

Base-line Study of Mammal Fauna of Dubai Desert Conservation Reserve, Dubai, UAE.

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Introduction

The Dubai Desert Conservation Reserve (DDCR) was established in 2003 as a protected area with the main aim of conserving the natural resources of Dubai's inland desert and to restore the natural fauna and flora to its original bio-diversity. In order to achieve this aim it was decided to carry out a number of surveys to assess the current situation and to determine the priorities for the next phase.

Within the DDCR very little was known about species belonging to the order Carnivora so the following questions were asked:

- What wild carnivore species are to be found in the DDCR?
- What is the distribution of these species?
- What is the population size of these species?
- Are there any feral species and where are they concentrated?

It was decided that the best method to answer these questions was to utilize camera traps. A camera trap is a conventional camera bundled with an infrared sensor system that triggers the camera when an animal passes through the infrared beam, further more the date and time of the event are also recorded on a data logger. Camera traps have the advantage of similar efficiency in detecting nocturnal and diurnal activities simultaneously with minimum environmental disturbance. In addition to animal detection, camera traps can provide additional information about patterns of activity and habitat use.

Target Species

The main focus of the survey was to assess the presence and distribution of the following species:

- Gordon's Wild Cat (*Felis silvestris gordonii*)
- Sand Cat (*Felis margarita*)
- Caracal (*Felis caracal schmitzi*)
- Arabian Red Fox (*Vulpes vulpes arabica*)
- Sand Fox (*Vulpes rueppelli*)

In order to attract these species the camera traps were baited with meat on a regular basis.

Effort Calculation

The current study is targeting to detect the presence or absence of target six species that are believed to occur in the region. In addition there are 3 introduced antelope species that are likely to pass through the camera traps. That gives us a total of 9 species to be sampled. These species comprise the potential large to medium mammal fauna in DDCR and it is an essential objective of this study to account for the alpha diversity (species richness) of this community and document it in the current early steps of DDCR. Thus, it is important to have an estimate of the minimum sampling effort that is required to account for all species present with considerable reliability. So the question was; what is the least number of sampling sites needed to reliably account for 9 species of mammals? An obvious way to answer this question is to conduct a pilot survey using several sites and use the species accumulation curve to estimate the asymptote or S_{max} , then the corresponding X axis value would represent the minimum number of sites required. Using data accumulated so far from the trapping in 7 sites, calculations estimated that minimum of 18 sites are to be sampled to reliably account of S_{max} (species richness) of 9 mammal species. The current level of sampling has only reliably detected only 6 species Fig(1). A good compromise is sampling for 3 years would yield in detecting about 95% of the species richness available with significant reliability.

Calculation of density were based on the Equation

$$x = \left(\frac{y}{2866.4} \right)^{\frac{1}{-0.957}} / 12.4$$

where y= camera days/photograph and x= number of animals /Km². The constant numbers are determined by slopes and intercept of the relation between x & y as investigated by Carbone et. Al. 2001 (Anim. Cons. 2001-4,75-79). These constants(2866.4 & -0.957) are determined by random walk model on the basis of assuming the animal is moving 3Km on average per day. If the animal is known to cover more distance the numbers should be changed. For 10 Km daily these are 703.1 and -0.938 respectively. The constant 12.4 is the correction factor.

Results

The current sampling was done over a period of 1029(Sept. 2004 - June 2006) life camera days at seven sites over the study area of the DDCR. These sites were representative of most habitats and vegetation cover types present in the DDCR and resulted in 1991 pictures. The pictures are classified in to four categories: 1) Test; 2) Empty; 3) Malfunction; 4) Live. A total of 1286 (64.59%) were classified as "Live" pictures they we then sorted according what was recorded as follows: a) Wild mammals; b) Wild birds; c) Grazing livestock; d) Feral mammals before being used for further analysis.

Table 1. shows the Activity records of camera trap photographs in the DDCR . So Far only two of the target species were recorded, namely, Red Fox and Gordon's Wildcat, in all likelihood this rules out presence of the other target species within the DDCr. Other wild mammal species that were recorded include Cape Hare *Lepus capensis*, Lesser Jerboa *Jaculus jaculus* and Hedgehog as well as the introduced antelope Arabian Oryx, Arabian Gazelle and Sand Gazelle. Wild bird species include Brown-necked Raven, Great Grey Shrike, Long-legged Buzzard and Lappet-faced Vultures.

The most abundant and most dispersed wild mammal species of those recorded was the Arabian Red fox, followed by the Arabian Gazelle which was also recorded at all the sites but with less frequency, the Gordon's Wildcat was the third most dispersed species. The density estimates show that the Red Fox has a strong representation in the DDCR. The total population is estimated at approximately 168 individuals with a pooled density of about 0.748 ind. /km². Gordon's Wildcat does still occur within the DDCR however the density estimate is very low. The density of the species was estimated as 0.023 ind. /km² yielding a population of only five individuals within the DDCR. There is strong evidence to suggest that competition with feral cats, which occur in high concentrations around human habitation, camel farms, tour operator camps etc., have forced the Gordon's Wildcats out of these areas limiting their range within the DDCR.

Table 1. Activity records of camera trap photographs in the DDCR

Site	Wild Mammals	Wild Birds	Grazing livestock	Feral Mammals	Total wildlife activity
For dan	87.14%	0.00%	5.71%	0.00%	92.85%
Nazwa	17.78%	40.00%	0.00%	35.56%	93.33%
Faq'a	35.61%	31.62%	19.37%	0.00%	86.60%
Spot	26.87%	52.00%	0.00%	0.00%	78.87%
Cam7	83.71%	14.93%	0.90%	0.00%	99.64%
Shj	17.14%	58.09%	7.62%	0.00%	72.85%
Cam5	47.06%	16.18%	5.88%	0.00%	69.04%

Conclusion

Mammal fauna of the Dubai inland desert have been badly impacted by decades of unsustainable utilization of the desert habitat with uncontrolled access for different activities such as livestock grazing and off-road driving. This has been shown in the results with only two of the target species being recording and it can be concluded with confidence that species such as the Sand Cat, Caracal and Sand Fox are absent from the DDCR. The Arabian Red Fox and Gordon's Wildcats are the only remaining small to medium sized predatory mammals left in the reserve. While the Arabian Red Fox population is relatively abundant, the Gordon's Wildcat population is suppressed and could be classified as threatened within the area. The main reason for the pressure on the wildcat population is through competition with feral cats which compete for food resource and territory as well, at the same time, threatening the genetic integrity of the species by hybridization. In order to protect the remaining Gordon's Wildcats a program has been started to capture and remove as many feral cats from the DDCR as possible, this program has been concentrated around human habitation and so far has been yielding good results but will need to be continued indefinitely as feral cats continue to move into the area from surrounding towns.

This survey has shown that the diversity of predatory mammals within the DDCR is critical and that serious conservation measure are required to protect the remaining species as well as focusing on the potential re-introduction programs for both Sand Fox and Sand Cat in the near future.

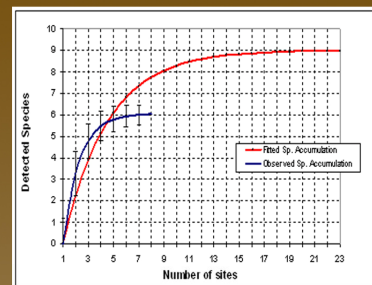
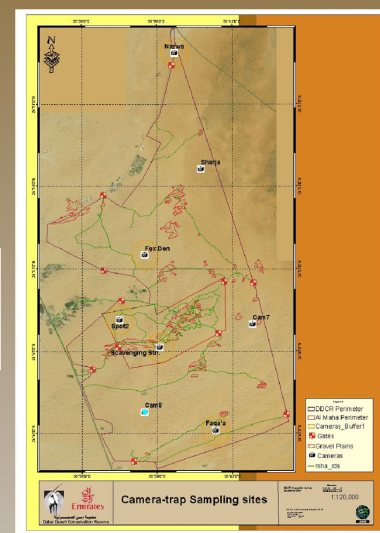


Fig (1) species accumulation curve shows that the current sampling effort accounts for 81.7% (6 species) only of the expected species richness and it requires at least 18 sites to be sampled to account reliably of the mammal fauna of DDCR. However, a compromise of 95% of the species richness (8 species) could be detected after sampling 11 sites.



Gordon's wildcat *Felis silvestris gordonii*



Cape Hare *Lepus capensis*



Lappet-faced vulture *Torgos tracheliotus*



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