

special
issue

N° 10 | Autumn 2016

CAT news

Cats in Iran





CATnews is the newsletter of the Cat Specialist Group, a component of the Species Survival Commission SSC of the International Union for Conservation of Nature (IUCN). It is published twice a year, and is available to members and the Friends of the Cat Group.

**For joining the Friends of the Cat Group please contact
Christine Breitenmoser at ch.breitenmoser@kora.ch**

Original contributions and short notes about wild cats are welcome **Send contributions and observations to ch.breitenmoser@kora.ch.**

Guidelines for authors are available at www.catsg.org/catnews

This **Special Issue of CATnews** has been produced with support from the Wild Cat Club and Zoo Leipzig.

Design: barbara surber, werk'sdesign gmbh
Layout: Christine Breitenmoser & Tabea Lanz
Print: Stämpfli Publikationen AG, Bern, Switzerland

ISSN 1027-2992 © IUCN/SSC Cat Specialist Group

Editors: Christine & Urs Breitenmoser
Co-chairs IUCN/SSC
Cat Specialist Group
KORA, Thunstrasse 31, 3074 Muri,
Switzerland
Tel ++41(31) 951 90 20
Fax ++41(31) 951 90 40
<ch.breitenmoser@vetsuisse.unibe.ch>
<ch.breitenmoser@kora.ch>

Cover Photo: From top left to bottom right:
Caspian tiger (K. Rudloff)
Asiatic lion (P. Meier)
Asiatic cheetah (IICS/DoE/CACP/
Panthera)
caracal (M. Eslami Dehkordi)
Eurasian lynx (F. Heidari)
Pallas's cat (F. Esfandiarri)
Persian leopard (S. B. Mousavi)
Asiatic wildcat (S. B. Mousavi)
sand cat (M. R. Besmeli)
jungle cat (B. Farahanchi)

The designation of the geographical entities in this publication, and the representation of the material, do not imply the expression of any opinion whatsoever on the part of the IUCN concerning the legal status of any country, territory, or area, or its authorities, or concerning the delimitation of its frontiers or boundaries.

SAM KHOSRAVIFARD¹* AND AIDIN NIAMIR²

The lair of the lion in Iran

It is more than a half-century since Iran lost its Asiatic lion. Lions were widespread in south Iran, specifically on the slopes of the Zagros and forest regions around Shiraz. They were slightly smaller than their African ancestor, with an obvious running belly fold, shorter mane, and thus visible ears. Current climate and other physical conditions in Iran seem to be in favour of the lions return. However, prey population and potential anthropogenic conflicts are major obstacles in re-introduction plans.

Everlasting beast

Although extinct in Iran's wilderness, lions are still alive in literature and fine arts. The lion has been Iran's national emblem for many years. An illustration of the lion with a sword in hand and the sun in his back was stamped on the Iran's flag for decades. This charismatic species has been known as a symbol of glory, grandeur and power since Mithraism era (Khosravifard 2010). Initiation into Mithraism consisted of taking seven steps or climbing a ladder. The lion (or leo) was the fourth step that asked for physical strength (Hami 1976). This perception of the lion has been frequently portrayed in paintings, sculptures and poets of Iranian artists (Afshari 2005, Ghasemloo 2005, Ze-krgu 2006). The archaic Pazyryk carpet has a design motif of the Asia-tic lion (Parham 1992, Tanavoli 2008). Hunting lions is a common pattern in Persepolis reliefs. The most renowned of these reliefs is the combat of the lion and a bull (Fig. 1). The lion as a sign of heroic triumph and illumination is fighting with a bull, which was known as a symbol of darkness and ignorance (Boyce 1996). The cultural significance of the male lion is still reflected in the sculptures of stone lions on the top of the graves of the dead men who are recognised as courageous and valiant in the Zagros (Fig. 1).



Fig. 1. Left: The lion and bull in combat at ancient Persepolis (Photo Courtesy: Abbas Jafari). Right: The stone lion on the top of the grave of a recognised courageous and valiant man (Photo Courtesy: Abbas Jafari).

haviour are limited to historical observation records or indirectly through similar studies on the only free ranging population of this species in the Gir Forest National Park of India. Lions in Asia are slightly smaller than their African ancestor (Nowell & Jackson 1996). They have an obvious running belly fold, and their mane does not extend to the forehead so the ears are always visible (Pocock 1930, Firouz 2005; Fig. 2 & 3). Since lions were divided into two Asiatic and African groups only around 100,000 years ago, they are still morphologically quite similar (O'Brien et al. 1987) and have just developed some minor traits due to their distinct habitats. The Asiatic lion has bifurcated infraorbital foramen which is different in the African specimens (O'Brien et al. 1987). The Asiatic lions are social predators. Social predation provides the possibility to kill creatures larger than those that a single lion could overpower alone. However, unlike the African lions, their diet consist mainly of livestock (Pocock 1939, Joslin 1973) and small wild ungulates, with a preference for Persian fallow deer *Dama dama mesopotamica*, wild boar *Sus scrofa*, and chital *Axis axis* (Meena 2009). This diet preference might be the reason that the pride size in Asiatic lion is relatively smaller; 2 to 5 females and male coalitions. Their home range is estimated around 110 km² for males (Nowell & Jackson 1996) and around 50 km² for females (Jhala et al. 2009). The coalition of males defends the territory of the pride.

Habitat and distribution

Historical distribution of the Asiatic lion was vast and ranged from Greece and Syria in the west through Azerbaijan, Iraq, Iran, Afghanistan, Pakistan, and up to India in the east (Jhala et al. 2009). The Asiatic lion once had an extensive distribution in Iran as well, ranging from the border of Iraq through the Khuzestan plain to the province of Fars. Schnitzler (2011) has reviewed literature on the historical evidences and collected a complete list of historical observations of the Asiatic lion. There are few other observation records that we added to the list (Table 1). Zell-e Soltan (1850-1917) the Qajar prince, who is famous for his extraordinary hunting records, has mentioned Dasht-e Arjan and Kamfirouz in the Fars Province as a main roaming area of the lion: "lions are also to be found here. Wild sheep, ibex, partridge, snow partridge, and bear are so abundant

that shooting them is of no importance...”, he wrote after a hunting trip near Ardekan Mountain (Zell-e Soltan 1989). His statement is concurring with Hasan Ibn Hasan Fasaei’s descriptions of the Fars Province between 1883 and 1894 (Fasaei 1993). He has mentioned the city of Nobandegan as a well-known area of the lions in the Fars Province. These location names had also been mentioned in Mostofi’s historical book (Mostofi 1983).

All available observation records of the Asiatic lion in Iran were located below 2000 m. The highest locations were reported from the surroundings of the Dasht-e Arjan (~1950 m) and the Kotal-e-Pirezan (~1700 m), and the lowest locations from the Khuzestan Plain (~50 m). The eastern part of the lion’s habitat in the country is confined to the southern and western slopes of the Zagros vegetated with steppe flora such as *Artemisia* sp. and *Astragalus* sp., and pistachio-almond woodlands where parallel ridges enclosing broad valleys. Mean annual rainfall in this part is higher at about 450 mm. Deep snow and freezing is also not unusual. Towards south-west the characteristics of the lion’s habitat gradually change and the *Amygdalus scoparia*, *Acer cinerascens*, and further south *Ziziphus spinchristi*, *Prosopis spigera* are dominant with sparse *Prosopis spigera* and Acacia thorn savannah in coastal area, until it reaches the Mesopotamian marches with halophile vegetation. This part of the habitat receives about 100 mm annual rainfall, while in summertime temperature routinely exceeds 50°C and the climate is occasionally very humid. The described habitat is not bounded to the Khuzestan and the Fars Provinces where all historical observations occurred. It continues with slight differences towards east into Hormozgan Province and a bit towards north where the Zagros Mountains meet the central plateau in the Kerman Province, and ultimately ends to the Hamoun Lakes at the border with Pakistan. This habitat distribution is in accordance with the distribution model of the lion in Iran (Fig. 4).

The habitat favourability model (Real 2006) for Asiatic lion in Iran was trained based on all historical observations ($n = 20$) over topographical (i.e. elevation, slope, and aspect), biological (i.e. Enhanced Vegetation Index), and bioclimatic variables. Elevation above sea level and mean diurnal temperature had the highest contribution, followed by maximum temperature of the warmest month and enhanced vegetation index. Khuz-

Panthera leo persica

Names:

Shir	شیر
lion	شیر آسیایی
Shir - e- Asiaei	شیر ایرانی
Asiatic lion	
Shir - e - Irani	
Persian lion	

Distribution in Iran:

Nowhere

Habitat area:

From dense reed-bed, dense savannah type bush and riparian forests of Khuzestan to the oak forests and pistachio-almond forest of the Zagros Mountains.

Head and body length:

170-250 cm (male)
140-170 cm (female)

Tail length:

60-90 cm

Weight:

160-190 kg (male)
120 kg (female)

Global Population:

Exists as a single isolated population in India, numbering approximately 350 animals. Total number of mature animals is 175.

Iranian Population:

0

IUCN Red List:

Endangered (2008)

CITES:

Appendix I

Country Red List:

Extinct



Photo P. Meier

estan Province and the west of Bushehr, Fars, and Kuhkiloye-Buyerahmad Provinces were ranked as the most favourable habitats. The rest of Bushehr and Fars Provinces from east, and Lorestan Province and part of Ilam Province from north formed a buffer with moderate favourability. Other provinces were ranked as unfavourable, except some fragmented areas in Hormuzgan, Yazd, Kerman

and Sistan-Baluchestan Provinces that were ranked as moderate favourable. Our modelling attempt also revealed a favourable habitat in the Sistan-Baluchestan Province, near the city of Iranshahr. This might be due to the effect of prevalence, bias in species occurrence data, or selection of the predictors and should be studied more carefully. There are many other biologic and anthropo-

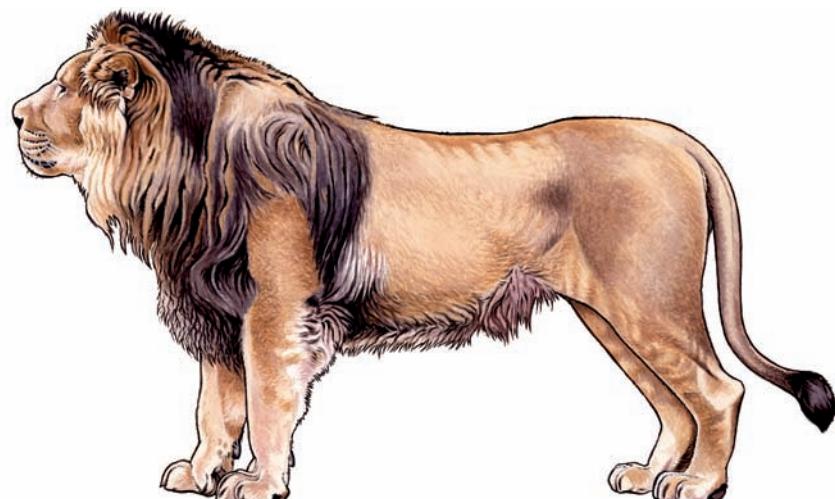


Fig. 2. Sketch of Asiatic Lion (courtesy of the Rotterdam Zoo).

Table 1. Data from the literature indicating the presence of lions in Iran during modern times. Adopted after Schnitzler (2011).

Locality	Date	Reference	SDM *	Remarks
Dasht-e Arjan (Fars)	1320s	Mostofi 1983	+	
Kamfirouz (Fars)	1320s	Mostofi 1983	+	
Ramhormoz (Khuzestan)	1841	Kinnear 1920	+	
Kuh-e Asemari (Khuzestan)	1841	Kinnear 1920	+	
Shushtar (Khuzestan)	1841	Joslin 1986	+	
Susa (Khuzestan)	1850	Kinnear 1920	+	
Kotal-e Pirzan (Fars)	1867	Etemaad 1985	+	
Shiraz (Fars)	1870	Guggisberg 1963	+	
Karun river (Khuzestan)	1875	Etemaad 1985		Vague location
Dasht-e Arjan (Fars)	1876	Etemaad 1985	+	
Nowbandegan (Fars)	1883	Fasaei 1993	+	
Dasht-e Arjan (Fars)	Late 1800	Zell-e Soltan 1989	+	
Kamfirouz (Fars)	Late 1800	Zell-e Soltan 1989	+	
Susa (Khuzestan)	1897	Guggisberg 1963	+	Currently Shush
Kazerun (Fars)	1900	Etemaad 1985	+	
Ahwaz road (Khuzestan)	1908	Schnitzler 2011		Vague location
Sannyat (Fars)	1916	Schnitzler 2011		Unidentified location
Posht-e Kuh (Fars)	1917	Schnitzler 2011		Unidentified location
Khark valley (Khuzestan)	1918-19	Schnitzler 2011		Probably Misspelled
Karun river (Khuzestan)	1940s	Firouz 2012		Vague location
South of Shiraz (Fars)	1923	Guggisberg 1963	+	
South of Persia	1928	Schnitzler 2011		Vague location
Dezfoul (Khuzestan)	1929	Guggisberg 1963	+	
Dezfoul (Khuzestan)	1932	Etemaad 1985	+	
Northwest Dezful	1942	Etemaad 1985	+	
Northwest Dezful	1943	Etemaad 1985	+	
Dez valley	1957	de Planhol 2004	+	

* SDM = Species distribution models. Data points that were used to train the SDM.

genic parameters that should be considered in the habitat modelling of the lion in Iran, specifically for conservation purposes such as species reintroduction. However, in the case of the Asiatic lion in Iran where species occurrences are few and subject to uncertainty, the use of knowledgeable experts

and deductive approaches wold be practical (Niamir 2011).

Lions don't come easy

Like other large carnivores on top of the trophic chain, lions should have had occurred in low densities and large ranges,

with large tracts of territory for maintaining viable populations. Taking into account the arid and mountainous environment, and the lower prey density, a lion in Iran would need more space than the average home range size given by Nowell & Jackson (1996). Such a large home range increases the competition over limited natural resources, thus the human-lion conflicts. Moreover, low density populations of such "conflict species" will have a high extinction risk since they are already living at the ecological/demographic lower limit and even a low or moderate additional anthropogenic mortality can push such a population over the edge.

In 1973, for the first time there was an agreement to exchange 15 lions from India with 7 cheetahs *Acinonyx jubatus venaticus* from Iran. Although preliminary studies, site selection, and even some site preparation activities had been conducted by the Department of the Environment DoE of Iran, the project was not executed (Khosravifard 2010, Firouz 2012). According to the site selection stu-dies, an area of 1,910 km² within the Arjan National Park (currently Arjan Protected Area) was nominated for the reintroduction purposes. As discussed above the allocated area won't be extensive enough to host 15 individuals. The state of the environment has changed since 1973, and any new reintroduction projects would definitely need an intensive assessment of the availability of suitable habitat and the potential extension of a viable population as key components of reintroduction planning. Restoration of the original habitat and amelioration of causes of extinction must be explored and considered as essential conditions for these projects (Sarrazin & Barbault 1996).



Fig. 3. Male Asiatic Lion and Asiatic lion cub in the Gir Forest National Park, India (Photos P. Meier).

References

- Afshari M. 2005. Beasts in literature. Encyclopaedia of Islamic world (Persian edition). Foundation of Islamic Encyclopaedia. Tehran, Iran, Vol. 9, pp. 428-430.
- Boyce M. 1996. A history of Zoroastrianism: the early period (Persian Translation: Sanatizadeh H.). Tous, Tehran, Iran, Vol. 2, pp. 155-158.
- Costa G. C., Nogueira C., Machado R. B. & Colli G. R. 2010. Sampling bias and the use of ecological niche modelling in conservation planning: a field evaluation in a biodiversity hotspot. *Biodiversity and Conservation* 19, 883-899.
- Elith J., Graham C. H., Anderson R. P. et al. 2006. Novel methods improve prediction of species' distributions from occurrence data. *Ecography* 29, 129-151.
- Elith J., Phillips S. J., Hastie T., Dudik M., Chee Y.E. & Yates C. J. 2011. A statistical explanation of MaxEnt for ecologists. *Diversity and Distributions* 17, 43-57.
- Etemaad E. 1985. The mammals of Iran. Department of environment, Tehran, Iran. Vol. 3, pp. 188-194. (In Persian)
- Fasaei M. H. H. 1993. Naseri trip diary. Amirkabir, Tehran, Iran. 175 pp. (In Persian)
- Firouz E. 2005. The complete fauna of Iran. I. B. Tauris & Co Ltd. London, UK. pp. 7-65.
- Firouz E. 2012. Memories of Eskandar Firouz. IBEX Publishers, Washington, USA. pp. 310-313. (In Persian)
- Ghasemlou F. 2005. Beasts and Persian authors . Encyclopaedia of Islamic world. Foundation of Islamic Encyclopaedia. Tehran, Iran. Vol. 9, pp. 423-428. (In Persian)
- Guggisberg C. A. W. 1963. Simba. Chilton books, Philadelphia, USA. pp. 58-64.
- Hami H. 1976. Bagh-e Mehr. (In Persian).
- Jhala V. Y., Mukherjee S., Shah N., Chauhan K. S., Dave C. V., Meena V. 2009. Home range and habitat preference of female lions (*Panthera leo persica*) in Gir forests, India. *Biodiversity and Conservation* 13, 3383-3394.
- Joslin P. 1973. The Asiatic lion: a study of ecology and behaviour. PhD Thesis, University of Edinburgh, Scotland. pp. 55-60.
- Joslin P. 1986. Distinguishing characteristics of the Asiatic lion (*Panthera leo persica*) and its distribution within historical time. *Zoological Society*, Chicago, USA. pp. 31-43.
- Kinnear N. B. 1920. The past and present distribution of the lion in south eastern Asia. *Journal of the Bombay Natural History Society* 27, 33-40.
- Khosravifard S. 2010. The Persian Lion. Iran cultural studies, Tehran, Iran. pp. 18-39. (In Persian)
- Meena V. 2009. Variation in social organization of lions with particular reference to the Asiatic Lions *Panthera leo persica* (Carnivora: Felidae)

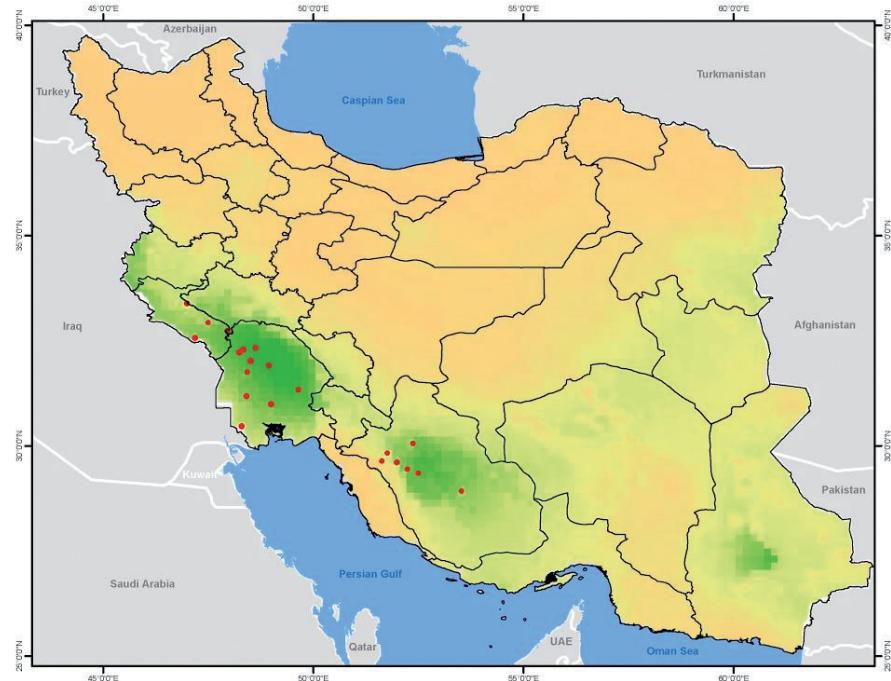


Fig. 4. Habitat favourability prediction of Asiatic lion in Iran, based on historic records (red dots, correspond to Table 1). Green shade = favourable habitat.

- of the Gir forest, India. *Journal of Threatened Taxa* 3, 158-165.
- Mostofi H. 1983. The purification of hearts (Persian re-edition). Donyay-e Ketab. Tehran, Iran. pp. 124, 136.
- Niamir A., Skidmore A. K., Toxopeus A. G., Muñoz A. R. & Real R. 2011. Finessing atlas data for species distribution models. *Diversity and Distributions* 17, 1173-1185.
- Nowell K. & Jackson P. 1996. Wild cats: status survey and conservation action plan. IUCN, Gland, Switzerland. pp. 37-41.
- Parham S. 1992. Mysterious story of Pazyryk carpet. *Nashr-e danesh Magazine* 14, 34-41. (In Persian)
- de Planhol X. 2004. Le paysage animal. L'homme et la grande faune: une zoogéographie historique. Fayard, Paris, France.
- Pocock R. I. 1930. The lions of Asia. *Journal of Bombay natural history society* 34, pp. 638-665.
- Pocock R. I. 1939. The Fauna of British India: Mammalia. Primates and Carnivores. Taylor and Francis, London, United Kingdom. 463 pp.
- Phillips S. J., Anderson R. P. & Schapire R. E. 2006. Maximum entropy modelling of species geographic distributions. *Ecological Modelling* 190, 231-259.
- Phillips S. J., Dudik M., Elith, J., Graham C. H., Lehmann A., Leathwick J. & Ferrier S. 2009. Sample selection bias and presence-only distribution models: implications for background and pseudo-absence data. *Ecological Applications* 19, 181-197.
- O'Brien S. J., Packer C., Herbst L., De Vos V., Joslin P., Ott-Joslin J., Wildt D. E. & Bush M. 1987.
- Biochemical genetic variation in geographic isolates of African and Asiatic lions. *National Geographic Research* 3, 114-124.
- Real R., Barbosa A. M. & Vargas J. M. 2006. Obtaining Environmental Favourability Functions from Logistic Regression. *Environmental and Ecological Statistics* 13, 237-245.
- Rebelo H. & Jones G. 2010. Ground validation of presence-only modelling with rare species: a case study on barbastelles *Barbastella barbastellus* (Chiroptera: Vespertilionidae). *Journal of Applied Ecology* 47, 410-420.
- Sarrazin F. & Barbault R. 1996. Reintroduction: Challenges and Lessons for Basic Ecology Elsevier Science Vol. 11, 474-478.
- Schnitzler A. E. 2011. Past and present distribution of the North African-Asian lion subgroup: a review. *Mammal Review* 413, 220-243.
- Tanavoli P. 2008. Lion rugs. *Encyclopaedia Iranica*. <http://www.iranicaonline.org/articles/lion-rugs>.
- Zekrgou A. H. 2006. Evolution in Art. Research and planning of textbooks, Tehran, Iran. pp. 30-45. (In Persian)
- Zell-e Soltan M. 1989. The destiny of Masoudi. Edited by Asatir H. K. (Ed.), Tehran, Iran. pp. 297-300, 314, 493. (In Persian)

¹ Department of Natural Resources, Faculty of Geo-information Science and Earth Observation ITC, University of Twente, POBox 217, 7500 AE, Enschede, the Netherlands
*sam.khosravifard@gmail.com

² Senckenberg Biodiversity and Climate Research Institute, Frankfurt am Main, Germany