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## A Pallas's cat roadkill in Iran

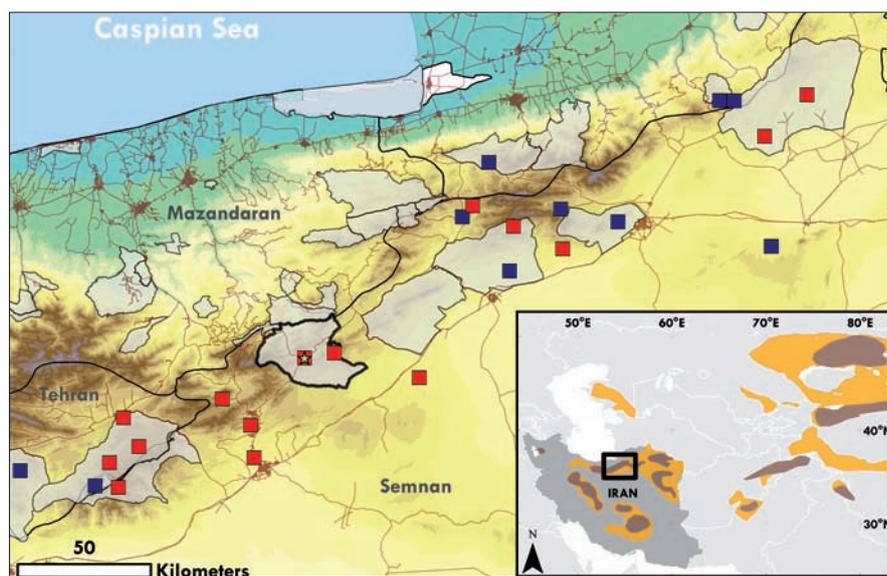
**Pallas's cats *Otocolobus manul* are globally threatened by human-generated habitat degradation and fragmentation and poaching, as well as depletion of their prey base. Vehicle accident mortalities of the Pallas's cat are not a common phenomenon, and we are not aware of any documented cases. Here we report the observation of a Pallas's cat roadkill in a protected area in northern Semnan Province, Iran.**

On 26 October 2017 at 14:25 h, a Pallas's cat was found dead on the edge of a paved road crossing Parvar Protected Area PPA, just 1 km south-west of Vavsar-e No (= Jadid) village in the border area between Mazandaran and Semnan Provinces (35°57'37" N / 53°33'08" E, at 2,200 m; Fig. 1). The first author inspected the carcass (Fig. 2), identified it as an adult female in good condition, and estimated that it had died the previous night. Apparently this Pallas's cat had been struck by a motor vehicle, but there was no obvious external damage to the specimen which was moved to Semnan Provincial Office of the Department of Environment DoE for further examination.

Morphometric body measurements were: total length = 480 mm; tail length = 260 mm; rear-foot length = 95 mm; ear = 53 mm; and weight = 2.36 kg. A necropsy undertaken by the first author revealed no bone fractures, but laceration of internal organs suggested that the animal had been involved in a high-impact collision. The stomach of the cat contained remains of a partially digested Afghan pika *Ochotona rufescens* and feathers of chukar partridge *Alectoris chukar* was found in its intestine. Examination of the skull, mandible and teeth confirmed that this was an adult, approximately 2.5 years old cat (Supporting Online Material SOM Figure F1, SOM Table T1). The skull and skin were deposited at the Osteology Museum of Semnan DoE, where they are currently waiting to be catalogued.

Approximately 35 km north of the town of Mehdishahr (then Sangsar), PPA is located at the ecotone between the Caspian Hyrcanian mixed forests and juniper forest steppe biomes in the central-southern slopes of the Alborz Mountains (53°19'–47' N / 35°53'–36°06' E; Fig. 1). PPA extends over a predominantly mountainous area of approximately 625 km<sup>2</sup>, with the altitude ranging from 1,350 to 3,782 m. There are several major villages inside and in vicinity of PPA. One main road (Semnan-Damghan) passes through PPA for approximately 37 km, whereas another road (Semnan-Sari) approximately 19 km long connects villages in this area to Mazandaran Province (Fig. 1). The latter stretch is mainly used by pastoralists who migrate with their livestock at this time of the year from summer pastures in the north in Mazandaran Province to lowland winter pastures in the south in Semnan Province. Livestock herds, often accompanied by dogs, dominate the surrounding area along this stretch, and we observed that the area next to the location of this roadkill was being heavily grazed (SOM F2). We presumed that disturbance caused by livestock herds might have triggered this Pallas's cat dispersal, although there is currently no evidence for this. The Pallas's cat, also known as manul, is widely distributed across Iran, possibly the western-most part of the species' global

distribution range, but it is generally considered a rare carnivore (Farhadinia et al. 2016, Moqanaki et al. in press). The threats facing these cats in Iran (incidental killing, habitat degradation and depletion of their preferred prey; Moqanaki et al. in press) underline the challenges facing this Near Threatened small felid across its global distribution range (Ross et al. 2016). The death of Pallas's cats due to collisions with vehicles seems to be rare, as we are not aware of any documented records in the literature. However, we do not rule out the occurrence of previous incidents, in Iran or elsewhere that have not been detected by wildlife authorities, or reported in the literature. Our report contributes to the current knowledge of human-induced causes of the Pallas's cat mortality. The current and future development of road networks in Asia risks exacerbating habitat loss and fragmentation for carnivore species (Ceia-Hasse et al. 2017). To date, roads have not been considered a threat to the Pallas's cat. Our observation of a Pallas's cat roadkill in PPA suggests that this species is not safe from expansion of road infrastructure, as re-



**Fig. 1.** Location of the Pallas's cat roadkill (asterisk in red square) in Parvar Protected Area, Semnan Province, and contemporary (2000–2017) records (5 x 5 km<sup>2</sup>) of the species (red: "confirmed", blue: "probable"; Moqanaki et al. in press). The inset shows location of the main map in relation to the approximate geographical distribution of the Pallas's cat in Western, Southern and Central Asia (dark brown: extant, light brown: possibly extant; re-drawn from Ross et al. 2016).



**Fig. 2.** Roadkill of an adult female Pallas's cat at the side of Semnan-Sari Road in Parvar Protected Area, Semnan Province, on 26.10.2017 (Photo M. A. Adibi).

cords of the Pallas's cat occurrence in human-disturbed habitats are emerging (Webb et al. 2014, Moqanaki et al. in press).

### References

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- Webb R., Pain D., McNiven D. & Francis S. 2014. Pallas's cat in disturbed habitat on the Tibetan Plateau. *Cat News* 60, 19–20.
- Supporting Online Material SOM Figures F1 & F2 and Table T1 are available at [www.catsg.org](http://www.catsg.org).

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**Adibi M. A., Shirazi M. R. & E. M. Moqanaki 2018. A road-killed Pallas's cat in Iran. Cat News 68, 21-22. Supporting Online Material.**

**SOM T1.** Skull measurements (in mm) of a road-killed, adult female Pallas's cat from Parvar Protected Area in Semnan Province, Iran.

<b>Skull measurement</b>	<b>Length (mm)</b>
Greatest length of the skull	87
Depth of the skull	43
Condylobasal length	80
Palatal length	34
Post-palatal length	40
Zygomatic breadth	64
Mastoidal breadth	46
Interorbital breadth	20
Post-orbital breadth	38
Breadth of braincase	45
Length of rostrum	22
Width of rostrum	23
Length of nasals	28
Occipitonasal length	79
Length of mandible	57



**SOM F1.** Skull of the road-killed, adult female Pallas's cat at the possession of Osteology Museum of Semnan Department of the Environment, Semnan, Iran (Photo M. A. Adibi).



**SOM F2.** A herd of domestic livestock grazing Parvar Protected Area, Semnan Province, within the habitat where the road-killed Pallas's cat was discovered (Photo M. A. Adibi).