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Field Report

Rüppell's foxes in Al Dhafra, United Arab Emirates

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Abstract

Here we provide a new record of Rüppell's fox *Vulpes rueppellii* in the Al Dhafra region of southwestern Abu Dhabi Emirate, United Arab Emirates (UAE). The presence of foxes in Al Dhafra represents an extension in the recognized range of the species within UAE.

Introduction

The Rüppell's fox is a small, arid-adapted fox that ranges across the desert biotopes of North Africa and the Middle East (Kingdon 1990; Harrison and Bates 1991; Lariviere and Seddon 2001). Despite its wide range, little is known about the species, which is listed as *Data Deficient* by the IUCN (IUCN 2006). Rüppell's foxes occur in most countries in the Arabian Peninsula, including Jordan, Saudi

Arabia, Yemen, and Oman (Gasperetti et al. 1985; Lindsay and Macdonald 1986; Nader 1990; Harrison and Bates 1991; Qumsiyeh et al. 1993; Olfermann 1996; Spalton 2002; Lenain et al. 2004). Many species accounts also suggest that Rüppell's foxes live throughout the UAE (Harrison and Bates 1991; Lariviere and Seddon 2001; Sillero-Zubiri et al. 2004). However, published, non-anecdotal records of the species in UAE are few. The aim of this paper is to update the distribution of Rüppell's foxes in UAE by providing a new location of their presence in the Al Dhafra region of the Abu Dhabi Emirate. The presence of Rüppell's fox in Al Dhafra represents an expansion in the known range of the species in UAE.

Methods

The Al Dhafra region is a large, remote natural area (~ 3,600 km²) composed of several differ-

ent desert habitats, including undulating sand sheet, sand dunes, gravel plains, and interdune sabkhas. The area lies in the southwestern corner of the Abu Dhabi Emirate and is defined by the 23°32' line of latitude in the north, the UAE-Saudi Arabia border in the west and the south, and the 52°52' line of longitude in the east (Figure 1; Drew et al. 2005). Al Dhafra harbours a diverse assemblage of wildlife, including spiny-tailed lizards *Uromastyx aegyptia microlepis*, houbara bustards *Chlamydotis macqueenii* and desert hares *Lepus capensis*. In 2004, the UAE Environmental Research and Wildlife Development Agency (ERWDA) conducted an extensive survey of the flora and fauna of the region and identified fox dens (either Rüppell's fox or red fox *V. vulpes arabica*) at 5 of 127 point locations throughout the area (Drew et al. 2005).

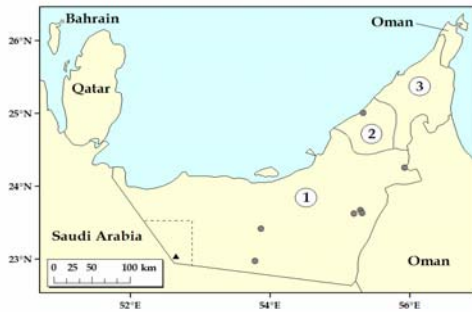


Figure 1. Published records (grey circles) of Rüppell's foxes in UAE (1 = Abu Dhabi Emirate, 2 = Dubai Emirate, 3 = Sharjah, Ajman, Umm Al Quwain, Ras Al Khaimah, and Fujairah Emirates) and the location of individuals (black triangle) captured in the Al Dhafra region (dashed line) between February and April 2005. Records from Gasperetti et al. 1985; Gross 1987; Kingdon 1990; Harrison and Bates 1991; Osborne 1996, 1992a, 1992b.

As a follow-up to the survey, we returned to a den location to confirm the presence of the species. We set 13 wire-mesh box traps (38x38x107cm double-door traps, Tomahawk Equipment Company, Tomahawk, Wisconsin, USA), each spaced 1km along a line transect beginning at N 23.04235°, E 52.63398° and continuing west. The transect crossed rolling sand dune habitat with interspersed outcrops of aeolianite stratum and gravel plains. Traps were baited with commercial cat food and set for one night in February, three nights in March, and one night in April 2005. We sexed,

weighed, and measured all captured foxes. We also collected scats deposited in traps and near dens to gain some understanding of fox diet in the region. Trapping and handling procedures followed those used for endangered San Joaquin kit foxes *V. macrotis mutica* (Cypher et al. 2000).

Results

In February, we captured and marked four adult (>1 year old) male Rüppell's foxes (Figure 2). In March, we captured five adult foxes, including three males and two females. We re-captured one of the males previously caught in February. In April, we re-captured one adult male that had been trapped in February. Body weights of foxes varied from 1,070g to 1,630 g (Table 1). Morphological measurements were similar to those reported from Mahazat as-Sayd Protected Area in Saudi Arabia (Table 1; Lenain 2000). Some of the foxes ($n = 4$) retreated to dens following release. All of the dens were located in aeolianite deposits in gravel plains or between sand dunes (Figure 3).



Figure 2. Rüppell's fox captured in February 2005 in the Al Dhafra region, Abu Dhabi, UAE. Photo: © Christopher Drew.

Scats collected from traps and nearby den sites ($n = 30$) included mostly invertebrates such as darkling beetles Tenebrionidae: *Mesostena puncticollis*, *Erodius octocostatus*, and *E. reichei* and scarab beetles Scarabaeidae: *Scarabaeus cristatus*. We also identified reptile remains in some scats, including white spotted lizard *Acanthodactylus schmidtii* and sand skink *Scincus mitranus*.

Table 1. Morphological measurements of Rüppell's foxes captured between February and April 2005 in the Al Dhafra region, Abu Dhabi Emirate, UAE. Body length measured from tip of nose to base of tail; tail length measured from base of tail to distal end of tail vertebrae; hind foot measured from end of longest toe to elbow; and ear measured from base of inside ear notch to ear tip.

<i>Fox #</i>	<i>Weight (g)</i>	<i>Body (mm)</i>	<i>Tail (mm)</i>	<i>Hind foot (mm)</i>	<i>Ear (mm)</i>
♀ 1	1070	438	265	100	85
♀ 2	1110	400	261	99	84
♂ 1	1125	400	232	85	84
♂ 2	1300	390	278	95	90
♂ 3	1275	441	279	96	90
♂ 4	1300	361	278	105	95
♂ 5	1630	451	320	109	99
♂ 6	1260	445	250	99	91
Mean ± SE	1259 ± 62	416 ± 11	270 ± 9	99 ± 3	90 ± 2



Figure 3. Rüppell's fox den in aolianite stratum in the Al Dhafra region, Abu Dhabi, UAE. The den entrance measured approximately 25 cm in width. Photo: © Christopher Drew.

Discussion

Rüppell's foxes captured in Al Dhafra represent the first confirmed records of the species in the region. The captures also represent an extension of the recognized range of Rüppell's foxes in the UAE. Despite the fact that many species accounts include the entire UAE in maps of the distribution of the species (Kingdon 1990; Lariviere and Seddon 2001; Sillero-Zubiri et al. 2004), few records exist for Rüppell's foxes in UAE and we are unaware of

any published sightings in western Abu Dhabi Emirate or adjacent lands in Saudi Arabia.

The few published records of Rüppell's foxes in Abu Dhabi Emirate include areas in central and eastern parts of the Emirate (Figure 1). Most of these records represent sightings by researchers of the UAE National Avian Research Centre during surveys for houbara bustard in 1991/1992 (Osborne 1996; 1992a; 1992b). The surveys also identified 'probable tracks' in some regions, including an area between Al Dhafra and Liwa in southern Abu Dhabi Emirate (Osborne 1996).

In other areas of UAE, few published records exist for the species. Harrison (1977) recorded the presence of Rüppell's fox in Jebel Ali in the Dubai Emirate and a skull was also reportedly found in the same region in 1973 (Gross 1987). In recent years, however, Jebel Ali has experienced rapid development with the expansion of the city of Dubai and no new records have been reported from the area (Gross 1987). In other parts of the Dubai Emirate, Rüppell's fox records are few with the exception of recent sightings near the Al Maha Desert Resort (Jongbloed et al. 2001).

Gasperetti (1985) reported the presence of

Rüppell's foxes in eastern UAE along the Abu Dhabi-Oman border (24°20'N 55°45'E). The Al Ain Zoo in Abu Dhabi Emirate also received a specimen from the same border in the 1970s and another from Liwa in south-central Abu Dhabi (Gross 1987). In the 1980s, hunters brought some specimens collected from the Empty Quarter of the Abu Dhabi-Saudi Arabia border to Dubai (Gross 1987). Records from the Abu Dhabi-Oman border, Liwa, and Empty Quarter remain largely unconfirmed and we are unaware of recent sightings from these areas.

The presence of Rüppell's foxes in Al Dhafra provides information that will allow wildlife managers to better understand and evaluate the species' status in UAE. This is particularly important as the species is thought to be declining in some areas. In 1996, the species was listed as IUCN *Vulnerable* in the UAE (Hornby 1996). The listing, however, was based largely on unpublished data and recent development in the country has brought new threats to the species (Tourenq and Drew 2005). In 2005, participants at the CAMP conservation workshop held at the Breeding Centre for Endangered Arabian Wildlife (Sharjah, UAE) assigned the species to IUCN *Endangered* in Arabia due to perceived declines. ERWDA also upgraded its status to IUCN *Endangered* in Abu Dhabi Emirate on the basis of declines in recent years (Tourenq and Drew 2005).

The causes of decline remain unclear. Urban development and expansion into desert environments are probably reducing available habitat to Rüppell's foxes, especially in the vicinity of the city of Dubai (Hellyer and Aspinall 2005). The effects of development and the population status of the species near urban areas, however, are unknown. In recent years, red foxes also expanded into more rural areas with the spread of cities and towns and are thought to have displaced Rüppell's foxes in several areas across their range (Ilani 1988; Kingdon 1990; Harrison and Bates 1991; Spalton 2002). Red foxes occur in Al Dhafra, especially around water sources and Bedouin camps (Drew et al. 2005; Drew and Loughland, unpublished data), but their impacts on Rüppell's foxes remain unknown.

In rural areas of Abu Dhabi, Rüppell's fox also face persecution by farmers, livestock herders, and desert rangers because of their perceived

impact on game species (e.g. houbara bustard) and livestock. Until recently, rewards were even offered for anyone who brought a fox tail to municipality offices. Poisoning campaigns that target feral cats and red foxes also inadvertently kill Rüppell's foxes in some areas. The impacts of persecution and poisoning on fox populations are unknown.

The Al Dhafra region is a 'proposed protected area' and represents one of the last remaining strongholds in UAE where Rüppell's foxes can live relatively free from human disturbance (Drew et al. 2005). The region also contains extensive distributions of aeolianite stratum that Rüppell's foxes and their prey depend on for dens and burrows (Drew et al. 2005). Protecting these habitats and the desert landscapes of Al Dhafra should be a priority conservation action for the species in UAE.

More information on Rüppell's fox distribution, especially in UAE, is urgently needed to allow a thorough evaluation of the conservation status of the species. Information on distribution will also allow researchers to monitor population trends, assess the impacts of threats such as urban development and red fox competition, and possibly mitigate declines. Standardized and repeated surveys of the abundance of the species, not only in Al Dhafra, but across the Abu Dhabi Emirate and UAE, are recommended.

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