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Ecology of the Onager (*E.h.onager*) in Iran: Movements, habitat use and population genetics.

Progress report – equipment evaluation & first field investigation

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Background

The Asiatic wild ass (*Equus hemionus*) has been declining both in numbers and distribution. Once distributed from China to Turkey and from India to Kazakhstan, this species is now restricted to areas within China, India, Mongolia, Kazakhstan, Turkmenistan and Iran (Kaczensky and Walzer 2008). Currently two protected areas (Bahram-e Goor and Touran) contain the last populations of onager (*Equus hemionus onager*) in Iran (see Tatin et al. 2003; Fig. 1).

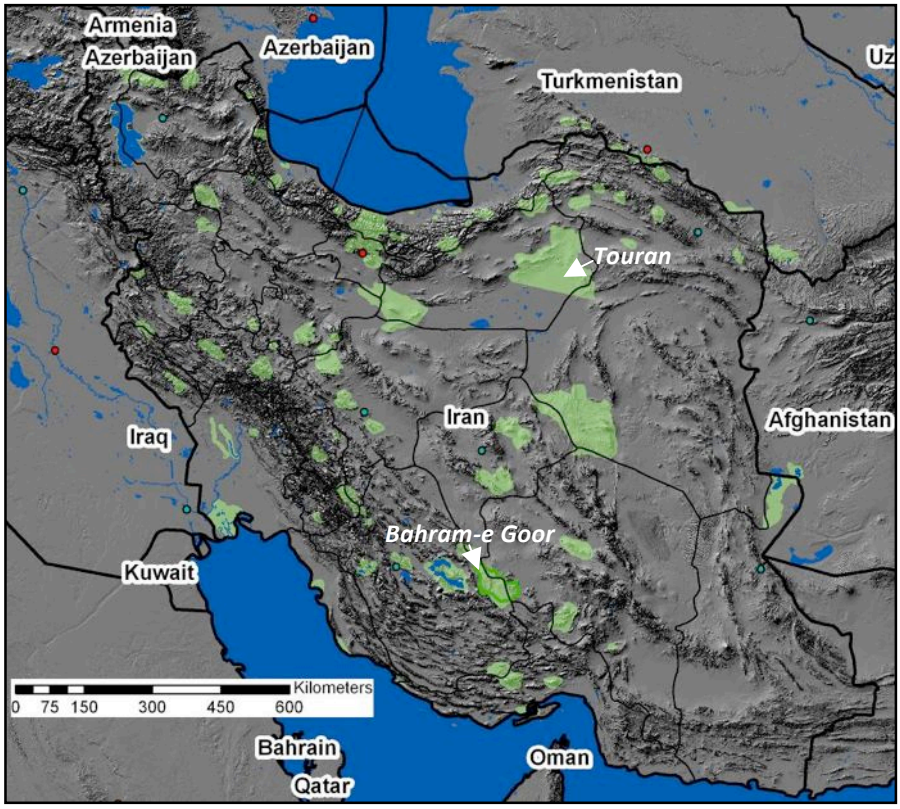

Fig. 1: Protected area network (green) of Iran with the two areas containing wild asses.

The population size of Touran and Bahram-e Goor areas has been estimated at approximately 150 and 300 individuals respectively by Department of Environment (DoE) personnel. While onagers in Touran protected area complex have been decreasing over the recent decade, the population in Bahram-e Goor has been regularly increasing (Momeni and Hamami submitted).

In general, very little is known about the ecology of the two wild ass populations in Iran. One of the main concerns regarding the conservation of the onager population in Bahram-e Goor protected area (PA) is the seasonal emigration of an unknown, but considerable number of animals. There have been observational reports of onagers (including reports of dead animals) in North-eastern (Shahrbabak plain), south-eastern (North of Hadjiabad), and North (Ghratapeh, Herat) of the Bahrem-e Goor PA. However, the fate of the migrating animals is not known; while certainly a number return to the protected area, others are possibly poached during the migration.

Knowledge about abundance and understanding the spatial and temporal patterns of habitat use by wild animals is central to their adaptive management. There is a particular lack of knowledge about abundance, habitat associations and movements of onager in their two remaining habitats in Iran.

In the first phase, this study aims to answer some of the basic questions outlined above by combining satellite telemetry and various forms of groundwork.

Study area

During the first phase of the research we will restrict our activities to the 4000 km² Bahram-e Goor PA, which is located in southern part of the Iranian plateau (see http://en.wikipedia.org/wiki/Iranian_plateau). The protected area was established in 1972 and contains a 300 km² core area which is designated a national park (Fig. 2). Bahrem-e Goor has a temperate arid climate with mean annual temperature and precipitation of 15° C and 150 mm, respectively. The altitude ranges from 1580 to 2840 meters. The vegetation consists of different perennial, shrub and even tree species such as mountain almond (*Amygdalus horrida*) and Turk terebinth pistache (*Pistacia atlantica*). Threatened species such as wild ass, Jebeer gazelle (*Gazella bennettii)*, Wild sheep (*Ovis orientalis*), Persian ibex (*Capra aegagrous*) and houbara bustard (*Chlamydotis maqueenii*) are present in the area.

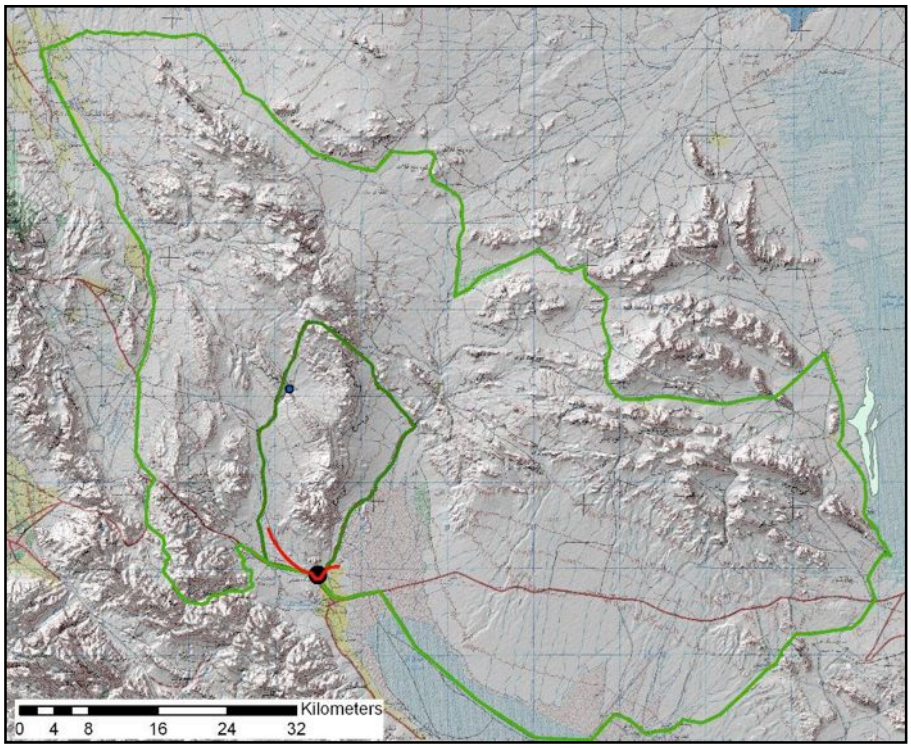

Fig. 2: Bachram-e Goor PA (4,000 km² in light green) with national park in the core area (300 km² in dark green). The black dot marks the DoE field station and the red line the wildlife fence established to prevent wildlife-vehicle collisions on the newly upgraded highway.

Testing of GPS / ARGOS collars

Given previous problems with GPS-Argos collars in central Asia (Kaczensky et al. submitted), we tested two Telonics GEN IV GPS-Argos collars (TGW-4583H; http://www.telonics.com/products/gps4/TGW-4583H.php) on domestic donkeys from 28.03. - 07.07.2009 (Fig. 3).

Fig. 3: Our two test donkeys collared ~40 km north of Bachram-e Goor in 2009.

The collars had a new radome antenna for improved ARGOS performance and transmitted data at 0.6 and 0.8 Watt, respectively. Collars were programmed to collect GPS positions every 5 hours and transmit them daily to the Argos satellite system.

Transmission of GPS positions via the ARGOS satellite system was quite variable from day to day, but significantly more successful for the 0.8-Watt collar and averaged 43% (Table 1; Fig. 4 & 5). Consequently we decided that all collars for onagers would transmit with at least 0.8 Watt and aim to retrieve dropped collars to access the data stored on board.

Table 1: GPS locations received via the Argos satellite system.

	Collar with 0.6 Watt	**Collar with 0.8 Watt**
N GPS locations expected	489	489
N GPS transmitted via ARGOS	157	211
Success rate	0.32	0.43

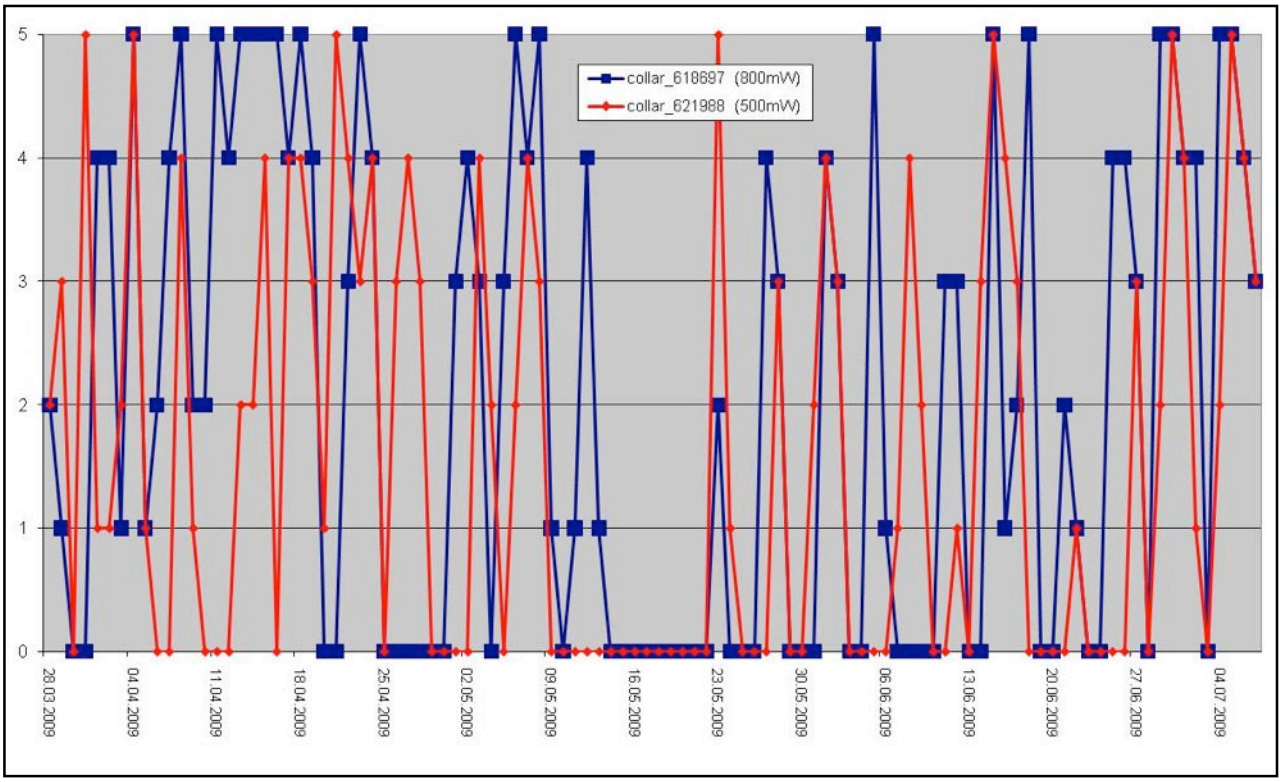

Fig 4: Number of GPS locations received per day via the Argos satellite system for the 0.8 and 0.6-Watt collar between 28.03. -0.7.07.2009.

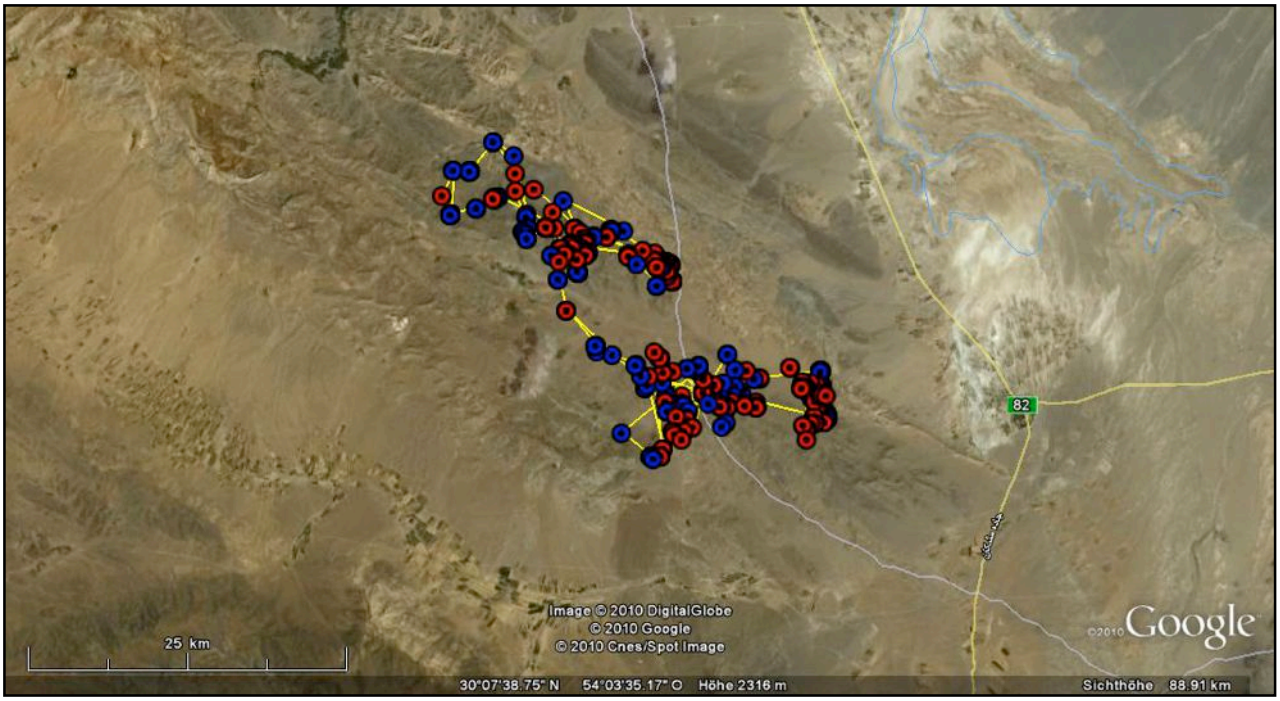

Fig. 5: GPS locations of 2 domestic donkeys ~40 km north of Bachram-e Goor.

First field mission to Bahram-e Goor

Capture attempts

Our first visit to Bahram-e Goor was scheduled for 23-28 November 2010. The main aim was to become familiar with the crew, area and test the equipment. Ideally we would collar the first onagers with GPS-Argos collars.

Our activities were concentrated in the area of the national park, where the bulk of the onagers could be found. Groups were quickly detected and several previously successful strategies tested to dart animals for collaring (Walzer et al.:

1) **Chasing by jeep**

The method proved tricky as the plains are intersected by numerous dry run-off channels and rather high *Zygophyllum* bushes, making a pursuit with a new and long vehicle difficult. An old Toyota landcruiser proved to be the ideal chase vehicle, but suffered from multiple technical problems (Fig. 6). For the next capture trip we have to acquire a project car and have it fixed for chasing onagers (e.g. double shock absorbers).

2) **Chasing by motorbike**

This method allowed approaching onagers quite closely. However, two people on the motorbike, the speed and the rough terrain make it a dangerous undertaking (Fig. 6). Even more as the shooter cannot hold on as he needs both hands on the gun. After two chases and one crash this method was dropped as too dangerous.

Fig. 6: Left: The almost ideal capture vehicle. Right: A motorbike provides little protection and few possibilities to hold on while darting.

3) Sitting at a hide over food or water

Apparently onagers mostly visit the water points and supplementary feeding points (Fig. 7) during the night. We did try to sit at one water point and at one water & supplementary feeding point in the early morning and around dusk. At the water point the closest onagers were >5km away the entire time. At the feeding site onagers approached, but were very skittish and did not come within shooting distance. However, the feeding sites had not been supplied with hay the last 10 days prior to our visit. Before our next visit rangers will start feeding the animals well in advance so that onagers will regularly visit the feeding sites. Furthermore, we will additionally bring transmitter darts to allow darting and subsequent recovery of the anesthetized animal in the dark.

Fig. 7: Left: Stocking a feeding point with hay at night. Right: Same place during the day, showing the hide.

4) Stalking onagers

Stalking onagers is apparently a method often used by poachers. Onagers were rather tolerant to an approach of up to 200m, but getting within shooting distance (30-70m) proved very difficult. Onagers stand mostly in terrain that provides little cover (Fig. 8) and groups are often spread out increasing the probability that one animal spots the approaching person.

Fig. 8: Onager group in the late afternoon in typical open terrain.

Satellite collar performance

We initiated 6 out of our 10 GPS-Argos collars upon arrival to test Argos performance. All six collars were able to acquire a GPS location and send it via the ARGOS satellite system upon activation. Thereafter collars were stored activated in one box in the vehicle. Consequently, collar performance could not be systematically compared between collars. Different positioning in the box and the close association likely explains the difference in performance and may be responsible for an outlier ~16 km off our actual track in the mountains to the SW (Fig. 9).

Table 2: Collar "performance" of the six collars initiated on 23.11.2010.

	Acquisition date				
ID	**23.11.2010**	**24.11.2010**	**25.11.2010**	**26.11.2010**	**Total**
618697B	2	3	4	2	11
621988B	2	2		2	6
647775A	2				2
647777A	1			2	3
647778A	3	2	2		7
647780A	4	2		1	7
Total	**14**	**9**	**6**	**7**	**36**

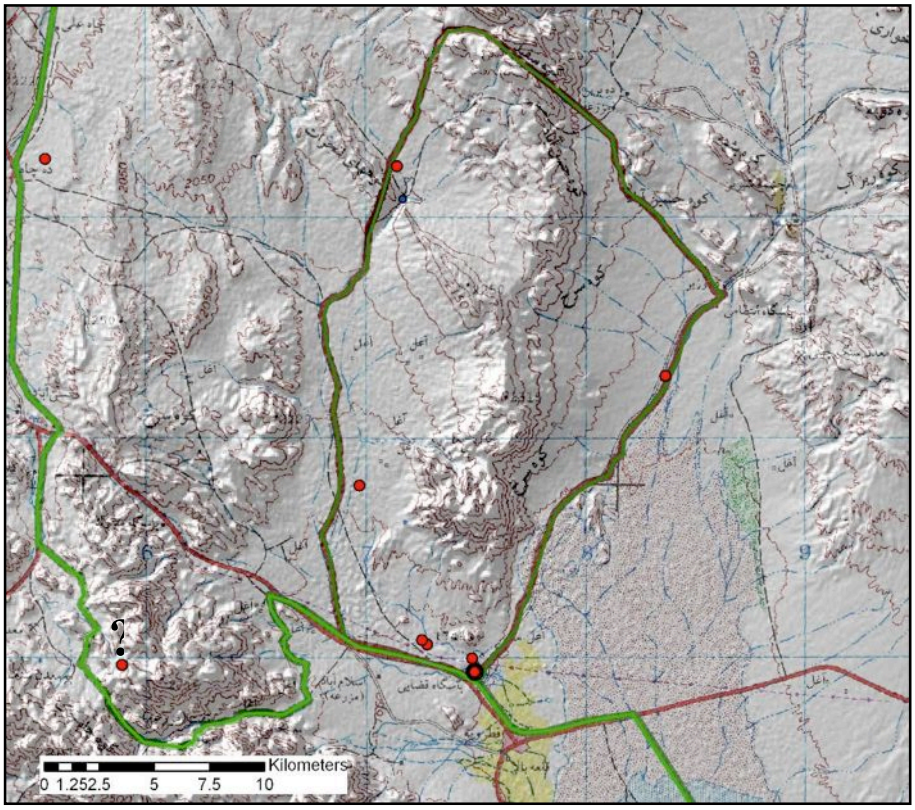

Fig. 9: GPS locations (red dots) transmitted during the November 2010 field mission. Collars were stored activated in a peli box in the back of the vehicle.

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