

Felids of Abbasabad Naein Reserve, Iran

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Iran has a high diversity of felids compared with other west Asian countries. A total of eight cat species, from the Persian leopard *Panthera pardus saxicolor* to the sand cat *Felis margarita*, exist in the country today, and there used to be two other species, the Caspian tiger *Panthera tigris virgata* and the Asiatic lion *Panthera leo persica*, that are now extinct (Etemad 1985, Ziaie 1996). As one of the latest reserves established in the country, Abbasabad has been officially protected since 2005 as a Hunting Prohibited Area. The present survey in this area was conducted in order to study five cat species: the Asiatic cheetah *Acinonyx jubatus venaticus*, the Persian leopard, the caracal *Caracal caracal*, the sand cat and the wild cat *Felis silvestris ornata*.

Study area

With an area of more than 3,000 km², Abbasabad is located 180 km east of the city of Naein in the eastern half of Esfahan Province in central Iran (Fig. 1). The reserve has rolling mountains extending from west to east with vast plains surrounding the mountainous areas. The elevation ranges from 703 m to 2,451 m with an average annual rainfall of 106 mm (range 79-157 mm). With an average annual temperature of 18.9 °C, Abbasabad is considered as a desert area with a dry desert climate (Esfahan University of Technology 2003). Most of the area is covered with representatives of halophytic and xerophytic plants, mainly of the families *Salsola-ceae*, *Chenopodiaceae* and *Rosaceae*.

Because access to the whole of the area is difficult, most of the field effort was concentrated in the western half, which is also believed to have the higher level of security required for conducting a camera-trapping survey.

Methods

The present survey of felids in Abbasabad Reserve was conducted between November 2002 and August 2007, and

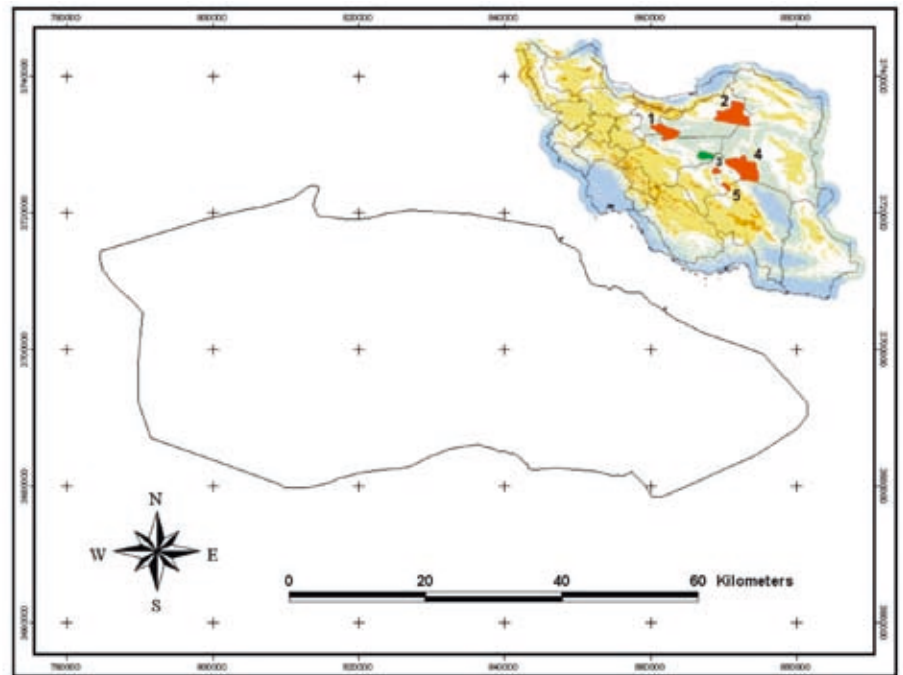


Fig. 1. Map of Abbasabad Reserve and its location (green) among the main network of cheetah habitats (red) in Iran: 1. Kavir NP; 2. Khar Turan NP; 3. Dare Anjir WR; 4. Naybandan WR; 5. Bafgh PA. (Iran map from Hunter *et al.* 2007, Cat News 46, p. 8).

enquiries were made with the local people of the study area. Sightings of each felid species by local people were only accepted after proper confirmation, mainly through assessing the observer's ability to identify the animal in a picture showing several other cats and larger carnivores. The behaviour of the animal, as described by the observer, sometimes helped to reveal the identity of the species seen.

As the first step, a basic distribution map was prepared using GIS on the basis of direct observations by game guards and local people. The distribution area was then searched for more evidence of each species and its prey. We only recorded large cat tracks (i.e. cheetah and leopard) and abandoned smaller tracks, because they are very similar to each other. Ultimately, we applied 2-4 camera traps inside the verified habitats, mainly along trails and dry watercourses, at more than 20 locations for periods ranging from 1 week to 2 months.

Results and Discussion

During the survey period, the presence of all five species of felids were confirmed in the area. Dens of sand cats and caracals were found in the western part of the reserve. From more than 900 camera-trap nights a total of 12 images were obtained of caracals and wild cats belonging to 7 capture events. Additionally, sand cats and caracals were observed (dead and alive) four times during the survey period. The survey results are summarized in Table 1.

Asiatic Cheetah

Once distributed across most desert habitats of eastern Iran, the Asiatic chee-



Fig. 2. Cheetah poached in the late 1990s (Photo H. Akbari).

Table 1. Results of felid surveys in Abbasabad Reserve

Species	Evidence of existence	Captures by camera traps
Asiatic cheetah	tracks, poached animal	0
Persian leopard	tracks and kill	0
Caracal	den, direct observation, live and dead capture, camera trap images	5
Sand cat	den, direct observation and live and dead capture	0
Wild cat	camera trap images	2

tah, with a population size of between 80 to 120 individuals, is now one of the most endangered species in Iran. As one of the most recently confirmed cheetah habitats in the country, Abbasabad is believed to be one of the main reserves in Iran holding a number of cheetahs (Farhadinia 2004).

There are some occasional observations made by local people throughout the area which were verified during the survey. Several different tracks were found that very likely belonged to cheetahs. Small tracks in the company of large ones indicated reproduction in the area.

Cheetah have never been observed attacking livestock; they feed mainly on wild sheep, wild goats and Jebeer gazelles. On the other hand, because of the low density of medium-sized ungulates, cheetahs also need to hunt smaller mammals which occur in relatively high abundance throughout the area.

Abbasabad is located within the principle network of cheetah habitats in Iran and is expected to play an important role facilitating any movement between the main habitats, particularly from the southern ones in Yazd Province. It is estimated that no more than 10 cheetahs live throughout Abbasabad.

Persian Leopard

The leopard is still relatively widespread and numerous in a number of areas compared with most large carnivores in Iran. There are about 550–850 animals in the country, some 55% of which live in protected areas (Kiabi *et al.* 2002). Abbasabad is one of the last strongholds of the leopard in Esfahan Province and occasional sightings of the species indicate a small population in the area. The species' range is very similar to the distribution of wild goats, covering

most of the central rocky mountainous terrain where access is difficult. Most of the leopards' kills found in the area were wild goats (Fig. 4), which reflects the greater abundance of the latter species than that of wild sheep, as well as the greater overlap of the goats' range with that of the leopards (Farhadinia *et al.* 2006). However, remains of wild sheep were also occasionally found, and scat analysis revealed that leopards sometimes consume small mammals, including rodents, as well. Local people sometimes reported leopard attacks on domestic camels and livestock, usually in the foothills. It is roughly estimated that 5 – 10 leopards live throughout Abbasabad.



Fig. 3. A young wild goat killed and hidden under a tamarisk as a specific leopard habit in August 2005 (Photo M. Beheshti).

Caracal

Little is known about various aspects of the ecology of the caracal in Iran despite its wide distribution throughout the eastern half of the country. Abbasabad is supposed to be one of the best habitats for the species in the country, and it seems that the animal has the highest abundance of all cat species in the area (Farhadinia *et al.* 2007). The caracal is well known among local people who give it names such as black-eared cat,



Fig 4. An adult caracal captured by camera trap on 16 July 2007 (Photo Iranian Cheetah Society /Esfahan University of Technology)

tufted-eared cat or secretive cheetah; it may sometimes be mistaken for the cheetah which is a sympatric species throughout most of its range in Abbasabad.

Most of the observations were made in the desert mountains and hilly terrains which are considered to be suitable habitats for rodents and hares. The species has never been seen on the flat plains of the area, just a few times along the roads; these are probably individuals in transit, switching between hilly habitats. Heptner & Sludskii (1992) stated that, with regard to the caracal's microhabitat preference, it is typically associated with either well-vegetated or rocky areas that provide cover for hunting as well as shelter (Fig. 4).

From examination of a limited number of scats and direct observations, it seems that rodents play an important role in the caracal's diet. Ground-living birds are also potential prey. On a visit to a caracal den among *Haloxylon* trees on sand dunes with three entrances on the ground, the skin of a domestic goat as well as remains of domestic chickens were discovered spread around the den. From interviews with local people, it was learnt that the animal is a regular visitor to small livestock inside the village and sometimes even kills domestic goats and their kids inside their corrals. However, the main losses sustained by local people and caused by caracals are poultry in Abbasabad (Farhadinia *et al.* 2007).

Sand Cat

With the smallest range of distribution in the country, the sand cat is one of the least known felids in Iran (Ziaie 1996). The species was not known in

Abbasabad before 2004 when a dead sand cat was found in the western area (Figs 5 and 6). So far five patches of the species' distribution have been explored mainly consisting of sandy plains with abundant saxaul trees. Because of



Fig. 5. A female sand cat found dead in Abbasabad in November 2004.

its small size and nocturnal habits, this animal is not well known to local people.

Wild Cat

The wild cat is one of the most abundant felids in Iran with a wide range of distribution throughout the country (Ziaie 1996). However, the animal is not regularly seen in the area of the survey. Results of camera-trapping efforts have confirmed wild cat depredation on small livestock in villages in the area (Fig. 7).



Fig. 7. Wild cat captured by camera trap on 7 August 2007 (Photo Iranian Cheetah Society /Esfahan University of Technology).

Conclusion

Out of eight felid species in Iran, five occur in Abbasabad Reserve, one of the highest diversities of cat species in Esfahan Province. This area is the only



Fig. 6. Sand cat den among sand dunes (Photo H. Akbari).

confirmed habitat for the critically endangered Asiatic cheetah in the province, functioning as a corridor connecting the main cheetah habitats in the country. Also, Persian leopards are known to live in the area, mainly throughout the mountainous terrain. Moreover, it seems that the caracal is the most abundant felid in the area with the highest number of direct sightings as well as of camera-trap captures. Two smaller cats, the sand cat and the wildcat, exist in Abbasabad but are rarely observed.

The ecology of small felids, especially of caracals and sand cats, is poorly known in Iran. On the other hand, as a result of the investigations carried out in Abbasabad, the reserve is now recognized as one of most promising habitats for cats, particularly small felids, in Iran. This reserve would thus seem to be a suitable location for a research project designed to address this deficiency by embarking on the first radio-telemetry study of caracals and sand cats in the country.

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