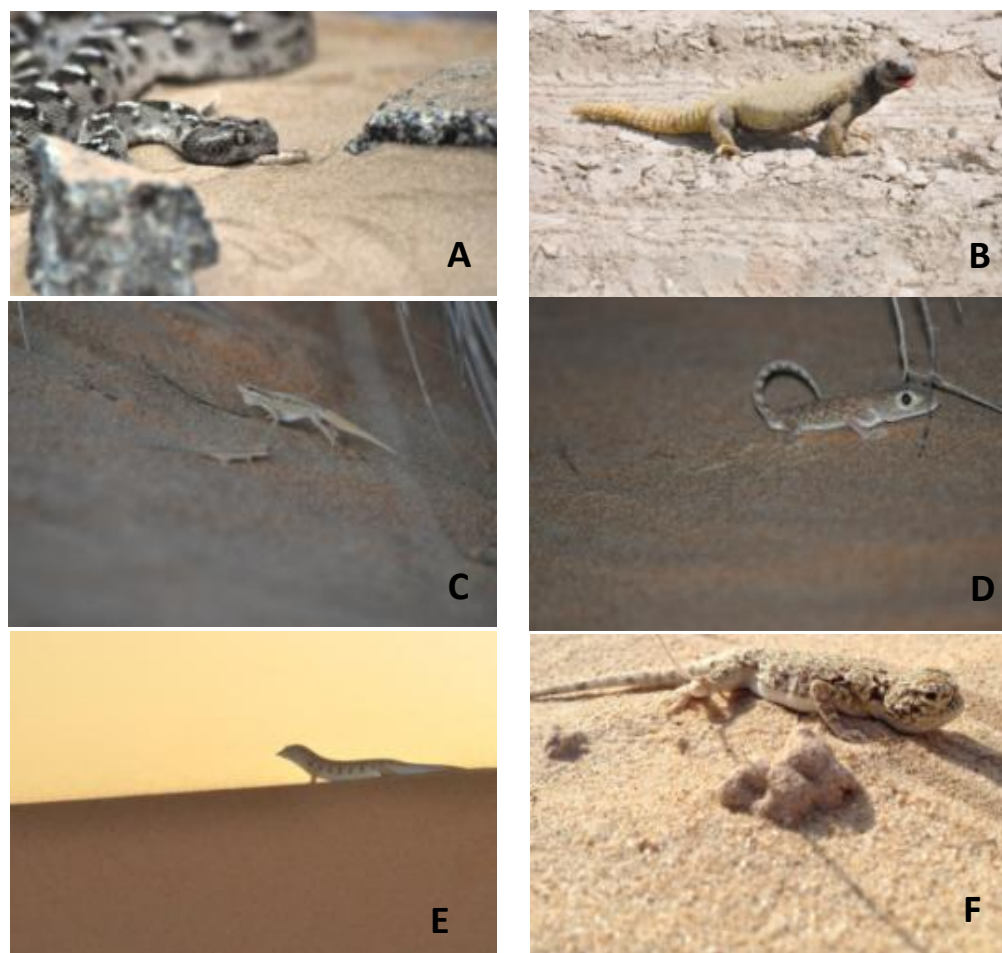


Fig. 3. Hidden animals in areas under Barari

A= Sind saw-scaled viper, B= Spiny tailed lizard, C= Hadhramaut sand lizard, D= Middle eastern short fingered gecko, E= Eastern sandfish, F= Arabian toad headed agama

4. CONCLUSION

According to our findings, the herpeto-fauna of United Arab Emirates is threatened mostly due to anthropogenic factors such as; off-road driving, desert safari and habitat destruction due to human interference. The system of protected area and conservation efforts for targeted mammalian fauna also resulted in providing refuge to these mostly unseen creatures. This protected area network can be very helpful in future conservation strategies and programs. This is a preliminary study and further detailed research in this regard would be helpful to develop sound strategies and integrated management interventions.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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