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#### THE CARACAL *CARACAL CARACAL* SCHREBER, 1776 (MAMMALIA: CARNIVORA: FELIDAE) IN UZBEKISTAN

Mariya Alexeevna Gritsina

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Mariya Alexeevna Gritsina 

Institute of Zoology, Academy of Sciences of the Republic of Uzbekistan, Tashkent 100047, Uzbekistan.  
mngritsina@gmail.com

### PLATINUM OPEN ACCESS



**Abstract:** This article provides information about 27 records of the Caracal *Caracal caracal* in Uzbekistan, particularly in the Kyzylkum Desert and the Ustyurt Plateau. The data collected between 2011 and 2017 were based on information from literary sources, field research, and interviews with local people. At least 11 individuals of the species were killed intentionally and one was run over by a car. Basic threats to the species in Uzbekistan are negative interactions between herders and Caracal, lack of knowledge about its protected status among local people, and lack of conservation measures. The preconditions for the protection of Caracal are the existence of remote unpopulated areas close to state borders between adjacent countries and socio-economic factors that prompt people to move from rural to urban areas. Caracal habitats are protected in Kyzylkum State Reserve, Saigachiy Landscape Sanctuary, and six wildlife sanctuaries. To conserve Caracal, it is necessary to strengthen the network of protected areas in deserts and raise the awareness of local communities and decision-makers in the national government. It is important to continue research on Caracal and develop a government-approved action plan for its conservation.

**Keywords:** Central Asia, interview survey, Kyzylkum Desert, negative interaction, threat assessment, threatened felid, Ustyurt Plateau.

**Russian Abstract:** В публикации представлена информация о 27 встречах каракала *Caracal caracal* в пустыне Кызылкум и на плато Устюрт (Республика Узбекистан). Приведены сведения за период с 2011 по 2017 гг., которые основаны на имеющихся литературных данных, собранном во время экспедиционных выездов материале и сообщениях местного населения. По крайней мере 11 особей каракала были преднамеренно убиты и еще одно животное было сбито машиной. Основными угрозами в Узбекистане представляются существующий конфликт между скотоводами и каракалами, отсутствие знаний об охранном статусе вида среди местного населения и отсутствие должных мер по его охране. Предпосылками для сохранения каракала являются наличие удаленных незаселенных территорий вблизи государственных границ между соседними странами и социально-экономические факторы, которые побуждают людей переезжать из сельской местности в города. Места обитания каракала охраняются в Кызылкумском государственном заповеднике, ландшафтном заказнике «Сайгачий» и еще в шести природных заказниках. Для сохранения каракала необходимо укрепить сеть пустынных охраняемых природных территорий и повысить осведомленность местного населения и лиц, принимающих решения на правительственном уровне. Представляется важным продолжить исследования по каракалу и в дальнейшем разработать одобренный правительством план действий по его сохранению.

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**Author Details:** The author, a graduate of the biological faculty, Samarkand State University, Uzbekistan, has a master degree in zoology. She worked as a researcher at the Zarafshan National Reserve and later Samarkand Museum of Regional Studies. Since 2015 she is a researcher at the Institute of Zoology, Academy of Sciences (Uzbekistan).

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## INTRODUCTION

The Caracal *Caracal caracal* is one of the rarest vertebrates in central Asia, where it occurs in Uzbekistan, Kazakhstan, Turkmenistan, northern Iran, and Afghanistan (Heptner & Sludskii 1972). Its range also covers arid regions in Africa, the Arabian Peninsula, the Middle East, Pakistan, and India (Avgan et al. 2016).

The Turkmen Caracal is included as Critically Endangered in the Red Data Books of Uzbekistan (Abdunazarov 2009) and Kazakhstan (Bekenov & Kasabekov 2010) and as Endangered in the Red Data Book of Turkmenistan (Hodzhamuradov & Imamov 2011). The species is included in Appendix I of the CITES (Avgan et al. 2016).

In the 20<sup>th</sup> Century, the Caracal was recorded on Uzbekistan's Ustyurt Plateau, in Lower Amudarya area, northwestern and southwestern parts of Kyzylkum Desert, and the plains adjoining Surkhan and Zeravshan rivers (Heptner & Sludskii 1972; Mitropolsky 1979; Lesnyak et al. 1984; Bogdanov 1992; Abdunazarov 2009). It inhabits bumpy, well-fixed sands along the Ustyurt Plateau escarpments and on gypsum and stony plains (Sapojnikov 1962; Heptner & Sludskii 1972). Its diet consists primarily of Tolai Hare *Lepus tolai*, Gerbils Gerbillidae, Jerboas Dipodidae, birds, reptiles, and insects. Sometimes it hunts Goitered Gazelle *Gazella subgutturosa*, Red Fox *Vulpes vulpes*, and lambs of Domestic Sheep *Ovis aries* (Sapojnikov 1960, 1962).

Only fragmentary data are available on its current distribution and population size in Uzbekistan. Studies on Caracal were not conducted since the 1980s. Most of the information on recent encounters with Caracal was published in Russian (Lim 2009; Lim & Klichev 2009; Gritsina 2012; Marmazinskaya et al. 2012; Bykova et al. 2015; Gritsina et al. 2016; Marmazinskaya & Mardonova 2016). Thus, this information is poorly available for the international audience and is expedient to provide in this article. This article summarizes all the data on Caracal currently available in Uzbekistan and specifies the existing threats, their causes, and conservation measures that need to be taken.

## STUDY AREA

Ustyurt Plateau lies between the Mangyshlak Peninsula, Kara-Bogaz-Gol Depression, Aral Sea, and Amudarya Delta. The plateau is an important transboundary region shared by Uzbekistan, Kazakhstan, and Turkmenistan. The Kyzylkum Desert covers the landscape between the Amudarya and Syrdarya rivers, which is bordered by the Aral Sea in the north and the

Tien Shan and Pamir-Alai ranges in the southeast. Most of the desert lies in Uzbekistan and Kazakhstan, with a few small portions in Turkmenistan (Fig. 1). The basic landscape of the Ustyurt Plateau is clay desert covered with Wormwood *Artemisia* or mixed Wormwood and Glasswort *Salicornia* communities, with occasional sand areas. The plateau is edged by 'chinks', a regional name for escarpments, which are up to 200m high in some places. Most of the plateau is covered with vegetation, varying from Wormwood and Glasswort in the northern desert subzone to ephemeral plants and Wormwood in the southern desert subzone. The summer is hot and long, lasting from May to September. Average daily temperature in July is 26–28 °C, reaching up to 40–60 °C in some years. In winter it drops to -26°C and even to -41°C.

The Kyzylkum Desert largely consists of fixed and semi-fixed dunes, with occasional patches of unvegetated sand. It includes extensive areas of clay, gypsum, taky, and saline soils and low sky islands. The plant species prevailing on sandy patches are Sand Sedge *Carex arenaria*, White Saxaul *Haloxylon persicum*, *Calligonum*, and Richter's Saltwort *Salsola arbuscula*; the ones on clay are Wormwood often mixed with shrubs, and *Anabasis salsa* mixed with Saltwort. Average temperature by day in July is between 26°C and 29°C, reaching up to 51°C, and in January between 0°C and 9°C.

## MATERIAL AND METHODS

Information was obtained through the collection and analysis of data from literature, field surveys, and interviews. Data collection in the field was carried out during expeditions to the Ustyurt Plateau and Kyzylkum Desert (Fig. 1). During the expeditions, we observed the terrain from elevated points using binoculars or telescope and installed camera traps (Covert UV562HD, Bushnell HD Trophy Camera Camo 119547, and Covert UV552). Using GPS based on WGS 84 datum, we recorded our car and walking routes as well as the points where we encountered wild animals.

For interviews with local people, we designed a questionnaire in Russian. It comprised 10 questions regarding the sex, age, and occupation of respondents, their knowledge about the presence of the species in their environs, their attitudes to wild carnivores, and their perception of interaction with carnivores and of threats to wildlife.

In the villages, we interviewed people who were outside their homes and asked them to recommend

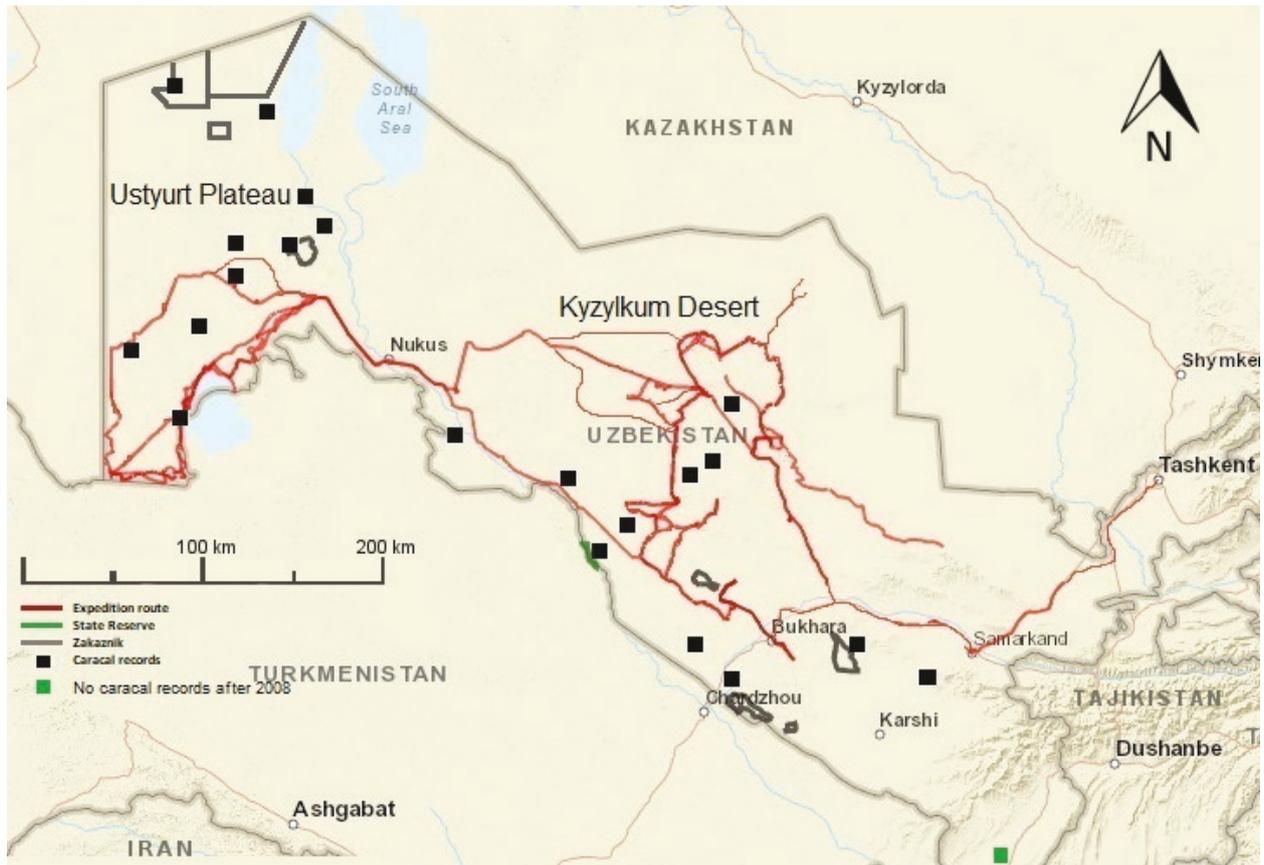


Figure 1. Surveyed areas in Uzbekistan between 2011 and 2017. Expedition routes are marked in red, and international border of Uzbekistan by a solid line.

hunters who were knowledgeable about wildlife. Outside villages, we interviewed all the shepherds that we met during our transits across the desert. We also collected data from the staff of a Bukhara regional nature protection organization and of a compressor station on the Ustyurt Plateau. We recorded the GPS location of each interview and wrote down the responses of the informants. During interviews, we showed them images of wild cats that possibly occur in the area (Asiatic Wildcat *Felis lybica ornata*, Jungle Cat *F. chaus*, Sand Cat *F. margarita*, Manul *Otocolobus manul*, and Caracal), of species that certainly do not occur in Uzbekistan (Andean Cat *Leopardus jacobita* and Fishing Cat *Prionailurus viverrinus*), and of species that historically occurred in the area (Cheetah *Acinonyx jubatus* and Tiger *Panthera tigris*). We noted all the data on Caracal records and attacks of Caracals and other predators on livestock to gain a general understanding of the situation in the region. We assessed threats to Caracal based on previous literature and results of the interview surveys.

## RESULTS

The analysis of published Caracal records was an important task for determining routes of our expeditions. Table 1 shows all available information on Caracal presence in Uzbekistan published between 2000 and 2016.

We did not find any record of Caracal in the area of the Surkhan River published later than 2008 (Fig. 1).

Our expeditions took place in the southern and central parts of the Ustyurt Plateau between 2011 and 2015, and in 2017. In 2011, we travelled in the southwestern Kyzylkum Desert. Between 2014 and 2015, we carried out surveys in the northwestern part of this desert, and between 2014 and 2016 in the central part. During the expeditions, we conducted 1,865.5km transect routes by car and 428km on foot and accumulated about 350 observations. Camera traps were set up in 50 locations, including 14 locations on Ustyurt Plateau on 1,080 camera trap days and 36 locations in the Kyzylkum Desert on 3,741 camera trap days.

We interviewed 104 local people from seven villages

**Table 1. Caracal records in Uzbekistan published between 2000 and 2016.**

Date	Location name	Type of record	Source
Summer 2000	Kyzylkum Reserve in northwestern Kyzylkum, riparian forests of the Tiksuat Section, bank of the Amudarya River in Ostrov Island section	Sightings of two individuals.	Salimov 2004
June 2005	Zeravshan-Uchkuduk Road, 30km from the town of Uchkuduk in central Kyzylkum	An individual killed by a car.	A.S. Nuridjanov pers. comm. June 2005; Gritsina et al. 2016
3.iv.2009	Sura Well, 35km from the Kyzylkum Reserve	An individual killed a few lambs in a sheep herd. Local people killed this individual, probably in retaliation for sheep losses. Later, the dead individual was stuffed and is now exhibited in the Museum of Nature at the Kyzylkum State Reserve (Image 1).	Lim 2009; Lim & Klichev 2009
2009	Ustyurt Plateau	One individual sighted.	Abdunazarov 2009
2011	Karnabchul, southwestern Kyzylkum, 8km southeast of Igrichi	One individual sighted.	Marmazinskaya & Mardonova 2016
2013	16km southeast of Igrichi	One individual sighted.	Marmazinskaya & Mardonova 2016
2014	10km northeast of Igrichi	One individual sighted.	Marmazinskaya & Mardonova 2016
July 2015	Northwestern chink of lake Sarykamysh	One individual captured on a camera trap.	Bykova et al. 2015

and 220 shepherds in the desert, including 278 in group sessions with 2–12 people and the remaining individually. Respondents were shepherds, hunters, farmers, housewives, village elders, and local authorities aged between 14 and 73 years.

Caracal occurrence reported by local people and camera trap records obtained during our field surveys are summarised in Tables 2 and 3. Information on observations and killed Caracals was published in Russian by Gritsina (2012), Marmazinskaya et al. (2012), and Gritsina et al. (2016).

Of the 324 respondents, 28 people (8.5% of total) pointed to the facts of killing Caracal in the past 17 years, either intentionally or as a result of trapping in snares set up for wild predators in general. Local people are completely unaware that Caracal is a law-protected species. Only 58 people identified Caracal correctly from the images. We recorded that the local population were on the whole less aggressive to Caracal than to Wolf. Wolf is considered the main threat to livestock. Eighteen people from the respondents were aggressive towards wild cats and believed that they caused significant damage to sheep and chicken.

Though we did not find any Caracal skins at local markets, we did find the skins and products of other small wild cats, mostly that of Asiatic Wildcat (14 skins and 21 hats) and Jungle Cat (four skins and two hats).

### Kyzylkum Desert

In the Kyzylkum area, we interviewed 245 people in five villages and in more than 40 locations. Villagers of Kalaata in central Kyzylkum reported a Caracal killed by herders on 20 March 2014 about 20km southwest of the



**Image 1. Stuffed Caracal exhibited in the Museum of Nature at the Kyzylkum State Reserve in Uzbekistan. © N. Marmazinskaya.**

village. Later, we found the carcass of a young female in the place indicated by the local people (Image 2). The cat was caught in a leg-snare near a sheep pen. Also, the villagers informed us of another Caracal killed by herders in 2012, which used to attack lambs in the calving period, killing up to 10 lambs at one time but leaving them uneaten. This information was confirmed by herders from the village of Jankeldy, 14km from Kalaata. They told us that people from Kalaata killed three individual Caracals between 2012 and 2013. An official of the Bukhara Regional Department of the State Committee for Nature Protection, F. Salimov, observed Caracals several times near the above-mentioned village of Jankeldy and on the shore of lake Zamonbobo in the past 10–15 years. He accounted for the sighting of one individual “several

**Table 2. Caracal records collected in Kyzylkum Desert during expeditions between 2011 and 2017.**

Date	Location name	Type of record
Between 2000 and 2005	Village of Jankeldy and lake Zamonbobo	Several sightings of individuals.
Autumn 2006	Surroundings of Turtkul	One individual sighted.
March 2011	Shore of lake Dengizkul	Caracal footprints found by M. Gritsina.
Between 2012 and 2013	Surroundings of Kalaata Village	Three individuals killed by herders.
October 2013	Near the town of Gazli	One individual sighted by F. Salimov, an official of the Bukhara Regional Committee for Nature Protection.
Autumn 2013	Lake Dengizkul	One individual sighted by F. Salimov.
20.iii.2014	20km southwest of Kalaata	One individual killed by herders.



**Image 2. The carcass of a young female found in Kyzylkum Desert in Uzbekistan on 20.iii.2014. © M. Gritsina.**



**Image 3. Caracal captured by a camera trap on 22.ix.2017 on Ustyurt Plateau in Uzbekistan. © M. Gritsina & D. Nuridjanov.**

dozen kilometres" from the village of Turtkul in 2006. In October 2013, he also saw a Caracal by day near the town of Gazli, and another one in the autumn of the same year not far from lake Dengizkul (Gritsina et al. 2016).

### Ustyurt Plateau

In the Ustyurt Plateau area, we interviewed 79 people in four villages.

Footprints of Caracals were recorded in seven places in the southern and central parts of the Karakalpak portion of the Ustyurt Plateau (Marmazinskaya et al. 2012).

In 2014, a hunter from the village of Kubla-Ustyurt killed a Caracal whose skin still remains in the village. We could not estimate the number of animals caught. In late April to early May 2015, the manager of the Kubla-Ustyurt Compressor Plant encountered an individual 5km from the Raushan Ascent on the chink, when he was returning to the village from Kungrad during daytime. The Caracal was lying on the road and only when the driver stopped the car and honked several times did the animal rise unhurriedly and go towards the chink (Gritsina et al. 2016).

In autumn 2010, herders killed an individual that took five lambs from a sheep pen near Churuk Well. According to local people, Caracals frequent the well area. In the same winter, a hunter from Kubla-Ustyurt killed a Caracal near the village. This was not the hunter's first Caracal, as in 1976 this person had killed another one (Gritsina et al. 2016).

On 22 September 2017 at 07.06h, one individual was captured in a camera trap on the eastern chink of Ustyurt Plateau, opposite the western bank of Sarykamysh Lake (Image 3).

Thus, in the years from 2000 to 2017, Caracal was documented in at least 27 localities in Uzbekistan, including 13 dead individuals and 14 live ones. At least 11 individuals were killed intentionally and one was run over by a car. Of the dead and live animals, the presence of Caracal in the area was recognised by its footprints in eight cases.

**Table 3. Caracal records collected in Ustyurt Plateau during expeditions between 2011 and 2017.**

Date	Location name	Type of record
1976	Kubla-Ustyurt Village	One individual killed.
Winter 2005	40km from Kirkkiz Village towards the chink of the Aral Sea	One individual killed by a hunter.
May 2010	Near Cape Aktumysyk in the Aral Sea village Karateren	One individual observed by workers of Microwave Relay Station 23.
Autumn 2010	Churuk Well Village	One individual killed by herders.
Winter 2010	Amudarya River near the city of Urgench	One individual killed.
Winter 2010	Surroundings of Kubla-Ustyurt Village	One individual killed by a hunter.
Winter 2011	Between the cities of Kungrad and Muynak, Aral Sea area	One individual caught in a trap.
May 2012	Southern and central parts of the Karakalpak portion of the Ustyurt Plateau	Caracal tracks in seven places identified by the survey team.
Spring 2013	Near lake Sudochoye	One individual sighted by a respondent.
Winter 2014	Village of Kubla-Ustyurt	One individual killed.
Between 2000 and 2014	Eastern chink of the Aral Sea village	Individuals often caught in traps set for Wolves.
Late April to early May 2015	5km from the Raushan Ascent on the chink village	One individual sighted by respondent.
22.ix.2017	Near Sarykamysh Lake on the eastern chink (Image 3)	One individual captured on a camera trap.

## DISCUSSION

### Threats to Caracal in Uzbekistan

Analysis of interview surveys revealed that all respondents with the exception of local authorities did not know that Caracal is included as a protected species in the Red Data Book of Uzbekistan (Abdunazarov 2009).

Five Caracals were hunted in retaliation for killing livestock. Another five individuals were killed intentionally by poachers, while two others were caught in traps set for other species.

The main reason for negative interactions between local people and mammalian predators including Caracal is the lack of knowledge of the people on how to properly guard their small livestock. They use traditional, long-established, outdated grazing and breeding methods. The pens built by herders have low walls without solid roofs. Enclosures on grazing grounds are mostly made of thin mesh tied to ordinary wooden sticks and are roofless. In spring and summer, sheep and goats graze and breed without any structures for their protection. Some herds are escorted by a few dogs *Canis familiaris*, usually of Tazy breed, but these dogs are rarely trained to guard and protect the livestock from predators. In addition, they are poorly fed by herders and therefore hunt small wildlife. Due to these circumstances, small livestock is a helpless and easy prey for predators. We did not find any evidence of dogs attacking Caracal.

Results of studies conducted in South Africa indicate that Caracal preys foremost on rodents (Grobler 1981; Palmer & Fairall 1988; Avenant & Nel 2002). The latter

authors demonstrated that predation by Caracal in the vicinity of West Coast National Park depended on the availability of wild prey and husbandry techniques; predation on small livestock was limited to the lambing season in spring when rodent densities decreased.

Although Caracal is a non-migratory species, it covers long distances of up to 90km during dispersals and in search of food and mates (Avenant & Nel 1998). For this reason, the fence along the border between Uzbekistan, Turkmenistan, and Kazakhstan poses a certain threat. Caracal habitats are interspersed by heavy-traffic asphalt roads and a network of dirt roads. In view of the Caracal killed in a traffic accident, the road network passing through Caracal habitat is a potential threat. Another potential threat is railways, with a few tracks crossing the feline's habitat.

### Ecologic factors possibly impacting Caracal distribution

Abdunazarov (2009) suggested that the quantity of available food impacts Caracal distribution and population size. We do not have any data on Caracal's food resources and its dependency on prey density. A specialized study is required to assess these ecologic variables.

Bekenov & Kasabekov (2010) suggested that cold and snowy winters have a negative effect on Caracal population because the species is not adapted to low temperatures and thick snow cover. Data on the death of Caracals as a result of cold and snowy winters in Uzbekistan for the last 15 years are lacking.

Some parts of Caracal habitats are remote and poorly accessible, which makes patrolling by nature protection

agencies problematic and ineffective. The main obstacles are insufficient funding, lack of technically-skilled human resource, and the absence of anti-poaching brigades. Owing to these circumstances, environment protection measures are currently not implemented.

### **Ecologic factors favouring the conservation of Caracal in Uzbekistan**

Caracal occurs only in the desert regions of Uzbekistan. The climate in deserts is characterised by low winter and high summer temperatures alongside other hard natural conditions such as strong winds, poorly accessible areas, and deficiency of fresh water. Some of these areas were brought into use during the Soviet period, but most of them remain unpopulated and are rarely visited by people. Among these unpopulated and unvisited territories are the southern portion of the Ustyurt Plateau, the section of northwestern Kyzylkum next to the border with Kazakhstan, and some parts of central Kyzylkum. These conditions determined by ecogeographic and socioeconomic factors leave many suitable habitats intact and are therefore favourable for Caracal conservation in Uzbekistan.

### **Socioeconomic factors favouring the conservation of Caracal in Uzbekistan**

In the Soviet period, many desert areas were intensively used for large-scale construction of roads, boring of wells, and establishment of rural communities. By now, some villages built in the Soviet times are fully or partly abandoned, and most areas are depopulated due to the migration of people to towns within the country or abroad.

Some of these territories lie close to the borders with Kazakhstan and Turkmenistan, and special permissions must be obtained from border police for visiting these areas.

Formerly, there were a number of small villages in the southern part of the Ustyurt Plateau where people used existent wells as water sources and lands as pastures for their livestock. Currently, no villages exist here any longer and livestock grazing is not practised.

These demographic factors lower human pressures upon wildlife and favour the conservation of biodiversity, including that of Caracal, in the region.

### **Existing conservation measures and measures that need to be developed**

Hunting Caracal is prohibited, as it is included in the Red Data Book of Uzbekistan (Abdunazarov 2009). Species listed therein can only be taken out of their

natural environment if there is a sanctioned quota and a permission approved by the Cabinet of Ministers and the Academy of Sciences of the Republic of Uzbekistan, in compliance with the Law of the Republic of Uzbekistan On Protection and Use of Fauna (No. 408, 19 September 2016) (Mirzeev 2016), and the Decree by the Cabinet of Ministers of the Republic of Uzbekistan On Regulation of Use of Biological Resources and On Permission Issuance Procedures in the Use of Natural Resources (No. 290, 20 October 2014) (Mirzeev 2014).

Caracal habitats are conserved in two protected areas, Kyzylkum State Reserve (IUCN Ia) covering 10,311ha, and Saigachiy Wildlife Sanctuary (IUCN Ib) with 219,800ha. The Kyzylkum State Reserve is a well-protected area, mostly because it is situated next to the state border with Turkmenistan. Visits to the reserve and its neighbourhoods are only allowed to local residents and holders of a special permit. The protection of the Saigachiy Wildlife Sanctuary founded in 2016 on the Ustyurt Plateau is unsatisfactory because of its vast area that is difficult to manage and is remote from settlements. There are 10 rangers who have four vehicles at their disposal but insufficient funding (fuel and daily allowances) for the continued patrol of the protected area. In addition, there are several smaller protected areas that include Caracal habitats, such as the Sudochy Ornithological Wildlife Sanctuary on the western side of the Amudarya Delta (50,000ha), Dengizkul Wildlife Sanctuary (50,000ha), Karakir Wildlife Sanctuary (30,000ha), Sichankul Wildlife Sanctuary in the Sundukli sands, southwestern Kyzylkum (70,375ha), and Karnabchul Wildlife Sanctuary in southwestern Kyzylkum (25,000ha). All these reserves must be considered 'paper parks' without real protection and management.

We think it is necessary to implement the following activities for Caracal conservation in Uzbekistan: 1) strengthen the protection of Caracal habitats in the existing protected areas and establish new protected areas in the Kyzylkum Desert and on the Ustyurt Plateau, 2) raise local people's awareness and knowledge and inform them about the need for Caracal research and protection, 3) improve the protection of livestock by establishing predator-proof corrals and herding practices, and 4) raise the awareness and knowledge of nature conservation agencies, hunters, and hunters' associations. Much more attention should be paid to scientific research on Caracal, particularly in terms of estimating its current status and range and of developing a functional population monitoring system. It is also important to design, approve, and implement an action plan for Caracal conservation in Uzbekistan and to secure support from conservation authorities.

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