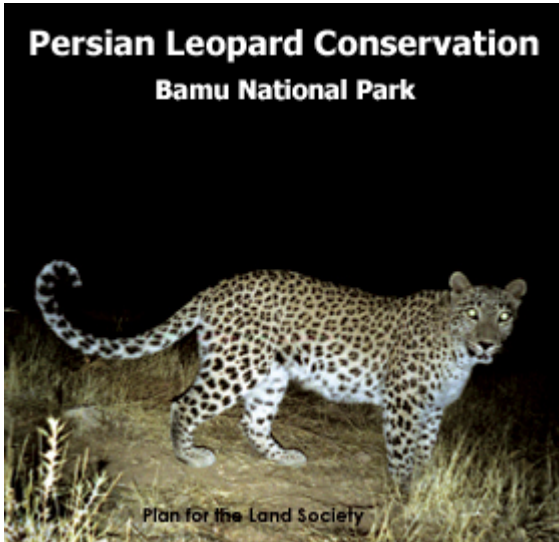


## Cat Project of the Month – March 2008

The IUCN/SSC Cat Specialist Group's website ([www.catsg.org](http://www.catsg.org)) presents each month a different cat conservation project. Members of the Cat Specialist Group are encouraged to submit a short description of interesting projects

### Persian Leopard Ecology and Conservation in Bamu National Park, Iran



"Dussy" the female leopard with a grown cub was photographed 5 times and is a new hope for survival of Persian leopards (Photo Plan for the Land Society).

The biologists of our NGO, Plan for the Land Society, surveyed numerous leopard habitats throughout protected areas of Iran and have chosen Bamu National Park in the Fars Province (southern Iran) for our project "Persian Leopard Ecology and Conservation in Iran" study. The reasons of this selection are relatively high leopard density, rapid habitat fragmentation, escalated poacher-warden conflicts and prey reduction in Bamu NP.

Amirhossein Kh. Hamidi is a research assistant of the project and a member of the Plan for the Land Society since 2006 who worked previously on Persian leopard in different parts of Iran. Taher Ghadirian is also a research associate of the Bamu project. The project is supervised by Arash Ghoddousi who has been involved in conservation of the Asiatic cheetah and Persian leopard since 2005 and is a Friend of the Cat Group since 2007.



Amirhossein Kh. Hamidi in Bamu National Park, Iran. (Photo H. Moshiri).

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submitted: February 2007

#### Background

The Persian Leopard (*Panthera pardus saxicolor*) is among the largest leopard subspecies which is listed in the 2007 IUCN Red List of Threatened Species as "Endangered". Its distribution area spreads across the remote high mountains of Iran, Afghanistan, Turkmenistan, Azerbaijan, Georgia and Armenia which consist of diverse climates and landscapes. Total population size of this subspecies does not exceed 1300 individuals (Khorozyan et al., 2005); most of the cats are found in Iran (550-850 animals) (Kiabi et al., 2002). However, over the past 25 years in many areas of this vast range the leopard was exterminated and in the others its numbers were significantly reduced. The drastic decline of population size has been a result of poaching, prey reduction and habitat loss. Surprisingly, no direct actions focused on Persian leopard conservation have been carried out in Iran and the cat is on the verge of extinction.

This project was initiated in June 2007 in Bamu National Park to protect leopards with the help of experienced conservationists and local communities under financial support provided by individual donors.



A typical landscape of Bamu National Park when the cold season begins. (Photo T. Ghadirian).

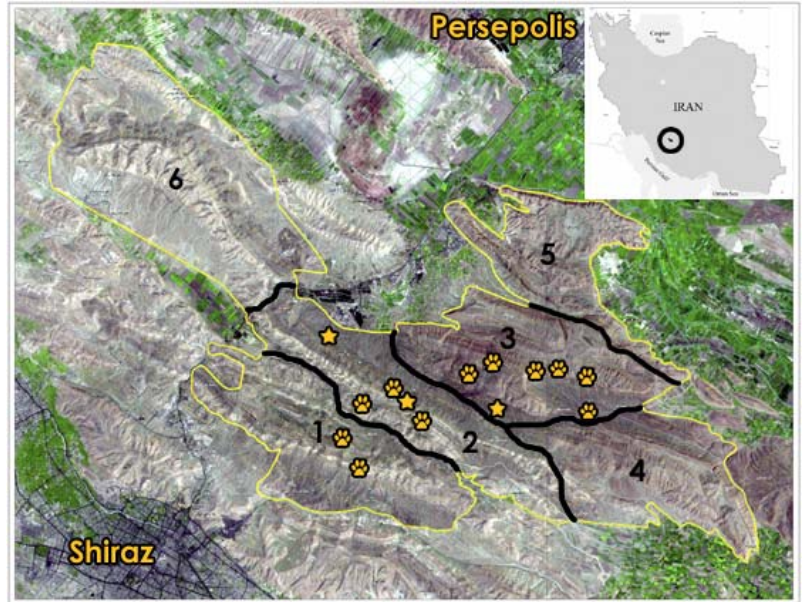
Recently, we have launched intensive camera-trapping in the defined sites, scat sampling for dietary and molecular analysis and pilot awareness-raising campaigning in several villages adjacent to the area. We anticipate that our project in Bamu NP will serve a model for continuous on-the-ground conservation throughout the leopard range in Iran.

The overall goals of the project are two: (1) Assess the status and structure of the leopard population in Bamu NP; and (2) Develop and launch the leopard conservation strategy in this protected area. To accomplish these ambitious goals, we will need to elaborate the action plan which would ensure the long-term survival of local leopards on a basis of baseline ecological data, involvement of local rural communities in biodiversity-related issues and establishment of local trust for leopard conservation.

### Objectives:

1. Use camera-traps to confirm presence/absence, obtain information on sex/age structure and estimate population size and relative abundance.
2. Study leopard diet by means of fecal analysis and investigations of prey remains.
3. Assess the status of competitor predators and staple prey species through photo-trapping and field surveys.
4. Increase public awareness in the neighbouring communities so that to reduce leopard and prey poaching and habitat loss.
5. Investigate the potential of ecotourism as a viable conservation tool in Bamu NP in the future.
6. Educate younger generation of enthusiasts in research and conservation of Persian leopards.
7. Train conservation staff of Bamu NP and local people the fundamentals of leopard monitoring and conservation.
8. Establish the game wardens' trust to promote the Persian leopard conservation in Bamu NP and build its capacities.

**Study area:** Bamu National Park is one of the famous game reserves located in the vicinity of Shiraz city, Fars Province close to the ancient ceremonial capital of Persian Empire in Achaemenids, Persepolis (515 B.C). The dominating landscapes are arid plains, steppes and rocky mountains. This area of more than 48000 ha has been officially protected since 1967 and upgraded to the national park in 1970. The altitudes range from 1600 to 2700 m. Mean annual precipitation (400 mm) and air temperature (16° C) indicate the temperate semi-arid climate (Darvishsefat, 2006). The main prey species for leopards in this area are wild sheep *Ovis spp.*, wild goat *Capra aegagrus*, goitered gazelle *Gazella subgutturosa* and wild boar *Sus scrofa*. Smaller prey, such as the Indian crested porcupine *Hystrix indica* and Cape hare *Lepus capensis*, are also taken. The Persian leopard is the largest carnivore in Bamu NP, co-existing with the wolf *Canis lupus*, striped hyena *Hyaena hyaena*, wild cat *Felis sylvestrus* and other carnivores.



The map of location of Bamu National Park (top right), study areas (Areas 1 to 3 have already been surveyed, the Area 6 is excluded from surveys), camera stations with leopard pictures (cat footprints) and direct leopard observations since June 2007 (stars).

The number of leopards living in Bamu NP was guesstimated earlier as 15-20 animals which is among the highest leopard numbers for any studied protected area in Iran (Kiabi et al., 2002). Today, this national park has been surrounded by ever increasing urban areas and other settlements which encroach additional lands and convert them to human landscapes. Another concern is the Isfahan-Shiraz highway passing through Bamu NP. The western part of Bamu (Area 6 on the map) is already deprived of all big game to poaching; it appears to be no longer a leopard habitat, nor is protected by game wardens any more. Therefore, we have excluded the Area 6 from this project.

### Methods

We prioritize the use of camera photo-traps to estimate the size, structure and long-term viability of the leopard population in Bamu NP (Henschel and Ray, 2003). Following the feasibility study, we have divided Bamu NP into 5 even areas (the western Area 6 was excluded – see above) on a basis of their topographic distinctiveness (see the map). This classification made for more intensive camera-trapping there. We set up 20 units of Stealthcam photo-traps in 10 camera stations in each area, i.e. as 2 units/station so that to photograph the same animal from both flanks and then individualize them. Photographic capture rates of carnivores and prey species have been used as the indices of relative abundance and the leopard density is being estimated by capture-recapture technique through the CAPTURE software as described elsewhere (Karanth and Nichols, 1998; Henschel and Ray, 2003).



Setting up the camera-traps on the mountain ridge to photograph leopards.  
(Photo T. Ghadirian).

Camera trap stations are located mainly on the game trails and along the mountain ridges where we found most of leopard signs (scats, tracks and scrapes). Leopards often move along the mountain ridges that offer a wide view of the surrounding area and frequently use the established trails (Lukarevsky et al., 2007). The sampling period was 21 days in each area, as it corresponds to an average life of batteries. We moved all 10 stations after 21 days of trapping in each grid to the next area. We got very useful photos of leopards and succeeded to identify individuals from unique spot patterns on body flanks. Simultaneously with photo-trapping, we collect leopard scats to determine the prey eaten from hairs and bones. We also measure tracks and scrapes to use them in population census.

Abundance and distribution of leopard's prey species are assessed using the seasonal censuses carried out by Bamu game wardens.

Information on human-leopard conflicts has been collected during surveys across the villages adjacent to Bamu NP. We have educated a local warden in photo-trapping and other leopard survey techniques within this project, so we plan to hire more local people and Bamu staff to the leopard conservation trust which is to be established in the near future.

Camera photo-trapping has been conducted in the Area 1, Area 2 and Area 3 since September 2007. Sampling effort is over 1250 trap-nights at the moment (1 trap-night = one camera trap operating all 24 hours per day). Now we are photo-trapping in the Area 4 and from March 2008 Area 5 will be studied. The overall results of photo-trapping over the 5 areas will be summarized in the April 2008.

We have started some pilot public awareness and educational campaigns in neighbouring communities. They have allowed to change public attitudes to leopards and wildlife in general and to make them more positive, especially among younger people.

Our surveys among local people have revealed that, in 2007, at least 2 leopards (cubs) were poached by a local hunter. That case led to an investigation by Fars office of the Department of Environment, confiscation of specimens and imposition of high fine on the hunter. Poaching seems to be the main threat to the Persian leopard in Bamu NP and killing 2 cubs, possibly with their mother, may cause an irreplaceable loss for nature.

Abundance and distribution of leopard's prey species are assessed using the seasonal censuses carried out by Bamu game wardens.



Using 2 cameras per station gives us good results on capturing both flanks of leopards (Photo: Plan for the Land Society)

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Two Persian leopard cubs killed by a poacher in Bamu National Park (Photo T. Ghadirian).



### **Preliminary Findings:**

Until now, we obtained 25 leopard photographs, from which at least 9 individuals are identified. From these, 2 are proved to be males, 2 are females, 1 is a cub and the others are still unidentified. Leopards were usually solitary and on trail use (Spalton A. et al 2006). Among other predators, wild cats and striped hyenas have been frequently photographed. Photo records also show a wealthy population of natural prey, such as wild boars and Indian porcupines. In addition, we enjoyed three sightings of leopards, including "Dussy" the female with her cub.

Information gathered so far and further on leopard signs will be incorporated to the GIS map to produce a spatial database of leopard distribution in Bamu NP. From preliminary macroscopic scat analysis remains of wild goat, wild boar and Indian crested porcupine was among the highest percents of contents.

Establishment of a local leopard conservation trust is on its way and is supported by authorities and stakeholders who could help the scientists in strategic and action planning.



Training and education of local game wardens is one of the main actions to survive the fragile population of Persian leopard in BNP (Photo T. Ghadirian).

### **Next steps:**

Our activities will be continued until 2010. After gathering a baseline database on leopard ecology in Bamu NP, we will shift gradually to more conservation-oriented actions, such as working with local people. Also, we plan to expand our leopard research on issues not previously addressed:

1. Radio-tracking of Persian leopards in Bamu NP to study the habitat use patterns, home-range sizes and behaviour.
2. Collection of more scat samples and implementation of their molecular genetic analysis to identify animal sex, genetic variation, population size and relatedness.

Our project is also providing opportunities for volunteers, students and experts to make conservation actions more efficient.

### **Acknowledgements:**

We wish to thank our team members for their continuing collaboration with the project including Hamed Moshiri, Delaram Ashayeri, Mona Hamzeh'pour, Salman Rasouli and Ali Turk Qashqai. Our gratitude goes to all the support of Mr. Zohrabi head of Biodiversity bureau of Department of the Environment of Fars province and all the game-wardens of Bamu National Park. We wish to extend our thanks to Igor Khorozyan for revision and editing the text and informative guidance of B.H. Kiabi and B.F. Darreshouri.

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**Project Information**

Duration:	June 2007 – ongoing
Location (see map):	Bamu National Park, Fars Province, Iran
Sponsor(s):	Individual donors
Project address:	A#20 13th Feizieh st. NiavaranTehran, Iran
Project leader:	Arash Ghoddousi, Head of Biodiversity Bureau of the Plan for the Land Society ghoddousi@plan4land.org
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