



The Persian Leopard: Ecology and Conservation in Northeastern Iran

Annual Report 2014

WILDCRU 
Wildlife Conservation Research Unit

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Introduction

We just finished 2014, a year full of excitement, challenges and achievement within land of the Persian leopard in northeastern Iran. Our project is now more established in the region within its three pilot sites, namely as Tandoureh, Salouk and Sarigol National Parks, all well-known to host the leopards for decades.

Since 2006 the Iranian Cheetah Society (ICS) has led efforts to understand the ecology of Persian Leopards in the region. This work shaped the basis for the present project which was established in mid-2013 in the University of Oxford's Wildlife Conservation Research Unit (WildCRU). Its goal is to conserve the endangered Persian leopard within multiple reserves in northeastern Iran, by producing both cutting-edge science and the expertise and training which is necessary for effective conservation.

We are exploring some hitherto unknown aspects of its ecology such as ranging behavior. We are particularly interested in understanding the value of parks and their boundaries in protecting the populations. We are also investigating how local communities' interact with the reserves. We are promoting their involvement with some sites by enhancing their knowledge and developing their capacity for conservation practice. Collaborative monitoring and the sharing of research findings are part of this process. The project's diverse components are aimed at ensuring the long-term survival of the Persian Leopard within multiple reserves in north-eastern Iran. The present document outlines activities undertaken during 2014.

The project's achievements are indebted to its dedicated team as well as volunteers who were devotedly involved in different stages of the project. We started our new year 2015 with a great excitement, an adult Persian leopard seen in Tandoureh National Park in early morning of January 1, 2015 which raised hope for a year full of success ahead.



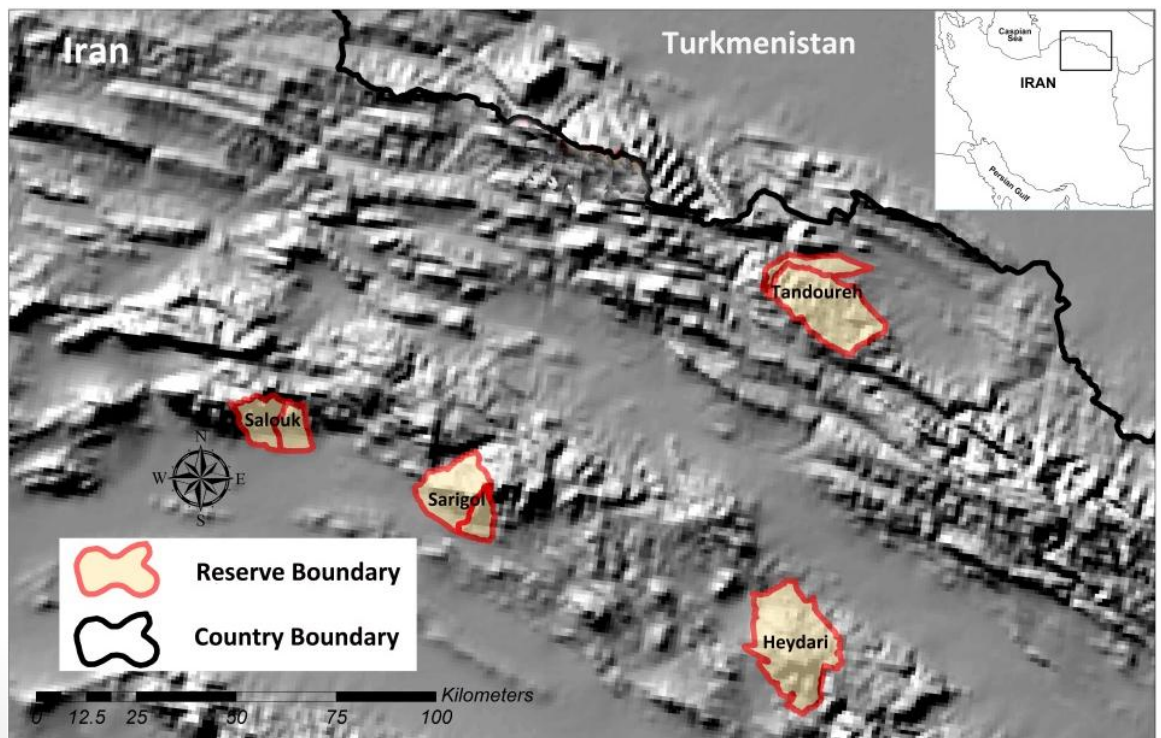
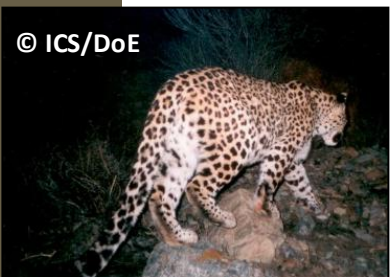
Project Sites

At the eastern extreme of the Irano-Anatolian Biodiversity Hotspot, the Kopet Dagh and Aladagh Mountains in northeastern Iran host a number of montane reserves, including Tandoureh, Salouk, Sarigol and Heydari (E57°15' to E59°15', N36° 20' to N37°20'). The latter area which was part of the project pilot sites in 2013 was excluded in 2014.

Located in two provinces of North Khorasan and Khorasan Razavi, they cover almost 1,395 km² of mountainous landscapes with altitude range of 1000 to over 3000 meter a.s.l., and with enormous cliffs and deep valleys. Generally, the mean annual precipitation and temperature are between 200 to 300 mm and ca. 15°C, respectively leading to the development of a temperate semi-arid climate. Potential ungulate prey in the leopard diet includes urial *Ovis vignei*, Wild goat *Capra aegagrus*, and Eurasian wild pig *Sus scrofa*. These areas also supports diverse range of carnivores, including gray wolf *Canis lupus*, striped hyena *Hyaena hyaena*, wild cat *Felis silvestris*, and Pallas' cat *Otocolobus manul*.

Livestock grazing is not permitted within National Parks. Nonetheless, a number of livestock nomadic pastoralists' herds are permitted to graze the adjacent protected area (in Tandoureh, Sarigol and Salouk) and Heydari Wildlife Refuge during summer (May-August) each year.

Moreover, local people residents living in surrounding villages keep domestic animals, mainly sheep *Ovis aries* and goat *Capra hircus*.



Human-dimension

People and Persian leopards: patterns of interaction and implication for conservation

We finished a year round survey with more than 80 herds representing nearly 300 households living around three national parks in northeastern Iran. They were interviewed on a seasonal basis to develop a comprehensive dataset to explore seasonal patterns and accurate number of loss due to different causes, including



predators. Persian leopard and grey wolf are two focal species; however, striped hyena and Eurasian lynx were also among reported predators, especially in Tandoureh.

Unlike many high conflict zones in west and central Asia, conflict with the leopard is not high among surveyed communities. However, there is a remarkable proportion of livestock annually lost due to a variety of disease, mostly unknown to the people.

The data analysis will be started soon to explore patterns of coexistence between human and leopards across multiple landscapes in northeastern Iran. The project findings will be injected into community-based efforts aimed to improve awareness among people and also to increase tolerance toward the leopards.

Parallel to human dimension surveys, we are developing a dataset composed of illegal culling of the leopards around the reserves, mainly in Tandoureh to explore potential impact of poaching on leopard population dynamics.



*An adult female leopard on a dog kill near Salouk National Park in August 2014
(©WildCRU/ICS)*

Capturing a problematic leopard in Iran-Turkmenistan Borderland

Since August 2014, a leopard was known to attack domestic animals near a village, named as Tazeh Ghaleh in northeastern Iran. Located just a few kilometers from Turkmenistan border, the village is surrounded by rolling terrains with juniper trees sparsely distributed on slopes within Kopet Dagh region, one of global high biodiversity hotspots. Between mid-August and mid-December 2014, the leopard killed 15 herd dogs, which is equal to one animal per each 8 days.

During summer, small livestock such as sheep and goat were mainly killed, because most of the local herds spent overnight in the pastures. Since October, most herds concentrated their daily grazing around the village and kept their animals within properly-built corrals inside the village during nighttime. So, the leopard switched its depredation from livestock to dogs. Moreover, the leopard attacked three persons when they tried to approach it on the kill. Thus, the people were frightened and avoided to leave their houses overnight.

In October 2014, they reported the situation to the local authorities, seeking for a solution to stop losing the animals. Thus, Iran Department of Environment's experts tried to apply a variety of methods to resolve the problem through keeping the leopard away from the village. Besides provision of necessary information, particularly with respect to encountering a leopard in the wild, they tried to make fire around the village, turning gunpowder around high risk places, aerial shooting to frighten the leopard, all seemingly not efficient to stop the leopard from killing dogs. Thus, translocation was considered in December 2014 as the final resolution which was based on the DoE's initial perception that it is a young "inexperienced" male.

We deployed foot-snares and captured the leopard. Its teeth were yellow with well-worn canines and incisors. Most of lower incisors were missing, revealing that it is an old adult leopard, estimating between 10 and 15 years. Accordingly, it was concluded that instead fitting the leopard with a GPS collar for translocation to a nearby reserve, the leopard needs intensive veterinary care and treatment, if any chance of re-wilding is sought. Therefore, the leopard was translocated to Wildlife Rehabilitation Center in Tehran for further maintenance and treatment.



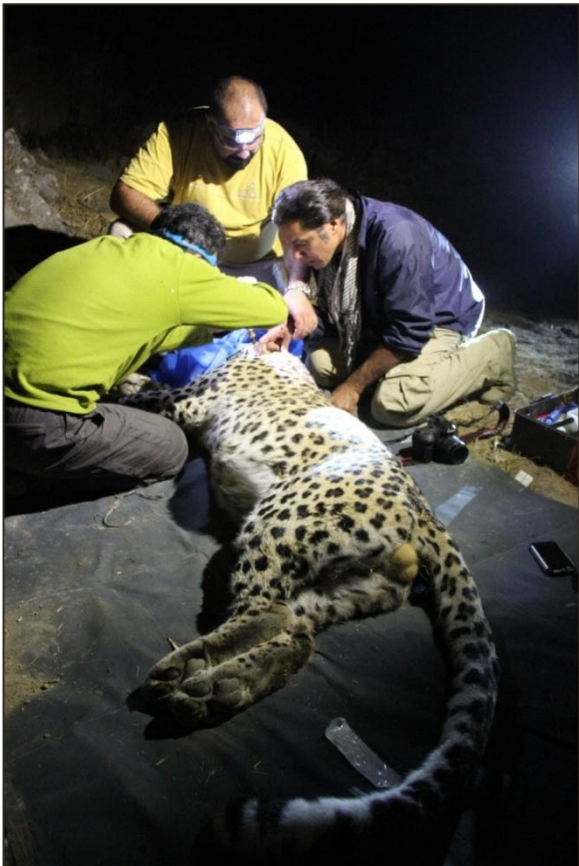
Biological Studies

Application of Iridium GPS collars to Persian Leopards in Northeastern Iran

Following pioneering works of Hamilton (1976) and Bertram (1984) who started to explore movement patterns of the leopard in eastern Africa, the species spatial



ecology has been intensively reported, predominantly from its African range. Also, limited number of field studies tried to understand the Asian leopards' ranging patterns, all from forested lowland areas. However, the scientific community still suffers from lack of proper knowledge regarding home range size and movement patterns of the leopards in west Asian rugged mountains with lower prey density where the endangered Persian leopard persists. Their remote habitat and cryptic nature make them inherently difficult to study and past attempts have provided insufficient information upon which to base effective conservation. In order to address the paucity of basic ecological information on leopards within mountainous ranges and to explore their spatial patterns, the present investigation has been launched in Tandoureh National Park, near Turkmenistan border in northeastern Iran.



We used Lotek Iridium GPS collar, each supplemented with a drop off buckle with timer only option (working after 52 weeks since deployment) that automatically removes the collar so that re-capture of animals is unnecessary. Given the wide-ranging movements of leopards in Iran, ideally data acquisition would be achieved by Iridium uploads. We deployed snare traps at two sites.

Capturing operation was accomplished in two phases. During first phase, two adult males were captured, named as Borna (meaning prime) and Bardia (an Iranian historic hero).

We moved our base camp on 16 October to another place to capture the leopards, far from two previous leopards to avoid re-capturing. We spent 20 nights within the camp, but due to heavy snowfall which could cause serious threats to the team members, we had to leave the area before becoming stuck in the snow.

The two collared leopards show significant avoidance in their movement patterns, never enter each other's range. Borna, the younger male twice left the National Park, approaching the nearby human communities which made us take necessary considerations with local rangers to make sure that the animal would not be poached. The second leopard, Bardia seems to be limited to his home range within the NP's heart, never approaching the area's boundary.



Our second basecamp in high elevations



Demographic assessment of urial, a main prey for leopard in NE Iran

Continuous monitoring to obtain detailed knowledge of prey-predator dynamics is

critical in wildlife management, particularly for small and isolated populations. In addition, given the leopard population relies mainly on a single prey species (urial) in various reserves in NE Iran, continued monitoring of the ungulate population dynamics is necessary. Therefore, besides the annual total count conducted by the Iran DoE (twice a year), reproductive parameters must be recorded (at least during the census programs) because the predators can affect the prey population growth through removing the kid cohort.

Thus, we started to assess status of urial wild sheep as the main leopard's prey in NE Iran to understand various demographic [parameters of the species across three national parks, namely as Sarigol, Salouk and Tandoureh. Accordingly, we are conducting seasonal field missions within each area to spot and count the species. During 2014, we finished data collection for three seasons, the winter data must be recorded in 2015.



Baseline status of Persian leopards in northeastern Iran

Northeastern Iran hosts a number of well-known reserves for the leopards where hosts a fair number of visitors every year. Many visitors are encountering the leopards in the wild here.

Thus, a centralized database is being developed to collect all available images of leopards taken by tourists and local wardens. Based on occasional images, a total of 11 leopards in Tandoureh as well as three individuals in Sarigol have been detected.

However, without proper methodological based fieldwork, obtaining a precise figure of the population size of leopards in each park would be very difficult. Below you can see some leopard images taken recently in Tandoureh National Park (© photos courtesy of A. Berger, M.Hasanzadeh, P.Rajabzadeh, S.Firouzi, B.Jalali).



Predation patterns of Persian leopards in northeastern Iran



As two collared leopards are now roaming their home range, GPS clusters are used to find their prey remains. Our data only belongs to fall 2014 when we had GPS collars on two leopards which show heavy predation pressure on males of two species, Persian ibex and urial sheep in northeastern Iran.

In addition to ca. 200 scats collected during 2013, we established a seasonal sampling program to collect fecal samples within three reserves parallel to prey surveys on a seasonal basis. During 2014, we were able to collect more than 200 fecal samples.



We plan to apply DNA fingerprinting technique to explore population composition of the leopards across multiple reserves in NE Iran. Fecal samples are stored in alcohol for genetic-based population investigations. Population genetics studies may provide the means to address camera trapping inadequacies for population size and sex-ratio estimation. In addition, genetic analysis can determine whether leopard populations suffer from a reduction in genetic variation, an alteration in population structure, and low levels of gene flow between disconnected and fragmented reserves.

Persian ibex is one of the main preys for the leopard in Tandoureh (©ICS/M.A.Rezvani)



Promoting Protection

Iran faces an emerging challenge, severe drought, particularly during hot summers when many springs become dry. As a result, many wildlife species, particularly leopards and their ungulate prey such as urial wild sheep face a difficult time finding water. In Salouk National Park, a promising leopard reserve in Northeastern Iran, one of the highlands' major springs dried up during the past summer. The spring's water level was so low that maintaining the natural water flow from the nearby sources was impossible.

Consequently, hundreds of urials were forced to go to nearby valleys in search of new water sources that are already occupied by local villagers. This situation was expected to increase poaching of urials.

Accordingly, in partnership with the Iranian Cheetah Society, necessary funds were raised to develop a reliable infrastructure for maintaining the water level of the spring through various individual donors.

The spring was restored using cement loops which seems to be a sustainable solution to use wind energy to secure water for the leopards and their prey.



A large herd of urial at restored waterhole in Salouk NP (© H.Shokrani)

Media and Outreach

We were lucky to be featured in various media from national TV to local newspapers, especially when we translocated the problematic leopard which received massive national coverage. Also, a short clip was aired on one of the

regional TV channels featuring our project in summer 2014. In October 2014, Iran Newspaper covered telemetry study with a title as “Borna and Bardia: Two Iran’s Staellite Leopards” (left image). Various online news agencies also reported our activities.

In order to raise public awareness, we are also producing a documentary, produced and directed by an award winning team from Wildlife Picture Institute who ranked as the most outstanding nature production crew in Iran with a variety of national and international awards, including several for the award-winning film “In Search for Persian Leopard” in 2011. Produced by Fatholla Amiri, the film crew accompanies the project team to film all events as the project goes on.



The film crew heli- shot is so useful , particularly when we were trying to investigate valleys where the problematic leopard had attacked people. It provides real-time images which is so helpful to avoid any dangerous encounter with the leopard (© M.Farhadinia)

Follow Us on Facebook

In order to share findings and activities of the project, we have created a facebook page, named as “My Journey with Persian Leopards” featuring project activities for public audience. The network has been growing rapidly, exceeding 3150 likes in three months with more than 6000 people reaching the posts. Updated regularly with project activities, the facebook page is expected to act as a media for data sharing and public awareness about the leopards and their landscapes among Persian speaking people. The facebook activities have been featured by mass media on several occasions in Iran.



Scientific publications

2014 was a wonderful year for us due to publishing a few papers in peer-reviewed journals. Totally, three papers have been published. Furthermore, we have been involved in data analysis, survey design and writing up for a few other papers from conservation modeling to conflict assessment which are all under revision in different journals.

Zoology in the Middle East, 2014
<http://dx.doi.org/10.1080/09397140.2014.939813>



Patterns of sexual dimorphism in the Persian Leopard (*Panthera pardus saxicolor*) and implications for sex differentiation

Mohammad S. Farhadinia*^{1,2}, Mohammad Kaboli¹, Mahmoud Karami¹, and
Hamid Farahmand¹

Biological Journal of the Linnean Society, 2014, **, ***-***. With 5 figures

Molecular and craniological analysis of leopard, *Panthera pardus* (Carnivora: Felidae) in Iran: support for a monophyletic clade in Western Asia

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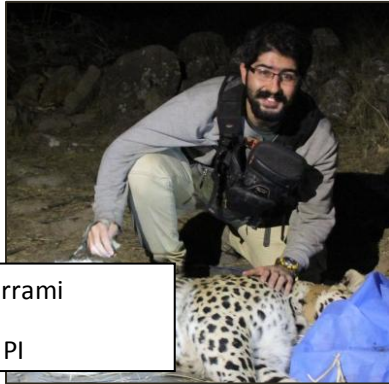
Eur J Wildl Res (2014) 60:341–349
DOI 10.1007/s10344-013-0791-y

ORIGINAL PAPER

Predator–prey relationships in a middle Asian Montane steppe: Persian leopard versus urial wild sheep in Northeastern Iran

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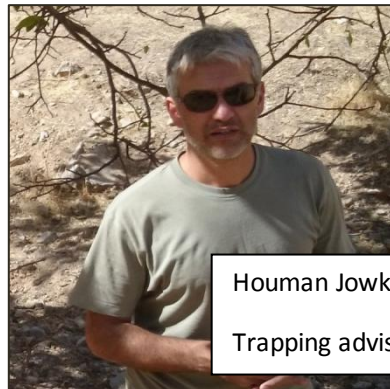
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Atieh Taktehrani
Leopard occurrence
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Houman Jowkar
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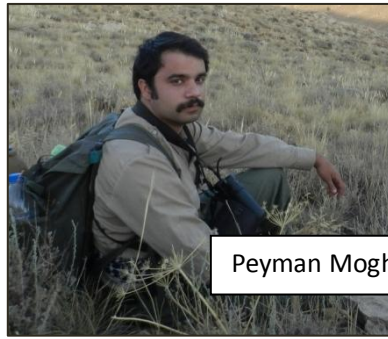
Navid Gholikhani



Pouyan Behnoud



Mostafa Jarah



Peyman Moghadas

Partners in 2014



Donors in 2014

people's trust for
**endangered
species**



PANTHERA
LEADERS IN WILD CAT CONSERVATION



صندوق محمد بن زايد

للمحافظة على الكائنات الحية

The Mohamed bin Zayed SPECIES CONSERVATION FUND



Thank You!

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We are greatly indebted to the Mohamed bin Zayed Species Conservation Fund because of recognizing this project to deserve a conservation award. Special thanks go to Nicolas Heard for his patience to arrange the grant transfer. We are grateful to the People's Trust for Endangered Species (PTES), particularly Jill Nelson and Nida Al-Fulaji for their hassle-free nature of the grant disbursal, who allowed us to use it in the best way possible to conduct a serious survey on the Persian leopard.

Furthermore, IdeaWild is thanked for provision of basic equipment for field work. As the next step of this project, our "Collar4Conservation" initiative was supported by Association Francaise des Parcs Zoologiques which is appreciated. Also, the British Institute of Persian Studies kindly supported airfare for the project PI.

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*PI and an adult male Persian leopard in Tandoureh National Park when seen using scoping light
(©P.Behnoud/August 2014)*