

Carnivores of the Tabuk Province, Saudi Arabia (Carnivora: Canidae, Felidae, Hyaenidae, Mustelidae)

Šelmy provincie Tabuk, Saudská Arabie
(Carnivora: Canidae, Felidae, Hyaenidae, Mustelidae)

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Abstract. Between 2010 and 2017, records of carnivores in the Tabuk Province were gathered using camera traps, live traps and direct observations. Altogether seven species of carnivores representing four families were recorded: two felines, *Felis margarita* and *Panthera pardus nimr*, a hyaenid, *Hyaena hyaena*, a mustelid, *Mellivora capensis* and three canids, *Canis lupus*, *Vulpes cana* and *Vulpes vulpes*. For each species, a list of localities is given and its current distribution is described. Unfortunately, many of the reported specimens were killed by hunters or local people. Major threats to carnivores in the Tabuk Province, such as killing and hanging, are discussed and potential solutions are suggested.

Key words. Carnivores, Saudi Arabia, conservation, distribution.

INTRODUCTION

The Saudi Arabian Province of Tabuk is located in the northwestern part of the Kingdom of Saudi Arabia. It borders southern Jordan, extending along the Gulf of Aqaba and the Red Sea, with a total area of 108,000 km². Different types of habitats are found in the Tabuk Province, including coastal mountains (maximum altitude ca. 1800 m) with moderate coastal plains east of the Red Sea, steppes in the eastern and central areas, and an extension of the Nofood sand desert towards the southeast. The black lava desert ('*Hara*') lies in the south between the Red Sea Mountains and the inner mountains.

The carnivores of Saudi Arabia have been a subject of several studies over three decades. The most comprehensive study was conducted by GASPARETTI et al. (1985) and included records of 15 species. Other studies were focused on carnivores of protected areas (SEDDON et al. 1997) or particular carnivore species (NADER & BÜTTIKER 1980, NADER 1984, 1991, 1996, SEDDON et al. 1997, MACDONALD et al. 1999, ZAFAR-UL ISLAM et al. 2010). The aim of the present study is to document the carnivore fauna of the Tabuk Province and discuss threats and conservation issues related to this group.

METHODS

Field trips were carried out to 33 localities in 2010–2017 (Table 1). Data were obtained by direct observations, especially for killed animals, by cage traps, and camera traps. The records were supplemented with photographs when possible. HCO nightXplorer UWAY-NX50 cameras were used for a total of 103 nights between December 2015 and May 2017.

RESULTS

Within the study, seven species of carnivores belonging to four families (Felidae, Hyaenidae, Mustelidae and Canidae) were documented from the Tabuk Province.

Felidae

Felis margarita Loche, 1858

MATERIAL EXAMINED. Killed animals: killed by hunters, Rowafah, 5 January 2013; Al Zetah, 31 December 2016. **Alive animals:** captured by a farmer and kept in a cage, Haqel, 14 September 2014 (Fig. 1).

REMARKS. The distribution of *Felis margarita* is shown in Fig. 2. All three localities are situated in the sand dune areas. The sand cat is subjected to several forms of persecution including hunting and capture. Fig. 1 shows a caged animal observed at Haqal and an individual caught by a local.

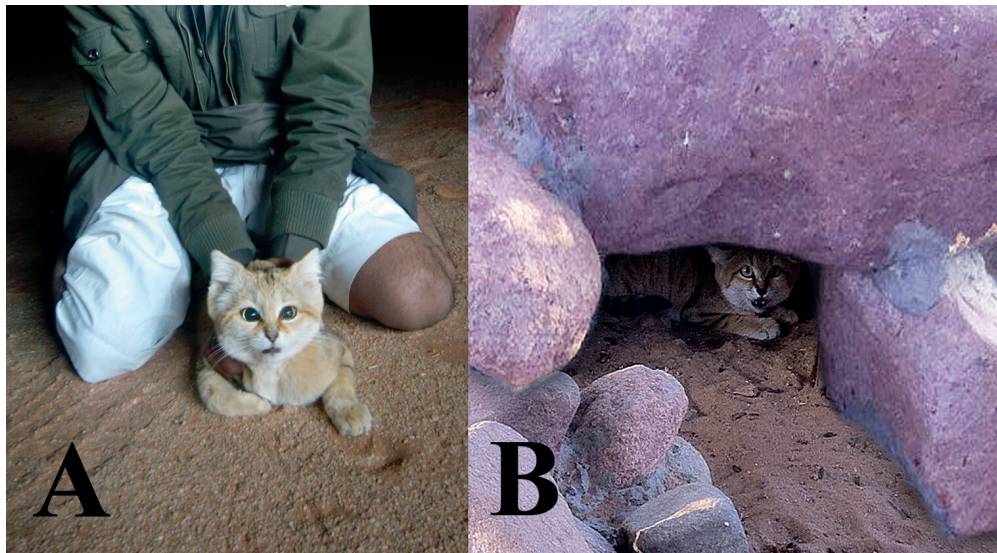


Fig. 1. Sand cat (*Felis margarita*) from the Tabuk Province; A – individual captured by a local from the Haqel–Alagan road; B – a cage-kept individual at Haqel.

Obr. 1. Kočka pouštní (*Felis margarita*) z provincie Tabuk; A – jedinec odchytený místním obyvatelům na silnici Hakel–Alagan; B – v kleci chovaný jedinec z Hakelu.

Table 1. Localities in the Tabuk Province that were surveyed between 2010 and 2017
 Tab. 1. Lokality v provincii Tabuk sledované v letech 2010 až 2017

locality /lokalita	coordinates / koordináty	N / s. š.	E / v. d.
Abu Rakah		27° 16' 16"	36° 47' 08"
Ain Al Akhdher		29° 02' 54"	36° 10' 11"
Al Bedea		27° 48' 11"	36° 33' 15"
Al Desah		27° 37' 57"	36° 32' 30"
Al Kheretah		27° 41' 52"	35° 58' 47"
Al Khonfah		28° 02' 53"	38° 45' 55"
Al Qelebah		28° 24' 17"	37° 40' 41"
Al Sero		28° 23' 17"	35° 36' 21"
Al Zetah		28° 52' 23"	35° 30' 50"
Alaqan		29° 10' 33"	35° 23' 50"
Around Sweage lake		28° 34' 49"	36° 35' 57"
At-Tubayq		29° 47' 05"	37° 25' 27"
Bajdah		28° 20' 51"	35° 47' 16"
Demaj		28° 22' 39"	36° 24' 15"
east of Geal		28° 08' 05"	35° 02' 48"
Gumailah		28° 17' 59"	35° 09' 02"
Haqel		29° 13' 07"	34° 56' 02"
Haqel–Alagan road		29° 10' 36"	35° 01' 34"
Harat Alrahah		27° 39' 51"	36° 42' 59"
Allawz mountain		28° 51' 24"	35° 28' 31"
Shar mountain		27° 41' 32"	35° 45' 04"
Magna		28° 23' 45"	34° 45' 08"
Rowafah		27° 44' 27"	36° 18' 14"
Sharma road		28° 18' 46"	35° 50' 51"
Shegry		27° 59' 17"	36° 00' 32"
south of Tabuk		28° 13' 55"	36° 32' 28"
Tadco farms		28° 31' 22"	36° 06' 55"
Taima Al Hamra farms		27° 38' 54"	38° 31' 41"
Taima Al Ktaeb		27° 28' 19"	38° 53' 34"
Tima		27° 38' 56"	38° 36' 57"
Wadi Al Akhdher		28° 05' 50"	37° 07' 42"
Wadi Al Gshabreah		27° 42' 36"	35° 44' 02"
Wadi Dham		27° 44' 27"	37° 30' 31"

Panthera pardus (Linnaeus, 1758)

MATERIAL EXAMINED. Field work yielded no direct or indirect observations. However, a photograph documenting one of the last Arabian leopards in the Tabuk Province was provided by one of the locals (Fig. 3). The photograph taken in 1952 shows a mounted specimen of the leopard killed by the locals in the Shar Mts., Tabuk Prov.

REMARKS. The leopard was reported several times from coastal areas of Tabuk, Yanbu and Al Madinah reaching far south to Abha (Al-Johany 2007). AL-JOHANY's records are based on observations in the period of 1998–2002. The Arabian Leopard has been facing many threats in its current distribution range. Perhaps the most important is the extensive hunting of its prey;

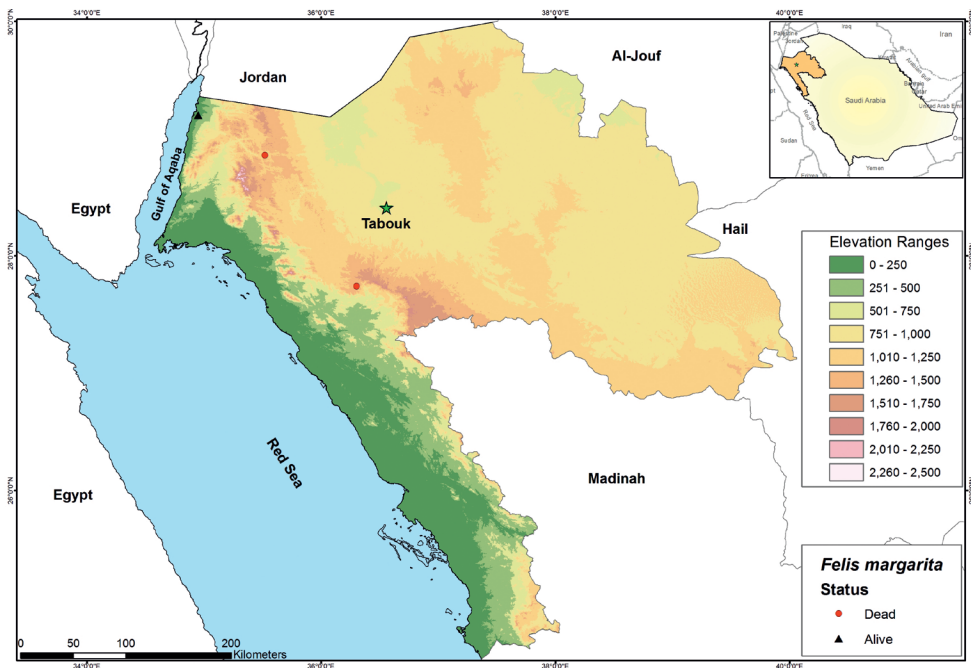


Fig. 2. Localities of records of the sand cat (*Felis margarita*) in the Tabuk Province.

Obr. 2. Lokality nálezů kočky pouštní (*Felis margarita*) v provincii Tabuk; červené body = mrtví jedinci, černé trojúhelníky = živí jedinci.

gazelles, ibex and hyrax throughout the year, reducing the prey populations (AL-JOHANY 2007). Furthermore, the use of poisoned carcasses of sheep, goats, and camels may severely affect its population size (JUDAS et al. 2006, ZAFAR-UL ISLAM et al. 2014).

Hyaenidae

Hyaena hyaena (Linnaeus, 1758)

MATERIAL EXAMINED. **Killed animals:** killed and hung by villagers, Abu Rakah, 12 October 2014; killed by villagers, Bajdah, 9 July 2013; killed by hunters, Wadi Al Gshabreah, 4 April 2014; killed by villagers, El Bedeaa, 8 October 2014; killed and hung, Al Desah, 25 December 2015; two individuals killed by hunters, east of Geal, 19 February 2016; killed by falconers, Gumailah, 21 February 2016; roadkill, between Haqel and Alagan, 31 August 2016. **Alive animals:** Harat Alrahah, 17 February 2016.

REMARKS. Only one of the ten striped hyenas observed during this study, was alive. Nine animals were found dead, often shot and hung on a tree (Fig. 5). The striped hyena is one of the most persecuted animals in the Kingdom. Hunters and villagers kill this animal on many occasions and hang its carcass at the village entrance as a sign of pride.

Mustelidae

Mellivora capensis (Schreber, 1776)

MATERIAL EXAMINED. **Killed animal:** killed by villagers, Tima, 9 January 2011.

REMARKS. The ratel is a widespread species in Arabia, with records mapped by GASPARETTI et al. (1985). However, this is the first record of this species from the Tabuk Province (Fig. 6). The only previous paper on the ratel from the Kingdom comes from ZAFAR-UL ISLAM et al. (2010), who trapped 17 animals in the Mahazat As-Sayd Protected Area, and reported a sighting of the ratel killing captive houbara bustards (*Chlamydotis macqueenii*) and attacking Rueppell's fox and red fox.

Canidae

Canis lupus Linnaeus, 1758

MATERIAL EXAMINED. **Killed animals:** killed and hung, Ain Al Akhdher, 17 February 2010; roadkill, Sharma road, 13 February 2011; killed by villagers, Allawz Mountains, 2 April 2012 and 4 July 2014; two wolves



Fig. 3. First published image of a mounted Arabian leopard from the Shar Mts., taken in 1952 (photo by Jameel ALTAF).

Obr. 3. První publikovaný obrázek vycpaného levharta arabského z pohoří Šar z roku 1952 (foto Džamil ALTAF).

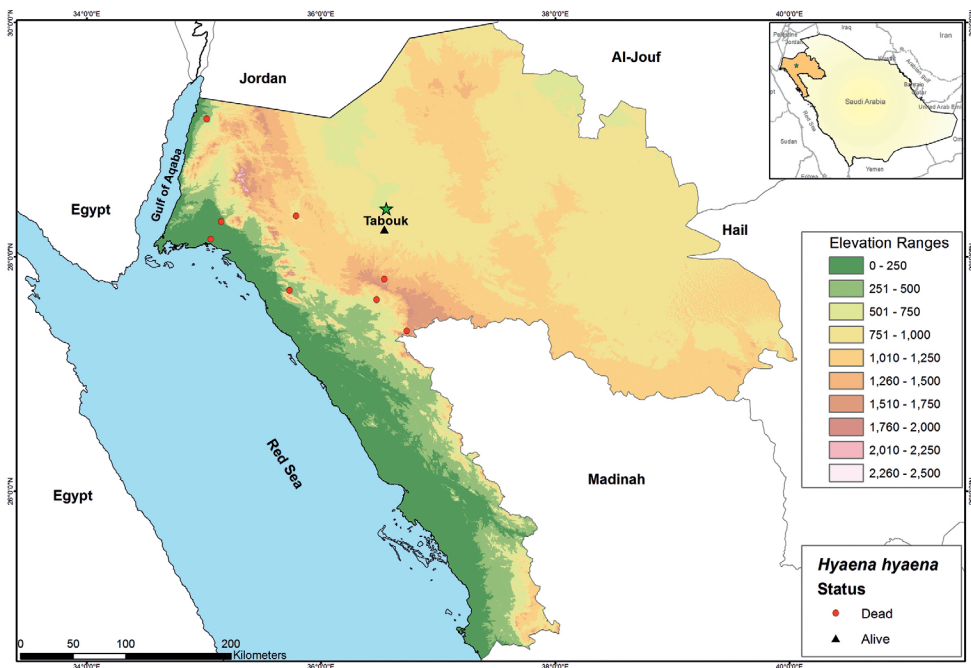


Fig. 4. Localities of records of the striped hyena (*Hyaena hyaena*) in the Tabuk Province.
 Obr. 4. Lokality nálezů hyeny žíhané (*Hyaena hyaena*) v provincii Tabuk; vysvětlivky viz obr. 2.

killed by hunters, Magna, 18 May 2013; killed by hunters, Al Zetah, 25 September 2013; killed by hunters, Al Khonfah, 28 March 2014; killed by hunters, Al Zetah, 25 September 2013 and 12 November 2014; roadkill, Sewage Treatment area, 28 December 2014; killed and hung, Taima Al Hamra farms, 21 January 2015; killed by hunters, Al Kheretah, 22 January 2015; roadkill, Wadi Dham, 9 March 2015; two wolves killed by shepherds, Al Bedeaa, 9 June 2015 and 16 January 2016; killed and hung by villagers, Al Desah, 3 January 2016 and 6 May 2017; two wolves killed by hunters, Jabal Shar, 6 February 2016; killed by hunters, east of Geal, 19 February 2016; killed by hunters, Harat Alrahah, 19 February 2016; two wolves killed by hunters, Gumailah, 21 February 2016; four wolves killed by hunters, At-Tubayq, 26 February 2016; killed by hunters, Taima Al Ktaeb, 26 February 2016; killed by hunters, Al Sero, 20 May 2016.
Alive animals: Bajdah, 13 March 2011; kept in a cage, Haqel, 27 November 2012; Haqel, 14 September 2014; Wadi Dham, 4 July 2014; kept in a cage, Demaj, 2 February 2016; At-Tubayq, 13 September 2017.

REMARKS. This study provides more than thirty wolf findings in the Tabuk Province (Fig. 7), most of the individuals were killed and hung by locals. Despite being a regionally endangered species, wolf is one of the most persecuted animals by locals. Villagers fear wolves for attacking their sheep herds. They often kill the wolf instantly and hang it at the settlement entrance as a sing of pride (Fig. 8). In this study, about thirty killed wolves were found displayed hanging



Fig. 5. Hung striped hyenas (*Hyaena hyaena*) at the entrances of villages or road sings.
 Obr. 5. Pověšené hyeny žíhané (*Hyaena hyaena*) u vstupů do vsí či na silničních značkách.



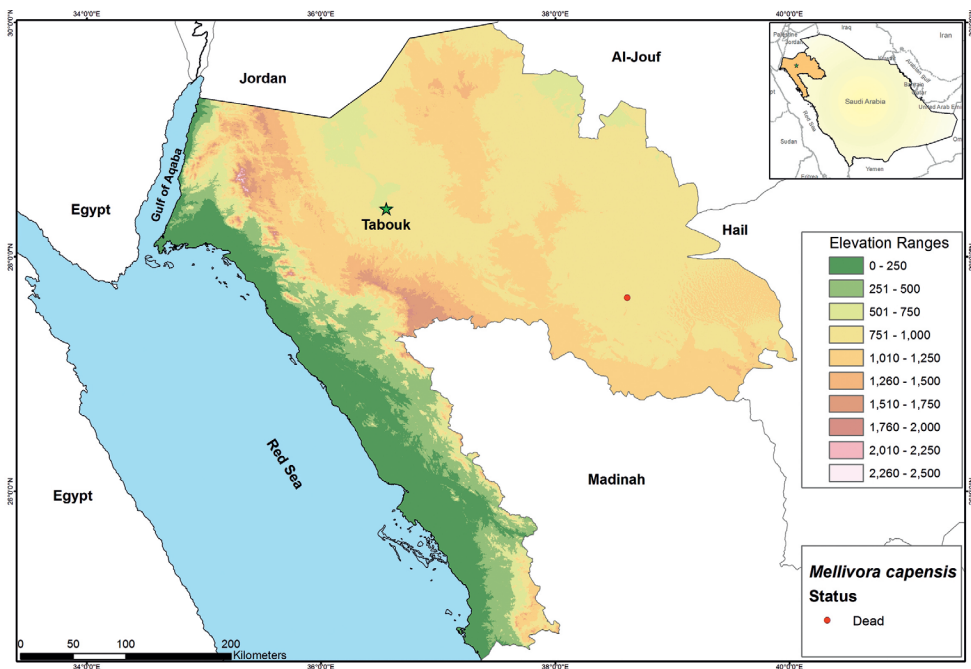


Fig. 6. Localities of records of the ratel (*Mellivora capensis*) in the Tabuk Province.
 Obr. 6. Lokality nálezů medojeda kapského (*Mellivora capensis*) v provincii Tabuk; vysvětlivky viz obr. 2.

on trees or road sings. In Saudi Arabia, two subspecies of the wolf occur (NADER & BÜTTIKER 1980, GASPARETTI et al. 1985); *Canis lupus arabs* Pocock, 1934, a small form distributed in southern Arabia, and the larger form, *Canis lupus pallipes* Sykes, 1831 known in northern Arabia. GASPARETTI et al. (1985) reported the latter form from Shigri and southern Haqel, while SEDDON et al. (1997) found the former form in the Harrat al-Harrah Protected Area. CUNNINGHAM & WRONSKI (2008) provided an update of the species distribution in Saudi Arabia, with additional 64 records made since 1999.

Vulpes cana Blanford, 1877

MATERIAL EXAMINED. **Killed animals:** killed by villagers, Bajdah, 22 May 2016. **Alive animals:** trapped and released, Bajdah, 14 December 2015; trapped and released, Bajdah, 16 January 2016; trapped and released, Bajdah, 10 February 2016; trapped and released, Bajdah, 18 February 2016; trapped and released, Bajdah, 10 April 2016; camera trapped, Bajdah, 16–19 March 2016 and 23–25 March 2016.

REMARKS. This study provides the second record of the Afghan fox in the Tabuk Province (Figs. 9, 10A). Distribution of the Afghan fox is restricted to sand stone deserts of the Tabuk area (Fig. 9). Previous records of the Afghan fox in Saudi Arabia were reported by AL KHALILI (1993) from the southwest part of the country. CUNNINGHAM & WRONSKI (2009) provided a detailed account

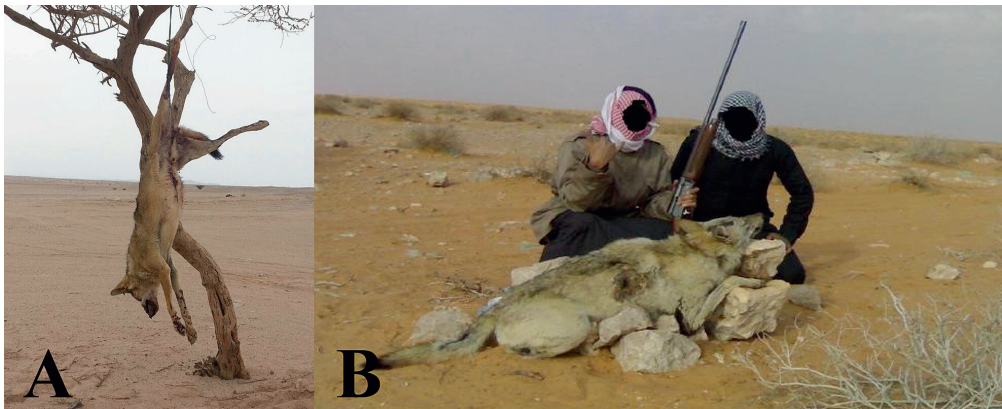


Fig. 7. Wolf (*Canis lupus*) from the Tabuk Province; A – hung wolf found in the Qumailah village; B – a wolf killed in Al Khonfah.

Obr. 7. Vlk obecný (*Canis lupus*) z provincie Tabuk; A – pověšený vlk nalezený ve vsi Kumajla; B – vlk zabítý v Al Chonfě.

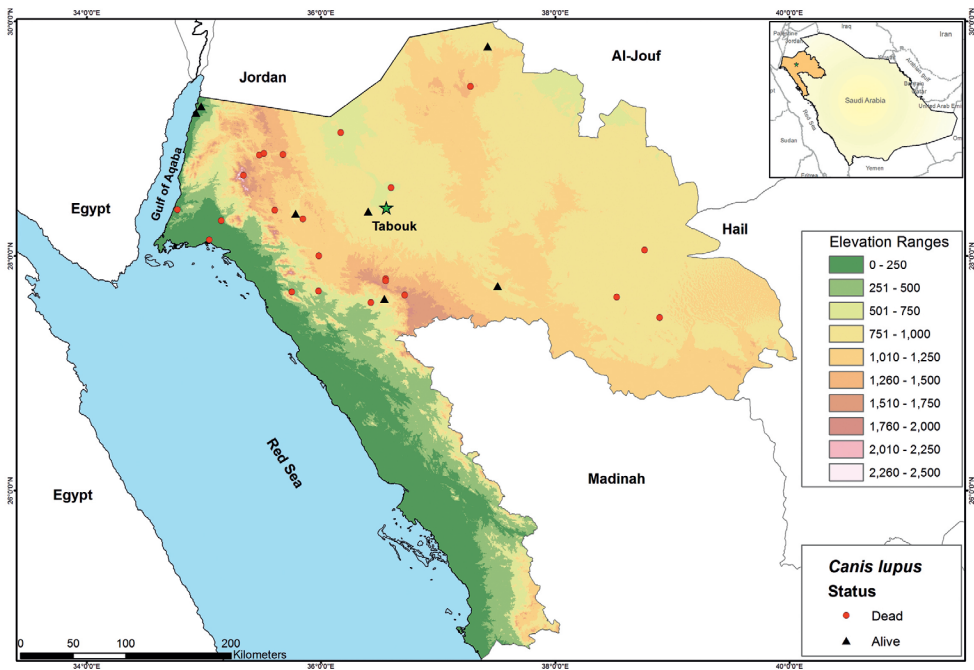


Fig. 8. Localities of records of the wolf (*Canis lupus*) in the Tabuk Province.

Obr. 8. Lokality nálezů vlka obecného (*Canis lupus*) v provincii Tabuk; vysvětlivky viz obr. 2.

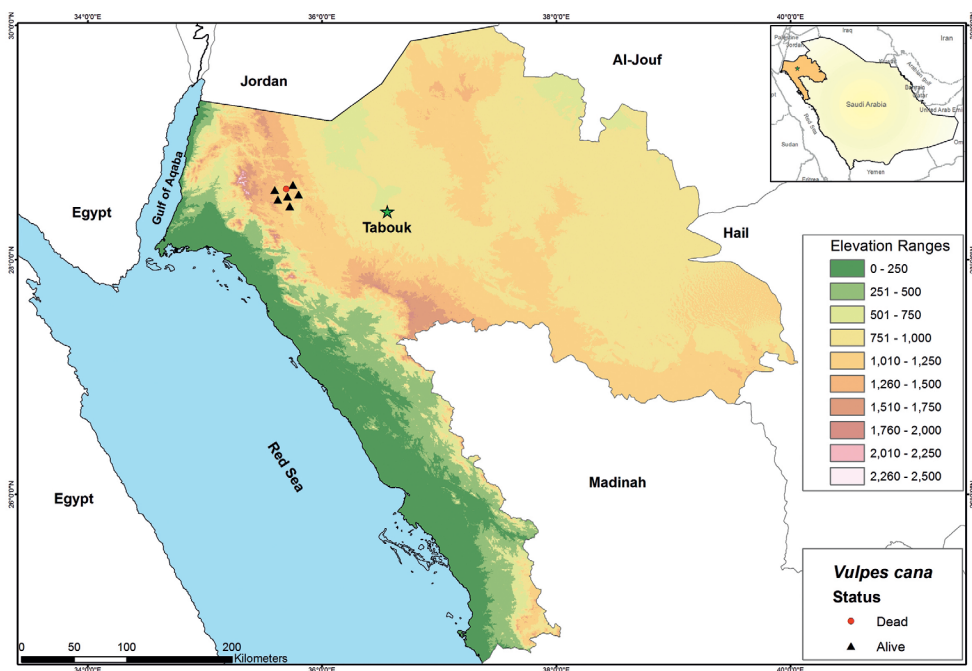


Fig. 9. Localities of records of the Afghan fox (*Vulpes cana*) in the Tabuk Province.
 Obr. 9. Lokality nálezů lišky kany (*Vulpes cana*) v provincii Tabuk; vysvětlivky viz obr. 2.

on the status of *Vulpes cana* in Saudi Arabia, with additional localities in the At-Tubaiq Protected Area and the Ibex Reserve. However, the Afghan fox was also reported from Wadi Rum in Jordan, close to the northwestern borders of the Tabuk Province (ABU BAKER et al. 2004).

Vulpes vulpes (Linnaeus, 1758)

MATERIAL EXAMINED. Killed animals: killed and hung, El Zawiah, 4 May 2012; roadkill, Al Qelebah, 23 September 2013. **Alive animals:** two foxes kept in a cage, Haqel, 14 September 2014; kept in a cage, Demaj, 2 February 2016; camera trapped, Bajdah, 19 February 2016; trapped and released, Al Sero, 21 February 2016; camera trapped, south of Tabuk, 5–7 March 2016; camera trapped, Shegry, 9–11 March 2016; adult fox observed with cubs, Wadi Al Akhdher, 22 March 2016; camera trapped, Tadco farms, 26 March 2016; camera trapped, Al Zetah, 21 May 2016; camera trapped, At-Tubayg Reserve, 10 May 2017.

REMARKS. Several red foxes were caught by live traps or camera traps during the surveys, other records include killed or captured animals by locals (Fig. 11). The red fox inhabits all types of habitats in Saudi Arabia (GASPARETTI et al. 1985). It frequents cities and villages as a scavenger. It is the only carnivore that is not affected by any form of threat (Fig. 10B).



Fig. 10. Foxes from the Tabuk Province; left – Afghan fox (*Vulpes cana*); right – red fox (*Vulpes vulpes*).
 Obr. 10. Lišky z provincie Tabuk; vpravo – liška kana (*Vulpes cana*); napravo – liška obecná (*Vulpes vulpes*).

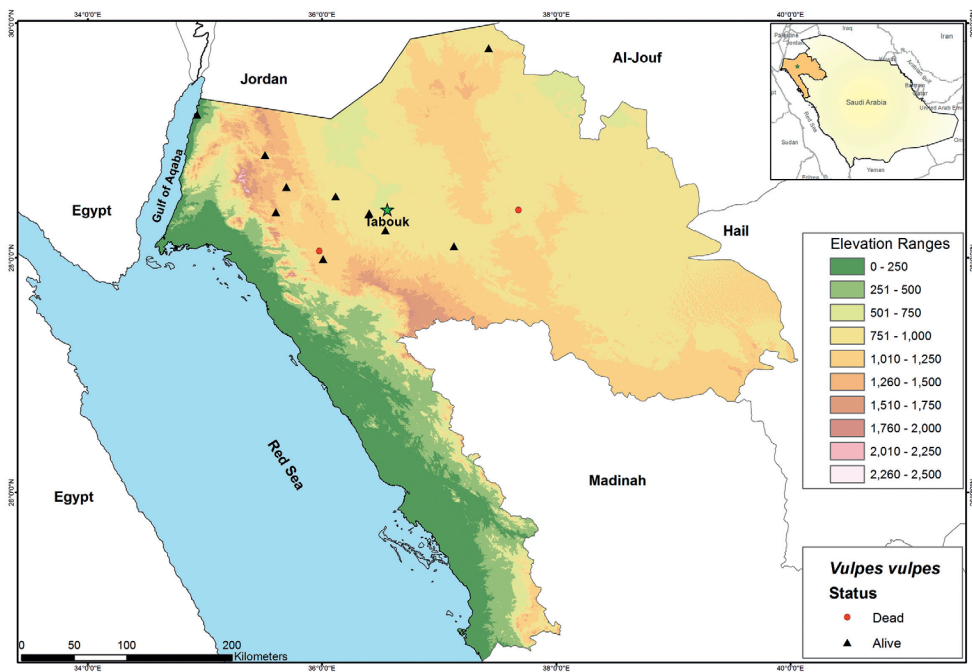


Fig. 11. Localities of records of the red fox (*Vulpes vulpes*) in the Tabuk Province.
 Obr. 11. Lokality nálezů lišky obecné (*Vulpes vulpes*) v provincii Tabuk; vysvětlivky viz obr. 2.

DISCUSSION

Although this study aimed to document the occurrence of carnivores in the Tabuk Province, it also provides evidence of a high level of persecution of these animals. It presents the magnitude of threats affecting carnivores in the Tabuk Province and in Saudi Arabia as a whole. Carnivores face several forms of threats, mostly shooting, trapping, and poisoning (MALLON & BUDD 2011). The high number of killed animals documented in this study suggests that the level of aggression towards these animals is on the increase. Most of the animals recorded were hung or mutilated as a sign of pride by hunters or villagers. The use of ‘tree hanging’ to display killed carnivores, especially wolves and hyenas, is a common practice in Saudi Arabia (CUNNINGHAM et al. 2010). Such conflict between humans and wildlife, wherever both coexist, is widespread in the world at a varying degree (ABBAS et al. 2015). However, in the Tabuk Province, a high level of this conflict was evident. The status of carnivores in Arabia is poor and requires immediate intervention, as five of seven mammalian predators recorded in this study are regionally endangered. The regional and global conservation status of the target species is summarized in Table 2.

There are several reasons for this catastrophic situation, however, only those important to the Tabuk Province are discussed. On one hand, villagers perceive predators as a threat to their well-being and livestock. Villagers depend on sparsely distributed wild plants to feed livestock. Therefore, most livestock in the Province is free ranging, which increases carnivore-livestock encounters, causing substantial financial loss. The use of enclosures might be one of the solutions to the conflict, however, it would entail extra financial costs for enclosure construction and maintenance and fodder purchase. On the other hand, the physical nature of the area, arid mountains with little to no access, increases the complexity of the situation as the documentation of violation against carnivores is very hard.

Despite the presence of laws and regulations to protect all forms of wildlife in Saudi Arabia, little has been achieved in protecting predators. Special regulations exist to protect wild carnivores, however with no avail (AL TURAEF 2014). Societal and topographic reasons complicate enforcement of such regulations. Therefore, solutions should stem from solving the human-carnivore conflict. One of the potential solutions would be the establishment of reserves that protect carnivores from persecution. Protected areas already exist in the Kingdom, acting as refuges for the carnivores as well as large ungulates. Of these protected areas, the At-Tubayq and Al Khonfah Reserves are in the Tabuk Province where human-carnivore conflict is at its minimum. In addition, the protection of large predators in the Province would benefit from

Table 2. Regional and global conservation status of carnivores reported from the Tabuk Province
Tab. 2. Regionální a celosvětový stupeň ohrožení šelem známých z provincie Tabuk

species / druh	regional status / regionální stupeň (2011)	global status / celosvětový stupeň (2016)
<i>Panthera pardus</i>	critically endangered / kriticky ohrožený	vulnerable / zranitelný
<i>Felis margarita</i>	near threatened / téměř ohrožená	least concern / málo dotčená
<i>Hyaena hyaena</i>	endangered / ohrožená	near threatened / téměř ohrožená
<i>Mellivora capensis</i>	near threatened / téměř ohrožený	least concern / málo dotčený
<i>Canis lupus</i>	endangered / ohrožený	least concern / málo dotčený
<i>Vulpes cana</i>	vulnerable / zranitelná	least concern / málo dotčená
<i>Vulpes vulpes</i>	least concern / málo dotčená	least concern / málo dotčená

a subsidy program to facilitate purchase of fodders and establishment of enclosures. And of course, once villagers have the substitute for free ranging livestock, enforceable severe penalties against violators must be implemented to prevent further persecution of carnivores. The above-mentioned strategies should be carried out along with public awareness programs directed at changing public perception of predators. Education that extends from public school curricula to public media along with religious scholars would certainly help in improving the public opinion on the value of wildlife and the importance of its conservation.

SOUHRN

Nález šelem z provincie Tabuk byly shromažďovány mezi lety 2010 a 2017 s použitím fotopastí, živochytých pastí a přímým pozorováním. Celkem bylo zaznamenáno sedm druhů šelem představujících čtyři čeledi: dvě kočkovité šelmy, kočka pouštní (*Felis margarita*) a levhart arabský (*Panthera pardus nimr*), jedna hyenovitá, hyena žíhaná (*Hyaena hyaena*), jedna lasicovitá, medojed kapský (*Mellivora capensis*) a tři psovitě šelmy, vlk obecný (*Canis lupus*), liška kana (*Vulpes cana*) a liška obecná (*Vulpes vulpes*). Každý druh je opatřen soupisem lokalit a mapkou, jeho současný stav rožšíření v provincii je tedy náležitě popsán. Naneštěstí bylo mnoho nalezených kusů šelem zabito lovci či místním lidem. Hlavní ohrožení šelem v provincii Tabuk představuje přímé zabíjení, ovšem potenciální řešení tohoto ohrožení je v textu dikutováno.

A c k n o w l e d g e m e n t s

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