



Fig. 2. Eurasian lynx with killed roe deer in Kampinos National Park (central Poland; Photo T. Diserens).

rate for Environmental Protection, Warsaw. <http://natura2000.gdos.gov.pl> (Access 21.02.2019)

Wizimirski J. 2007. Martwy ryś w Lasach Spalskich. *NaszTomaszów.pl* Codzienna Gazeta Internetowa. <https://www.nasztomaszow.pl/wiadomosci/27261,martwy-rys-w-lasach-spalskich> (Accessed 21.02.2019).

Żuczkowski M. & Żuczkowski M. 2012. Na tropie rysia. *Karkonosze* 3, 20–22.

Supporting Online Material SOM Table T1 and Figure F1 are available at www.catsg.org.

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First camera trap record of Persian leopard in Ustyurt State Nature Reserve, Kazakhstan

In Autumn 2018, a live Persian leopard *Panthera pardus saxicolor* was recorded for the first time on a camera trap on the territory of the Ustyurt State Nature Reserve USNR (Mangystau Region, Kazakhstan). This is the fourth confirmed case of the appearance of a leopard in Kazakhstan, with three occasions in the Mangystau region and one occasion in Zhambyl region. Likely leopards come to Kazakhstan from neighbouring Turkmenistan. The article contains recommendations on further studies to identify whether other individuals are present in the area, the introduction of the leopard into the Red Book of Kazakhstan and on the expansion of the territory of the Ustyurt State Nature Reserve and its protection zone in order to preserve the entire desert ecosystem, including the Persian leopard.



Fig. 1. Illegally trapped and killed Persian leopard in the Karakiyan province, Mangystau region in May 2015, 90 km from the place where Persian leopard was captured in the reserve, source: <https://tengrinews.kz/events/stali-izvestnyi-podrobnosti-ubiystva-leoparda-mangistauskoy-274733/>

The Persian leopard was assessed as Endangered on the IUCN Red List of Threatened Species in 2008 (Khorozyan et al. 2006, 2008), given an estimated 800–1,000 individuals remaining. Persian leopards were once distributed across the whole Caucasus region, the Iranian and Anatolian Plateaus and the southern parts of Central Asia. A rapid decline of leopard range and numbers occurred due to hunting, persecution, trapping, poisoning, habitat destruction and loss of prey in the 18th and 19th centuries. By the mid-20th century leopards had disappeared from large parts of their range, which historically included Russia, Turkey, Georgia, Armenia, Azerbaijan, Iran, Iraq, Lebanon, Syria, Afghanistan, Uzbekistan, Tajikistan, Turkmenistan and western Pakistan (Khorozyan et al. 2008).

According to experts, until the end of the 20th century, the leopard had never been observed in Kazakhstan (Heptner & Sludsky

1972, Sludsky et al. 1982). Only in the last two decades, three reliable facts of illegal killing of this species became known: the first incident occurred in 2000 in Zhambyl region (Shakula 2004); and two more leopards were killed in Mangystau region in 2007 and 2015 (Plakhov et al. 2016; Fig. 1).

Despite these observations, the Persian leopard has never been considered an extant species in Kazakhstan and therefore is not protected under the Red Book of Kazakhstan. In autumn 2018, during the implementation of the project on supplemental feeding of vultures in the Ustyurt State Nature Reserve (supported by Rufford Small Grants Foundation; Pestov et al. 2017), camera traps for the first time registered the presence of a Persian leopard in Kazakhstan.

Study Area

USNR was established in 1984 in Kazakhstan. Its objective is the conservation of the unique natural and archaeological features, flora and fauna of a unique desert ecosystem. The reserve is located in the Karakiya province of the Mangystau region in Kazakhstan. USNR encompasses 2,233.42 km². The reserve includes the southern part of the Western chink of the Ustyurt, a narrow strip of the plateau adjacent to it, the eastern part of the Karyn-Zharyk Kenderli-sor depression and fragments of the sandy massif Karyn-Zharyk, as well as the Karamaya mountain. Climatically, the region where the reserve is located belongs to the continental south Turan desert zone (Plakhov 2006).

In addition to the Persian leopard, the reserve is home to several mammal species, including Urial sheep *Ovis orientalis vignei*, goitered gazelle *Gazella subgutturosa*, wolf *Canis lupus*, fox *Vulpes vulpes*, Asiatic wild-

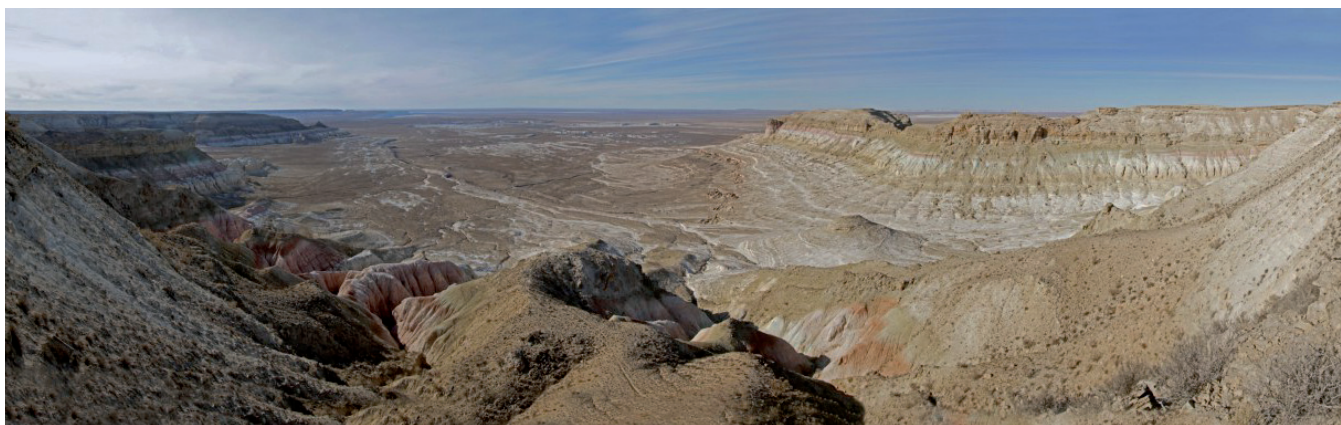


Fig. 2. Habitat of the Persian leopard in the Ustyurt State Nature Reserve (Photo by M. Pestov).

cat *Felis lybica* and caracal *Caracal caracal*. In the course of inventory of ungulates in the reserve conducted in autumn 2018, 548 urials and 360 goitered gazelles were counted. The tolai hare *Lepus tolai*, the yellow squirrel *Spermophilus fulvus* and the chukar partridge *Alectoris chukar* are also common. Finally, according to older literature (Plahov 2006), the sand cat *Felis margarita* and Pallas's cat *Otocolobus manul*, are also considered to be present but have not been recorded since the establishment of USNR.

Methods

Between April and December 2018, reserve personal have monitored vultures by means of camera traps at three sites baited with slaughterhouse by-products. Each site was equipped with two camera traps installed at a distance of 3 to 4 m from each other.

Results

In the evening of 29 September 2018, for close to 120 seconds, from 22:57 h to 22:59 h, the Persian leopard was captured for the first time by a camera trap while arriving at the bait site, sniffing and then leaving. This camera trap site was located on the rocky edge

of the cliff of the Ustyurt Plateau (Fig. 2) and stands at 175 m.

On 11 November 2018, at 6:57 over 60 seconds, two camera traps recorded again a leopard at the same location (Fig. 3). We believe this is the same animal but the poor quality of the photographs taken in September unfortunately does not definitely confirm so.

For the third time, the same Persian leopard was recorded (Fig. 4) on the second camera trap site on 7 December 2018, in the daytime for 5 minutes (from 16 hours 27 minutes to 16 hours 31 minutes). This site is also located on the stony edge of the cliff of the Ustyurt plateau. The leopard sniffed the remaining camel bones and one of the camera traps, and then laid down next to the bones for about 60 seconds. The leopard approached this site from the previous one. The distance between them is about 18.6 km in a straight line.

The vegetation at both locations where the leopard was recorded is typical for the Ustyurt Plateau and includes the following plants: *Anabasis eriopoda*, *A. brachiata*, *Nanophyton erinaceum*, *Atraphaxis replicata*, *Convolvulus fruticosus*, *Limonium suffruticosum*, *Zygophyllum ovigerum*, *Reaumuria fruticosa* and *Artemisia kemrudica*.

Discussion

As of this writing, the Persian leopard has been recorded on the territory of Kazakhstan on four occasions, in three instances in the Mangystau region (Fig. 5). In addition, during social surveys in the region, we obtained anecdotal reports of several leopard encounters over the past two decades. However, this information cannot be verified.

Leopards are likely to periodically migrate from neighbouring Turkmenistan, where 80–100 of them are still found (Geptner & Sludsky 1972, Lukarevsky 2001, Red Book of Turkmenistan 2011, K. Khojamuradov, pers. comm. 2018). The distance from the Ustyurt reserve to the western Kopetdag in southern Turkmenistan, where the leopard lives at present, is at least 600 km. Tracks and remains of dead leopards were found in the Bolshoi Balkan range in 2017 (K. Khojamuradov and A. Potaeva, pers. comm.). The distance from USNR to the Bolshoi Balkhan range is about 370 km. In 1989, some leopard tracks were also spotted in the Kulansai gorge at the Kara-Bogaz-Gol bay in north-western Turkmenistan (Lukarevsky 2001). This site is approximately 170 km south of the observation in USNR.



Fig. 3. Camera trap photo of the Persian leopard set up by the authors on the first bait site on the territory of the Ustyurt State Nature Reserve on 6 November 2018 (Photo USNR/Pestov/Terentyev).

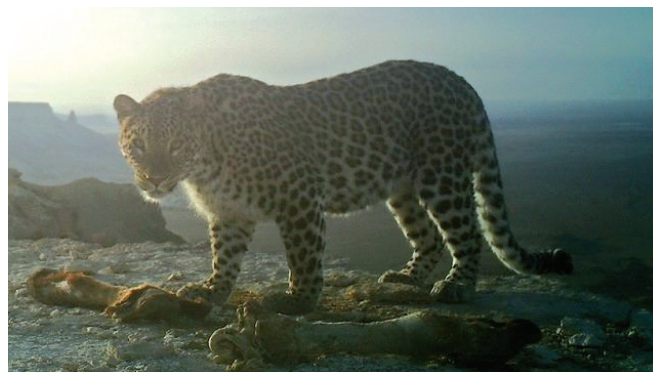


Fig. 4. Camera trap photo of the Persian leopard, set up by the authors on the second bait site in the Ustyurt State Nature Reserve on 7 December 2018 (Photo USNR/Pestov/Terentyev).

Three camera trap records over a period of 70 days in the USNR allow us to hope that the leopard will remain in the area. Habitat conditions are close to optimal: this area has little human disturbance, its relief provides good cover and within a radius of several kilometers, there are springs with reed beds. The appearance of the leopard in Mangystau provides additional arguments in favour for adopting measures to preserve all the biological and landscape diversity of the Ustyurt Plateau. When USNR was established, the scientists' opinion was not fully taken into consideration and because of this, only the Western chink of the Ustyurt Plateau and Kenderli-sor were set aside as protected. At present, proposals for the expansion of the reserve as well as for its nomination as a UNESCO World Heritage Site were not taken into account despite experts' justification (Pestov & Dieterich 2015). The reason for this is a conflict of interest with plans to develop the territory of the southern Ustyurt near the reserve's borders in order to explore and exploit the Kansu and Samtyr gas fields. We propose to increase the buffer zone of the reserve up to 10 km and to establish a new protected area in the South Ustyurt, including the Kaplankyr chink, near the border of Kazakhstan with Turkmenistan and Uzbekistan. These measures could be part of a compromise, given that significant part of the southern Ustyurt is planned for exploration and production of hydrocarbons. Relevant proposals were submitted to the Committee of Forestry and Fauna of the Ministry of Agriculture of the Republic of Kazakhstan.

The leopard currently is not listed in the Red Book of the Republic of Kazakhstan (2010). At present, with the support of the Central Asian Desert Initiative CADI project, we have already developed a biological justification for including the Persian leopard in the Red Book of Kazakhstan. This document will be submitted to the Government of Kazakhstan in the near future. In addition, experts are currently discussing the preparation of an Action Plan on the Persian leopard in Kazakhstan. In this context we also call for further research in Turkmenistan and Kazakhstan to investigate whether there are more leopards in Kazakhstan; and what routes they migrate between the two countries.

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References

Heptner V. G. & Sludskii A. A. 1972. Mammals of the Soviet Union. Vol. 2, Part 2. Carnivora (Hyenas and Cats). Vysshaya Shkola, Moscow. 169–171 pp. (In Russia).

Lukarevsky V. S. 2001. Leopard, striped hyena and wolf in Turkmenistan. M. Signar. 128 p.

Pestov M. V. & Dieterich T. P. 2015. Plans to develop the Kansu gas field on the border of the Ustyurt reserve are a real threat to the ecosystem of the reserve and the largest population

of the Saker Falcon in Kazakhstan. Birds of prey and their protection 31, 24–31.

- Pestov M. V., Nurmukhambetov Zh. E., Terentyev V. A., Mukhashov A. T., Pulatov A. A. & Turmagambetov S. M. 2017. Results of the project on supplemental feeding of vultures in the Ustyurt State Natural Reserve (Kazakhstan) in 2016. Raptors and their protection 34, 12–26.
- Plakhov K. N. 2006. Ustyurt State Nature Reserve. Reserves of Central Asia and Kazakhstan. Almaty: Tethys, Almaty. 107–118 pp.
- Plakhov K. N., Pestov M. V. & Nurmukhambetov Zh. E. 2016. Occurrences of the Persian leopard in the Republic of Kazakhstan. Teriofauna of Russia and adjacent territories. International Meeting (X Congress of the Teriological Society of the Russian Academy of Sciences). M.: Partnership of scientific publications KMK. 325 p.
- Red Book of Kazakhstan. 2010. 4th edition. Volume I: Wildlife. Almaty, DPS. 324 p.
- Red Book of Turkmenistan. 2011. Wildlife. Volume 2. Ashgabat. 384 p.
- Shakula V. 2004. First record of leopard (*Panthera pardus*) in Kazakhstan. Cat News 41, pp. 11–12.
- Sludsky A. A., Afanasyev Yu. G., Bekenov A. A., Grachev Yu. A., Lobachev Yu. S., Makhmutov S., Strautman E. I., Fedosenko A. K. & Shubin I. G. 1982. Mammals of Kazakhstan. V. 3, Part 2. Predatory (marten, cats). Alma-Ata, Science. 264 pp.
- Khorozyan I. G., Baryshnikov G. F. & Abramov A. V. 2006. Taxonomic status of the leopard *Panthera pardus* (Carnivora, Felidae) in the Caucasus and adjacent areas. Russian Journal of Theriology 5, 41–52.
- Khorozyan I. 2008. *Panthera pardus ssp. saxicolor*. The IUCN Red List of Threatened Species 2008.

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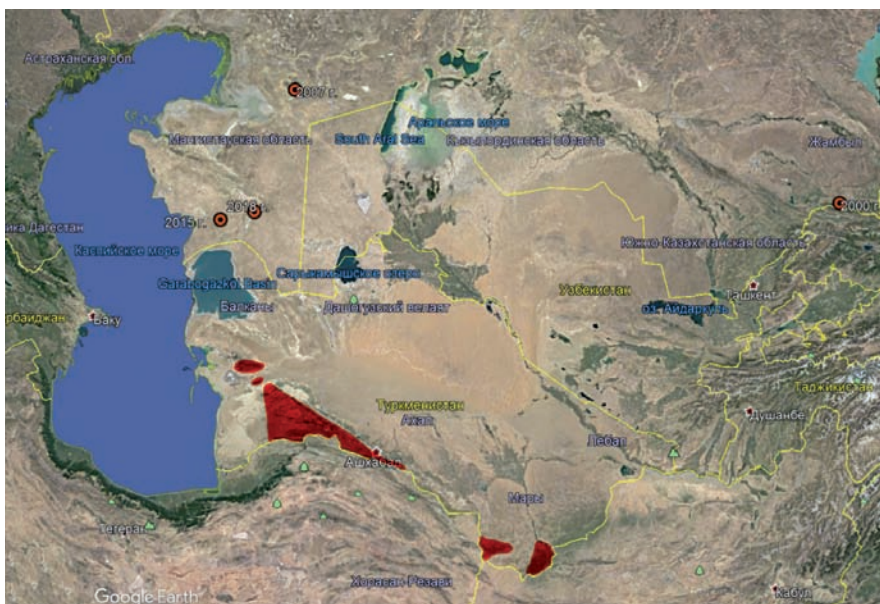


Fig. 5. Range of the Persian leopard in Kazakhstan and neighbouring Turkmenistan (according to Heptner & Sludsky 1972 and Khojamuradov, pers. comm.).