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Up-date on the behaviour and status of the critically endangered Onager, *Equus hemionus onager*, from Iran

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Abstract

The onager *Equus hemionus onager*, an Asiatic wild ass endemic to Iran, is categorized as Critically Endangered on the IUCN Red List. Its biology and conservation requirements are poorly documented. We report some observations made in 1997 and 2000 on the behaviour and ecology of the two remaining populations, located in the Touran Protected Area and the Bahram-e-Goor Reserve. Recent population counts by the Department of Environment of Iran (471 in the Protected Area, and 96 in the Reserve) are markedly lower than the count of 600 - 770 made in the 1970s in the Touran Protected Area. We observed social interactions between stallions and mares outside the breeding season which contrast to the known social structure of this Persian subspecies. Poaching, competitions with domestic animals, removal of shrubs for domestic use, and land conversion have been identified as the main threats to the two remaining onager populations. In addition, geographical isolation could cause the loss of genetic variability in these two relatively small populations, and also makes them more susceptible to the potential effects of stochastic events such as drought or disease. Public awareness, protection, and scientific studies in Iran must be urgently supported by both national and international organizations in order to prevent the extinction of these two apparently dwindling populations of onager.

Keywords: wild ass, conservation status, *Equus hemionus*, Iran, onager, behaviour.

Introduction

The Asiatic wild ass, *Equus hemionus*, is one of the seven worldwide equid species: the others being *E. hemionus*, *E. kiang*, *E. africanus*, and zebras: *E. zebra*, *E. grevyi*, *E. burchelli*, and wild horse *E. ferus przewalski* (MOEHLMAN 2002). In historical times, isolated populations of Asiatic wild asses were located through a range which extended from Turkey to northern China and from Kazakhstan to Saudi-Arabia and India (DUNCAN 1992). The species *Equus hemionus* is present in China, Mongolia, Turkmenistan, Kazakhstan, Iran and India (MOEHLMAN 2002). Currently, the World Conservation Union (IUCN) identifies six subspecies of *hemionus*: the Mongolian Wild Ass, *E. h. hemionus*, the Gobi Khulan, *E. h. luteus*, the Kulan, *E. h. kulan*, the Indian Wild Ass, *Equus h. khur*, the Syrian Wild Ass, *E. h. hemippus*, and the Onager, *E. h. onager*, (HILTON-TAYLOR 2000). The Syrian Wild Ass being extinct, other sub-species are considered „critically endangered" (*kulan* and *onager*), "endangered" (*khur*), or "vulnerable" (*hemionus* and *luteus*; MOEHLMAN 2002). The wild populations of onagers ("Goor" in Farsi language) are exclusively located in Iran, whereas an introduced one is found in Saudi-Arabia and a hybrid population *onager* x *kulan* exists in Israel (DUNCAN 1992, ZIAE 1996).

Since the taxonomy of the species *hemionus* remains unclear (occurrence of several morphologically indistinguishable subspecies, dispersed populations, trends in population size unknown), priorities for conservation are difficult to plan. The Equid Specialist Group of the IUCN highlights the lack of data on demography, genetic and behavioural ecology on *hemionus* (DUNCAN 1992, MOEHLMAN, 2002). Despite the fact that there is a recent increasing interest into the zoology of Iran (ANDERSON 2002), data on several species of mammals are very scarce. Except some literature published during the seventies (FIROUZ 1974, GROVES 1974, FITTER 1975, HARRINGTON 1977, PINDER & BARKHAM 1978), very few information on the status of the remaining population of onagers is available. Having the opportunity to make observations on onagers in

collaboration with the Department of Environment (hereafter "DoE") of the Islamic Republic of Iran and Iranian experts, we carried out two expeditions in the two areas containing the remaining wild populations: the Barham-e-Goor Reserve (SE of Iran; hereafter "BGR") and the Touran Protected Area (NE of Iran; hereafter "TPA"). The populations reintroduced in Kavir National Park and Khosh-yeilagh Wildlife Refuge are extinct according to the DoE (DoE, pers. comm.).

Material and method

TPA is situated in the province of Semnan, north-east Iran, (fig. 1) and was classified as a Protected Area in 1975. One of the underlying objectives when creating this Protected Area was the protection of the Onager population and its habitat (HARRINGTON 1977). Located at a mean altitude of about 1,000 m, TPA covers an area of 14,000 km². It is characterised by semi-desert vegetation with shrublands of *Zygophyllum spp.*, *Haloxylyon sp.* and *Salsola spp.* (IUCN, 1977). We spent 5 days in TPA during March 2000, including 3 days at the Majarat area and 2 crossing the reserve.

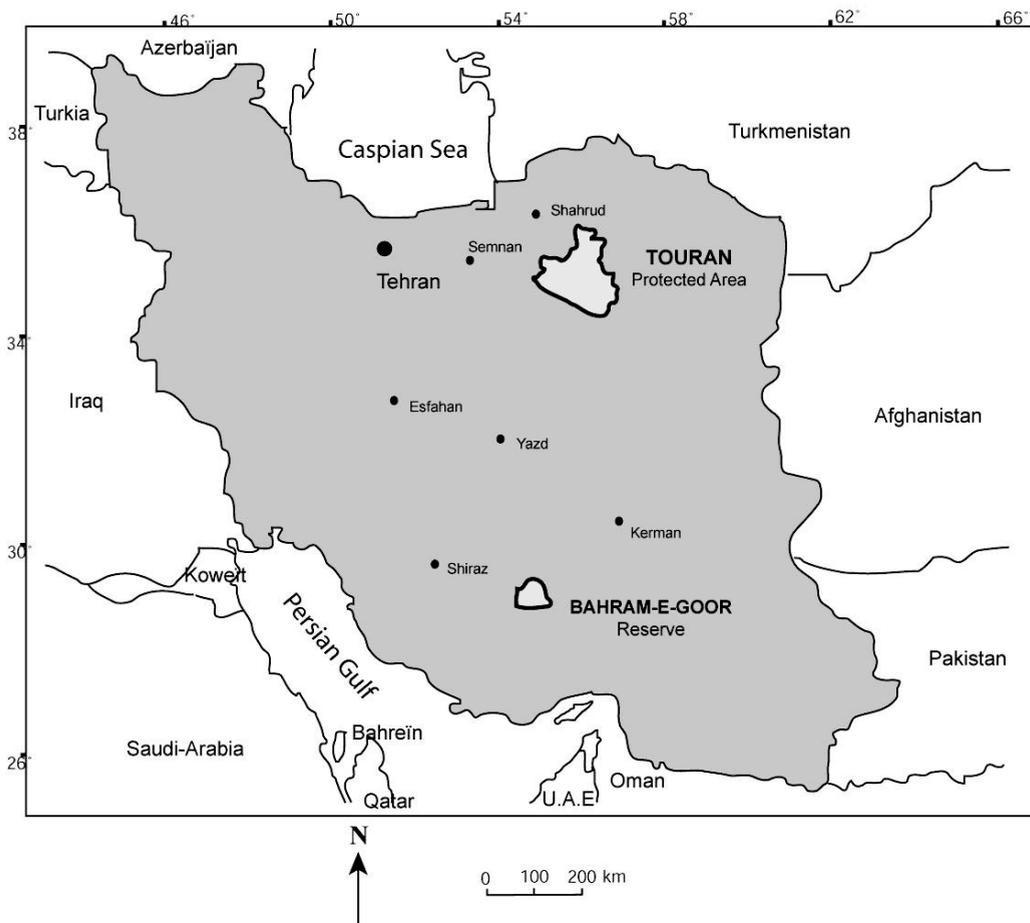


Fig. 1: Location of the both last remained populations of onagers in Iran.

BGR (fig. 1) obtained the status of Protected Region in 1972. It is situated in the Fars province, south-centre Iran. Its total area covers 3,850 km². The shrub vegetation of the desert steppe plain (alt. 1,400 m) is dominated by *Artemisia alba*, *Astragalus sp.* and *Zygophyllum spp.* (IUCN,

1977). We spent five days in November 1997 in the 600 km² reserve which is under complete protection from hunting, agricultural use and grazing.

We spent 5 days in November 1997 in the 600 km² of the reserve that is under complete protection from hunting, agricultural use and grazing. In both areas we observed onagers from a maximum distance 1.5 km, generally from the tops of hills and, when it was possible, we approached the groups to < 400 m in order to check the sex ratio and to age individuals using criteria from FEH et al. (1996). The DoE numbers are based on total count method: areas are divided into strictly defined areas in which all individuals are counted (walky-talkies communication avoids double counts). Concerning our data, numbers given thereafter indicate the sample on which we made observations but are not corresponding to a 'total count'.



Fig. 2: Onagers grooming each other in Touran Protected Area (photo: D. TATIN, 2000).

Results and discussion

We observed a total of 84 individuals in the Bahram-e-Goor Reserve in 1997 and a total of 57 individuals in TPA in 2000. In the Majarat area of TPA, 43 individuals were observed during the 3 days spent in the field. During autumn 1996 and January 2000, the DoE censused 96 and 471 onagers in BGR and TPA respectively by total count method (table 1). A three-week survey in November-December 1973 censused 600 to 770 onagers in TPA (HARRINGTON 1977). In the surroundings of Majarat, 110 to 140 individuals were counted. This site was considered as one of the most important sites for onagers in TPA at this period (Harrington, 1977). For both populations, we estimated the proportion of young (percentage of foals on the total of individuals seen) in order to compare it with studies on *hemionus* which used the same calculation. The proportion of young estimated in the Majarat area of TPA (17.5 %) is comparable to the one of BGR (16.6 %). These results are also similar to the average percentages measured by the DoE (18.4 %) in TPA in 2000 and calculated for Gobi desert kulans (*E. hemionus luteus*) by FEH (2001; 14.5 %), and for Turkmen Kulans (*E. hemionus kulan*) by SOLOMATIN (1973; 15.6 %). Studies on demographic parameters are urgently needed in order to clarify the rate of increase of both populations.

Table 1: Population estimates and counts, and number of young, of onagers in the Touran Protected Area and the Bahram-e-Goor Reserve, made by Harrington (1977), the Department of Environment (DoE), and observed during this study

Source (date)	Touran Protected Area			Bahram-e-Goor Reserve	
	HARRINGTON 1977 (Nov.-Dec. 1973)	DoE (Jan. 2000)*	this study (Mar. 2000)	DoE (autumn 1996)*	this study (Nov. 1997)
adults, n (%)		384 (81.5)	47 (82.5)		60 (83.3)
foals, n (%)		87 (18.5)	10 (17.5)		14 (16.7)
total	600-770	471	57	96	84

*surveys made by the DoE were 'total counts' (see text for details)

In November 1997, the group size of the BGR population ranged from 2 to 74 individuals (mean = 18.87; median = 9) and in March 2000 from 2 to 22 individuals in TPA (mean = 5.25; median = 4.5). Solitary individuals were observed in both populations. During his autumn-early winter survey in TPA, HARRINGTON (1977) observed a gathering of 162 individuals and wardens reported a second one totalling 550 individuals.



Fig. 3: Group of onagers in the Bahram-e-goor Reserve (photo: D. TATIN, 1997).

In November 1997 (outside the breeding season), in BGR, one successful mating and 2 mating attempts involving the same pair were noticed. The same stallion had been herding different mares two days before. Herding behaviour (neck and head in one extension line towards the ground; FEIST & McCULLOUGH 1976, FEH et al. 1994) on mares had also been observed two times in TPA after a stallion was scared by a danger (unidentified by observers) and drove the group away. We could also observe two groups (1 male, 4 females and 6 young; and 1 male, 5 females and 3 young) drinking together at the same spring. No aggressive interactions were recorded (chase, kick or bite). When all the animals finished drinking,

the 2 groups separated and moved each in opposite direction. The species *hemionus* is considered as "territorial": some stallions are defending food and/or water resources, and no permanent bonds exist between male and female adults (KLINGEL 1977). Data on the social behaviour of onagers, as sub-species, are scarce but it is suggested that some onager stallions are territorial (DENZAU & DENZAU 1999). In Equids, both territorial and "family" type social structures exist. In onagers, a family-type social structure may exist as it has been observed in the Gobi Khulan in Mongolia (FEH et al. 1994, FEH et al. 2001).

Poaching, overgrazing by domestic animals, removal of shrubs and bushes for firewood, and land conversion were reported by MADKHOUM et al. (unpubl.) in decreasing order, to represent the four major threats for the Protected Areas in Iran. Concerning onagers, conservation problems mentioned by the wardens we met are the same (information collected sparsely, no systematic interview undergone). Poaching for medicinal purposes has been reported by HARPER (1945) and mentioned once by a local, but generally wardens and local people think that the main purpose for poaching is meat. We add the threat of geographic isolation to the danger concerning the viability of both populations. According to wardens and local people, no movements or migrations of onagers were reported between TPA and BGR or between TPA and the Turkmenistan border, where a population of *hemionus* subsists (MOEHLMAN 2002). Geographic isolation could severely affect the demography of such small Onager populations facing the loss of genetic variability, population "bottle-neck", and/or stochastic events, including droughts or diseases (DUNCAN 1992, MOEHLMAN 2002, PRIMACK 1998).

Recent genetic analysis of *E. hemionus onager* and *E. hemionus kulan*, based on mitochondrial DNA, suggested that the two subspecies had diverged recently and that too little distinctiveness existed to separate them at subspecies level (OAKENFULL et al. 2000). However, the authors presume that the taxonomic status is not clear because of the origin of the studied individuals. DNA samples were collected on captive animals which might have suffered from a founder effect, resulting from a very low number of imported animals (OAKENFULL et al. 2000). This effect is known to diminish the genetic variability. Thus, genetic material from wild individuals is urgently needed to test this hypothesis.

Collecting information on demographic parameters (e.g. size and composition of the population, number of breeding adults, reproductive rate), behaviour (e.g. social interactions, mating system, length of parent-offspring links), environment (e.g. location of resources, inter- and intra-species competition, human disturbance) and genetics of the species concerned is crucial for the implementation of effective population conservation efforts. This work could be conducted by the new generation of biologists that is rising in Iran (KIABI et al. 2002 and KIABI pers. com.). Local actions are currently undertaken by wardens and employers of the DoE to counteract the effects of overgrazing and to improve access to water for onagers and wildlife (removal of domestic herds, hay supply, artificial water ponds). Through their daily contact with local people, wardens and employers of the DoE are a major component in public awareness. The two Onager populations are part of the natural and cultural Iranian heritage and are presently heading towards extinction. Public awareness, protection and scientific studies in Iran must be urgently supported by national and international organisations in order to keep the last grounds for wild onagers in Iran.

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