

SOME THOUGHTS ON THE STATUS OF MANUL *OTOCOLOBUS MANUL* IN THE MOUNTAINOUS AREAS OF THE REPUBLIC OF UZBEKISTAN

Gritsina M.¹, Abduraupov T.¹, Soldatov V.²

¹*Institute of Zoology, Academy of Sciences of the Republic of Uzbekistan,*

²*UNDP/GEF Project “Sustainable natural resource and forest management
in key mountainous areas important for globally significant biodiversity”,*

Tashkent, Uzbekistan

mgritsina@gmail.com

Abstract. This article provides information about the results of the Rufford Small Grant Foundation project «Specification of the status of Manul (*Otocolobus manul*) in Uzbekistan» implemented with additional financial support from OSME (Ornithological Society of the Middle East and Caucasus) in the framework of the project «Monitoring of IBA “Oygaing valley” and the adjoining territories, Uzbekistan». According to literary sources, Manul used to inhabit the Kyzylkum Desert, Ustyurt Plateau and southern (mountainous) part of Uzbekistan. This article also includes data obtained in the course of a study carried out with the support of Pallas's Cat International Conservation Alliance in the south of the country. The research was carried out between 2015 and 2017 in Western Tien Shan and the west of the Hissar-Alai region. The collected data was based on camera trapping and local people interviews. The expeditions were largely focused on collecting data on Turkestan Red Pika (*Ochotona rutila*) as one of the potential food objects for Manul and the distribution of Red Marmot (*Marmota caudata*) whose burrows can be used as shelters. As a result, the presence of Manul was not confirmed during the studies; however, some data were collected about key factors that are likely to limit the habitat of Manul in Uzbekistan. The status of Manul in the country is still unknown.

Keywords: Manul, Uzbekistan, mountainous areas, Turkestan Red Pika, Western Tien Shan, western Hissar-Alai region

Introduction

Manul (*Otocolobus manul*) is a small wild cat included in the IUCN Red List as Near Threatened and in Appendix II of CITES. Earlier, in 1983, the cat was included in the Red Data Book of Uzbekistan as a rare and little-studied species that is decreasing in number and threatened by hunting and the economic development of the country (Sadikov 1983). It was not listed in later editions of the Red Data Book of Uzbekistan (Abdurakhmanov and

Kreytsberg 2003, Azimov 2006, 2009) due to a complete lack of data (Gritsina 2013).

According to literary sources, Manul used to inhabit the Ustyurt Plateau, sky islands of the Kyzylkum desert and southern (mountainous) part of the country (Sultanov 1939, Leviev 1939, Ishunin 1961, Sapozhenkov 1961, Geptner and Sludskii 1972, Mitropolskiy 1979, Lesniak et. al 1984).

No research into this cat was carried out for over 30 years, although it continues to be present in all the lists of vertebrates of Uzbekistan. Most of the information about Manul distribution can be found in literary sources of the Soviet period, which, however, was not confirmed by material findings (skins, bones). Finally, in 2014 a reconnaissance survey of Manul was carried out in Uzbekistan. Camera traps were set in the sky islands of the Kyzylkum desert forming an isolated area within the species' range. Locals and experts were interviewed but no new data relating to the presence of Manul was obtained (Gritsina 2015).

The aim of the projects by Rufford Small Grant Foundation and Pallas's cat International Conservation Alliance was to specify if Manul was present in Western Tien Shan and western Hissar-Alai mountainous region. The main stimulus to carry out research into this territory came from literature sources which provide the following information:

O. V. Mitropolskiy (2005) notes that no reliable confirmation of the presence of Manul in Western Tien Shan was recorded. However, in the autumn of 1980, in the lower part of the Keles River valley (Kazakhstan) hunting dogs – fox terriers – pulled a Manul from a hole (no skin or skull present in zoological collections). The author notes that Manul habitation in the mountains of Western Tien Shan is quite likely, especially in the area of Red Pika's distribution in the Pskem River valley.

There is more literary data available on the western part of the Hissar-Alai mountain region. According to them, Manul once lived in the Baysun Mountains, which was confirmed by a skin obtained in Sherabad District (Sultanov 1939). However, currently, this skin cannot be found in any of the zoological collections in Uzbekistan. According to hunters, Manul also used to inhabit in the foothills and mountains of Saryassiya District (Leviev 1939). Later, A. A. Allayarov (1963) and I. G. Ishunin & A. A. Allayarov (1964) conducted research in the lower part of the Surkhan River but did not find Manul. The authors indicate that no information on the animal was found in the Republican department of *Uzkoopzhivsyrye*, nor was it recorded in any zoological collection.

Later, a number of scientists indicated that Manul inhabited the southern part of Uzbekistan, but in their works they refer to the sources mentioned above (Kuznetsov 1941, Novikov 1956, Ishunin 1961, Sludskiy 1973, Geptner and Sludsky 1972, et al.). Lesnyak et al. (1984) maintain that they «recorded Manul Cat in Surkhandarya province» without giving any factual information or references to sources.

Thus, we have only two instances of reliable confirmation of Manul Cat habitation in Surkhandarya province. However, the skin of the cat discovered in the mountains of Sherabad cannot be found in any zoological collection.

Material and methods

Before planning field trips we studied available literary sources and the collections of the National University of Uzbekistan and Institute of Zoology under the Academy of Sciences of the Republic of Uzbekistan. It helped us select areas most likely to be the species' habitats, where we put the greatest focus on those inhabited by Turkestan Red Pika (*Ochotona rutila*), which is, apparently, principal prey of Manul. As a result, some data was collected during the field expeditions to the Pskem, Oygaing and Shabirsay valleys in Western Tien Shan (August 2015, July 2016), the Igrisu valley in the buffer zone of the Hissar State Reserve in the west of the Hissar-Alai region (August 2015, April 2016), and Baysuntau (August 2015, April 2016) and Kelif-Sherabad Ranges (November 2016, April 2017).

During the expeditions we installed 18 camera traps (Covert UV552, Covert UV562HD and Bushnell HD Trophy Camera Camo 119547) within the potential habitat of Manul and surveyed the area with the help of GPS (WGS 84 datum). The cameras were set to take pictures 24 hours a day, with a 1-second interval between each in a series of 3 pictures. The camera traps were operating in 37 locations for 1821 camera days.

During transects we were registering places and the number of Red Pikas, Red Marmots and other rodents. We covered 84.8 km of transect routes by car and 119.5 km on foot (Western Tian-Shan) and 243 km of transect routes by car and 93 km on foot in Hissar-Alai.

The area was surveyed with the help of binoculars (Olimpus 10x40, Nikon 10x42) and a telescope (Optolyth 80x60), which was used in camps. Pictures were taken with the help of cameras (Nikon D3200 lens Nikkor AFS55-300, Nikon D7200, lens S55-300).

We interviewed local people and local authorities to collect information on the presence of Manul and on factors that can potentially impact its distribution in areas it still inhabits.

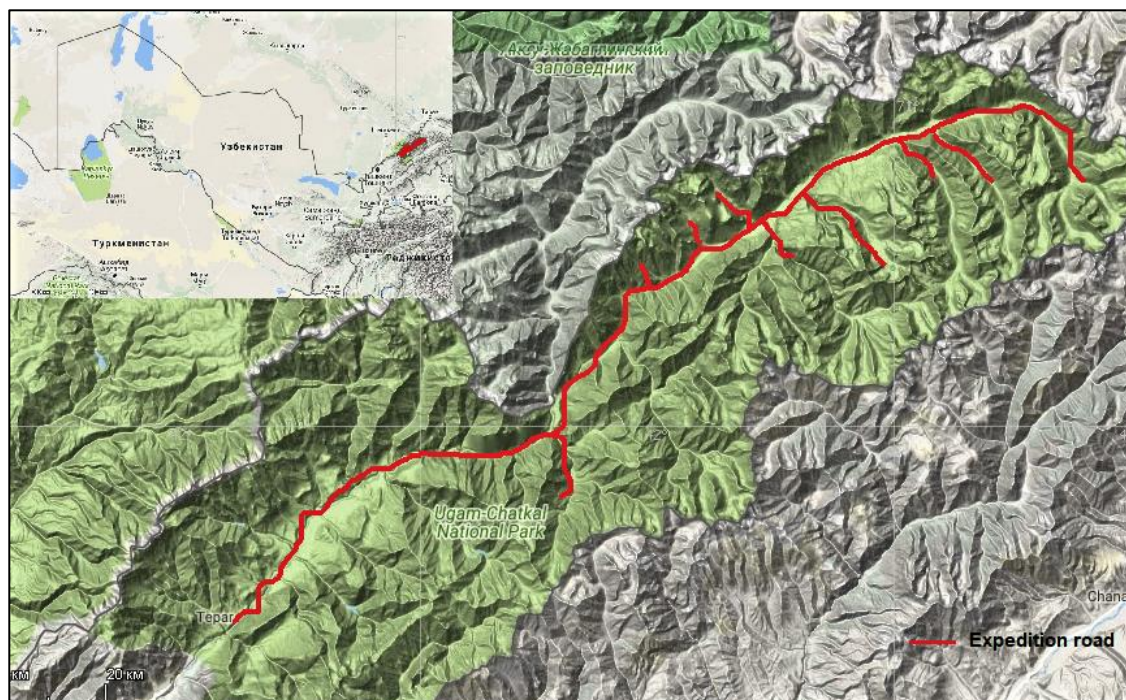


Fig. 1. Survey route in Western Tien Shan

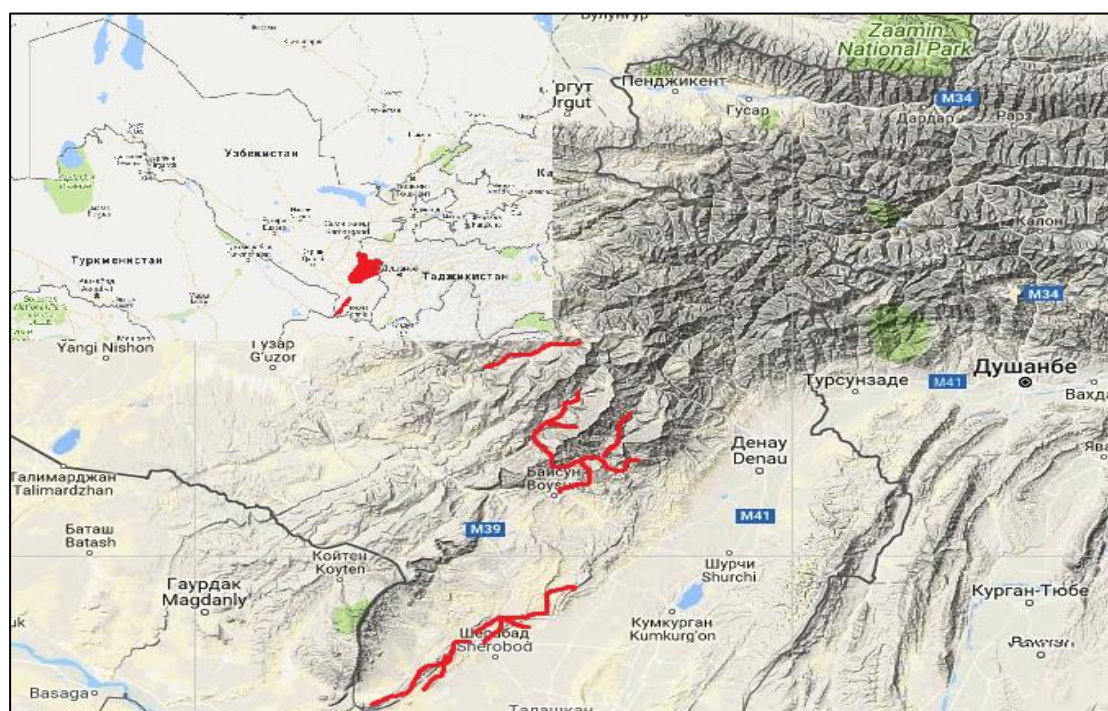


Fig. 2. Survey route in the western Hissar-Alai region

Results

During the research there was no Manul recorded by camera traps, which, certainly, does not signify its absence in Uzbekistan. It is often very hard to impossible to establish reliably the fact of a species' absence in an area (Jackson et al. 2005).

To estimate the occurrence of Manul we collected data from local people and attempted to analyze potential habitats to establish if they were actually suitable for the cat's habitation. We decided upon the main criteria for each site: a) food availability throughout the year; b) snow depth; c) shelters availability; d) existence of anthropogenic threats. Given below are analysis results for each site.

Western Tien-Shan

Interview data

All permanent residents were interviewed in the Pskem, Oygaing and Shobirsay river valleys: seven families of beekeepers (16 people), the staff of the avalanche station 'Oygaing' (3 people) and avalanche station of 'Maydantal' (6 people); people temporarily staying in the territory – inspectors of Brichmullinsky Forestry (17 people), inspectors of Ugam-Chatkal National Park (5 people), border soldiers (10 people) and shepherds (35). Only one respondent told that he saw Manul, but not in the project area (specifically, near Akbulak, Chatkal Range, at the border with Kyrgyzstan). There is a possibility, however, that the respondent could confuse it with Asiatic Wild Cat (*Felis lybica ornata*) living in this territory.

a) year-round food availability

The distribution of Red Pika in the study area raises some interesting questions. Turkestan Red Pika is considered a rare species distributed within a limited area. V. M. Petrov (1961) was the first who recorded Red Pika in the region: he observed this species in the Pskem Range, in the area between the Chiralmasay and Ikhnachsay Rivers, the Pskem's tributaries, as well as on the northern slopes of the Chatkal Range, in the upper course of the Akbulaksay in Uzbekistan and the Chetbergsay, the tributary of the Ters River in Kyrgyzstan (Mitropolskiy 2005). V. I. Kapitonov encountered the animal in the Ugam Range, near Sayram Peak (Bernstein 1980). We found out that Turkestan Red Pika inhabits in much larger area along the Pskem River, living in relatively dense colonies on scree. We discovered colonies of the animal in the following places: two colonies were recorded in the middle stream of the Baykariksay River, where 3 individuals of Pika were observed; on the dam of Lake Shobyrcul – 1 individual; in the upper stream

of Shabyrsay – 4 colonies of Pika with 6 animals observed. In addition, Red Pika was recorded by camera traps – two animals on the dam of Shobyrcul lake and three on a path on the north-western slope of the Pskem Range near Shobyrcul lake. Thus, Pika cannot be regarded a prolific species, while its distribution is distinctly mosaic. We believe the Red Pika is not sustainable food for Manul.

The next potential food object for Manul is Tolai Hare (*Lepus tolai*). Our observations and the records of camera traps show that Tolai Hare is scarce in the Pskem River basin. We recorded the animal's scat only in one location – in the Ugam Range, near Anaulgensay. There were no alive Hares seen. Tolai Hare cannot be basic food for Manul.

Since to collect data on murine rodents requires a special approach, we did not obtain any. However, the lists of rodents inhabiting the project territory provided by V. P. Kostin (1953), B. S. Vinogradov and I. M. Gromov (1984) and O. V. Mitropolskiy (2005) suggest that potential food objects may include some non-hibernating species, such as Juniper Vole (*Microtus carruthersi*), Social Vole (*Microtus socialis*), Tien-Shan Vole (*Microtus kirgisorum*), Kazakhstan Vole (*Microtus ilaeus*) and Silver Mountain Vole (*Alticola argentatus*) as well as Tamarisk Gerbil (*Meriones tamariscinus*) occurring mainly at low altitudes in mountains, Wood Mouse (*Apodemus uralensis*) and House Mouse (*Mus musculus*) which keeps to human-inhabited areas.

As for land-nesting birds, we estimated the numbers of Chukar Partridge (*Alectoris chukar*). In 2015, we counted 202 birds on our way from Pskem village to the 'Oygaing' snow avalanche station. In 2016, we counted 67 birds on our way from Pskem village to the 'Oygaing' snow avalanche station and in the Tekeshsay, Ayutor Vostochniy and Baykyraksay valleys, at altitudes from 1.600 to 2.900 m above sea level. On 7 July 2016, in the middle part of the Baykyraksay River valley we recorded 15 newly born chicks of Chukar Partridge, and on 3 July 2016, 15 fledglings were observed near Tekeshsay. The camera trap installed in the Akkapchigay River valley captured adult Partridges with fledglings between 15 August and 8 September 2015: 15 August 2015 – 4 fledglings; 28 August 2015 – 1 adult and 1 fledgling; the same day, two hours later – a group of 1 adult and 5 fledgling; 30 August 2015 – a group of 5 fledgling and 2 adults; the same day – a group of 3 fledglings; 1 September 2015 – 1 adult with 2 fledglings; 8 September 2015 – 1 adult (Ten et al. 2017). Thus, although this population of Chukar Partridge has more potential for reproduction, it was not actually big at the time of the survey.

b) snow depth

According to the data from the ‘Oygaing’ and ‘Maydantal’ snow avalanche stations, the snow cover in some places is up to 2 meters deep and even more. Even the southern slopes of mountains are completely covered with snow more than 30 cm deep for 3-4 months each year. As is known, the snow cover in 30 cm and more in depth is a serious limiting factor for Manul (Geptner and Sludskii 1972, Kyriluk and Puzanskiy 2000).

c) shelters availability

There are enough shelters in the territory – niches and crevices in rocks, large stones, slabs and the burrows of Red Marmots. We got a general idea of the Red Marmot’s occurrence in the project area. We recorded 160 individuals of Red Marmot during a total of 115 km of hiking. It became obvious that the colonies are unevenly distributed and suppressed by grazing livestock and dogs. To specify the number of Marmots and the density of settlements further targeted research is needed.

d) existence of anthropogenic threats

The main threat in the project area is livestock pasturing. As a rule, each shepherd has 4-5 large dogs. These dogs catch marmots, particularly, young ones, and feed on them (Chernogayev et al. 1996). This was also supported by our observation of the behavior of Marmots and dogs in the shepherds’ field camps. Guns had been confiscated from local people because of the area’s location close to the state border, which, however, did not stop poaching, as, according to interviews, people use loops and traps. In most cases they poach Red Fox (*Vulpes vulpes*), Stone Marten (*Martes foina*), Chukar Partridge, Siberian Ibex (*Capra sibirica*), Wild Boar (*Sus scrofa*), Wolf (*Canis lupus*), Red Marmot and Tien Shan Brown Bear (*Ursus arctos isabellinus*), the last species included in the Red Data book of the Republic of Uzbekistan (2009). Seasonal overgrazing has been recorded in the last 7 years. The heaviest overgrazing takes place from mid-May till September, which was learnt through analysis of the data from camera traps. As soon as livestock leaves pastures, the number of wild animals increases and they begin to be active even during daytime. It should be noted that we did not find any facts confirming the use of pesticides in the project territory.

Western Hissar-Alai area

Interview data

In the middle stream of the Igrisu River and in the Baysuntau Range a total of 12 hunters, 24 shepherds, five workers from the Forestry Service and 47 residents of villages were interviewed. In that area we met three persons who not only identified Manul, but also described their encounter with the

animal. Their information seems reliable, as the abovementioned respondents confidently associated Manul with Turkestan Red Pika. Also, we had a talk with B. Aromov, a researcher at the Hissar State Reserve, who had been working in this territory for more than 20 years. He never heard about the animal from either hunters or local people, nor did he ever see Manul himself. In the territory of the reserve camera traps have been working from 2013 till now (Esipov et. al. 2016), but no records of Manul have been made yet.

In the Kelif-Sherabad area we interviewed in total 51 persons from local communities, 35 of which were shepherds, 4 hunters, 3 geologists and 9 farmers. None of the respondents could identify Manul in a picture; nor did they know what kind of cat that was or see it before.

a) year-round food availability

The middle stream of the Igrisu River and the Baysuntau Range are populated by Red Pika. We recorded 4 colonies in the Igrisu valley near Chakchar village in 2015, but in 2016 the colonies were destroyed by locals. One individual of Red Pika was recorded in the Baysuntau Range in an area known as Khodga Gurgurota. It seems Red Pikas are not numerous there and their geographic range is fragmented.

Tolai Hare is quite common in the middle stream of the Igrisu River; on a 24-kilometre transect we recorded scat in 17 locations, and the camera traps often captured the hare. In Baysuntau Tolai Hare is quite scarce – we recorded it only twice.

According to literary sources (Vinogradov and Gromov 1984), the Hissar Range and its spur, the Baysun Range, are habitats for the following non-hibernating species: gerbils living in the foothills – Libyan Gerbil (*Meriones libycus*), Mid-day Gerbil (*Meriones meridianus*), Tamarisk Gerbil and Great Gerbil (*Rhombomys opimus*), as well as Grey Hamster (*Cricetulus migratorius*), Bucharian Vole (*Blanfordimys bucharicus*), Carruther's Vole (*Microtus carruthersi*), Afghan Vole (*Blanfordimys afghanus*), Silver Mountain Vole, Wood Mouse and House Mouse.

Chukar Partridge is not very abundant in the middle stream of the Igrisu River, as during two trips we saw only 4 birds. In the Baysuntau Range in Khodga Gurgurota area Chukar Partridge was not numerous species, after 2 visits the total number of birds recorded is 43.

The Kelif-Sherabad area is not a habitat for Red Pika. Hibernating species include Yellow Ground Squirrel (*Spermophilus fulvus*) inhabiting the clay-

rich areas of the foothills, which are actively used by man and undergo heavy anthropogenic pressure. Jerboas inhabit the foothills, sometimes occurring as high as rock formations. These include Small Five-toed Jerboa (*Allactaga elater*), Severtzov's Jerboa (*Allactaga severtzovi*) and Grey Hamster. The commonest non-hibernating species are Libyan Gerbil, Mid-day Gerbil, Tamarisk Gerbil and Great Gerbil. These inhabit primarily the foothills, where friable soil allows for digging burrows; they occur at higher altitudes, but avoid rocky areas. Besides, there are a number of Vole species, which, according to literary sources (Vinogradov and Gromov 1984), inhabit the mountains and foothills of Surkhandarya province but which we did not record during our research expedition. These include Afghan Vole, Bucharian Vole, Silver Mountain Vole and Carruther's Vole.

The territory is inhabited by Tolai Hare, which, though quite a common species in Uzbekistan, is currently rare in the area under study. We did not see any alive individual in over 300 km of car transect and around 70 km of walking transects. Only in three locations we recorded scat. Hare was only once captured by one of our camera traps. Probably, their low number resulted from regular poaching and active cultivation of lands and also may be associated with natural change in population size.

The territory is a home for a number of bird species. Non-migratory birds that build their nests on the ground and stay in the area throughout the year include Chukar Partridge and See-see Partridge (*Ammoperdix griseogularis*). On a 3 kilometre transect we recorded 25 individuals of Chukar Partridge and 15 individuals of See-see Partridge. Those two species are numerous in this area.

b) snow depth

In the middle stream of the Igrisu River the snow is deep, more than 1 meter, while the snow level can reach 2 m and on the northern slopes and 30 cm on the southern slopes of the Baysuntau Range. The snow cover is not a factor preventing Manul from inhabiting the Kelif-Sherabad area. Snowfalls are rare in the region, the thickness of snow cover never exceeds 10-15 cm and it does not normally remain on the ground for more than a few days.

c) shelters availability

The middle stream of the Igrisu River and the Baysuntau range have a large number of niches and crevices in the rocks, large stones and slabs. However, we did not record any colonies of Red Marmot. The Kelif-Sherabad Range features diverse relief suitable for Manul, as it can live in both rock formations and clay-rich foothills. However, all foothills in the area and rock

masses in the Kelif-Sherabad Range are being used actively for agricultural purposes.

d) existence of anthropogenic threats

The middle stream of the Igrisu River is a densely populated area. Because of insufficient supplies of electricity and gas people cut down shrubs and forests. Livestock grazing occurs everywhere, with the same problem recorded in the Baysuntau Range. All piedmont areas up to altitudes of 1,800-2,000 m above sea level are densely populated. In addition, people poach and do not conceal it. For example, in the Machaydarya River valley we recorded instances of poaching on rare species: local people offered us three skins of Central Asian Otter (*Lutra lutra seistanica*), two skins of Tien Shan Brown Bear (*Ursus arctos isabellinus*) and one hat from its skin, as well as the skins of Turkestan Lynx (*Lynx lynx isabellinus*) and Tajik Markhor (*Capra falconeri*) (Gritsina et al., 2016).

The Kelif-Sherabad Range is widely used as a pasturing ground for domestic animals (sheep, goats, cows, horses and donkeys), in some places throughout the year. This resulted in the formation of heavily degraded areas which cannot be inhabited by wild animals. Each shepherd has from 2 to 4 dogs which they do not feed and the animals have to search for food for themselves: they pillage birds' nests and hunt after rodents and other mammals. By summer the number of drinking places decreases and they become poorly accessible or inaccessible to wild animals because of shepherds and dogs present in the territory. The ridge is surrounded on all sides with towns and villages, the largest of which are Sherabad and Pashkhurt. Among the biggest problems in these communities are poor supplies of gas and electricity, which forces the people to cut the vegetation in the mountains (currently, there are almost no shrubs and trees in the foothills). The local people's main occupation is farming, with large areas of land used as fields, orchards and pastures. In addition, the range is surrounded with a network of roads and bordered with a railway from the south, which is currently not used. Local people acknowledge that illegal hunting after all types of animals is thriving in the territory. The government does not make any efforts to control the activity in the area. We discovered traces of geological operations, in particular, exploring shafts and rubbish. Although the operations were, probably, carried out over 10-15 years ago, the people and equipment had disturbed and impacted the environment. The pits (excavations) left after the operations became traps for a number of vertebrate animals, which could not get out once they got into them. Also there is a project to build a plant in the western part of the ridge: the area has received proper geological studies and the preparations for the construction are in full swing. Obviously, this territory will become uninhabitable for a

number of vertebrate species. We did not find any facts confirming the use of pesticides in the studied territories.

Conclusion

As a result, no signs were recorded during the research confirming the presence of Manul. However, we made research into several potential habitats and drew a general idea about the availability/non-availability of literary and interview data, as well as about basic natural and anthropogenic factors that may impact the habitation of Manul, which is reflected in Table 1. The following criteria were used to assess the possibility of the cat's habitation in each of the study areas: encounters with Manul in literary sources, year-round availability of food, snow cover less than 30 cm deep, availability of shelters and recorded anthropogenic influence.

Table 1. Criteria to estimate the suitability of study areas for the habitation of Manul

Study area	Encounters recorded in literary sources	Encounters recorded during interviews	Food availability throughout the year	Snow cover less than 30 cm deep	Shelters availability	Existence of anthropogenic threats*
Western Tien Shan (Pskem, Oygaing, Shabirsay valleys)	—	—	+	—	+	**
Igrisu River valley	—	+	+	—	+	***
Baysuntau Range	+	—	+	—	+	**
Kelif-Sherabad Range	+	—	+	+	+	***

* – low; ** – medium; *** – high.

Table 1 shows that Kelif-Sherabad is the only area that meets 4 of the 5 estimation criteria (except for anthropogenic influence, which is medium to high throughout) and is therefore the most suitable for the cat's habitation. However, the Kelif-Sherabad Range is a densely populated area used actively for pasturing and farming, which results in the low level of diversity (abundance) of mammals inhabiting it.

Red Pika, potential food for Manul, is found in three of the studied areas – in the Pskem, Oygaing and Shobyrsay valleys, the middle stream of the Igrisu

River and the Baysuntau Range. Colonies of Red Pika in all the three territories are small and fragmented, which means Red Pika cannot be a sustainable food object for Manul. Tolai Hare is prolific in Western Tien Shan and in Kelif-Sherabad and Baysuntau Ranges. Populations of Chukar Partridge are stable, and this species demonstrates good potential for reproduction. Every study area is inhabited by voles, which are available as food throughout the year. However, this information is based on literary data. Thus, there is generally enough prey for Manul to satisfy its alimentary needs.

All the project areas have enough shelters, with colonies of Long-tailed Marmot recorded in the Pskem, Oygaing and Shabyrsay valleys.

The main threat across the project areas is livestock grazing, with the territory of the Kelif-Sherabad Range being the most degraded by pasturing. As the areas are poorly supplied with gas and electricity, local people actively cut vegetation. The most active poaching was recorded in the west of the Hissar-Alai region.

Thus, the status of Manul in the country is still unknown. Probably, Manul does not currently inhabit the Kelif-Sherabad area (perhaps, it did earlier) because of the anthropogenic pressure and, possibly, climate changes that have taken place in the last 50-60 years. The Igrisu valley in the west of the Hissar-Alai region and the Oygaing, Pskem and Shabyrsay valleys in Western Tien Shan are unlikely to be the habitats of Manul, which is primarily because of the thick snow cover in winter. Since the spurs of the Baysuntau Range are mentioned as the habitat of Manul, we think research D. Roe, Rinchen Wangchuk and Don O. Hunter, 2005, surveying snow in the territory should be continued, primarily, on its medium and low altitudes, as the upper part of the range is covered with deep snow in winter.

Further data should be collected with the help of interviews and camera traps, with a special focus on the Turkestan Range, since we did not do make any survey of this area.

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